



Netherlands Enterprise Agency

Seed potatoes Tanzania

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EXECUTIVE SUMMARY

1. This report aims to support Dutch-Tanzanian dialogue on the opportunities to develop the potato sector in Tanzania, including on B2B opportunities in the potato value chain. The scoping study was carried out on behalf of The Dutch Embassy in Kenya. The overall objective is to investigate if the private sector, the Tanzanian government, and possibly other development initiatives can support importation and local multiplication of high-quality seed potatoes from The Netherlands.
2. The study aims to answer three key questions: How can supply of ware potatoes in Tanzania be increased; how do farmers currently have access high quality seed potatoes, and; how can small-scale farmers in the potato sector increase income and employment. The study then concludes and recommends on the 1) possibilities for export of Dutch seed potato varieties to Tanzania, and 2) possibilities for commercial production and multiplication of the imported seed potatoes.
3. To come to the conclusions and recommendations the consultant conducted desk study, followed by in-depth interviews with public and private potato sector actors and experts.
4. On the issue of increasing supply of ware potatoes, the study found that within Tanzania the Southern Highlands zone (Iringa, Njombe, and Mbeya regions) are most important for potato and seed potato production; and that due to increasing demand from consumers potato production is on the rise yet hampered by a lack of availability of quality seed. Potato producers here are small in size and have relatively low yields per acre. Current ware potato production in Tanzania does not meet the demand. All potato crop produced is consumed, with occasional imports – mainly from Kenya – to fill the gap during off-season periods. During the peak production season in the southern highlands occasional export to neighboring countries and even Kenya is observed. Tanzania has a very limited range of processed potato products, with the bulk of the potato crop sold as ware potato and eaten as a boiled vegetable.
5. On seed potato production it became clear that there is no regular supply of certified seed, leaving a huge seed supply gap in Tanzania. Except for one key player, there are hardly any private sector investments in the seed production area, and public institutions are not able to close the gap alone.
6. On increasing income and employment in the potato sector, it was found that commercial production and marketing of ware potato in the Southern Highlands and elsewhere in Tanzania is unregulated. Benefits of the potato production chain are not favouring income and employment of small-scale potato farmers and/or small traders. Actors felt that this will increase by, for example, improving yields and by more market-oriented production systems, and by adding value through simple on-farm activities (grading, sorting).
7. One conclusion of the study looks at the opportunities for seed potato imports from the Netherlands. Important is that Government officials interviewed see importation as a logical means to increase national production, as long as it follows official rules. The conclusion is that rather than testing the idea (this Scoping study) the proposing of the idea, based on preparatory discussions with all stakeholders, should now start. Elements in this next step are entering discussions on seed potato certification standards; launching the idea with the three key decision makers that have been identified; and test the plans against the official Regulatory framework for seeds (including seed potatoes), including registration of new varieties. The report provides further insights in these elements. The conclusion also provides a list of actors – other than the three - that are important to involve in dialogues.

8. The second conclusion is on the opportunities to produce and multiply Dutch quality seed in Tanzania. It looks at the limited public sector facilities to produce clean pre-basic seed, and how private investments in this would benefit the sector. With farmers and middlemen eager to get access to clean seed potatoes, pricing of seed remains an issue and multiplication of imported seed seems needed. Within the Southern Highlands, the Njombe and Makambako districts and surrounding areas seem most suitable to do so.
9. Overall the study shows that Tanzania has a huge comparative advantage in the region in terms of land availability, proximity to the sea and potential high-value potato markets. This, in combination with key government actors unofficially supporting the idea of closing the gap in availability of high quality seed through importation of Dutch seed, provides opportunities for developing an import-based seed production and distribution system to improve potato yields.
10. As a result of this scoping study the following actions are recommended, in order of priority:
 - 1) investigate the interest of Dutch seed exporters to participate in a seed development,
 - 2) identify strategic partners in Tanzania,
 - 3) set up preparatory discussions with strategic partners in Tanzania to introduce the concept of fast-track seed import and multiplication to policy makers,
 - 4) confirm whether unrestricted import of seed potatoes is possible and under which import requirements,
 - 5) confirm variety registration regulations and security of variety protection,
 - 6) seek official approval from policy makers in Tanzania to develop a seed development project,
 - 7) proceed with project formulation and development of Terms of Reference.

1. INTRODUCTION

Background

This research has been carried out on behalf of The Dutch Embassy in Kenya. Meru Agro Ltd. has been asked to perform a country-sector scan for Irish potatoes in Tanzania. The outcomes of this scan will support a Dutch-Tanzanian dialogue on the scope and options for developing the potato sector in Tanzania and, related to the current business climate, provide the initial mapping of potential B2B opportunities in the potato value chain.

There are good opportunities for developing a quality seed production and distribution system to improve potato yields and contribute to food security. The seed potato sector in Tanzania is one of the least developed in East Africa. There is high potential for improving potato production and productivity considering the vast land and suitable agro-ecologies countrywide. Tanzania has a comparative advantage in the region in terms of land availability and price, proximity to the sea and potential high-value potato markets. The country's potato unstructured value chain clearly demonstrates high potential for improvement.

Objective

The overall objective of this research is to investigate if the private sector, the Tanzanian government, and possibly relevant development initiatives can support importation and local multiplication of high-quality seed potatoes from The Netherlands.

The research aims to provide insight in three key questions (Part 1 of this report):

1. How can the supply of ware potatoes, produced by (small-scale or commercial) farmers, for consumption and processing purposes, be increased significantly?
2. From which Tanzanian commercial seed potato producers do local (small-scale) potato farmers get access to high-quality seed potatoes of different varieties? Which are these varieties? How do farmers buy these seed potatoes?
3. How can income and employment in the potato sector, especially among small-scale farmers, can be increased significantly?

Based on these insights this Scoping study will then conclude and recommend the Dutch Embassy on the following issues:

1. What are the possibilities for unrestricted and fast-tracked imports of Dutch seed potatoes by means of full market access and security for protection of seed varieties?
2. Following such import of Dutch seed potatoes (from The Netherlands, or from Kenya): what are the possibilities for private potato seed production and multiplication, under the supervision of relevant Tanzanian authorities, by commercial farmers with a proven track record.

Methodology

To get better insights in these issues, literature review was performed on the seed potato sector in Tanzania (and East Africa) and interviews held with public and private actors and experts involved in the Tanzanian potato sector. This included a field visit to the main potato growing areas in the Southern Highlands region, as well as to Dar es Salaam. In total 26 semi-structured interviews were held.

