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# Tanzania Agricultural Insurance Feasibility Study

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Conducted by Syngenta Foundation for  
Sustainable Agriculture (SFSA) for  
the Swiss Capacity-Building Facility (SCBF)

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## 1. Goals of the Study

In order to reach the goal of a more professional Tanzanian agricultural sector, investment by stakeholders and Tanzanian farmers is required along with innovative solutions to encourage and protect increased farmer investment. The success of agricultural production does not only depend on a farmers' agricultural knowhow, but also on the climatic and environmental conditions, which are generally beyond the grower's control. This is where the development of agricultural insurance becomes important.

In India, over the last 10 years index insurance has grown to enable access to agricultural credit for over 22 million farmers, unlocking a value of 3.1 billion USD in agricultural investment. While investment in agriculture throughout Sub-Saharan Africa has led to increases in cash and subsistence crop productivity, weather risks (erratic rainfall, flooding, and subsequent disease) are threatening these gains. Without risk management tools, formal financing and investment by farmers, these gains will remain limited. One potential risk mitigation tool is agricultural micro insurance. This will effectively create a safety net for farmers to enable and encourage them to invest in their farms and raise productivity, increase food security, and reduce the risks financial institutions face when lending in agriculture.

Syngenta Foundation for Sustainable Agriculture (SFSA) started the Kilimo Salama (Safe Agriculture in Kiswahili) project in Kenya in 2009 to develop and market agricultural risk mitigation products. These insurance products protect smallholders' investment in quality inputs so they can pay off agricultural loans, and start afresh at the next season even if there is a drought. Through indexes based on weather station and satellite data, objective and low cost monitoring enables an affordable risk mitigation solution for previously uninsurable farmers. To distribute the insurance, the team leverages agricultural value chains and mobile networks to support access to credit, inputs, and markets.

The goals of this study were to investigate:

1. To what extent risks can be insured through formal risk transfer.
2. To what extent these insurance products would be attractive and affordable to farmers.
3. Whether insurance products would be financially viable for the private sector stakeholders.
4. Propose and outline pilots that could be financially viable for insurers, relevant to farmers.

The findings of this study will serve as a roadmap for Kilimo Salama's entry into Tanzania's agricultural insurance sector.

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## 2. Tanzania Introduction

Tanzania is an East African country with a population of 47.78 million (2012) with a national GDP of USD 28.24 billion. Agriculture is the largest sector of the economy in Tanzania. The majority of the population (about 75%) lives in the rural areas where their livelihoods depend on agriculture either directly or indirectly. Agriculture contributes actively to the GDP at 26.8%.

The country experiences two types of rainfall regimes. A uni-modal regime occurs between November/December and April over Southern, Southwestern, Central and Western areas. A bimodal regime has two rainy seasons; both a short rain and long rains season. The short rains season occurs between October and December over the Northern Coast, North-eastern highland, Lake Victoria basin and the Islands of Unguja and Pemba.

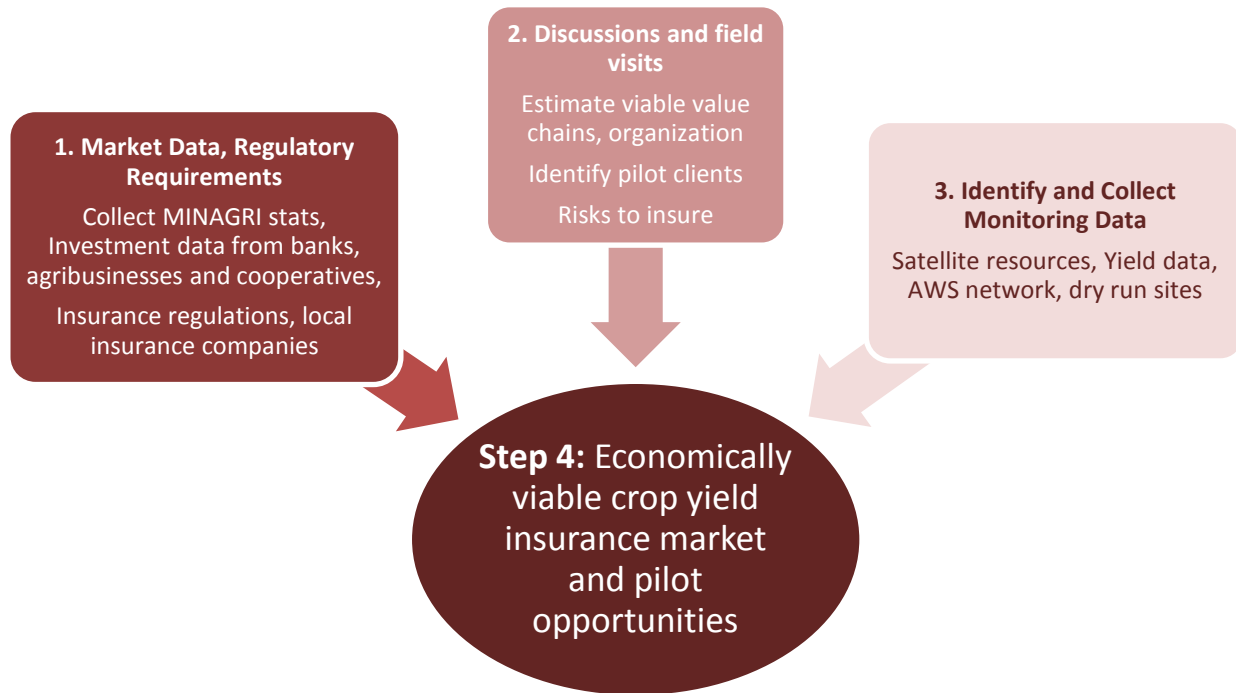
The insurance sector has grown in the past years from 6% of adults in 2009 to up to 19% of adults in 2012 having an insurance product; most are through group life insurance embedded in a loan or deposit account with a financial institution (2012, Cenfri Tanzania Access to Insurance Diagnostic). Tanzania Insurance Regulatory Agency (TIRA) is the independent regulatory authority of the insurance industry of Tanzania and had as per December 2011 a total of 26 insurance companies (including 1 reinsurance company), 89 insurance brokers, 572 insurance agents, and 47 loss assessors & adjusters. Of the uninsured population 60% indicate that they do not have insurance because they cannot afford it, 24% do not know how insurance works, 18% do not know how to find out where to buy it and 14% do not know what insurance means.

