SCF Small & Medium Enterprise Competitiveness Facility

FRESH FRUIT & VEGETABLE SUB SECTOR / VALUE CHAIN ANALYSIS TANZANIA

Executive Summary

MARCH 2008

STUDY COMMISSIONED BY SME COMPETITIVENESS FACILITY AND CONDUCTED BY MATCH MAKER ASSOCIATES LIMITED (MMA)

Background to the study

SME Competitiveness Facility (SCF) is a matching grants opportunity for businesses in Tanzania that wish to develop or increase their ability to trade and export. The SCF aims to support product quality improvement and the meeting of international standards to enable SMEs access potential markets within and outside Tanzania. SCF supports the Government of Tanzania's endeavour to develop the business sector as an engine of pro-poor economic growth, in line with Tanzania's National Strategy for Growth and Reduction of Poverty (MKUKUTA). The SCF focus is on business activities that contribute to export, economic growth, employment creation and the reduction of poverty.

Since early 2006 SCF has focused primarily on two types of interventions: agro processing for fruits and vegetables, spices, natural products such as seaweed, and sisal; and three services: food safety (traceability, food safety audits), trade development (effective trade fair participation, branding, supply chain management) and packaging. SCF phase one will end in June 2008 and SCF II is currently being planned. It is projected that fruit and vegetables will also be in focus in Phase II. It is in this context that SCF has commissioned Match Maker Associates Ltd to undertake a number of selected subsector studies in the fruit and vegetables sector in Tanzania. The studies of different intensities include the following:

Fully-fledged Sub Sector Analysis:

- Dried fruits and vegetables for urban market and export
- High value and fresh vegetables for local market

Quick Scans:

- Fresh and processed tomatoes for local and regional markets
- Baby vegetables for EU market
- Fresh mangoes for Middle East market
- Fresh citrus for local and regional market

The studies draw main reference from North-Eastern corridor (Tanga, Kilimanjaro, Arusha, and Manyara regions). The overall objective of the studies is to highlight the dynamics of the respective subsector in terms of products and market focus. Studies are geared at identifying the main challenges and opportunities for growth and competitiveness and proposed value chain upgrading strategies as well as the roles of various stakeholders.
Specifically the studies have covered the following areas:

- Identifying market requirements particularly for the local, regional and in some cases international markets
- Identifying the key players involved in each stage of input supply, production and marketing and other critical services using the value chain approach
- Identifying production base and productivity issues in the study areas
- Analyzing the factors affecting performance of the existing value chains, and identifying ways to improve competitiveness
- Analyzing the roles and relationships of actors in the industry for implementation of the interventions

- Making recommendations that are useful for promoters of the study related to economic development through the growth of SMEs in agriculture and the objectives of MKUKUTA and the on going planning for SCF II.

Below is a compilation of the main findings, conclusions and recommendations from all the studies.

SECTION ONE: VEGETABLE STUDIES

1.1 High Value Vegetables for Local Market

Vegetables are a wide field of study. There are different varieties and different consumer market segments and preferences. Trade can be local, inter-regional and international. According to the proponents and practitioners of sub sector analysis methodology, it is crucial to define the precise parameters of a sub sector in order to create focus and clarity. Whilst acknowledging this necessity, it was necessary to adopt a working definition of fresh vegetables for the urban market. *Sub sector in this study is defined as a basket of commonly demanded vegetables, and higher value vegetables demanded in the urban market and produced in the Northern corridor of Tanzania.* The **common vegetable basket** includes tomatoes; cabbage, carrot, cauliflower, iceberg lettuce, sweet pepper and the main **high value vegetables** are broccoli, zucchini and soft (red) lettuce. The market focus in the study is the urban markets in Dar es Salaam, Arusha and Moshi. In Dar es Salaam the most important entry point for vegetables is Kariakoo market. The main production areas of temperate vegetables are in the Southern and in the Northern highlands. In the Northern Corridor the main production area is Lushoto District, which produces an enormous variety of vegetables. In Kilimanjaro Region Hai and Siha Districts are the most important production areas while in Arusha Region there is small-scale production in Arumeru District and some areas have specialised in specific crops.

