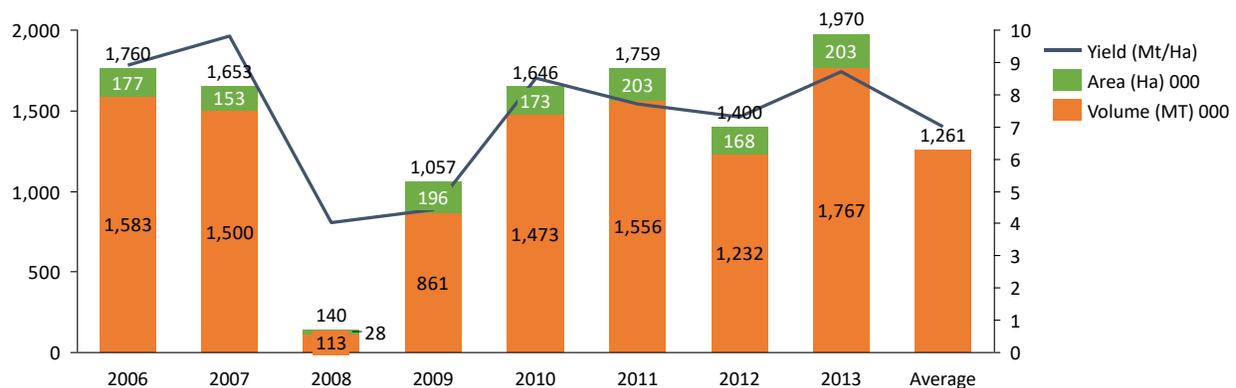


The Business Case for a Tanzania Integrated Potato Value Chain

1. Current Status

- Despite the high levels of commercialization of potatoes in that farmers sell more than 80% of what they produce, most of the SHFs cultivating potatoes and the small scale retailers and vendor selling products to consumers, obtain very low levels of incomes from those enterprises, and thus remain in poverty. The main causes of this problem are many but the most critical is limited business partnerships in the value chain resulting in weak linkages to markets
- Tanzania is the 6th largest producer of potatoes in Africa supporting more than 500,000 farmers. Potatoes are among the leading cash crops for smallholder farmers with over 80% of the potatoes grown are sold for cash income (compared to 40 -50% for beans, maize and rice). Potatoes are more profitable compared to cereals (especially in the highlands); with experts estimating three (3) fold higher incomes from potatoes.
- Potatoes are also providing calories and nutrition to smallholder farming households and millions of urban poor in cities and towns in Tanzania and the rest of the EAC. Studies have found that consumption of potatoes in the EAC doubled between 1999 and 2010, a rate of growth in demand second only to rice. This growth in demand is expected to accelerate in tandem with urbanization, since potatoes are among the leading sources of calories for low income earners in the urban areas. This is due to greater versatility in potatoes' products and more stable price compared to cereals.
- Production increases have primarily been driven by increased land use, with little growth in yields (Figure 1). The potato has gained significant importance as production and area under cultivation grew at an annual rate of 10% between 1991 and 2012 growing much faster than the staples maize and cassava. Surplus potatoes are exported across borders to Kenya, Zambia, Malawi and DRC

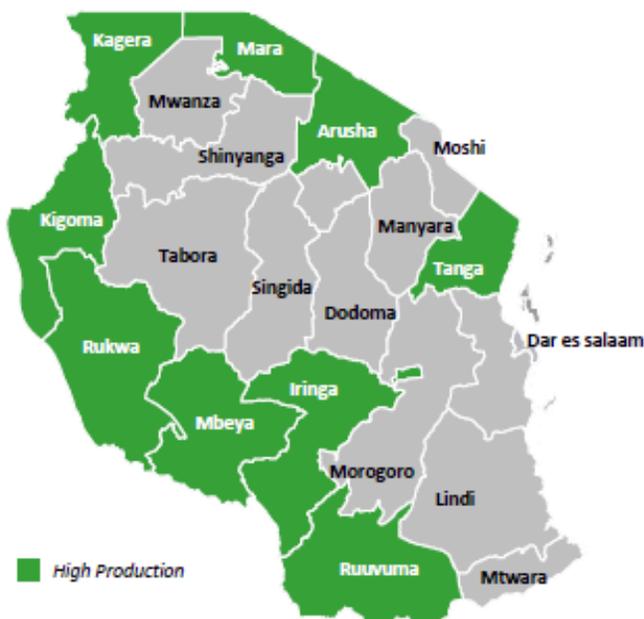
Figure 1: Annual Production Estimates



- Potatoes serve a dual role as a major food and cash crop guaranteeing household food security and providing income