With agriculture contributing significantly to the country's economy and 38% of adults reporting hunger due to drought as their third biggest risk, the value of having an agricultural insurance product is evident. However with the exception of some pilots in agricultural insurance, agricultural insurance for smallholder farmers is absent in the market. This is a gap and a space for opportunity that the insurance sector can utilize to develop relevant products for this market and expand their market share.

### 3. Methodology

The goal of the feasibility study was to estimate the potential for developing commercially viable crop and livestock insurance in Tanzania and to identify clients. Recognizing the diversity of the agriculture and livestock sector, the team conducting the study investigated the commercial viability of 8 value chains, establishing for each whether it would be beneficial for the farmers and stakeholders to insure the crop, and if it would be financially attractive for the insurer and Kilimo Salama. Analysis was done on maize, dairy livestock, cotton, tobacco, coffee, rice, sorghum, and sunflower.

The study was conducted in three phases – overview in below illustration.



#### Phase 1: Data collection

Data was collected from Tanzania’s government ministries, its agencies, and its development partners. In the private sector, the team met with banks, agribusinesses, processors, and input companies, also leading to product development and new clients. Additional information was gathered from several crop specific studies and interviews with agricultural NGOs.

#### Phase 2: Field visits

In the second phase the collected data was verified by field visits and discussions with farmers, agribusinesses, potential clients, farmer groups, and other stakeholders. As data on commercial profitability can change quickly over time, field and stakeholder interviews generally provide a good sounding board for testing market research data, especially when assessing the risks and input use.

#### Phase 3: Weather and yield data collection

Through meetings with the Ministry of Agriculture, meteorological department, and field level discussions, it was determined what reliable historical daily rainfall data (from rain gauges and/or automated weather stations) are available and what crop yield data is taken on a seasonal basis at a small administrative unit.

#### Phase 4: Identification of commercially viable products and pilots

After considering the data collected in the first three phases, value chains and specific aggregators were identified where crop or livestock insurance could be distributed. For a product to be commercially viable, three key elements should be present:

1. The risk or risks identified by farmers needs to be insurable.
2. For the risk identified, the appropriate data needs to be available.
3. The premium volume/margin needed to cover operational costs after 3 years.

For the risk to be insurable it must fit with an insurance product available in the market. Table 1 provides an overview of the products available in the market and the risks they can cover. Kilimo Salama currently only does multi-peril insurance for livestock in Kenya.

**Table 1: Available Agriculture Insurance Products**

Product	Type of Farmer	Risks Covered	Value Chains	Data Needed
<b>Multi-peril, visit based</b>	Large and Livestock	Named risks	All crops, livestock	Yield data from individual farms
<b>Weather index</b>	Small and Large	Drought, Excess rain, Weather-related disease	Maize, sorghum, coffee, tobacco sunflower, cotton	Weather data (min 15 years daily rainfall)
<b>Satellite index</b>	Small and Large	Drought, Excess rain, Weather-related disease, flooding	All above + horticulture and irrigated crops	Satellite data (min 15 years)
<b>Area yield index</b>	Small and Large	All catastrophic risks, excluding hail	All above	Yield data (min 5 years)

The third factor listed is key for insurance companies to remain interested in the product beyond the initial pilot stage. There are two factors that influence this: operational cost and potential premium volume.

Operational cost is determined by the distribution channel used for the product. Crops that are grown by farmers in groups, for well-established agribusinesses, or for which financing is available, have a lower operational cost to distribute.

Potential premium volume is determined by the market potential, in particular how many farmers grow the crop, but also to what extent growers invest in inputs for the crop. Coupled together with how the farmers are aggregated, this determines a realistic future premium volume.

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## 4. Data Availability

Traditional crop insurance based on farm visits and assessments has not been viable in most developing countries and faces difficulties with moral hazard and adverse selection. Index insurance, either through area yield or weather indices, provides an alternative. Since it employs an objective third party data source, index insurance does not have the same drawbacks as traditional insurance. Index based products cover specific risks and therefore need to “fit” the crop insured. For instance, if the crop does not suffer from drought risk, drought index insurance is not a relevant product and farmers will not likely to be willing to pay for the cover.

For the historical weather data, daily rainfall satellite data is available from the United States’ NOAA. Field verification would need to be done through a dry run with a partner/potential client. This will aid the team in quantifying the losses in yield from drought at certain parts of the growing season, especially for crops that Kilimo Salama does not have experience in.

From discussions with the Ministry of Agriculture and with partners in the field, dependable and accurate historical yield data collected per crop at a low administrative level is likely not available on a timely enough basis for an insurance product. For important cash crop value chains wherein the government is active in extension and procuring the final harvest for international sale (cotton, coffee, tea, tobacco, oil seeds, cashew), there may be yield data. A multi-peril product could be valuable to pick up production losses attributed to widespread pest damage or disease in addition to weather, but depends on the availability of quality yield data.

## 5. Insurance Sector

The Tanzanian Insurance Regulatory Authority (TIRA) is the independent regulatory authority of the insurance industry of Tanzania. Its mission is to develop and promote an efficient, fair, safe and stable insurance market for all policy holders and promote insurance expansion. The insurance regulatory framework in Tanzania is contained in the Insurance Act of 2009 and its Regulations, as well as the Code of Conduct and Ethics for the Tanzania Insurance Industry inserted as a schedule to the Regulations. Tanzania's insurance industry had a total of 26 insurance companies (including 1 reinsurance company), 89 insurance brokers, 572 insurance agents, and 47 loss assessors & adjusters (2011 Annual Insurance Market Performance Report, TIRA).

In Tanzania the insurance business is divided into two main classes, general (which include health, accident, and asset-related classes) and long-term (defined to include life and annuity, endowments, and other classes typically associated with life insurance).

### 5.1 Regulation

TIRA actively supports financial inclusion. The Insurance Act grants broad discretionary powers to the Commissioner for application as an inclusion-friendly tool to promote growth and development within the insurance sector. In recognition of the need to facilitate an inclusive insurance market, TIRA is developing micro insurance regulations. An early draft of the regulations communicates TIRA's intention to focus on the intermediation space for micro insurance, through the creation of a micro insurance agent category, rather than to allow for a separate micro insurance license.

The draft regulations define micro insurance conceptually as products accessed by the low-income population. Low-income households, in turn, are defined as those working in the informal sector. The definition thus explicitly excludes formal employees, but imposes no income cut-off. No specific product parameters are set, apart from specifying that micro insurance products will be classified as either life or general, not both. All micro insurance products must be submitted to TIRA for approval. Thus whether a product qualifies as micro insurance or not will be decided on a case-by-case basis.