The sub sector characteristics and channels of high volume (commonly known) vegetables and high value vegetables are rather distinct and therefore, they are discussed separately.

The trading of **high volume vegetables** is highly diversified and informally organised. There are local brokers (dalali) who negotiate deals between farmers and buyers (this is especially the case in Lushoto). There are also buyers from outside (wanunuzi/watajiri) who buy larger quantities to sell in wholesale markets. These buyers hire transporters and in Lushoto they do that through transport brokers. Within the larger wholesale markets (Kariakoo, Arusha main market) there are brokers (dalali's) who receive the load of produce (on credit) and sell it on to retail traders. These brokers know each other and work closely together; they form a cartel and make it difficult for new comers to enter. Many traders are specialised in certain produce. There is little transparency in the trade, which put farmers in a disadvantaged position.

The Lushoto – Dar es Salaam (Kariakoo) Channel
The characteristic of this channel, based on research in Lukozi village, is that produce is transacted at farm level and that there is a broker in-between the farmer and the buyer. Buyers/middlemen (matajiri) come to the village where they meet with the broker (dalali). The broker (dalali) is a local person and there are for example approximately 50 Dalali's (Chokoo) in Lukozi village alone. Buyer and broker know each other (e.g. the dalali the mission talked to, works with 50 buyers, others might have 20-30 buyers). Dalali's are specialised in crops, e.g. potatoes, tomatoes, cabbage and

carrots. On arrival in DSM wholesale market (Kariakoo), the load is passed on credit to another dalali in the market. He sells it in smaller quantities to retail traders, such as market stand holders or hotels and shops. In between the dalali and the retail salesman is the 'mpimaji', the one who weighs the product into kg quantities, so it can be sold in smaller quantities.

Rural Wholesale Market Channel
This channel is characterised by a product exchange at a rural wholesale market place and examples of these markets are Kwasadala (Hai District) and Sanya Juu (Siha District). A farmer takes his produce to these rural wholesale markets but at the same time a farmer might also collect/buy from neighbour farmers. Traders buy from farmers at these markets after which they transport it to the urban wholesale markets. In some cases (Kwasadala – tomatoes) there are brokers in between farmers and traders.

Urban Wholesale Market Channel
Some larger farmers organise their own sales and take their crop direct to the urban wholesale market. These farmers might also buy from neighbour farmers to fill a truck. An example of this channel is found in the Oldonyo Sambu (Arusha region) – mainly a carrot producing area – where some farmers/traders after buying from neighbour farmers deliver directly to Arusha whole sale market.

The trading of **high value vegetables** for the local market is more organised but also more diverse. In addition to the channels mentioned above, it also has two more channels.

Usambara Lishe Trust (ULT) channel
ULT is one of two farmers' organisations in Lushoto and its objective is to link farmers to the market. There are four groups of roughly 50 farmers who sell to ULT. ULT deals with a large range of vegetables, basically any type that is grown in Lushoto, and currently there are four groups of roughly 50 farmers who sell to ULT. ULT has specific outlets for their vegetables, including Mövenpick Hotel in Dar es Salaam, Saverio Pizzeria, vegetable shops on the DSM Peninsula (upper end of market) and Dar Es Salaam Corridor Group, which supplies the ships in the DSM harbour. It also provides organic vegetables to two outlets in Dar es Salaam, and it could develop into a larger organic vegetable supplier to urban markets. ULT also sold to Shoprite and Shoprite would regularly send a cool truck but communication and timing was very difficult and prices were very low, and at the end this outlet was lost.

Contracted production channel
This channel is characterized by a contract between farmer and buyer, i.e. Shoprite Supermarket, with high demands on quality and continuity and reliability of supply. The Shoprite contract stipulates that Good Agricultural Practices (GAP) is to be adhered to and it includes a clause that prices can fluctuate according to the market price and quality. The procurement manager of Shoprite DsM is visiting the supplying farms on a regular interval to monitor the production and to discuss problems. There is again a quality check on the vegetables on arrival in the pack house. Shoprite has outsourced the purchase, quality control and packaging to two companies: 'Freshmark' in Arusha and 'Castor' in Dar es Salaam. Freshmark has contracted approximately 25 farmers (groups). Castor is mainly supplied by 'Poverty Gulch' from West Kilimanjaro and by 2 individual producers from Lushoto and by ULT. Shoprite has also outsourced the transport of the produce from the farm to the packing house to a company called Millennium.