PART 1: QUICK SCAN ON THE POTATO SECTOR IN TANZANIA

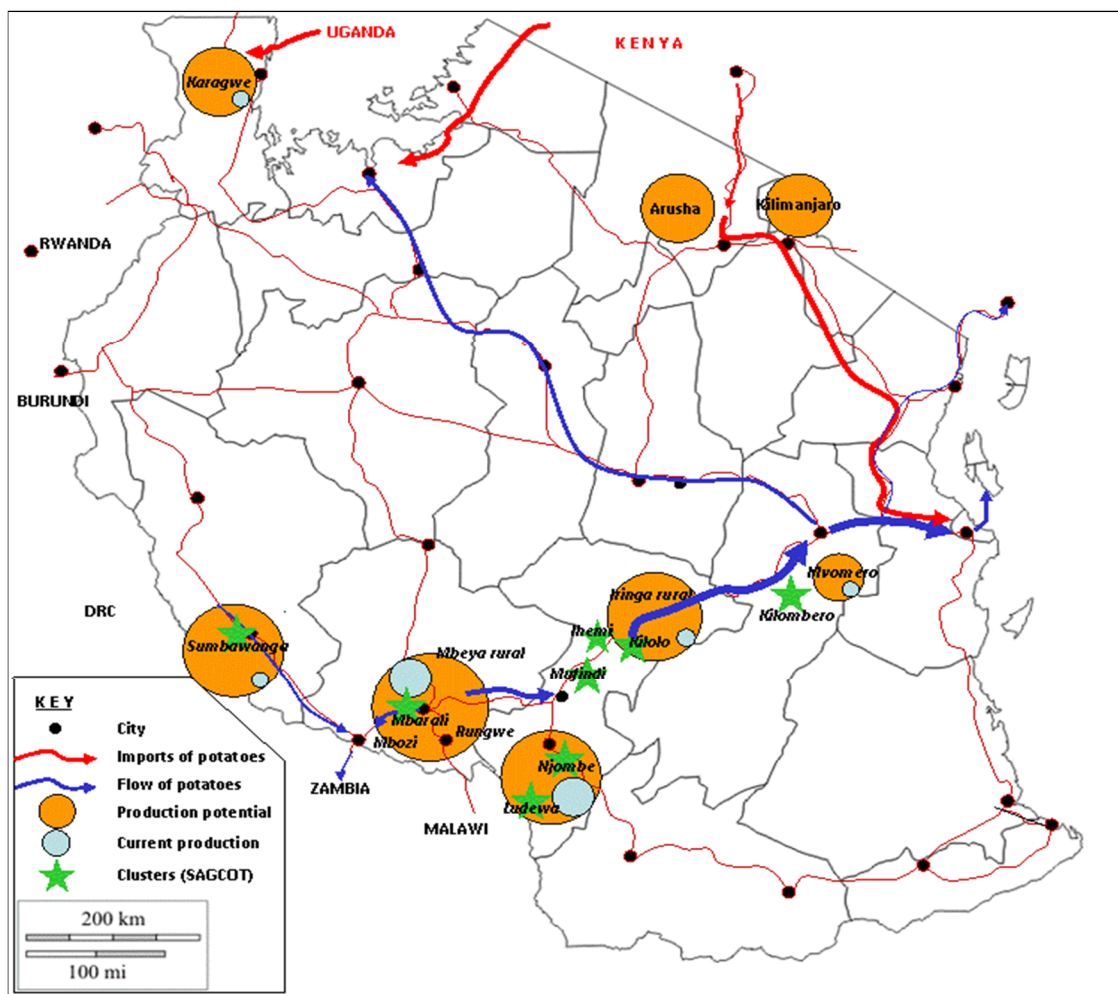
2. Increasing supply of ware potatoes

How can the supply of ware potatoes, produced by (small-scale or commercial) farmers, for consumption and processing purposes, be increased significantly?

Key production areas

The total area planted with potato in Tanzania is 170,000 ha per year (FAOSTAT, 2012). In total there are 28 Tanzanian districts where potato is grown. These all have highland ecologies. Of these districts, thirteen are located in the Southern Highland agro-ecological zone, and nine in the Northern zone. The key production areas in Tanzania, including the Iringa, Njombe, and Mbeya regions, are shown on the map below.

Within the Southern Highlands zone, the Iringa, Njombe, and Mbeya regions are most important for potato and seed potato production. They account for 70-80% of potatoes produced in Tanzania. Due to increased demand, particularly from consumers in urban areas, potato production is expanding, especially within the Southern Highlands region.



One of the key issues holding back productivity is the lack of access for local farmers to clean certified seed potatoes. This is caused by a) a lack of modern varieties registered in Tanzania (a precondition for any farmer to produce certified seed), and b) the lack of seed production capacity. Local farmers today achieve average yields of 5-7 tons per hectare. With clean seed material small holders have proven to achieve 15-20 tons per hectare. Providing farmers with good material can increase their income by a factor of three to four times.

Farm size and productivity in the Southern Highlands

Most of the farmers that cultivate potato in Southern Highlands are small – ranging from 0.4 to 10 acres. One interview with farmers in this range showed that small farmers have lower yields per acre (per harvest season): while a farmer with 0.4 acre produces 12.5 tons/ha, a farmer with 4 acres produces 15 tons/ha, and a farmer with 20 acres can produce 20 tons/ha. Another interview indicated that average production of a farmer ranges between 10-25 tons/ha. The difference in yield is mainly explained by the capacity of farmers to invest in adequate inputs and knowledge related to good agronomic practices. Most of these farmers do not apply the required inputs. The ‘official’ yield capacity of recommended varieties, such as the Kikondo variety, is 40 tons/ha. The majority of farmers can break-even with a yield of 20 tons/ha. At a yield of about 25 tons/ha, the gross profit of a farmer can be about TZS 700,000. Yet proper application of inputs (fertilizers, chemicals and seed) and labor will account for over 60% of the production cost.

General characteristics of the Southern Highlands potato production areas are the following:

Region's characteristic	Southern Highlands Regions				
	Iringa Njombe	Ruvuma	Mbeya	Rukwa Katavi	Total average
Land area (km ²)	58,936	66,477	62,420	75,240	263,073
Total population	1,495,333	1,117,166	2,070,046	1,141,743	5824,288
Agricultural population	1,238,135	947,356	1,647,756	946,505	4779,752
Urban population	257,198	169,810	422,290	195,238	1044,536
Population growth (%)	1.5	2.5	2.4	3.6	2.5
Population density/km ²	26	18	34	17	24
Households	346,815	232,340	491,929	222,868	1,293,952
Average household size	4.3	4.8	4.2	5.1	4.6
GDP per capita (TZS)	980,000	866,000	893,000	727,000	-
Poverty level (%)	15	20	21	24	-

Source: CFVA, 2009-2010

Production seasons, diseases

Farmers and District officials in the Njombe district, a major potato producing district in the Southern Highlands, indicate that producers in the area enjoy three cropping seasons: planting in September and harvesting in February; planting in February and harvesting in July; and planting in July and harvesting in December. Yet Agriculture Research Institute's Uyole researchers doubt this – during seasons with excessive rainfall (common in the Southern Highlands) quickly deteriorates the crop. In fact the researchers believe that countrywide Tanzania only has one good potato cultivation season, which is free from excessive rainfall. Kenya and Uganda, they say, have two good cultivation seasons. They also feel that only with irrigation a third season could be achieved.

As in other countries in East Africa, Tanzanian farmers have to find ways to deal with a number of diseases. Although all farmers interviewed respond that they do not suffer from diseases, they indicate to struggle with a disease that they name the ‘Fango disease’ – a result of seasonal

excessive rainfall. This is probably the Late Blight disease. Until now there is no variety that is resistant to this disease. The level of brown rot (or Bacterial wilt) soil infection is said to be low – it occurs but is not threatening. Late blight is probably the most feared one in the Northern Highlands zone: the disease is favored by cool, cloudy, wet conditions. Some farmers interviewed mention that they occasionally face both early and late blight diseases. The commercial farm Mtanga Farm in the Southern Highlands indicates it does not face problems with diseases since it follows standard agronomic practices. 80-90% of their production meets quality standards, which is possibly also the result of it being a large farm with plenty of space for crop rotation, and sufficient investment for adequate crop protection.

Status of the potato value chain and end-users of potato (products)

The Southern Highlands zone is one of the official seven agricultural zones in Tanzania, and the most important potato production area.

Most farmers do not use improved quality seeds and other inputs (fertilizers and chemicals). Those who do use inputs apply limited amounts of fertilizers and some chemicals to prevent late-blight disease. Most inputs are sourced from local dealers who supply inputs for varied crops and livestock. Some producers obtained subsidized fertilizer (to be used for maize), but divert some to potatoes because the crop is their main cash crop.

The current ware potato production does not meet the total annual demand. Generally all potato crop produced is consumed, with occasional imports – mainly from Kenya – to fill the gap during off-season periods. On the other hand during the peak production season in the southern highlands occasional export to neighboring countries and even Kenya is observed. Storage facilities are still clearly lacking to even out the discrepancies between supply and demand.

Northwestern regions of Tanzania do not have a good supply of potato due to poor infrastructure linkage with the Southern Highlands, resulting in Kenya and Uganda taking advantage of good road networks to export to the regions

Low-income families cannot afford potato consumption because the retail price is high, and during scarcity prices go even higher. Still population growth and growing urbanization will trigger higher demand of ware potato, especially retailed by street food vendors and other food service.