Only micro insurance agents may distribute micro insurance. The category is broadly defined as any individual, company, NGO, Self-Help Group, or MFI appointed by an insurer to act as micro insurance agent for distribution of micro insurance products. Micro insurance agents are to be registered, subject to having either a National Secondary Education Certificate or a Certificate of Proficiency in Insurance. An agent must indicate upon application which type of micro insurance it will distribute. They must then enter into an agreement with an insurer that clearly specifies the terms and conditions, as well as their duties and responsibilities. It is not specified whether the number of insurers per agent is limited, which would imply that it is open-ended. – *Extract from 2011 Annual Insurance Market Performance Report, TIRA.*

### 5.2 Market Opportunity

Insurance usage in Tanzania has grown dramatically in recent years from around 6% of adults in 2009 to up to 19% of adults in 2012. 60% of the uninsured population indicated that they do not have insurance because they cannot afford it, 24% do not know how insurance works, 18% do not know how to find out where to buy it, and 14% do not know what insurance means. From the collected information it is clear that active measures are required to sensitize the population on insurance, and insurance products should be designed with affordability in mind. The growth in insured numbers is mainly seen in credit life. This is primarily attributed to the bundling of life insurance covers into loans by financial institutions (banks, micro finance organizations, SACCOs) and the introduction of new distribution channels like mobile network operators (an example being "TigoBima"). Outside of these mandatory



channels, voluntary uptake of insurance still remains low. (2012, Cenfri Tanzania Access to Insurance Diagnostic).

With the exception of some pilots in agricultural insurance and a number of private and NGO community-based health insurance schemes, agricultural and health insurance are absent in the low-income end of the market. This absence is in spite of 38% of adults reporting hunger due to drought as the third biggest risk they face, after the risk of having to be admitted to hospital for medical care followed by death (2009, FinScope Survey)-- showing a clear demand for insurance products. The latest official insurance usage figures in Tanzania from the FinScope 2009 survey (*a nationally representative demand-side survey on financial service usage, awareness and perceptions by Financial Sector Deepening Tanzania (FSDT)*) estimated that up to 16.4 million individuals could theoretically afford some insurance cover. Of them, almost 13 million have no insurance cover. This is a substantial large untapped market.

### 5.3 Agriculture and Insurance

Despite an urbanization rate of 4.7% per annum (2012 CIA World Fact Book), FinScope 2009 shows that nearly three quarters of the population remain rural. Agriculture provides a livelihood to about 80% of Tanzanians (2011, The World Bank), with the sector dominated by smallholder farmers cultivating an average farm size of between 0.9 hectares and 3.0 hectares.

The main challenges faced by smallholder farmers interviewed during the feasibility study are weather risks and the lack of finance, as financial institutions continue to consider smallholders too risky to lend to (2011, AgFiMS Tanzania Technical Demand Side Report). Insurance is proposed as the risk hedging tool to address both issues. However, despite the importance of agriculture, agricultural insurance products are absent in the micro insurance market, with the exception of few pilot programs

### 5.4 Viable Distribution Channels

From an insurance distribution point of view, in 2009 the Tanzanian population is categorized by the Tanzania Access to Insurance Diagnostic report by Cenfri in the following excerpts.

An estimated 72% (15,270,645) of adults in Tanzania are in what can be termed as the “hard to reach” category. This category is characterized predominantly by rural dwellers who tend to only have a primary education, are unbanked, have inconsistent levels of income as well as limited formal points of access for insurers. Tapping into this group will require innovative product design and distribution channels with the use of well-capacitated aggregators to unlock this market.

Another 28% of the market is either in the:

- A. “Within reach” segment (4%) where individuals earn a relatively consistent level of income and provide insurers with a formal point of access, either through their bank account or through their employer.
- B. “Flexible premium” group (6% of the adult population 1,265,694 individuals). Characterized as having moderately consistent income levels, are banked, a majority have a mobile phone, and nearly a third have credit with a formal institution. Tapping into this group will require products with features suiting their income realities.
- C. “Innovative distribution” segment (17.8%) of the adult population (3,759,532 individuals). Characterized by relatively inconsistent levels of income, are unbanked, and have limited access to mobile phones.

There are significant untapped opportunities in the insurance market. Re-engineering existing channels to be more flexible and introducing innovative distribution channels would be key for success. Some of the channels that are considered to have a higher probability of success are:

- A. Use of established brokers as sales points. Most insurance business is signed up through brokers. Kilimo Salama interviewed brokers who have expressed interest in forming a collaborative partnership.
- B. Use of financial institutions like banks, MFIs and SACCOs. Though most bank customers and formally employed individuals are likely to already have some kind of insurance cover, they generally have some link to agriculture either through their parents or rural dependents. This represents untapped opportunities. Some MFIS and SACCOs have been observed to set up a self-insurance model or to include formal insurance in their loans.
- C. Distribution through agricultural value chains, like processing plants, out grower schemes, input supplier networks, agricultural lenders, and agricultural cooperatives. Though this has been reported to be limited in Tanzania, as agricultural value chain infrastructure is underdeveloped both in capacity and scale.
- D. Mobile network operators (MNO) as a distribution channel are attractive because of high levels of mobile phone ownership (63%). Additionally there is a strong trend across the globe for MNOs to become involved in insurance distribution. MNOs are an ideal distribution channel as they control a range of communication channels, have a large client base, have mobile money services, and can easily aggregate premium payments.

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## 6. Analysis of Crop Value Chains

For the study, eight crop value chains were analyzed for commercial potential and feasibility for insurance, and then grouped by potential; the following sections include the findings.

### Potential Value Chains

- A. Maize
- B. Coffee
- C. Sunflower
- D. Sorghum
- E. Rice
- F. Tobacco
- G. Cotton
- H. Dairy Livestock

## 6A. Maize

Maize is the major food security crop in Tanzania, engaging millions of smallholder farmers on more than 4 million hectares. The maize value chains in Kenya and Rwanda have been the primary focus on Kilimo Salama in those countries and it will likely be the same in Tanzania. In maize, Kilimo Salama evaluated three different potential distribution channels – through large scale seed multipliers and through micro finance institutions giving input loans to smallholder farmers.

### Maize Seed Multipliers

Tanzania has regions that receive uni-modal rains and others that receive bimodal rains. The two rainy seasons are the long rains season (Masika) and the short rains season (Vuli). The long rains season normally covers the whole country while the short rains season is normally found in a few regions -Dar es Salaam, Pwani, Morogoro, Tanga, Kilimanjaro, Kagera, Mwanza, Mara, Kigoma, Zanzibar, and parts of Mbeya, Arusha and Shinyanga regions (2011 Ministry of Agriculture Annual Report).