- Farmers either use their previous harvest as seed potatoes or receive quality seed from a multiplier. Mtanga and Crop Bioscience are the only formal seed potato distributors that provides various farmers' groups with third generation seeds for commercial distribution.
- Tanzania has 4 registered varieties with an additional 7 in research phase. Widespread adoption has been low with less than 1% using new varieties
- Potatoes are produced in two distinct Zones (Figure 2) of Tanzania a) the Southern Highlands with leading producer districts of Njombe, Mufindi, Makete, Kilolo, Ludewa, Mbeya, Rungwe, Sumbawanga Rural and Nkasi; and b) the Northern Highlands and Lake zones with the leading producing districts being Arusha Rural, Meru, Hai, Mwanza, Rombo, Same, Lushoto, Karagwe and Ngara..

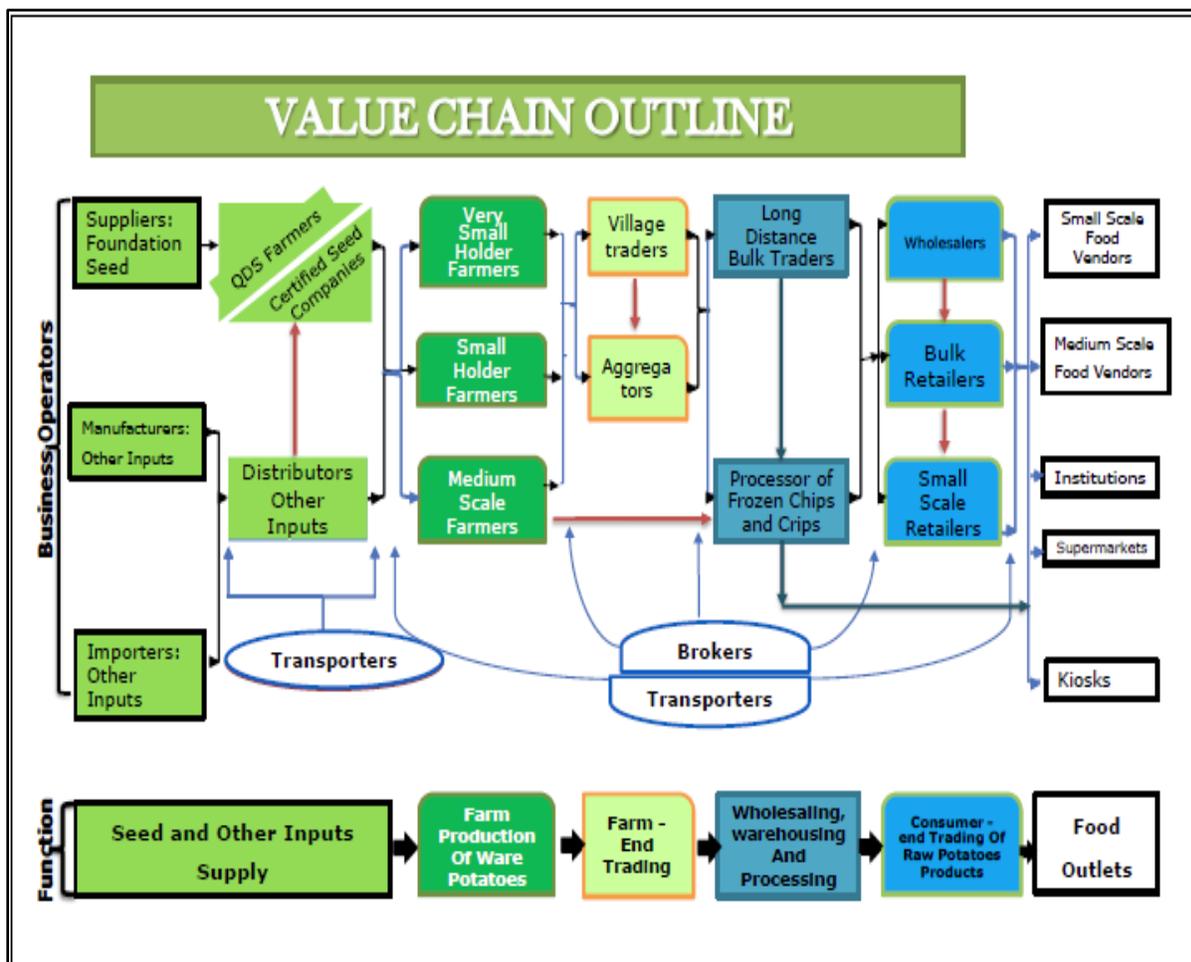
Figure 2: Potential and current Potato producing regions in Tanzania