Population growth seems to be the trigger for demand for potatoes. There is no significant scope for external potato trade between Tanzania and other countries in the region. Any impact through adoption of improved production and marketing (cost price competitiveness) and a higher level of urbanization will increase domestic demand.

Tanzania, like its neighbors, has a very limited range of processed potato products. The bulk of the potato crop is sold as ware potato and eaten as a boiled vegetable. The development of locally owned urban takeaway outlets (fast food kiosks) in the major cities has increased the demand for potato for processing into chips (French Fries). At the moment there is no crisps processing facility in Tanzania. Crisp market development is also hampered by high volumes of imported crisps from processing giants such as Lays and other brands from South Asia.

The spread of fast food restaurants and the growth of the tourism industry are important sources for introducing fries to local populations. Frozen French fries are also attractive to urban middle and high-income population because of their convenience. In Tanzania, the demand of both crisps and French fries will mainly be from tourism food services, and from affluent urban population through supermarkets.

The Scoping mission was unable to identify professional potato processing companies in the Southern Highlands. There was one, Crispo Ltd. that was based in Iringa, yet it had stopped its operations just before this survey took place. Mtanga Farm, as private producer of seed potato, plans to invest in processing facilities in the near future. Processed products such as French fries

are sourced mainly from Kenya, sometimes from South Africa, and even from Belgium and Germany.

The largest branch of the Kenyan-owned Uchumi supermarket in Dar es Salaam states that it sources 200 kg of ware potatoes per month, from only three suppliers that source from Mwanza and Mbeya. Uchumi sells the produce at around 18% profit margin at a selling price of TZS 1,500 per kg. Another supermarket, the Tanzanian-owned Shoppers in a high-end neighbourhood of Dar es Salaam, sources its potatoes from the Mkuranga district in Coastal region, and from Aldo Tanga. Its selling price is TZS 1,700 per kg. Shoppers also source potatoes from Kenya, which are of better quality and appearance, at a selling price of TZS 3,900 per kg. See Annex 4 for Fresh quality specifications for the consumer market.

The current status of the Potato value chain in the Southern Highlands can be summarized as follows:

Production	Processing
Moderate levels of productivity	Ware potatoes are marketed without any processing
No value addition before marketing	Emerging processing facilities for crisps but small volume
Absence of quality and clean seeds and hence restricting yield	No facility for processing frozen French fries
Low capital of farmers restricting optimal application of inputs	Food service and substantially street food vendors prepare ready to eat Chips in urban areas
Opportunities	Market
Unmet local market, need for import substitution	Local production does not meet local demand (prices go high during shortage in supply)
Value addition potential (grading, synchronised production and harvesting)	Low income population cannot afford potato as part of their meal
Adoption of improved farm production techniques	Potential for exporting seed and ware potato from Tanzania – although competition from producing neighbours (Malawi, Kenya, Uganda, and Rwanda) must be addressed.
Public-private investment in facility to produce clean starting material for seed production, e.g. tissue cultured planting material	
Investment in commercial, market-oriented farming	
Investment in storage facilities	

Conclusions:

Supply and utilization of ware potatoes can be increased significantly by:

- Availability of modern varieties for table and processing purposes
- Availability of healthy (certified) seed potatoes at affordable prices to increase yields
- Creating awareness with small-scale farmers on the effect of healthy seed and other crop inputs (demonstration plots) on yields and income
- Adoption of improved production practices to increase yields
- Micro-finance to allow small-scale farmers to invest in adequate crop inputs
- Improving linkages between producers and consumers (markets) to increase farm gate prices and reduce transaction costs
- Reducing cost price of ware potatoes to make them affordable for low-income families
- Investment in market-oriented production and use of specific varieties for specific purposes (e.g. processing)
- Investment in storage facilities

3. Seed potato production

From which Tanzanian commercial seed potato producers do local (small-scale) potato farmers get access to high-quality seed potatoes of different varieties? Which are these varieties? How do farmers buy these seed potatoes?

Most farmers source informal (low quality) seed potatoes from traders. There is no regular supply of certified seed. The seed supply gap in Tanzania is huge requiring deliberate and targeted interventions to develop seed potato production and marketing enterprises that are

commercial and self-propelling. The public institutions will not achieve to close this gap without strong private sector participation.

Mtanga Farm Ltd is so far the only private sector company producing certified seed potatoes in Tanzania. Their seed potatoes are limited in quantity and can only solve the challenge of seed shortage in its immediate neighbourhood. Unmet demand for quality seed potato and low quality of nearly all potato planting material used in Tanzania offers many opportunities to the private sector. Several initiatives to produce healthy seed have been initiated and are summarized in the next section.

Present seed potato producers showing opportunities

The first seed potato producer is Mtanga Farm, the new and biggest private seed potato investor in the Southern Highlands zone (and whole of Tanzania). It owns exclusive land rights of over 500 hectares of developed agricultural land. Its seed potato chain engages with 150.000 farmers in the region. Mtanga seed potatoes are grown from tissue cultures and multiplied under controlled conditions on its farmland. Mtanga Farm has created 20 hectares of trials and produced 600 tons of seed for trials and multiplication over 3 seasons. It has installed irrigation for up to 4 hectares of first generation field multiplication. This year (2014) the production stood at 1,200 metric tons, compared to 500 metric tons in the year before. The varieties certified by TOSCI include Meru, Sherekea, Asante, and Tengeru. The farm's annual yield is 15 tons of seed potato per hectare, which is three times the national average. To cover for extra occasional demand, the farm imported 4 new varieties from Europe which are now in the process of being tested and registered: the Rumba, Laura, Jelly, and Marabel varieties, which saw the following yields in 2014 (see table).

Variety	Planted area (Ha)	Actual Yield (Kg)/0.01386Ha	Estimated Yield/Ha (T/Ha)
Rumba	0.01386	443.72	32.0
Laura	0.01386	436.92	31.5
Jelly	0.01386	454.26	32.7
Marabel	0.01	276.24	27.6

It also has nine new varieties under trial (not known from which companies). Mtanga Farm already supplies seed potatoes within the Southern Highlands zone, within the Njombe, Iringa and Mbeya districts, to 1000 buyers serving 10-20,000 small and medium scale farmers. The farm has two green houses with capacity to supply seed potato production for over 100 hectares). Mtanga Farm's tissue culture originates from the Oserian Development Company Ltd in Kenya. The cost of tissue is currently \$0,42 per plantlet. To fill the two greenhouses requires 14,000 plantlets per crop. The retail price of the seed is TZS 800 in 2014 compared to TZS 1,000 last year: a 20% decrease in price. The farm is equipped with a potato grader, a planter, a lifter and a sorter. The hardware is supplied by Grimme, as are the tractors and spraying equipment. Mtanga Farm's seed storage unit can accommodate up to 1,200 metric tons (can plant about 500 ha.)

In the context of this study it is important to know how many times Mtanga Farm multiplies its mini tubers in the field before the seed potatoes are sold. And to get more details on whether this seed is certified by TOSCI. Also more insights are needed on the seed potato price compared to the final ware potato price.

The second seed potato producer is the Agricultural Research Institute-Uyole (ARI Uyole) in the Southern Highlands, which currently produces limited quantities of early generation seed. It is currently developing a seed potato multiplication and dissemination strategy that will strongly involve private seed multipliers especially under the decentralised, quality-declared planting

material (QDPM) scheme. The seed supply gap in Tanzania is huge requiring deliberate and targeted interventions in developing seed potato production and marketing enterprises that would be commercial and self-propelling. During the past 4 years ARI Uyole has been engaged in a Finland funded program, managed by CIP, to strengthen the current seed potato sector. The program will be completed in February 2015.