Large scale farms generally cultivate at least 20 hectares of land. The 2011 Annual Agricultural Report shows the number of farmers growing maize during the long rains season is almost four times the number growing during the short rains season (2008, Large scale Farmer Report). During the long rains season, Manyara had the largest planted area of maize (5,496 ha) followed by Arusha (3,404 ha), Dodoma (2,830 ha), and Kilimanjaro (2,343 ha). The regions with large scale farmers planting a medium-sized area of maize were Iringa (1,319 ha), Ruvuma (1,231 ha), Pwani (1,365 ha), Tanga (1,211 ha), Mara (1,067 ha), and Morogoro (867 ha). This information was supported by interviews with Alliance for a Green Revolution in Africa’s (AGRA) Scaling Seeds and Technologies Partnership in Africa (SSTP) project, which supported 12 national seed companies.

### Sector Organization

Seed companies produce seed in two ways; on farm production and by use of contracted farms. In contracted farm arrangements, the seed companies maintain the responsibilities of ensuring the farmers use quality seed for multiplication and continuously advising in the production cycle to ensure seed quality. Several seed companies extend an input loan to their contracted farmers or assist in securing bank financing through a guarantor model.

### Sector Investment

Seed multipliers are considered professional farmers who use a regal farming system on their farms that is highly mechanized. Since production is required to be of the highest quality, the farmers invest highly in quality seed, fertilizer, and pest/disease control.

### Sector Risks

**Table 2: Risks for Maize Seed Multipliers**

	Risk and description
■	<b>Drought</b> - Drought at grain filling causes yield losses of 30-40% depending on the severity.
■	<b>Erratic rains</b> – late onset of rains, or rains disappear after planting leading to replanting.

### Data Availability

Seed multipliers keep detailed records of production cost and yields. Many who have operated for several years have sourced weather data for their farms to guide their operations- for example, to know when to plant. Satellite data is available.

## Maize Seed Multipliers Pilot and Immediate Potential

**Table 3: Potential Insurance Products for Seed Multipliers**

	Product	Risk covered	Comments
	<b>Area yield index</b>	All risks that cause lower yields	Requires the Ministry of Agriculture to consistently do a season crop assessment survey with a crop specific yield component. Requires the farmer to provide historical production, yield data.
	<b>Satellite index</b>	Drought, Excess and Erratic Rain	Requires robust satellite product, and will require ground proofing.

### Conclusion Maize Seed Multipliers

A maize large holder and contract seed multiplier product is viable. The professionalism of the sector indicates that a weather risk insurance product would be viewed as an essential tool to the farmers.

### Maize Micro Finance Institutions (MFIs)

With the majority of maize in Tanzania grown by smallholder farmers, access to inputs and quality extension is a serious challenge. Through quality inputs (certified or hybrid seed, fertilizer) given on credit by a micro finance institution, coupled with extension training, farmers can greatly improve yields.

### Sector Risks

**Table 4: Risks Smallholder Maize Farmers**

	Risk and description
	<b>Drought/erratic rains at planting and flowering</b> – when the rains disappear after planting, germination fails and replanting is necessary. Lack of rain at flowering leads to poor grain filling.
	<b>Input availability</b> – use of quality inputs (fertilizer, certified seed, and crop protection products), though with the MFI providing the inputs on credit, this risk is mitigated.
	<b>Farmer agronomy knowledge and access to quality extension services</b> – through MFIs, farmers can gain access to training and extension.

### Data Availability

Satellite data is available for the area and rain gauges to ground proof products and new indexes.

### Potential products

**Table 5: Potential MFI Maize Insurance Products**

	Product	Risk covered	Comments
	<b>Satellite index</b>	Drought, Excess and Erratic Rain	Requires robust satellite product, and will require ground proofing.
	<b>Area yield index</b>	All risks that cause lower yields	Requires third party area yield data. Farmers need to be in organized groups.

### Pilot and Immediate Potential

There are ongoing discussions with MFI organizations in Tanzania to insure their farmers for the next season starting November 2014.

### Conclusion MFI Maize

There is strong potential for rapidly growing smallholder MFI maize insurance products.

## 6B. Coffee

In Tanzania coffee is grown by about 450,000 smallholders. Coffee is sold in the form of cherries or green coffee. The two main types grown are Arabica and Robusta. It is estimated that total area under coffee production is 265,000 hectares. Arabica coffee is grown on the slopes of Mount Kilimanjaro and Mount Meru and in Mbeya and Ruvuma regions in the Southern Highlands. Arabica coffee makes up 70% of Tanzania's coffee production with Robusta constituting the remaining 30% (Tanzania Coffee Board).

Coffee trading is at its peak during the harvesting seasons of July to December in the North and South, and May to October in the Western regions. There are three coffee markets: the internal market where farmers sell at their farm gates to private coffee buyers; through farmer groups and cooperatives; and through auctions which are conducted every week during the above indicated months. Licensed exporters come to the auction and buy coffee from suppliers who can be individual farmers, farmer groups, and cooperatives. They can also buy from other private buyers and exporters who sell premium top grade coffees that are allowed to bypass the auction and be sold directly. Direct export enables growers to establish long term relationship with roasters and international traders (Tanzania Coffee Board).

The coffee industry is heavily regulated by a board set up in 2001 by an act of parliament. The Tanzania Coffee Board is mandated to "make regulations governing the cultivation and marketing arrangements of coffee including the monitoring of its price" and to "protect the interest of farmers against syndicates of buyers which may be formed through formation of Associations." Other organizations that are involved in coffee development in Tanzania are the Tanzania Coffee Board (TCB) which is the industry regulator on all matters pertaining to production and marketing; the Tanzania Coffee Development Trust Fund (TCDF) which manages stakeholders and resources for coffee development activities; the Tanzania Coffee Research Institute (TACRI) that undertakes coffee research; Tanzania Coffee Association (TCA), which is a private association of coffee traders; and Tanganyika Coffee Growers Association (TCGA), an association of coffee estate growers.

### Smallholder Cooperative Coffee

Smallholder farmers produce 90%+ of the coffee in Tanzania. Smallholder farmers mainly sell their coffee through aggregated groupings called 'farmer groups.' The coffee from these farmers is channeled and sold through the coffee board auction. Discussions with one coffee marketing organization revealed that smallholder farmers in cooperatives use curing factories to prepare their coffee for presentation to the auction market in exchange for a service fee per kg. Smallholder farmers are not tied to any one processor or marketer but instead choose in accordance to the proximity of the factories, the quality of service, and percentage of curing losses incurred.