- The area of land with potential for sustainable production of potatoes due to favorable natural conditions is estimated to be 2 million hectares – while, currently only about 200,000 hectares are on average under cultivation. Therefore, there are possibilities to expand the area under potato cultivation in response to the projected expanded demand.
- In the absence of storage facility, farmers leave potatoes in the ground hoping to get better farm gate price after harvest season. This leads to post harvest losses of more than 30%
- Local commercial potato processing is nonexistent with 80% of the processing market is currently captured by informal processors.
- Women dominate the food enterprises of the potatoes' value chain(s) as small scale retailers and vendors

- Tanzania can position itself as a leading producer of potatoes in the region as it develops its processing facilities with potential to export processed potatoes to the region.
- The value chain is highly fragmented and is principally controlled by many small traders and brokers discouraging scale, efficiency and investment. Figure 3 provides a map of the current marketing arrangements and thus the nature of the value chain from production to consumption. Nearly all farmers “store” their mature potatoes in the ground and sell directly from the field, leading to limited aggregation and grading of the ware potato going to the market. It also leads to glut and low prices when farmers have to harvest to free the fields for the next crop leading to high fluctuation on farm gate prices and market prices. The marketing of ware potatoes involve too many different nodes many of them brokers who add minimal value, other than their monopoly on market information, resulting in high transaction costs – taking value from the poor SHFs, SRVs and consumers.

Figure 3: Potato Value chain in Tanzania



2. Market Demand Analysis

- Consumption of potatoes in Tanzania is on the rise due to increased urbanization, growing tourism sector, proliferation in fast food restaurants making chips readily available, significant change in dietary patterns of both high and low income groups where households prefer chips compared to any other potato product, increased number of higher education institutions, affordable price of chips and increased income levels for urban populations (Tesfaye, et al. 2010). A rapidly urbanizing population and growing college and university student population that is spending more on processed potato products drive increased consumption of potatoes (Figure 4). At the same time, importation of processed products (frozen chips and crisps) into Tanzania is increasing rapidly (Figure 5).

Figure 4: Per capita Consumption of potatoes

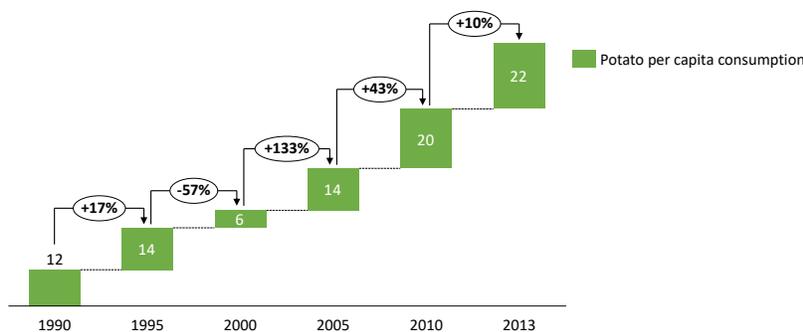
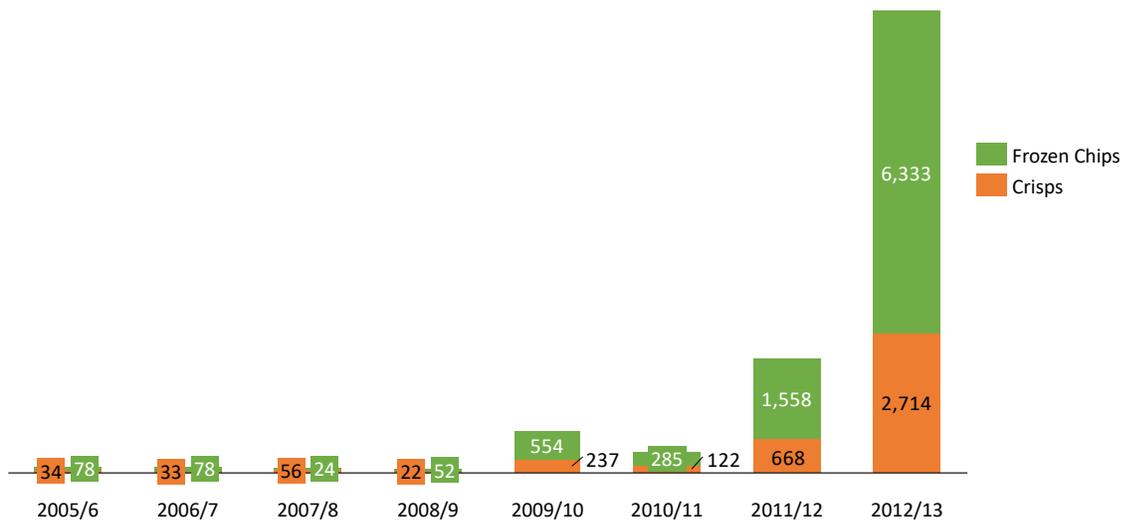