At the moment of the interview, end 2014, ARI was engaged in production of seed potatoes. Its production commences from tissue culture, with mini tubers from green houses to 1st field generation, then 2nd field generation, and from there to potato seed producers. Every 4 cycles these producers get new seed. This multiplication system of seed potatoes is cost intensive. Plantlets require investment in greenhouses. Currently the cost of a mini tuber is US\$ 0.30 and that of one plantlet is US\$ 0.40. Both prices are gross – excluding transport costs. Prices (selling prices) for seed potato are TZS 400 per kg for non-certified and TZS 700 per kg for certified varieties. Meanwhile, farmers are not used to buying new seed – they rotate the same old tubers resulting in quality constantly deteriorating.

ARI's farm has 122 ha irrigated land, which is used by 1,006 farmers. The land is divided into small plots, with each farmer occupying one-quarter of an acre. Farmers here strongly support the irrigation schemes for potato production to control water flows, resulting in improved cultivation schemes and higher yields. The farmers produce 30-35 tons of ware potato per ha, higher than the rain-fed production. Cost of contributing to the irrigation scheme per farmer is low: an annual membership fee of TZS 10,000 and TZS 2,500 per ¼ of an acre per season. All small farmers state that there is capacity for growing the potato businesses.

The third seed potato producer is The National Agricultural Research Service (NARS). Its tissue culture laboratories in Tanzania are said to have capacity to produce more than 50,000 in-vitro plantlets annually although no more than 26,000 can be utilised with the current government and private greenhouse space undertaking seed potato multiplication. The current annual mini-tuber production capacity is approximately 200,000 mini-tubers of which, 120,000 and 80,000 are produced by the public and private sectors, respectively. The greenhouse space needs to be expanded to utilise the tissue culture production capacity to above 50%. This can be through building new green houses at ARI Uyole, in the Northern region of Tengeru and engage the private sector to invest in mini-tuber and early generation seed potato production in both northern and southern highland regions.

Conclusions

- The main seed source for farmers is informal seed (small tubers kept from previous harvest of ware potatoes) sold by local traders
- Initiatives to produce healthy seed are concentrated in the Southern Highlands where conditions are suitable for seed production
- Mtanga farm is the only modern, commercial seed farm with a current output of 1200 tons of seed potatoes produced from minitubers
- Mtanga farm multiplies 4 registered varieties originating from CIP, and another 4 varieties from the Netherlands are being tested or registration.
- Public institutions producing seed potato are ARI-Uyole and NARS, both producing in-vitro material and minitubers, resulting in limited amounts of healthy seed for farmers
- ARI-Uyole also produces limited quantities of early generation seed to feed into a decentralized, quality declared seed scheme involving small private seed multipliers
- Despite many years of public efforts to produce seed, the total output of healthy seed is currently less than 1% of total seed requirement
- Seed production initiatives in Tanzania concentrate on the slow-track method of producing seed from in-vitro plants and minitubers. Few public institutions have the managerial and investment capacity to manage both the production of minitubers as starting material as well as the effective field multiplication of this material. The end

result is either low quantity of certified seed after field multiplication, or insufficient quality of seed.

- The fast-track seed production method is principally different from the seed production method currently applied in Tanzania. In the fast track method the first part of the seed chain (in-vitro plants and minituber production) is done in the Netherlands and the second part (field multiplication) in Tanzania. This approach to seed production is new for Tanzanian policy makers and needs to be explained carefully.

4. Increasing income and employment in the potato sector

How can income and employment in the potato sector, especially among small-scale farmers, be increased significantly?

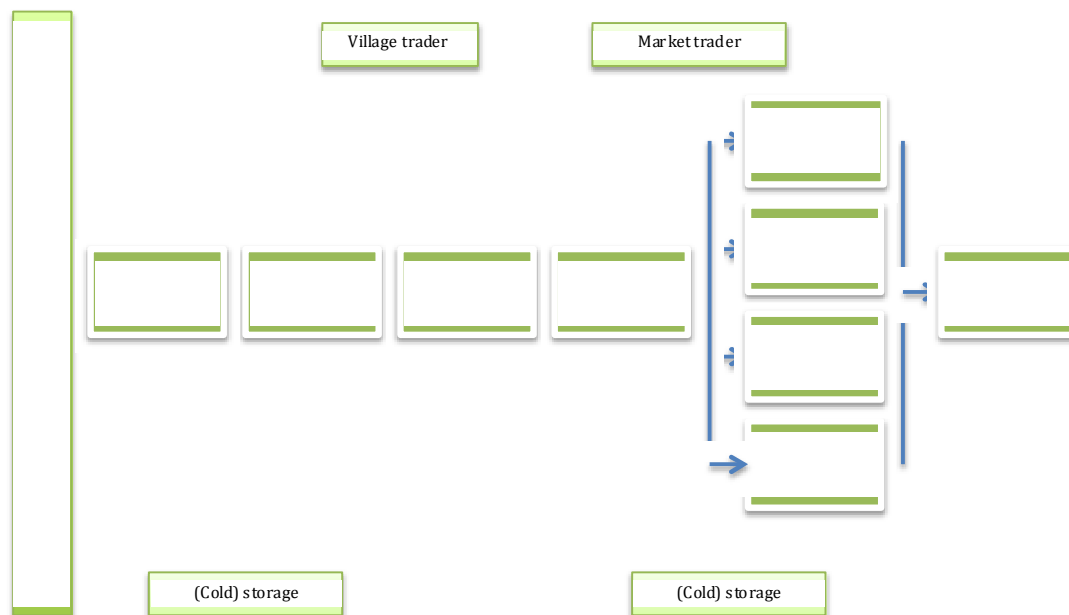
Expanding consumption and production

Due to increased demand, particularly urban demand, potato production is expanding within the Southern Highlands zone, and is recently spreading into central (Morogoro) and north eastern (Kilimanjaro, Arusha and Manyara) Tanzania. The Lake Victoria zone's urban centers receive most of their ware potato from Kenya and Uganda. Western urban centers rarely receive fresh potato due to poor road infrastructure.

Such expansion is good for income and employment growth in the sector. Commercial production and marketing of ware potato in the Southern Highlands, like elsewhere in Tanzania, is unregulated. Yet producers and traders are in long-term relationships that are built on trust. These relationships and the marketing systems in general appear to work well enough, yet equality in terms of benefits of the potato production are not in favor of income and employment of small-scale potato farmers and small traders. Village traders / middlemen for example only get about 2% of the end-selling price – they have no substantial investment in the chain apart from their own time and labor. Retailers of ware potatoes get higher percentages (44%) of the end-selling price: they only handle small volumes compared to other chain actors. Meanwhile street food vendors make even higher margins: 72% of the end-selling price (preparing ready to eat French fries prior to their sale).

Key actors

Most of the poor and low-producer farmers sell their ware potatoes to village traders or fellow farmers, while big producers and rich farmers sell to wholesalers in urban areas. This is because small-scale farmers cannot afford to take ware potatoes to the larger markets. Very few farmers are able to hire trucks to take their products directly to the big markets found in big cities such as Dar es Salaam, so the majority sells produce to local traders / middlemen. To have a clear view of the actors in the Tanzanian potato chain the Scoping study prepared the following figure on the structure of its actors and relationships.



Market structures at rural level

Due to land pressure, most smallholder farmers do not adopt a rotational farming system to improve soil fertility and control diseases and pests. Potatoes are a heavy user of fertilizers. Some of the farmers are indigenous to the area while others are immigrants from different areas. They moved into the area and hired farms for ware potato production. Most of these farmers produce ware potatoes for commercial purposes.

The bulk of potatoes are sold into the ware market as an ungraded product. The marketing system is not well organized, with most farmers being price takers, and retailers and subsequent consumers paying high prices due to the high transaction costs of farmers and traders. Most of the village traders are indigenous to the area and do not involve themselves in ware potato production. Most of them are young people aged between 20 and 45 years. Business in ware potatoes is regarded to be their main source of income.