The **profitability analysis** has been a painstaking process as the data gathered were not consistent. The reasons for the data to be unreliable and difficult to compare, both between actors and between regions are: **(i)** prices fluctuate significantly; **(ii)** the measurements in the chain are not standardised and even within one chain the measurements are changing from one actor to the next; and **(iii)** the actors in the chain are all prone to high risks of losses or damage. Despite the fact that data are inconsistent an attempt was made to calculate the Simplified Gross Margins (SGM) for the different actors. In most cases the activities are profitable but taking in account the above, the calculated SGMs can only be a proxy indicator of the profitability**.**

There are many **constraints and opportunities** in the high value and volume vegetable sub sector and the main ones are presented in the next table.

Constraints	Opportunities
• Farmers lack sufficient technical and innovative knowledge (improved production techniques, pest & disease control, soil fertility, harvesting& post-harvest techniques) resulting in low production efficiency, crop losses, non-sustainable production systems, etc • Lack of irrigation facilities and knowledge about it, causing farmers to be unable to produce off-season and improve market access. • The chain is not transparent and the middlemen are dominating the chain, which results in farmers having no grip on marketing their produce • Quality does not seem to be a factor that influences the price, which is a missed chance for better pay to farmers for better quality. • Spot market arrangements prevail, supply chains are long, resulting in high transaction costs, which reduces or profit for farmers • Lack of access to appropriate financial services for farmers and traders, resulting in lack of working capital to invest in moving up into the chain or invest in farming • No data availability on district level, making it difficult for policymakers and support organisations to understand reality and take informed decisions. • Lack of effective formal institutions to support the sector and implement regulations, hampers development of the sector	• Technical and innovative knowledge is available in Institutes such as Horti Tengeru, AVRDC, but also with smaller organisations such as Floresta, TOAM etc. • The horticultural sector is in the lime light and many institutions and programmes/projects are emerging to support the development of the sector • Mobile telephone network available in most areas even rural, so market information can be communicated fast. • Urban centres and markets continue to grow and consequently niche market for high quality produce is growing. • There are interesting and successful examples of empowering farmers through running business platforms and through marketing group formation • Improved access to SACCO's for farmers is pursued by the Government of Tanzania among others • A study was commissioned by TCCIA Iringa and supported by the BEST Programme on standardisation of measurements

The major features of the **sub sector dynamics** are: **(i)** the prevailing spot market arrangements and long chains with many actors; **(ii)** the lack of implementation of regulations by relevant institutions leaving room for default; **(iii)** inadequate sharing of information which causes distrust,

(iv) dependency on rain-fed production (lack of irrigation facilities) causing over-production in the common harvest season and high prices in the season of shortage; and **(v)** niche markets are continuing to develop, particularly high quality end markets such as hotels and supermarkets, and there is also a growing demand for organic vegetables.

Sub sector development can be stimulated both **by generic interventions** that address the constraints in the sub sector, mostly executed by supporting and service delivery institutions, and **value chain development interventions** that explore the opportunities in the sub sector in a collaborated and coordinated effort driven by the private sector. In the next paragraphs both type of interventions will be presented but the focus is on the latter as they prove to have a bigger impact and are generally more sustainable.