### Sector Organization

The task of aggregating the coffee and channeling it to the Coffee Board auction would be difficult without the board's use of primary cooperatives. These cooperatives register individual farmers and then form the basic unit of registration with the board. Each farmer is then bound to produce and sell coffee through the primary cooperative of which he or she is a member (Tanzania Coffee Board).

### Sector Investment

Analysis of collected data revealed that only 16% of cooperative coffee farmers used chemical fertilizer on the coffee bushes (2005, TACRI).

### Sector Risks

Table 6 ranks the risks identified by a coffee value chain stakeholders.

**Table 6: Risks for Cooperative Coffee Growers**

Risk and description
<b>Prices, fluctuations in world coffee prices</b> – at a farm level low coffee prices, mean farmers have less money for seeds, tools, and other inputs in the following season and subsequent production falls from less fertilizer use and area actively cultivated.
<b>Curing losses</b> - can be as high as 20% and is used as the bargaining chip to recruit more farmers. The lower the curing losses a factory registers the more attractive it is.
<b>Diseases</b> - Coffee Berry Disease during wet seasons affects berry quality.
<b>Drought, erratic rains during flowering</b> - reduces number of berries by an estimated 50% in similar varieties grown in Kenya.
<b>Excess Rain, rains during wood formation and at mid-season</b> - causes the crop to produce fewer flowers, and less berries.

**Data Availability**

Production data is available on a seasonal basis from cooperatives, estates, and private companies and is aggregated by the Tanzania Coffee Board. Weather data is accessible through satellites.

**Pilot and Immediate Potential**

During the feasibility study Kilimo Salama spoke to a coffee marketing organisation which has curing factories. The curing factories serve smallholder farmers aggregated into farmer groups and cooperatives. The marketing organisation advised that a smallholder product would best be channeled through organizations that offer farmers services with a financial component.

Meetings with officers in the Ministry of Agriculture – Cooperatives section reinforced the above, as not all coffee cooperatives are considered serious in their investment and production practices.

**Table 7: Potential Insurance Products for Cooperative Coffee**

Product	Risk covered	Comments
<b>Area yield index</b>	All risks that cause lower yield	Using area yield data available by curing factory. Farmers are spread over a large region and main challenge is the identification of a common aggregator
<b>Satellite index</b>	Drought, Excess Rain, Weather related disease	Requires robust satellite product, and will require ground proofing.

**Conclusion Cooperative Coffee**

The Tanzania Coffee Board and cooperative arrangement is administratively effective, though may partly restrict the marketing options of individual farmers and producers. Kilimo Salama recognizes that cooperative coffee via the curing station is a viable channel, however since the curing stations do not have contracts with the farmers it may make it difficult to integrate an insurance product.



## 6C. Sunflower

Sunflower is an oilseed that is grown in the central zones of Singida, Dodoma, Morogoro and the south-eastern zones of Iringa, Ruvuma, Rukwa, and the Chunya and Mbozi regions of Mbeya where grains such as rice and maize do not perform well. Millions of households in Tanzania are engaged in edible oilseed production, especially sunflower and sesame (2012, National Sample Census of Agriculture Smallholder Volume II: Crop Sector – National Report).

Traditionally, sunflower was considered a women’s and poor man’s subsistence crop, with low yields between 135 and 225 kg per acre. The importance of sunflower and other oilseeds has increased considerably. This is in line with the increase of the world market demand for sunflower from 2.8 million tons in 2000 to 4.8 million tons in 2009. Farmers are expected to increase oilseed crop production as an alternative income source, improving household food security (2012, SNV Tanzania).

### Sector Investment

To analyze the farm investment typically made for the sunflower crop, Kilimo Salama used information from interviews with sunflower farmers. The typical initial investment for a one hectare sunflower crop using improved seed and sufficient amounts of fertilizer is about 200USD/Ha.

### Sector Risks

**Table 8: Risks for Sunflower Growers**

	Risk and description
	<b>Prices and markets</b> - domestic policies on price setting and taxation distort the edible oilseeds market, and discourage farmers to engage in oilseed production as a business.
	<b>Sector organization</b> - edible oilseeds actors and enterprises are only beginning to be coordinated, which limits their capacity to influence changes, access inputs, and services.
	<b>Input access and usage</b> - use of low quality seeds leads to low productivity and oilseed supply.
	<b>Drought and erratic rain</b> - drought and erratic rains affected farmers in the 2012/2013 season

### Data Availability

Satellite would be used to acquire data for the development and pricing of weather index products.

### Pilot and Immediate Potential

An existing Kilimo Salama client in Kenya is piloting sunflower production within their Tanzanian groups in the long rains season of 2014. Kilimo Salama is conducting a dry run in plots in four villages to better understand the crop and the region for weather index development. Farmers will be extended an input package for crop production with potentially a weather index insurance component bundled in.

**Table 9: Potential insurance products for sunflower**

	Product	Risk covered	Comments
	<b>Area yield index</b>	All risks that cause lower yields	Farmers need to be in organized groups. Requires yield data from a reliable third party.
	<b>Satellite index</b>	Drought, Excess and Erratic Rain	Requires ground proofing for a crop cycle for new crops and regions

### Conclusion for Sunflower

The edible oilseed sector is beginning to be organized, but it will take time until it is a functional commercial value chain. However, sunflower is a high value crop and the sector is projected to grow, with processors and aggregators directly sourcing the harvest from farmers. Since the crop relies on rain, Kilimo Salama’s approach would be to work with the aggregators and offer financial solutions to the farmers where insurance can be bundled into an existing arrangement.



## 6D. Sorghum

At the national level, a total of 669,102 households planted sorghum in the long rains season and 146,429 in the short rains season. Sorghum is considered the 4<sup>th</sup> important food crop in Tanzania ranked on the basis of area planted and production, behind maize, rice, and beans (2007/08, Tanzania Agriculture Sample Census). Sorghum is a drought tolerant crop traditionally grown in areas with marginal annual rainfall, like the central zone covering Dodoma and Singida regions; Lake Zone covering Mwanza, Mara and Shinyanga regions; and the southern zone of Lindi and Mtwara regions. Sorghum was commercially grown on 35 large-scale farms during the long rains season and 14 in the short rains of 2011 (2012, National Sample Census of Agriculture 2007/08).

### Sector Investment

Investment is currently limited, though increased use of improved seed, fertilizer and pesticides would have considerable impacts on yield. If micro finance institutions or lenders do agricultural loans in the form of improved inputs, there would be a major change in farmer investment levels.