Southern Highland zone's village traders or the small-scale farmers themselves sell their crop to wholesalers (middlemen) who transport the crop mainly to the Dar es Salaam market. Most of the wholesalers are not indigenous to the area but come to the area during the harvesting periods and the majority has big capital. Wholesalers / middlemen receive around TZS 40,000 per bag (1 bag = 100kg), stating that a realistic price should be TZS 50,000 per bag. In general the small-scale farmers are negative about price levels they receive from these middlemen. A regional middleman visits about five farmers per day, to an average total of 50 farmers. On a weekly basis a middleman transports 700-800 bags, paying maximum TZS 45,000 per bag of highest quality. Middlemen are satisfied about the quality of ware potato they can get. About 80% of the produce they find consists of good, big size potatoes free of diseases. A regional middleman interviewed transports six trucks per day, with 50-80 bags per truck. This middleman buys between TZS 30,000-35,000 per bag, and sells at TZS 50,000 per bag to consumers and/or restaurants.

All farmers and middlemen that were interviewed believe that in terms of market-price ratio the ware potato production and marketing offers them good business. They are currently able to satisfy demand, and most supply the same markets in Dar Es Salaam. At present there are some trade links into Kenya, DRC, and Zambia, yet these are occasional and unregulated. Tanzania does not yet export large volumes to neighboring countries although some export from the Mbeya region during peak production may be observed. Its neighboring countries have

sufficient own production, which is backed up by more-developed seed and ware potato production programs.

The strong fluctuation during the year of potato supply to the market is a strong indication of the need to investigate the benefits of potato storage to even out the seasonal discrepancies between supply and demand and strengthen the position of potato producers. Storage could also open the possibility of introducing the warehouse receipt system for providing credit to farmers.

Conclusions

- Income among small-scale farmers can be increased by improving yields and by more market-oriented production systems
- Value adding through simple on-farm activities such as grading and sorting can further increase farm income as well as provide employment
- Overall value chain development and better linkages between farmers and markets will help to improve equality in terms of sharing benefits among chain actors, resulting in higher returns for small-scale farmers
- Small-scale farmers, being price takers, will benefit from jointly selling their produce with other farmers as this will increase their bargaining power
- Investment in storage facilities could also strengthen the bargaining position of potato producers and open the possibility for introducing a warehouse receipt system.

PART 2: ADVISE ON NEXT STEPS

5. Opportunities for seed potato imports from The Netherlands

The possibilities for unrestricted and fast-tracked imports of Dutch seed potatoes by means of full market access and security for protection of seed varieties.

Position of government, next steps

The Scoping mission did not get an *official* mention of support by Government actors for establishing a system of seed potato production based on imports of seed of modern varieties. Yet in discussions there has not been any rejection of the idea – most see it as a logical means to increase national production and focus on the rules that need to be followed.

As such, the idea of an import-based system has been discussed and has received moderate initial support from Government actors; it now requires careful further investigation. This means that the idea must be ‘launched’, i.e. the Scoping is over and Proposing the idea should start. A decision on this must be based on: the conclusions and recommendations of this study; follow up and preparatory discussions with a small number of key strategic partners; a business model on how to attract potential private investors in seed potato production; and real interest to enter the Tanzanian market among Dutch exporters.

Seed potato certification and standards

Tanzania works through an official seed certification institute that is responsible for quality control for seed of all crop species, including seed potatoes. The country is also one of the signatories of the East African harmonised seed standards, which is less rigorous than the national standards.

Tanzania is currently testing its seed potato certification scheme for eventual adoption in routine seed potato quality control. Full implementation of a formal version of this seed certification system will take time and resources to apply routinely considering that few private companies are currently producing certified seed.

In the meantime, other quality assurance schemes are being implemented to ensure that minimum standards for the production of large quantities of quality potato planting material are applied.

Decision makers on potential imports of Dutch seed potatoes

According to the National Plant Protection department, under the Directorate of Plant Health Services – in this case the most relevant department in the Ministry of Agriculture Food Security and Cooperatives (MAFSC) – the following institutions are critical when considering imports of Dutch seed potatoes:

1. National Plant Protection department, as issuer of importation licences
2. TOSCI, as Plant Health Inspectorate
3. ARI Uyole, as Research Institute specialized in (seed) potatoes

- The role of the first, the National Plant Protection department, is to ensure planting materials are clean from diseases and pests. It issues import permits for planting material, based on a country-dependent analysis. For imports from The Netherlands it will require a lists of pests that affect seed potato production in that country. If all criteria are met the Ministry grants a permit. The Ministry uses the Crop Protection Compendium tool, which gives a rough idea on what conditions should be tested. It is also important to know for which diseases it should be tested. Under ideal circumstances the procedure will take four weeks. It is known by the Ministry that Dutch seed potatoes have been imported before, but only in small quantities.

The Department's main challenge is to transfer research knowledge on multiplication to farmers. There is a lack of funds for this due to government limitation. In the new situation, the Ministry transfers knowledge to Districts and that is where it stops. Districts are not under the Ministry any longer; they report to the Ministry of Regional and Local Administration.

- The role of the second, the Tanzanian Official Seed Certification Institute (TOSCI), is that it is the government Seed Certification Institute. It is responsible for testing and certification of seed. Varieties from within the East African Community (EAC) require less testing than varieties from outside the EAC. The applicant of tests requires complying with DUS standards: Distinctiveness, Uniformity and Stability. In addition, the new variety needs to pass two National Performance Trials (NPTs). Once varieties pass the test(s) they are registered and can be owned and marketed. Seed cannot be sold before the variety has been registered. Before entering the NPT advance Yield Trial (AYT) data needs to be provided to Tosci by the breeder. Also the motive for registering the variety needs to be provided. The Technical Committee will then discuss the variety, and if standards are met it will pass to National Variety Release Committee. If tests have already been carried out in other EAC countries these have to be shared, followed by application for NPT trial. Seed originating from other EAC countries do not require new Advance Yield Trial (AYT) data – the applicant merely needs to show this info from the originating country. Only one NPT (one season) is required in this case. Then too the Technical Committee will discuss the variety and pass it if standards are met. In both cases, once the Committee has passed the variety, the applicant receives a permit from the Ministry. The procedure for testing and registration of varieties may take the applicant three years.

- The role of the third, the Agricultural Research Institute-Uyole (ARI-Uyole), is that it is well connected and linked to the MAFSC. It is based in the Southern Highland zone. ARI-Uyole is a public institution, primarily undertaking agricultural research and development under MAFSC. ARI-Uyole was founded in 1968 and in 1976 it became semi-autonomous organization, the Uyole Agricultural Centre (UAC). The UAC primary functions were research and training for agricultural development, which were supported by NORDIC countries (Norway, Sweden, Finland, Iceland and Denmark). In 1993, the government formally dissolved the UAC semi-autonomous status to its present status: it is now one of the public agricultural research and development institutions of in MAFSC, which in this case caters for the Southern Highlands Zone. Its objective is to deliver demand-driven agricultural technologies, information services and knowledge to farmers and other stakeholders, for increased agricultural productivity, profitability, competitiveness and sustainable use of natural resources in the Southern Highlands zone.
- Roots and tubers sub-research programs are one of programs in MAFSC under the Directorate of Research and Development. It has the mandate of conducting research on cassava, sweet potato and potato. This program seeks to develop improved varieties tolerant to diseases and pests and high yielding varieties. Its major areas of research include: develop high yielding varieties; identify insects and diseases, including those that affect potato; develop and address agronomic practices for potatoes; multiply and disseminate improved potato varieties, including the techniques that have been developed; and establishing a good system of seed potato production using aeroponics and tissue culture technology.

Regulatory framework for seeds (including seed potatoes)

TOSCI's Regulatory framework for agricultural seeds in Tanzania is provided in two documents: The Seed Act of 2003 and the Seed Regulations of 2007. The Seed Act makes overall provisions for the control and regulation of the standards of all agricultural seeds. In the Seed Act the Tanzanian Official Seed Certification Institute (TOSCI) is officially charged with all aspects of seed quality control and seed certification. TOSCI is also responsible for the National Performance Trials (NPT) of new varieties. The exact responsibilities and authority of TOSCI are specified in the seed act. TOSCI is the equivalent of Kephis in Kenya and its activities and responsibilities are similar to that of Kephis. Tosci apparently faces challenges processing varieties that originate from Kenya. Due to the high price of land seed production is more expensive in Kenya than it is in Tanzania. Seed Co Ltd., for example, has for this reason shifted production from Kenya to Tanzania. It is felt that Kephis, Kenya's counterpart of TOSCI, does not want to share information related to NPTs, variety registration and overall seed certification to stop companies moving to Tanzania, thereby loosing on seed production at a national scale.