The following **generic interventions** are proposed:

- Develop markets for business services, including training on technical issues, marketing, IPM & organic training and business awareness training, making use of the existent supply of training by established organizations.
- Support the upgrading knowledge and skills of extension workers, and improving their means to reach the farmers.
- Support the implementation of business platforms in relevant channels, in order to bring actors together to look for developing value chains (Faida Mali).
- Support the awareness raising about the role traders could play in disseminating knowledge, creating change and improving the value chain.
- Supporting development of an effective system to provide market information to farmers and to traders (Mviwata).
- Support the dissemination of innovative knowledge from research done in Institutes such as AVRDC.
- Support Horti Tengeru to revive the knowledge and expertise built up in the GTZ-IPM project.
- Support the initiative of TAHA to bring partners together for the development of the horticulture sector.
- Improve access to irrigation for horticulture producers.
- Disseminate lessons learned from the Rural Improved marketing programme (Mviwata), to other areas.
- Improve access to SACCOS or other financial services for small holders in vegetable production.
- Enforce the introduction and use of standardized measurements
- Stimulate farmers to start organizing themselves in order to form farmer marketing groups
- Develop quality control systems for TZ niche markets (organic, high quality)
- Support relevant institutions to improve the keeping of records in order to establish a reliable data base.

Two value chains are proposed, both based upon already existing models.

1. **Institutional marketing**; a value chain around a central market, where the farmer owned Marketing Board is the chain leader. This model has been developed by MVIWATA and set up in a few places in the Uluguru Mountains, Morogoro. It is recommended to study this model and take it on further in such a way that the Marketing Board takes a stronger and more active role as chain leader.
2. **Collective marketing;** a value chain based upon existing channels, such as Usambara Lishe Trust and AMSDP promoted marketing groups. The value chain is to be formed around a farmers group. It has to be realized however that it would require substantial capacity strengthening to develop well functioning groups.

The proposed **way forward** is as follows:

Short Term Interventions

- Dissemination of study finding and emphasis on the opportunities;
- Build up an inventory of resource people and organisations that have expertise in horticulture, working with small holders or market linkage;
- Support TAHA with its membership drive of small holder farmers, ask TAHA which support they need;
- Support TAHA in the establishment of a platform of organizations supporting the development of the horticulture sector;
- Meet with Mviwata in order to: 1) learn about the Improved Rural Marketing Program and disseminate lessons among organizations that could possibly interested in developing similar structures, and 2) learn about the initiative to set up an improved rural market in Tanga and assess if SCF support could add to the success of the plan;
- Carry out a training need assessment focused at producers, traders and extension staff and compare that with the training offered currently;

Medium Term Interventions

- Strengthen the newly established platform of supporting organisations in horticulture, initiated by TAHA;
- Facilitate the discussion on the role of traders in disseminating knowledge to farmers and in realizing changes for improvement of the chain;
- Support the platform to develop and promote 'farming as a business' and other relevant training packages for farmers, traders and their supporting organisations;
- Support the platform to develop ways to disseminate information to small holders, traders and their organisations (market information, research results, innovative knowledge, etc);
- Stimulate the forming of farmer groups, associations or new co-operatives;
- Organise meeting with regional commissioners to disseminate information on the study and create support in the improvement of the sub sector of fresh vegetables;
- Initiate and support a campaign to make Tanzanians consume more vegetables;

Long Term Interventions

- Support initiatives of the platform of supporting organisations;
- Support financial institutions to provide appropriate financial services (focused at investment in trade, irrigation facilities and infrastructure);

- Support enforcement of standardisation of measurements in the trading;
- Support institutions to develop quality control systems.