### Sector Risks

**Table 10: Risks for Sorghum growers**

	Risk and description
	<b>Drought at germination</b> - as a cereal, sorghum requires sustained rainfall from planting to crop establishment. If there is drought, the initial cost of labor, seed, and planting fertilizer is lost.
	<b>Pests and diseases</b>
	<b>Prices and market</b> – some sorghum farmers are not formally aggregated, leading to individual sales efforts where middlemen can exploit the farmers.

### Data Availability

Satellite data would be used build indexes.

### Pilot and Immediate Potential

Micro finance institutions (MFI) that work with smallholder farmers through an input loan and training model have shown interest in venturing into sorghum production in Tanzania. Two of the national seed companies supported by the AGRA Scaling Seeds and Technologies Partnership in Africa (SSTP) project, are involved in sorghum production.

**Table 11: Potential Insurance Products for Sorghum**

	Product	Risk covered	Comments
	<b>Area yield index</b>	All risks that cause lower yields	Farmers need to be in organized groups. Requires yield data from a reliable third party.
	<b>Satellite index</b>	Drought, Excess and Erratic Rain	Requires ground proofing for a crop cycle.

### Conclusion Sorghum

A sorghum weather index product would have business potential when bundled with loans from organizations that work directly with farmers with the purpose of financially supporting them, marketing their produce, or contracting them for seed multiplication.

## 6E. Rice

Paddy production is mainly in Arusha, Morogoro, Shinyanga, Rukwa, Mbeya, Mwanza, Kilimanjaro, and Ruvuma. These eight regions together produced about 2,212,918 tons, which is equivalent to 84 percent of the national total paddy production in the 2009/10 agricultural year, as reported in the agricultural annual report. Both the area planted and production has increased 98.5 percent since 2007/08. The main reasons for the increase in paddy production are: the increase in the area cultivated, use of fertilizers under the government input voucher system, husbandry practices, adequate rainfall distribution, increase in the use of irrigation, and the availability of paddy seeds.

Smallholder farmers are found in close proximity to large holder farmers and seed multipliers. This was observed in Mngeta region where a large holder farming unit produces paddy seed and sells the local farmers quality seed at subsidized prices. Smallholders are aware of the benefits of producing quality grain through the use of certified inputs.

### Sector Investment

Average initial investment per acre is 25,000 Tsh-30,000Tsh for seed and 50,000 Tsh for fertilizer.

### Sector Risks

In table 12 the risks in the sector are ranked in order of importance. The estimated losses due to the described risk are based on discussions during field visits with Tanzanian farmers in November 2013.

**Table 12: Risks for rice growers**

Risk and description
<b>Price fluctuation</b> - farmers reported that rice prices fluctuated season to season, creating a delay in setting selling prices for loan repayment.
<b>Drought at germination</b> – farmers reported a drought in 2012/2013 forced him to replant
<b>Floods</b> - rice farms in the region interviewed have a high clay profile meaning the soil holds water for longer. Farmers have experienced flooding in farms with poor drainage.
<b>Farmer lacks agronomy knowledge</b> resulting in poor agricultural practice

### Data Availability

Index insurance for rice would be based on data from satellites. Plantation farms that smallholder farmers are clustered around have weather stations which can be used for ground proofing.

### Pilot and Immediate Potential

Kilimo Salama could work with aggregators extending input loans to smallholder rice farmers. The aggregators source for credit facilities through local banks and microfinance institutions to extend seed and fertiliser input loans. The farmers pay back the loan from the sale of their harvest.

**Table 13: Potential insurance products for smallholder rice**

Product	Risk covered	Comments
<b>Area yield index</b>	All risks that cause lower yield.	Farmers need to be in organized groups. Requires yield data from a reliable third party.
<b>Satellite index</b>	Drought and Flooding	Requires ground proofing for a crop cycle for new crops and regions

### Conclusion Smallholder Rice

A dry run with a rice aggregator group was concluded in mid-2013 that enabled Kilimo Salama to design an index for the product. With active interest from potential clients and partners, products could be offered for the next season, starting December 2014.

## 6F. Tobacco

Tobacco is a major cash and export crop/foreign exchange in Tanzania, with the majority of the production done by smallholders grouped into cooperatives. It is closely and regulated by the government through the Tanzania Tobacco Board.

There is one main tobacco season, with most planting done in January for a harvest from March to May. It is grown in several areas of the country, primarily the Western and Southern Highlands, including: Singida, Katavi, Tabora (biggest producer), Urambo, Shinyanga, Kigoma, Kagera, Ruvuma, Iringa, and Mbeya. Main risks include drought, pests, world price fluctuations, availability of quality inputs (seed, fertilizer, crop protection products), and access to extension services.

The most recent government tobacco production data is for 2009/2010. The Ministry of Agriculture said in a meeting with Kilimo Salama that they will start doing the monitoring and tracking of tobacco production, with updated numbers available soon. Production grew between 2007/2008 (55,357 tons) and 2009/2010 (94,243 tons on 78,926 hectares). The collected data also shows that the yields per hectare dropped over this period from 0.9 tons/ha to 0.8 tons/ha, perhaps due to lower use of fertilizer on a per hectare basis.

Tobacco production is mainly undertaken by smallholder growers; in 2010 84,289 farmers grew tobacco. Through cooperatives, some farmers grow on a contract basis for the tobacco trading companies and receive input loans from agricultural banks at the start of the season.

### Stakeholders:

- 1. Tobacco Board of Tanzania** ([www.tobaccoboard.or.tz](http://www.tobaccoboard.or.tz)): “To render timely and quality to tobacco growers and tobacco traders in terms of registration, technical backstopping and facilitation of private sector contribution in the tobacco industry for enhanced and sustainable growth for the sector’s and country’s benefits.” The Tobacco Board may be able to assist with production data and connections with cooperatives and tobacco traders.
- 2. Ministry of Agriculture** ([www.agriculture.go.tz](http://www.agriculture.go.tz)) “nucleus for providing policy guidance and services to a modernized, commercialized, competitive and effective agriculture and cooperative systems by 2025” and “ to deliver quality agricultural and cooperative services, provide conducive environment to stakeholders, build capacity of local Government Authorities and facilitate the private sector to contribute effectively to sustainable agricultural production, productivity and cooperative development.” The Ministry has already been consulted and is supportive of the introduction of weather insurance products.
- 3. TORITA** ([www.torita.or.tz](http://www.torita.or.tz)) is “the sole Tobacco Research Institute in the country. Its mandates entail development and dissemination of technologies to the Tobacco growing community for improved productivity to support the Tobacco sector goals in social-economic development of the country.” TORITA would be a source for agronomic data used in developing a tobacco index.
- 4. Tobacco Cooperatives** - Most tobacco farmers are grouped into cooperatives of varying quality. Some cooperatives procure inputs on behalf of member farmers and/or have contracts with tobacco traders for the production. Top cooperatives will be recommended by Ministry of Agriculture for follow up meetings.
- 5. Tobacco Traders, Processing Companies** - These companies are the major intermediaries and aggregators in the tobacco value chain. They do “seed production and dissemination to farmers countrywide, green leaf purchase from farmers in the field, tobacco processing ready for end-users, and domestic and export dry leaf selling” (Tanzania Tobacco Board).