The Seed Act specifies that the Minister of Agriculture approves the release of new varieties upon advice by the National Seeds Committee. The process of application, testing, release and registration of new varieties is further specified in the Seed Regulations. The Seed Act further indicates that all new varieties are published in the Government Gazette and that the Director responsible for crop development will maintain a national catalogue of approved varieties.

The Seeds Regulations provide details of all procedures of variety testing, release, and registration as well as procedures for seed certification including inspection, seed classes, tolerances for disease and pests, certification, labeling, requirements for trade. In seed certification the following classes are distinguished: breeders seed, basic seed, certified 1 and certified 2. The tolerances for diseases are extremely strict and probably not realistic for a starting seed production system. The list of diseases is not complete, e.g. the tolerances for potato leaf roll virus (PLRV) are missing. The Seed Regulations also provide forms for all steps in seed production including application for variety registration, seed production, seed

certification, and application for a license to trade. For the import of seed potatoes a licensed seed trader in Tanzania can obtain an import permit from TOSCI.

Registration of new varieties

Variety registration procedures, i.e. for variety testing, release and registration in Tanzania are similar to those at Kephis in Kenya. As mentioned, application for variety registration has to be done with TOSCI, which will require that prior to application for NPT a DUS test (Distinction, Uniformity and Stability) is carried out – by TOSCI, or alternatively DUS data are provided by the owner of the variety. During the following season TOSCI will carry out the National Performance Trials. NPT has to be done in at least one season and at least 3 sites. NPT application has to be supported with data from yield trials in two previous seasons from not less than three recognized testing sites in Tanzania or any other East African country. Dutch varieties registered in the NPT in Kenya only have to be tested for one season in Tanzania, provided Kephis makes available the NPT data of the Kenyan test sites.

The NPT is overseen by a National Performance Trial Technical Committee (NPT-TC). This committee, with 10 members, recommends the release of new varieties in a report to the National Variety Release Committee (NVRC). The NVRC with 14 members will review the recommendations received from the NPT-TC and will advise the National Seed Committee (NSC) on the release of new varieties. The final decision on variety release is with the NSC. A document on East African Standards for seed potatoes has been developed with support from USAID. The standards are similar to the ones indicated in the Seed Regulations of Tanzania but it distinguishes 3 certified seed classes compared to two certified seed classes in the Seed Regulations of Tanzania. The certification procedures in the East African Standards are worked out in more detail compared to the Tanzanian Seed Regulations. It is not clear at present whether or not TOSCI will use (part) of the East African Standards and procedures.

Imported seed needs to meet Tanzanian quarantine requirements as provided in the Plant Protection Act. Further study of the specific import requirements for seed potatoes from the Netherlands is required.

Other actors important for potential imports of Dutch seed potatoes

- The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) can play a vital role in the seed potato sector, by creating transformative interventions. It already cooperates with the (only) commercial seed potato producer Mtanga Farm, with ARI Uyole Research Institute, Yara, and Syngenta. SAGCOT can assist a potential seed potato project by shortening the registration process for new seed varieties originating from EA countries and/or from The Netherlands or other EU countries. It can provide a network and financial support to support the seed potato sector, and support to demonstration of simple technologies and equipment to producers and farmers, in cooperation with Kigani Agro. SAGCOT has experienced difficulties in persuading KEPHIS in Kenya to release data, hearing in return it is the applicant who must get this data from KEPHIS by itself. It cooperates very well with Ugandan authorities. Within this context SAGCOT looks forward to see Tanzania becoming an official member of UPOV in the very near future. SAGCOT supports foreign investors in the seed potato sector, but wishes to work with not just one seed company: it wishes to see several investors coming in at the same time. These investors should not only import and multiply seed but also involve in training farmers on the benefits to use better seed. According to SAGCOT, marketing of seed potato must be structured from farm to fork, including investments in good storage facilities, as well as in R&D programs. Finally and crucial, importing high quality seeds should address nutrition value as well, besides the economic and food security aspects.

SAGCOT is an inclusive, multi-stakeholder partnership with the goal to develop the region's agricultural potential. It was initiated at the World Economic Forum (WEF) Africa summit 2010 with the support of founding partners including farmers, agri-business, the Government of Tanzania and companies from across the private sector. Its objective is to foster inclusive, commercially successful agribusinesses that will benefit the region's small-scale farmers, and in doing so, improve food security, reduce rural poverty and ensure environmental sustainability. The model of a public-private partnership (PPP) approach is used for achieving these goals, and the initiative is the first PPP of such a scale in Tanzania's agricultural history.

- The International Potato Center (CIP) is part of the CGIAR consortium, a global partnership that unites organizations engaged in research for a food secure future. In the Tanzania context, potato varieties have been developed or cleaned for diseases by CIP, in collaboration with National research stations since the 1970s. These are considered to be superior in qualities such as yields, resistance to diseases, dormancy period, maturity period or taste as compared to 'local' or existing varieties. Improved varieties also include those varieties originating from trials conducted by NARS and selected and adopted by farmers because of their superior qualities. The interview concluded on the fact that new superior varieties have not been out in the fields with the farmers for more than 35 years due to absence of a seed multiplication program. Varieties now with farmers are those whose origin is unknown and/or varieties that were released by NARS without being cleaned for diseases for 35 years.

There was limited CIP intervention in Tanzania between 1988-1994. From 1994-2008 the country received CIP potato clones. But unlike other countries in the region Tanzania had limited human and capital investment in potato research and development. The potato program in Tanzania had not had major R&D interventions or internal effort to utilise the germplasm that had been acquired over time, as other countries did. Consequently no varieties have officially been released and registered for legal production and trade until 2012. In 2011, the National Agricultural Research Service (NARS) considered revitalising the potato sector through a CIP-led, Finish Government funded 'Seed Potato Development Project Tanzania' (2011-2014). The project's focus was primarily on building a strong foundation for seed potato production and improved potato R&D to position Tanzania at the same level as other countries in East and Central Africa.

- Earlier work in variety development before this project, from 2008-2012, with the support of CIP, the Syngenta Foundation's Seed2B program, and Mtanga Farm Ltd. resulted in release and registration of four CIP-bred varieties. These are now the 'allowable cultivars' whose seed can be legally produced and traded. The potato sector re-development initiative, so far initiated by the Syngenta Foundation and with Finish Government support, will become a new foundation to re-launch Mtanga Farm to a higher level by 2020. However, this will only be possible through a re-energised R&D effort and with strong public-private partnership participation.

Other actors less important for potential imports of Dutch seed potatoes

- The Agricultural Seed Agency (ASA), has as role to promote available seed. It was established under the Executive Agencies and was launched in 2006 as a semi-autonomous body under the Tanzanian Ministry of Agriculture, Food Security and Cooperatives. The Agency took over the responsibilities that were performed by the Seed Unit of the Ministry of Agriculture Food Security and Cooperatives. The aim of establishing ASA is to ensure high quality agricultural seeds are available to farmers at affordable price. The key functions of ASA include: expanding seed production and distribution networks so as to facilitate seed accessibility by farmers, the promotion of increased private sector participation in the seed industry development through establishment of public-private partnerships or joint

ventures in seed production and distribution, the promotion of increased demand of certified seed by farmers, and a strengthening of research capacities for breeding and producing varieties that address farmers' specific demands.