1.2 Fresh and Processed Tomato for Local and Regional Markets

Tomato production is higher than any other fruit and vegetable crop in Tanzania with a total production of 129,578 tons, which represents 51 percent of the total fruit and vegetable production (Tanzania Agriculture Sample Census – 2003). This is followed by cabbage with 41,495 tons (16.3%) and onions with 36,087 tons (14.2%). The production of other fruit and vegetable crops is relatively small. Morogoro region has the largest planted area of tomatoes (6,519, 19.3% of tomato planted), followed by Iringa (3,274 ha, 10.3%), Tanga (2,569, 8%) regions and Zanzibar (2,370 ha, 7.4%) island.
In the northern belt the Ngarenanyuki region is famous for its relatively large-scale tomato production. The area is blessed with ample water. Even in the dry season there is sufficient water for furrow and field irrigation. At an altitude of more than 1.200 meter above sea level, the region has favourable growing conditions and relatively fertile loamy soils. The farmers of Ngarenanyuki show extraordinary entrepreneurial skills by organizing a steadily increasing year round flow of fresh tomato trade to the distant markets of Mombassa, Dar es Salaam and Zanzibar. Mombassa is 12 hours away by truck over pothole roads. The journey takes 8 hours of driving and 4 hours of waiting time, mainly for border formalities. The estimated volume of cross border trade of tomato is 30 trucks per week in low season up to 50 trucks each week in the peak season. Each truck contains 200 crates of 40 kg and the average cross border trade totals an estimated 320,000 kg per week. It results in an annual volume of 16,000,000 kg of fresh tomatoes with a value of TShs 6 billion (3.8 M EUR and 0.23 Euro/kg) of which 40% is expected to be produced in Ngarenanyuki[1].

The tomato sub sector consists of many actors performing various functions ranging from seed production, input supply, production, brokering, bulking, trading, processing, wholesaling, retailing and exporting. The main channels are:

- ***Vegetable basket channel***; it consist of one medium scale producer who produces high quality vegetables by using highbred seed under irrigated circumstances and by applying modern farming techniques, including pest control management. Her main markets are Shoprite Dar es Salaam and lodges and hotels in the Northern circuit of Tanzania.
- ***Fresh tomato trade***; the trade in (fresh) tomatoes is very vibrant and engages many brokers, middlemen and traders. The fresh tomato trade is characterised by spot market arrangements, including manipulation of farm gate prices by lack of transparency in weights and measures and misinformation of farmers of end market prices. Due to inadequate handling particularly during storage and transport, post harvest losses can range between 20 to 50%.
- ***Export channel***; substantial volumes of tomatoes from the northern zone are sold to Kenya. The trade of tomatoes (with exception of the well organised Ngarenanyuki farmers) is monopolised by the Kilombero traders association. Obviously, this is in the advantage of the Tanzanian farmers as the prices are controlled. Cross border trade is hindered by low cooperation of the Tanzanian and Kenyan border officials, uses of different measures standards, and lack of harmonisation of (food) standards

[1] All information regarding the Ngarenanyuki farmers and their production for the Mombasa market is extracted from a report 'Improving the Tanzania - Mombasa cross border chain' by F. van Koesveld under auspice of AfriVeg project

- ***Processed tomatoes***; there are a number of tomato processing companies in Tanzania and the biggest are (in order of capacity): Dabaga Industry, Red Gold and Natural Choice. All processors are struggling to source sufficient tomatoes, particularly during the period December to June (rainy season) when prices are also (extremely) high. In order to address the shortfalls, they buy tomatoes in abundance during the high production period and store it as pulp and concentrate. One of the processors even buys tomato paste from China and reconstitutes it in its ketchup and sauce.
- ***Dried tomato channel***; the main but still small player in this chain is River Cottage industry. It produces high quality tomatoes and part of it is processed in dried tomatoes. Presently, it is a fully integrated operation but a (small) outgrowers scheme is a future and interesting option due to potential high yield (as a result of technical assistance, good seed material and irrigation) and the generally high prices. This channel is further discussed in the dry fruit and vegetable sub sector study.

The major constraints and opportunities in the tomato sub sector are shown in the table below:

Constraints	Opportunities
▪ Lack of storage and preservation facilities, forcing farmers to sell immediately. ▪ Most (small scale) farmers still depend on rain fed farming and therefore are not able to produce the whole year around ▪ High costs of certain inputs, e.g. hybrid seeds, fertilizer and pesticides, makes it hard for SS farmers to shift to high management practices ▪ Strong fluctuating prices that make it hard for farmers to decide when and to whom to sell. ▪ Nearly total absence of contractual arrangement and hence SS farmers do not benefit from embedded services ▪ Some processors lack consistent supply and hence import tomato paste from China ▪ Poor packaging and transportation results in high losses on the way, which costs are transferred to the farmers	▪ Increased availability of Improved seed like Tanya and Tengeru 97 enable farmers to increase yield ▪ Hotels & lodges, particularly in the North, have an unsatisfied demand of vegetables, including tomatoes ▪ Good quality tomatoes, especially from hybrid seed, could fetch prices as high as Tshs 1,200 per kg ▪ All processors are in the process of expanding their production capacity and hence will need more supply. ▪ Available and accessible electrical and sun drying technologies and knowledge offer farmers opportunities to preserve tomatoes and add value ▪ Some programmes have develop adequate financing mechanism for farmers, e.g. through SACCO's