### Sector Organization

The majority of tobacco grown in Tanzania is by smallholders (85,000), many of whom are organized into cooperatives. Individual farmers or cooperatives may have contract growing relationships with tobacco traders, or may sell at the farm gate. Some of these contracts are linked to credit for inputs, or cooperatives take loans from banks to purchase fertilizer and crop protection products.

### Sector Investment

Farmer use of improved seed and fertilizer varies across the country and between cooperatives, but is generally low.

### Sector Risks

In table 14 the risks are ranked, informed by discussions with the Ministry of Agriculture, information from the Tobacco Board, and a report by TORITA (TORITA Tobacco Production Baseline Survey 2011).

**Table 14: Risks for Tobacco Growers**

Risk and description
<b>Drought</b> throughout the season
<b>Replanting risk</b> from rains followed by periods of drought at the start of the season.
<b>Input supply</b> is not available at the optimal time undependable due to few distributors
<b>World market price fluctuations</b> affect the price farmers receive for their production. Can work both for and against the farmers' interest to have the contract price set at the start of the season.
<b>Pests</b> can cause losses in yield or quality and farmers have to apply significant crop protection chemicals
<b>Farmer agronomy knowledge and access to quality extension services</b>

### Data Availability

Satellite data is available. Field verification would need to be done through a dry run with an identified partner or tobacco processing company, especially around the extent and impact of drought on yields, as Kilimo Salama does not have experience with tobacco products in other countries.

**Table 15: Potential Tobacco Insurance Products**

Product	Risk covered	Comments
<b>Area yield index</b>	All risks that cause lower yield.	Multi-peril product could be valuable to pick up production losses also attributed to widespread pest damage, but depends on the availability of quality yield data.
<b>Satellite index</b>	Drought and Excess Rain	Requires robust satellite data (available) that would need to be ground proofed (could be done through the extension staff of a processing company).

### Conclusion Tobacco

An insurance pilot in tobacco would target large cooperatives who have contracts or are receiving inputs on credit from tobacco buyers, or who collectively purchase fertilizer and crop protection products. Cooperatives would be identified with the help of the Ministry of Agriculture and through the tobacco processors and major tobacco buyers.

## 6G. Cotton

Cotton is “grown by between 350,000 and 500,000 mostly small-scale farmers and is the largest export crop in Tanzania” according to the Cotton Development Trust Fund Strategic Plan I 2011 – 2015. It is tightly regulated and partly subsidized by the government through the Tanzania Cotton Board (TCB) and the CDTF, and is regulated through The Cotton Industry Act (CAP. 201).

The cotton sector was restructured at an industry-wide level in 2011/12, reports Gatsby’s Cotton program lead, with 290,000+ farmers receiving inputs on credit from ginner, for a record crop that season. Just the following 2012/13 season, “political support faltered and the arrangements were not renewed for the season, contributing to a 40 per cent fall in output.”(Gatsby’s Cotton and Textile Development Program). Issues in the contract arrangements between growers and ginner included: delayed delivery of inputs, set contract prices for cotton changing at the end of the season, inputs not provided on credit-farmers had to pay cash up front, and farmers selling their harvest to other companies instead of repaying the ginner for the credit extended.

There is strong potential for cotton growth in the next few years beyond the current 42 districts around Lake Victoria where 99% of Tanzania’s cotton is grown, if the contract ginner-farmer relationship can be successful. The cotton sector has been going through reforms since the 1990s with the goal of creating a more productive and professional sector driven by smallholders. Yearly cotton production has been highly variable each year for the past 10 years, with fluctuations in the world market price affecting what farmers received and quality inputs and erratic weather affecting farmers’ productivity.

### Stakeholders:

**1. Tanzania Cotton Board (TCB, [www.cotton.or.tz](http://www.cotton.or.tz))** is a parastatal organization formed in 2001, operational from 2004, the TCB carries out regulatory functions and other activities to benefit the cotton industry. It is funded by the government and through contributions from cotton stakeholders through the Cotton Development Trust funds (CDTF) and the Tanzania Gatsby Trust fund (TGT). As the main regulatory body, they would be an important partner supporting the insurance and could help with government policies to make the insurance a better fit for the current sector set up.

**2. Cotton Development Trust Fund (CDTF, [www.cotton.or.tz](http://www.cotton.or.tz))** is an independent institution bringing together stakeholders of the cotton industry, established in 2006. It is a service delivery institution of the cotton industry and is tasked with facilitating the importation and distribution of inputs and supporting cotton extension services, among others (CDTF website). As the main implementing body for input delivery through ginner, setting compulsory insurance could be done at this level.

**3. The Cotton and Textile Development Program (FTDP) of Tanzanian Gatsby Trust (TGT)** started in 2007, supports the TCB to holistically improve the smallholder cotton value chain, focusing on improving the contract relationships between ginner and farmers. Activities include “reforming regulatory requirement for ginner to get a license, improved access to inputs, extension to improve farming practices and developing the downstream industry.” (FTDP website)

**4. Smallholder Farmers** - with over 400,000 smallholder cotton farmers producing around Lake Victoria, these would be the target beneficiaries of the insurance. On average they grow 2 acres and depend on ginner for both knowledge and inputs. Recent government programs have attempted to organize the farmers better. If a product is pursued, extensive farmer interviews and workshops will be done.

**5. Cotton Ginner** - there are 43 ginner registered to purchase cotton from farmers. In the government scheme, inputs are supplied to farmers via ginner who then extend those inputs on credit to the farmers, repaid in cotton at the end of the season. If this contract set up is further developed, ginner would be the logical aggregators in the cotton value chain.

## Sector Organization

The vast majority of cotton grown in Tanzania is by smallholders (about 400,000) who sell their harvest to one of 43 ginners who then process the cotton. There has been increasing focus to create contract grower relationships between the farmers and ginners, with the ginners more efficiently distributing both subsidized and unsubsidized inputs on credit. From the CDTF programs, cotton farmers are organized into “Farmer Business Groups” and the ginner has a contract with the group. This has had limited success; the team will wait to see how the 2014/2015 season goes and if this approach proves successful.