- The Tanzania Seed Trade Association (TASTA), has as objectives to: promote the use of improved quality seed, to strengthen communication with African (and world-wide) seed industries, and to facilitate establishment of national seed trade associations in Africa. TASTA provides information to its members (seed companies) and interacts with regional governments and NGO's involved in seed activities in order to promote the interests of the seed industry. It promotes activities that lead to regulatory harmonization throughout Africa to facilitate movement of seed, and to develop a statistical database on African seed production and trade.

Conclusions

- The seed potato supply gap in Tanzania is huge, and will not be closed by the current interventions by public and private institutions that produce minimal amounts of healthy seed
- The current seed supply gap and good prospects for markets for ware potatoes provide potentially good opportunities for fast-tracked seed imports from the Netherlands
- The regulatory framework for the seed sector, including seed import and multiplication, is in place but the specific import requirements for seed potatoes from the Netherlands need to be further investigated and confirmed
- Legislation in Tanzania is favorable for variety registration and protection but the details of security for variety protection in practice needs to be further investigated
- New varieties need to be tested in at least two seasons but varieties already registered in Kenya (or any other country in the East African Community) need to be tested only one season in Tanzania
- The provision by Kephis of NPT information of Dutch varieties tested in Kenya is critical to shorten the variety registration process in Tanzania
- The main decision makers on seed imports are the National Plant Protection Department (import license) and TOSCI (variety testing and registration, and seed certification standards)
- Seed imports from the Netherlands are likely to be opposed by public institutions like ARI-Uyole and CIP since both receive funding to develop varieties and to produce seed potatoes. Dutch seed imports will be seen as a direct competition threatening their sources of income.
- SAGGOT would seem a suitable strategic partner to launch the idea of an import-based seed system, prepare a business model and gain the support of Tanzanian decision makers for an import-based seed development project.
- SAGGOT can play a vital role during project implementation and in linking Dutch and local business partners.

6. Opportunities for local seed potato production and multiplication

Following import of Dutch seed potatoes (from The Netherlands or from Kenya): the possibilities for private potato seed production and multiplication, under the supervision of relevant Tanzanian authorities, by commercial farmers with a proven track record.

Opportunities

Production and sales of seed potato is extremely limited in Tanzania. The public seed farm of the ARI has always been the sole supplier. Currently the public sector has very limited facilities to produce clean pre-basic seed. Supplies of tissue-cultured material are obtained from the

International Potato Centre (CIP) in Nairobi, Kenya. Investment in improved facilities to produce tissue cultured materials and pre-basic seed is viewed as a great benefit to the sector, and as an essential first step in supporting increased production and improved quality.

Experience from other EA countries shows that through the tissue culture and minituber approach the outputs of healthy seed for farmers are limited and that seed is often of insufficient quality. Key actors involved in the (seed) potato sector in Tanzania view importation of seed potatoes as worth the investment since normal size seed tubers are easier to handle than in-vitro materials and minitubers resulting in higher multiplication rates during field multiplication. Importing seed from a reliable source of basic seed in the Netherlands also means that upscaling (or downscaling) of seed imports and multiplication is easily done depending on the market for certified seed. Upscaling or downscaling in the in-vitro and minituber production system is more complicated because production planning (starting with the number of in-vitro plants) takes place several seasons before the end product (certified seed) is sold to farmers. The seed import system is more flexible and can respond more quickly to changing market prospects (demand of certified seed of a specific variety).

Experts note that importation of tubers can only become profitable if these tubers are multiplied at least one or two times as 'field generations'. Interviews showed that both farmers and middlemen are eager to get access to new clean seed potatoes, even if the price is somewhat higher.

Potential seed potato production area

The Njombe district, mentioned earlier, is by far the most important district for potato production. The district is situated at 2,940 metres altitude, which provides good conditions for seed production provided that isolation distances from infected ware potato fields are respected. There are about 200 farmers cultivating the crop, based in 44 villages and with 39,400 households. Last season they cultivated 18,800 hectares of land, and produced 324,000 tons of ware potato. During interviews farmers indicated that their land size varies from 0.5 to 20 acres, with 5-10 acres being the most common size. Potato is the number one crop for farmers in this district. The district works closely with private sector companies such as Yara, Syngenta and Mtanga Farm, and with the Research Institute ARI in Uyole, on demonstration plots, mainly for Kikongo varieties.

This shows that commercial seed potato production is feasible, and that such private investment finds the support of the main (semi) government research institute.

In all cases seed certification is under the supervision of TOSCI. However, full implementation of formal seed certification is still in progress and is not applied routinely. The main reason is that few institutions are producing certified seed and that the area planted for formal seed production is still very limited. Seed inspectors of TOSCI lack experience in recognising potato diseases in the field and need further training in field inspection.

Also, the Makambako district is a very suitable area for investment in seed potato production. It is situated only 60 km south of Njombe yet with very different climatic conditions. The district lies on 1700 m altitude, has a population of 94,000, and, according to District officers, 75% of its households are producers of ware potato. These producers cultivate 500 hectares of land in total, with an average farm size of 0,5 acres. They can only cultivate one season per year due to lack of sufficient rainfall (700mm annually). Where possible they use irrigation schemes. The Mufindi district accounts for between 500-600 farmers, with each one cultivating a farm of 0.5-3 acre, and yielding around 10 tons/ha.

Conclusions

- Tanzania has huge comparative advantage in the region in terms of land availability, proximity to the sea and potential high-value potato markets. This provides opportunities for developing an import-based seed production and distribution system to improve potato yields.
- Climatic conditions for multiplying imported seed potatoes are favourable in the high altitude areas of the Southern Highlands
- Regulations for seed inspection and certification are in place at TOSCI but full implementation of formal seed certification is still in progress and is not applied routinely since few institutions produce certified seed
- Seed inspectors lack experience in potato and will need additional training
- Availability of adequate lab facilities for analysis of tuber samples as part of seed certification needs to be further investigated
- A network of (small) private seed producers is being developed by both Mtanga Seed farm as well as by public institutions such as ARI-Uyole. These farmers are potential multipliers of imported seed.
- The only professional seed enterprise is Mtanga farm with 500 ha of land; additional professional seed growers are to be identified, trained and supported.

8. CONCLUSIONS AND RECOMMENDATIONS

1. With 170.000 ha planted per year potato in Tanzania can be considered as an important food crop.
2. The amount of healthy seed available is less than 1% of national seed requirement that is the main reason for the current low yields (average about 6 tons/ha). With adequate inputs, including healthy seed, current yields can be tripled.
3. Apart from lack of healthy seed, weak points of the potato sector include low adoption of improved production practices, low inputs, poor linkages between farmers and markets, unequitable distribution of profits among the value chain actors.
4. The main potato production area is the Southern Highlands where mainly small-scale farmers produce some 80 % of the Tanzanian potatoes. Conditions for seed production in the high altitude areas of the Southern Highlands are good.
5. Most varieties used by farmers have been used for decades without input of new seed. Recently, four new varieties were released from CIP bred materials and another 4 varieties from the Netherlands are currently in the process of being registered. These varieties are currently multiplied via in-vitro plants, minitubers and one or two field multiplications.
6. Current seed production initiatives concentrate in the Southern Highlands. This includes a) the only large scale private seed potato farm Mtanga Farm with 500 ha of land and modern facilities for minituber production, storage and field operations, and b) Public institutions including ARI-Uyole and The National Agricultural Research Service. Mtanga produced 1200 tons of seed in 2014 while both public organisations produced very limited amounts of seed due to lack of resources.
7. Due to population growth and increasing demand for processed products market prospects for ware potato production for table and processing purposes are good; this results in an increasing demand for healthy seed of modern varieties. With the current output of healthy seed being less than 1% of national seed requirement this provides opportunity for a fast-track seed import and multiplication project with participation from Dutch seed exporters.
8. Some Dutch seed exporters are already active in the Tanzanian market and may oppose intervention by a seed development project in which various competitor seed exporters will participate. Hence, the interest from the Dutch seed exporters to participate in a possible

seed potato development project needs to be investigated before further project preparations take place.