Figure 5: Imported products into Tanzania



- According to the World Bank, 27% of Tanzania’s population lived in cities in 2012 and is expected to surpass 50% by 2030. Since it is approximated that nearly 80% of potatoes produced in Tanzania is consumed by urban population and consumption per capita

almost doubled over the last 20 years, consumption per capita is expected to triple by 2030.

- Rapid increase in potatoes consumption per capita in countries like Kenya, Malawi and South Sudan which are already importing from Tanzania also signifies growth of export market potential for Tanzania potatoes.
- Potatoes in Tanzania are processed and consumed in various forms. Majorly processed products include; crisps, frozen chips, chips, mashed potato, potato flour, potato balls and boiled potatoes, potato sauces and fried or grilled potatoes (Tsfaye et al.; 2010). Chips are the most preferred potato food product in Tanzania and consumption is increasing within low, medium and high income groups.
- Institutions such as schools, universities, hospitals, police and the army, are currently the most concentrated centre of consumption.
- The Tanzania potato processing industry is still in its infancy and is dominated by informal businesses run by the youth as a form of employment. Entry barriers are low and technological know-how to process food products such as ready to eat chips, crisps and frozen chips is also relatively low.

3. Previous Investments

Government of Tanzania

Seed Potatoes Development Project (SPDP-Tz) project implemented by Agricultural Research Institute at Uyole in the Southern Highlands zone with support of CIP and Finland Government is one of the investments by the Government. The project focused on establishing potato seed systems and in so doing, they found that there is high demand for seeds particularly in Southern and Northern Highlands of Tanzania. Experience from SPDP shows that sustainable production of quality seeds require building strong Research and Development system to provide necessary public goods like maintaining quality, appropriate standards, and best practices, establishing plant pathology laboratories.

AGRA

Under the SAGCOT Potato Partnership, where they are up-scaling improved seed potato varieties for smallholder farmers in Njombe, Tanzania. The project seeks to transform the potato value chain in order to bring higher yields and profits to Njombe farmers, catalyze economic development throughout the region, and enhance food security across Tanzania. The main partners of the SAGCOT Centre Limited (SCL) in this project are: Mtanga Farms (and partners Yara and Syngenta); Agriculture Research Institute (ARI)-Uyole, National Agriculture Development Organization (NADO) and the Local Government in Njombe Region. The partnership works with other service providers such as potato equipment suppliers and BDS providers for critical services needed for the commercialization of the sector such as mechanization.