## Sector Investment

Farmers are supposed to receive subsidized seed and crop protection products through the CDPT, though this does not always happen. Farmers do buy inputs, worth about 28,000 TSH (17.50 USD) per acre, usually from the ginners. There is very low fertilizer use and more crop protection products would improve yield. If more credit is extended to farmers, input use may increase.

## Sector Risks

In table 16 the risks are ranked in order of importance from most to least, informed by discussions with the Gatsby Trust, interviews with cotton experts, information from the Cotton Board (annual report and website) and the Tanzania Cotton Sector Development Program Baseline Study Report – June, 2012.

**Table 16: Risks for Cotton Growers**

	Risk and description
	<b>Drought</b> throughout the season and <b>replanting</b> risk from rains followed by a period of drought at the start of the season.
	<b>Pests</b> – in particular Bollworm - can cause major losses in yield or quality. Can be controlled by crop protection chemicals the TCT subsidizes, but access to these products is not always possible.
	<b>Input supply</b> – especially seed and pesticide – is late or unreliable.
	<b>World market price fluctuations</b> affect the price farmers receive for their production. Can work both for and against the farmers’ interest to have the contract price set at the start of the season.
	<b>Farmer agronomy knowledge and access to quality extension services</b>

## Data Availability

Satellite data is available. Field verification would need to be done through a dry run, potentially collaborating with Gatsby’s extension officers. Yield data is possible as the TCT highly regulates the cotton sector. If products for cotton were developed, TCT would be consulted on how they collect data and if data is collected at the district level. This would enable a multi-peril product.

**Table 17: Potential Cotton Insurance Products**

	Product	Risk covered	Comments
	<b>Satellite index</b>	Drought and Excess Rain	Requires ground proofed satellite data. Would cover seasonal drought, excess rain and specific drought at planting.
	<b>Area yield index</b>	All risks that cause lower yield.	Multi-peril product could be valuable to pick up production losses attributed to pest damage, depends on TCT yield data.

## Conclusion Cotton

An insurance pilot in cotton would target ginners who work with large numbers of farmers with input credit. From discussions with sector players, this is a situation that may happen in the future if the development of the cotton sector goes as planned.



## 6H. Dairy Livestock

The dairy industry in Tanzania is emerging with 300,000-500,000 total improved dairy cows in the country, compared to 3.3 million improved dairy cows in Kenya and 1.2 million in Rwanda. Most of the herds are local breeds with milk consumed at home or at the village level. 10% of milk produced reaches the formal sector. There are a few large scale operations.

A government report states: “Development of the dairy industry is limited by inadequate nutrition, support services and insufficient supply of dairy stocks, inadequate financial credit and processing facilities, poorly organized marketing system, and animal diseases.” Interviews Kilimo Salama conducted support this.

If an insurance product were developed, it would likely be structured similarly to the product Kilimo Salama has in Kenya, as a named mortality cover were farmers decide to insure select cows. The insurance is linked to a Care Calendar that advises farmers on routine health care (deworming, tick control, mineral supplements) and requires them to take up vaccines. From discussions with local vets, few dairy farmers are current taking the East Coast Fever vaccine and the availability of others is limited. The effectiveness of the vaccines is also in question, as they require a reliable cold supply chain to keep them viable – a challenge in rural Tanzania.

There are dairy insurance products currently on the market from local insurance companies, but they have had limited uptake because they have many conditions, similar to the Kilimo Salama Care Calendar, about using vaccines. However, contrary to Kenya, access to the vaccines is difficult, so many farmers do not see the value in the insurance products.

### **Sector Organisation**

Most dairy cows are owned by small and medium scale farmers who use the majority of the milk for home or local consumption (90%). Projects from East Africa Dairy Development (EADD), Southern Highlands Dairy Development Project, and Tanga Dairy Development Project have or will set up milk collection and chilling centers. However, their projects have not reached scale and the majority of farmers are not linked to these networks by way of a cooperative structure. Though there are a limited number of larger-scale professional dairy farmers with large herds of 50-100+ animals, the vast majority of large scale farmers in Tanzania with livestock have beef cattle or local cows.

The main industry bodies are the Tanzania Dairy Board and Milk Processors Board. There are 15+ dairy processing plants in Tanzania, both publicly and privately owned.

### **Sector Investment**

From discussions with sector stakeholders, there is limited credit and lending for purchase of cows, especially for smallholder farmers. There are a few projects developing milk collection centers or targeting large scale farmers with feedlots or those looking to purchase imported cows.

### **Sector Risks**

The following risks were identified by dairy sector stakeholders and reports.

**Table 18: Risks for Dairy Livestock**

Risk and description
<b>Lack of cooperative infrastructure/organized value chain</b> – a network of cooperatives and milk collection centers is still being developed, with few areas adequately served. This lack of widespread formal milk collection networks makes farmers difficult to aggregate.
<b>Access to vaccines and quality animal health products</b> – vaccine distribution is emerging and some farmers have difficulty accessing quality animal health.
<b>Diseases (Tick-borne/ECF, Foot and Mouth, Tsetse fly-borne)</b> - diseases are the main cause of dairy cow mortality. Many are preventable with proper animal care and product use. Most animals are grazed, making them come in contact more often with ticks carrying fatal diseases.

**Data Availability**

There is limited dairy cow mortality data available, especially data that addresses individual cases of death and differentiates between dual-purpose and improved dairy cows, and is available for different parts of the country. A 2013 ILRI baseline study has overall mortality figures in 4 areas. Additional surveys could be done if a product is offered.

**Potential Products**

**Table 19: Potential Insurance Products for Dairy Livestock**

Product	Risk covered	Comments
<b>Mortality data</b>	Named risks – diseases and accidental death	Requires current and historical data on cattle mortality including causes of death, year, and severity of catastrophic events. This can be collected by objective third-parties (ILRI) where adequate data does not currently exist.

**Conclusion Dairy Livestock**

The dairy sector in Tanzania is developing. Without clear aggregators that would enable Kilimo Salama to reach large numbers of farmers/cows, it likely is not a good fit for Kilimo Salama’s current approach to dairy insurance. There are new stakeholders entering the dairy sector, with East Africa Dairy Development (EADD) and processors working with emerging dairy cooperatives. If these interventions are successful, or there is an increase in lending for the purchase of dairy cows, it could be interesting to develop a product for Tanzanian dairy farmers.



# Tanzania Agricultural Insurance Feasibility Study

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