9. Tanzania is a member of UPOV and national seed legislation is favourable for an import-based seed production system with protected varieties.
10. Varieties that are registered in Kenya (or any other East African country) have a shorter testing and registration procedure than varieties from countries outside the EA Community. Further investigation is needed to confirm the specific variety registration procedures, the security of variety protection, and specific import requirements for seed potatoes.
11. The following institutions are important in relation to imports of Dutch seed potatoes: the national Plant Protection Department (quarantine issues and import licences), TOSCI (variety testing, seed inspection and seed certification), and Agricultural Research Institute-Uyole (R&D, variety development and basic seed production).
12. Full implementation of formal seed certification is still in progress and is not applied routinely since few institutions are producing certified seed. Seed inspectors lack experience in potato. Availability of adequate laboratory facilities at TOSCI for analysing tuber samples needs to be further investigated.
13. Considering the fact that public research institutions are mandated and financed to develop new varieties and produce seed, it can be expected that these institutions will not welcome the competition from Dutch seed exporters as this may threaten their funding. Hence, the official support from Government actors for establishing a system of seed production based on Dutch seed imports is critical and will require careful preparatory discussions with a small number of key strategic partners in Tanzania.
14. An important local strategic partner is SAGGOT, a multi-stakeholder partnership organisation aiming at developing the region's agricultural potential through fostering successful agribusiness that will benefit small scale farmers and improving food security. SAGGOT can assist to get the seed project accepted with local policy makers and also help the project to shorten the registration process for new varieties, facilitate import procedures, and provide a network and linkages with important local stakeholders.
15. As a result of this scoping study the following actions are recommended, in order of priority: 1) investigate the interest of Dutch seed exporters to participate in a seed development, 2) identify strategic partners in Tanzania, 3) set up preparatory discussions with strategic partners in Tanzania to introduce the concept of fast-track seed import and multiplication to policy makers, 4) confirm whether unrestricted import of seed potatoes is possible and under which import requirements, 5) confirm variety registration regulations and security of variety protection, 6) seek official approval from policy makers in Tanzania to develop a seed development project, 7) proceed with project formulation and development of Terms of Reference.

Annex 1: Technical details on seed potatoes in Tanzania

To be done

1. List of all registered seed potato varieties in Tanzania
2. The time between application and issuing of import permit?
3. Dutch seed potatoes imported before (small quantities): when, by whom, which varieties.
4. Background on the Kitongo seed potato varieties. Multiplied by Mtanga farm or only by ARI-Uyole? Are they listed in the variety catalogue?

Annex 2: Schedule of field research / interviews

Day	Visit
09/11/2014	Travel Arusha-Mbeya
10/11/2014	ARI Uyole Research Institute, Mbeya, Dr Rogers Kakuhenzire – CIP Country Project Director
	Mbeya City Council, Mr Kasenge, District Coordinator Mr Matembi, Round potato Crop Officer
	Small scale farmer, Mbeya
	Small scale farmer, Mbeya
	Small scale farmer, Mbeya
	Small scale farmer, Mbeya
	Small scale farmer, Mbeya
	Middleman, Rungue
11/11/2014	Makete City Council Mr Partson Mwaansumbule, Crop Officer
	Makete Farmer, Uzuni village
12/11/2014	Njombe City Council Mr Ernest Ngaponda, Agricultural Officer Mr Victor Luvinga, Agricultural Field Officer
	Makambako City Council Mr Anderson Ahadi, Agricultural Officer Mr Peter Munguyampa, Agricultural Field Officer
	Makambako Transporter
13/11/2014	ARI, Uyole Research Institute Dr Murray, Head Mr Owekisha Kwigizile, Agricultural Research Scientist
14/11/2014	Travel Mbeya – Arusha
17/11/2014	Travel Arusha – Mbeya
18/11/2014	Mbeya, Nane Nane Mr Mwakibete, Ground irrigation manager Mbeya medium scale Farmer Mbeya medium scale Farmer
	Mufindi City Council Mr Francis Magembe, Principal Agricultural Officer
19/11/2014	Mtanga Farm Iringa Office Mr Ravindra Patil, COO Potato Division
	Mtanga Farm, Kilolo Estate Mr Hendrik Ruth, Farm Manager
20/11/2014	SAGCOT, Dar Es Salaam Mr Geoffrey Kirenga, CEO Mr Maria Ijumba, Head of Cluster Development
21/11/2014	TOSCI, Dar Es Salaam Mr Adolf Saria, Head National Performance Trials
22/11/2014	UCHUMI Supermarket, Quality Center branch Buyer SHOPPERS Supermarket, Shoppers Plaza brunch Manager
24/11/2014	Ministry of Agriculture Food Security and Cooperatives Plant Health Services, Plant Quarantine and Phytosanitary Services Mr Katemani Mdili, Agricultural Officer Mrs Adam Mdesa Mwashu, Principal Agricultural Officer Mrs Dorah John Amuli, Agricultural Officer
25/11/2014	Travel Dar Es Salaam - Arusha

Annex 3: References

- Country Report on the state of plant genetic resources for food and agriculture, Tanzania, FAO, 2009
- Farmer practices and adoption of improved potato varieties in Kenya and Uganda, Working Paper, CIP, 2008
- East African Standard, Seed potato— Specification, East African Community, 2011
- Hosea Mpogole, Melchior E. Mlambiti and Reuben M.J. Kadigi, Round Potato Production in Southern Highlands of Tanzania: Are Smallholder Farmers Becoming Commercial?, 2013
- Mid-Term Review of the Program for Africa’s Seed Systems, TANZANIA, The Alliance for a Green Revolution in Africa, 2010
- Ministry of Agriculture, Food Security and Cooperatives, Plant Health Services, The Seeds Act, 2003
- Ministry of Agriculture, Food Security and Cooperatives, Plant Health Services, The Seeds Regulations, 2007
- Namwata BML, Lwelamira J, Mzirai OB, Adoption of improved agricultural technologies for Irish potatoes among farmers in Mbeya Rural district, Tanzania: A case of Ilungu ward, Journal of Animal & Plant Sciences, 2010, Vol.8, Issue 1: 927-935
- Nyunza G, Mwakaje A.E.G, Analysis of round potayomarketing in Tanzania: The case of Rungwe District, International Journal of Business and Social Science, Vol.3, No.23, 2012
- Results of the Southern Highlands’s Zone agricultural research and development fund, Crop production, ARI Uyole, 20013
- Syngenta Foundation for Sustainable Agriculture (SFSA), Conversation with the CGIAR Fund Council, Kenya, 2013
- Southern Agricultural Growth Corridor of Tanzania (SAGHOT), Value chain and Market analysis, Irish potato.
- Seeds and Agriculture Research Processes in Tanzania: The case of small scale farmers’ participation in setting research agenda, EU funded INSARD project Conducted by ESAFF May, 2013
- International Potato Center, www.cipotato.org
- Food and Agriculture Organisation of the United Nations (FAO), Statistics Division, <http://faostat3.fao.org>
- Fact Fish Database, www.factfish.com
- Mtanga Foods Limited, www.mtangafoods.com
- National Bureau of Statistics, Tanzania, www.TNBS.go.tz
- Southern Agricultural Growth Corridor of Tanzania, www.sagcot.com

Annex 4: Fresh quality specifications for the consumer market

Produce	Red and White potato
Colour	Reddish purple skin Rich golden yellow flesh (Red) creamy to pale tan skin Creamy to pale yellow flesh Creamy to white skin and flesh
Visual appearance	Shallow eyes Clean skin
Sensory	Firm when tested with finger pressure Not soft or spongy No foreign odours or taste
Shape	Uniform oval to slightly flatten No deformed shape Approximately oval to long oval
Size	Weight range grading: Small: 60-110g Medium: 111-350g Large: +350g
Insects and physical damage	No obvious live insects No evidence of rodent or nematode damage No cuts or splits No severely malforms or root constricted tubers No green areas on the skin or an overall green tinge No evidence of bacterial wilt No black/brown sunken spots due to blight



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