In year 2014, Crop Bioscience Solutions (CBS) a commercial biotech company located in Arusha, was funded by AGRA to enable small holders' farmers in Northern Tanzania to access high yield

potato varieties. The project established seed system by initiating early generation seed that will be further multiplied to reach the level of certified seed. The interventions project have made in potato seeds has proved beyond doubt that, investing in production technology will transform potato farmers around Tanzania and contribute to national economy and food security in the region. Following a successful seed Potato technology gains and the impact on higher yields have attracted key players including services providers and off-takers (potatoes processors) who are ready to team up with CBS to support potato integrated value chain. Furthermore, CBS has been invited to set up a Potato production Park at Dareda Fields in Manyara region - Northern Tanzania. The production park will include 150 Acres of Potato seeds production unit run by CBS for five year on lease arrangements, farmers under their existing cooperative (RIVACU) producing ware potatoes on 1200 acres, RIVACU - a cooperative apex setting up marketing infrastructures to link to processors and ware potato wholesalers.

Dutch Government

MoU on Investment Government to government (G2G) project aiming to build capacity of Tanzanian regulators and Introduction of Dutch seed potatoes, mechanization, storage solutions, logistics and processing

Center for Development of the Potato Industry in Tanzania, CD-PIT

The Center for the development of the Potato Industry in Tanzania is collaborative effort of the Ministry of Economic Affairs of the Netherlands and the Ministry of Agriculture and Fisheries of Tanzania. The physical center is located in the Mbeya region of Tanzania. The program of the center aims at accelerating the growth of the potato industry in Tanzania and empowering professionals, lead farms and Tanzanian and Netherlands businesses to be effectively active in the potato value chain.

The establishment of CD-PIT in Tanzania is a concerted collaborative effort of the both Ministries that aims at:

- Developing a robust, competitive sector, with focus on facilitating private sector sustainable development and creation of jobs;
- Building capacity of smallholder farmers in Tanzania for sustainable potatoes production and marketing;
- Value creation for Tanzanian smallholder farmers and companies involved in the value chain; improved food security, more safe and healthy food;
- Sustainable business relations between Dutch and Tanzanian partners

Comic Relief

Calories and Household Incomes from Potatoes Sub sector (CHIPS) Project: *Structuring Enterprises and Trade of Potatoes to Enhance Incomes for Smallholder Farmers in Tanzania While Delivering Affordable Prices for Low Income Consumers in East Africa* is the project with the goal

of enhancing incomes and accelerating wealth creation for smallholder farmers (SHFs) of potatoes, and retailers and vendors of potato foods in Tanzania. It aims at increasing productivity, efficiency, profitability and volumes of businesses involved in the potato value chains - in response to market demand. The project interventions are focused on:

- Enhancing effectiveness of collective marketing/procurement of outputs and inputs by trading associations and cooperatives of 20,000 SHFs and 15,000 SRVs.
- Increasing supply of market preferred potato and potato products by 18,000 SHFs and 12,000 SRVs.
- Increasing competitiveness and efficiency of trading in potato and potato products through sustainable business consortia.
- Increasing equitable involvement of women and youth in decision making and access to resources and benefits of potato value chain

4. Synergies with Existing program

Both CD-PIT and CHIPS are programs with an opportunity to leverage. CD-PIT is focused on Dutch Private Sector investing in opportunities in the potato value chain with focus on the south. CHIPS has an integrated approach focusing on local private sector including small scale retailers but is weak with large private sector in processing. This leaves a major gap in the Northern and Lake regions and on large local private sector in processing and seed supply.

The Proposed AGRA program should focus on the Northern and Lake regions and support local private sector along the value chain to invest in seed production and distribution, cold storage, mechanization and processing. Details of investments are below in interventions to revamp the sector

5. Government of Tanzania Focus

The government of Tanzania has identified the potato crop as one of the focus crops under ASDP II. It is identified as cash crop. It will therefore benefit from government's investments in:

- Sustainable Water and Land Use Management
- Enhanced Agricultural Productivity and Profitability
- Commercialization and Value Addition

Constraints across the value chain

- Limited access to certified seed
- Limited access to markets by smallholder farmers who have to sell to intermediaries
- Poor Agricultural Practices
- Limited infrastructure to support commercialization of potato value chain
- Limited access to finance

- Agriculture policies and resources have traditionally focused on cash crops for export and on cereals, leaving potatoes and other root crops at the periphery
- Limited local processing
- Loose linkages and partnerships between research, farmer organizations and stakeholders stand out as an important constraint
- insufficient extension focused on production that targets market demand
- Contracts provided to farmers are not enforced
- Insufficient support given for co-operatives and aggregation centres focused on potatoes

Opportunities for Smallholder Farmer transformation

With population growing and urbanization continuing to grow, feeding habits are rapidly changing in favor of easy-to-prepare foods such as chips. There is good potential for the growth of processing industry and good market access for both fresh and frozen potato chips in the Tanzania. These opportunities can be brought to fruition through developing and integrated value chain by developing business partnerships in the value chain to build string market linkages amongst stakeholders

While the poverty reduction benefit of linking smallholder producers of staple foods to markets are great and well known, implementation has proven difficult because:

- The smallholder farmers are often reluctant to make the first move to increase quantities and qualities to produce a marketable surplus in the absence of assured access to profitable markets;
- At the same time, the potential off-takers, especially medium to large scale processors are not willing to invest comprehensively because of the risk of failing to obtain adequate raw materials and/or on time deliveries.

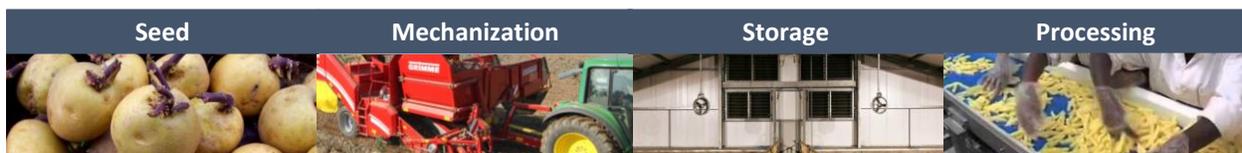
Therefore, program design needs to flexible to support the development of smallholder-targeted business models that are attractive to other private agribusiness players in the sub-sector as well as food security interests of governments. It is not enough to up-grade smallholder systems alone but rather parallel work is required on the points of interface with others. For example, it makes a lot of difference if an intervention to improve the smallholders' business skills is co-designed and co-implemented with the other value chain partners, compared to the usual approach of having an NGO or government extension providing it to the smallholders in isolation of the business partners.

The increased surplus production and importation of processed potato product is a good indication of the need for the approach focused at supporting improvement of efficiency in trading but most importantly putting processor in the lead of market development for the sub-sector. Given the correlation between urbanization and increase in the consumption of potato products, and based on past increases of population (+3%), per-capita income (+7%), and urbanization (+5%) per year in Tanzania, the compound effect would be a rapid expansion in the volumes demanded to about 2.4 mil MT by 2025. As consumption is also increasing strongly in

the neighboring countries and Tanzania has large un-tapped potential for production, there is a good potential to expand the export of potatoes and/or its products.

Some companies have started to produce processed potato products to take advantage of the increasing demand for processed potatoes to supply the super market chains, catering service providers and hotels mushrooming in Dar-es-Salaam and major cities in Tanzania. Increasing investment in enterprises that specialise in processing, packaging and selling of processed potatoes coupled with creation of awareness on the use of these products would increase this demand and thus making the industry grow. This will increase the demand for quality seed potatoes and of the varieties that would increase efficiencies in processing. New seed varieties and production of quality seeds demanded for production of processed potatoes is of prime importance.

Interventions to revamp the sector



To move the sector forward it is proposed to partner with the Kilimo Trust CHIPS project and the Dutch funded CD-PIT to scale market driven interventions. The proposed interventions will not only support the SHFs to increase yields, but will incorporate investments and participation in value chains by private firms undertaking trade, commerce and agro-industry businesses.

The interventions will focus on market-first approach to catalyze consortia of private sector players along value chains to invest own resources with grants for technical assistance to expand/improve marketing structures and processing of potatoes into differentiated products demanded by the market. There is also room for use of matching grants to support the building of strong market linkages that improves chances of the private sector obtaining good returns on investment.

The intervention will be anchored in using knowledge and information on markets and demand characteristics, to support development of market-driven win-win business consortia anchored on an agribusiness firm.

The gaps across the value chain represent a USD 739 million market opportunity of new investments, which can be targeted in the following areas:

- Investment in Seed Multiplication and Distribution would lead to farmers benefitting from improved seed, as well as seed varieties more appropriate for processing to bring about increased smallholder productivity and income and Improved quality/consistency of processors' supply. There is need to enhance regulators' capacity to monitor quality efficiently

- Investment in smart use of other inputs (fertilizer and crop protection) would lead to farmers applying good agricultural practices and leading to higher yield and incomes. This will be done by embedding knowledge and information services within the supply chain. Retailers and suppliers of agriculture inputs will be trained and encouraged to embed this services in the supply chains at their own cost
- Investment in Storage facilities for both seed potatoes and ware potatoes to mitigate against high post-harvest losses, low prices during harvest time, and reduced incentives for farmers to increase production. This will lead to greater consistency of processors' supply and creation of aggregation points that private actors may leverage to improve value chain coordination. This investment will be enhanced by defining clear and transparent food safety regulations for storage, mechanize handling, grading and sorting, develop financing schemes with cooperatives. It is envisaged that cold storage will be centrally located at the town or in major cities with an elaborate distribution network of mobile cold trucks could be the core integration factor for the value chain. The aggregation point can be managed through various business models; i) By farmers (as a collective marketing tool); ii) By a trader (as a collection point); iii) By transport or logistics player (as broader horticultural distribution channel)
- Investment in processing to provide sufficient opportunities for growers of potatoes to sell produce to formal markets. This will lead to higher and more consistent prices for farmers, lower inventory costs, and foreign exchange requirements for retailers currently importing. Increasing investment in enterprises that specialize in processing, packaging, and selling of processed potatoes coupled with creation of awareness on the use of these products would increase this demand and thus making the industry grow. This investment should be in partnership with seed companies and training organizations to ensure farmers grow required varieties and quality with concurrent Invest in cold storage to maintain a year-round supply. It will be enhanced by building relationships with farmer cooperatives and develop out-grower agreements.
- Investment in linking farmers to off takers supplying non-processing markets to enhance incomes of smallholder farmers and small retail vendors and ensuring that consumers get high quality potatoes and affordable prices
- Investment to increase mechanization potentially through an entrepreneur that provides planters and harvesting equipment services for potatoes to farmers. Farmers would require financing to help them pay for mechanization services. This would be advantageous since the machine operator will bill for work done
- Improve the access to finance for farmers and other actors in the value chain. In order to break this cycle, formal financial institution, in the form of development banks, government institutions, public private partnerships, or commercial banks, should build the necessary networks that allow farmers to access healthier financial conditions and to have better credit conditions. Specific financial services which need to be considered include 1) Leasing finance for mechanization 2) Commercial finance for processors 3) Input finance for a smallholder farmer 4) Wholesale group lending to farmer groups, associations, cooperatives 5) Financial education and literacy

- Develop farmers skills in the knowledge and use of improved farming practices by adopting yield increasing technologies of seed and inputs to meet quality and quantity commitments in forward contracts with buyers and processors.
- Public policies to proactively encourage horizontal and vertical organizations of farmers, traders and others in the value chain; trade facilitation legislations and practices; or advisory service.
- Infrastructure - such as warehouses; agro-industries; feeder roads; power supply; water for irrigation and other operations

Consortiums

The consortium approach will be employed to efficiently link farmers to outputs and inputs markets. The basic structure has an “Anchor Firm” – in the form of a major trading and/or food processing company - with very good and proven linkages to national, regional (EAC), and global markets for the targeted commodity and/or processed products of the commodity. This approach is proposed since it will see:

- a) The value chain actors (VCA) in a strong business partnership with redefined relationships towards each other – with a collegial mindset rather than individualistic;
- b) All VCAs investing to expand their understanding of, and sharing knowledge about, the markets and demand dynamics;
- c) Recognition by all VCAs that they all have to make profit while ensuring that the final price cannot exceed what the consumer is willing to pay;
- d) The VCAs negotiating and planning together how to capture more value and share it more equitably along the value chain for the benefit of all
- e) The VCAs acting in concert and seeking partnership with government and other development partners on public goods needed to improve the value chain performance

These interventions are projected to reach up to 250,000 farmers and will lead to doubling of yields and doubling of incomes for smallholder farmers as shown below

Gross Margin Analysis Per Ha			
Current Scenario		With Certified Seed	Best Case Scenario
Yield (Kgs)	7000	20000	30000
Market Prices USD (per 100Kg)	25	25	25
Revenue	1750	5000	7500
Total Variable cost per 100Kgs	980	2800	4200
Gross Margin	770	2200	3300