The tomato sub sector is quite dynamic and some of the major features are (not in order of priority):

- Most of the local processors are substantially expanding and upgrading their processing capacity. It shows that they have faith in the market developments and that they feel that they can compete with the wide range of imported tomato (based) products.
- None of the (interviewed) processors have formal buying arrangements with producers but some of them claim they have tried in the past but with poor results. However some processors provide 'informal' support to reliable and consistent producers, in the form of sharing transport costs, attractive pricing, seed, loans and advice. Red Gold has a very special arrangement with Alpha Seed Company; the latter is presently the sole supplier of tomatoes to Red Gold who after processing returns the seed to Alpha Seed for sorting, packaging and distribution.

- The marketing arrangements for each of the processors differ; one is directly marketing its products, mainly in the proximity of the factory but also to some outlets in Dar es Salaam; another is combining direct marketing, particularly to large outlets like Shoprite and other supermarkets with engaging distributors; and the third one is only selling via 4 distributors of which one is taking the products to neighbouring countries.
- The prices of tomatoes fluctuate strongly during the season. Prices are generally low during the second half of the year as it is the harvesting period but start increasing in December as supply is running out and short supply/high prices persist in the first half of the year.
- There is potential for import substitution, both at the level of the raw material and final products. Some processors are importing tomato paste in large quantities as a replacement of fresh tomatoes. Regarding the final product there is a wide range of imported tomato ketchup/sauce available in shops such as Heinz tomato ketchup, Tiffany tomato ketchup, American garden tomato ketchup and All Gold tomato sauce. The (local) processors are keen to compete with these imported products and they are confident they can expand their market share.
- Unfortunately the producers are rather disorganized and joint bulking and marketing hardly exist. Hence, spot market arrangements prevail to the detriment of the producers. It is somehow a catch 22 situation for producers who depend on rain fed farming as they harvest all around the same time and tomatoes being a highly perishable food crop they are forced to sell it fast and at generally low prices as supply exceeds demand. For those who have access to irrigation, the situation is very different. In principle they are able to produce the whole year around and hence have a much higher rewards for their investments and efforts. Even then, there are only few examples of farmers who undertake a collaborated effort in marketing.
- There is the prevalence of some niche markets; lodges, hotels and even Shoprite Dar es Salaam are buyers who require a high quality and safe product and they are willing to pay high prices for it (above TShs 1,200 per kg). Obviously, they wish to have a whole year around and consistent supply, implying that it has to be grown under irrigated and (pest) controlled circumstances.
- The vibrant cross border trade was also already mentioned and according to recent research it benefits the producers, particularly in the Northern Zone of Tanzania. The magnitude of the trade and the opportunities it provide is yet to be established.
- The availability of appropriate, high yielding and affordable tomato seed has strongly contributed to the development of the sub sector. Particularly, AVRDC – the World Vegetable Centre – and Alpha Seed Company were in the forefront of research and development of good varieties and the most popular and widely used are Tanya and Tengeru 97. Due to the increased popularity also the large seed suppliers like East Africa, KIBO, MultiFlower and SUBA are selling Tanya and Tengeru 97.

Sub sector development can be stimulated both by generic interventions that address the constraints in the sub sector, mostly executed by supporting and service delivery institutions, and value chain development interventions that explore the opportunities in the sub sector in a collaborated and coordinated effort driven by the private sector. In the next paragraphs both type of interventions will be presented but the focus is on the latter as they prove to have a bigger impact and are generally more sustainable

The most important proposed **generic interventions** are:

- Engage transporters in identifying solutions that reduce transport costs and losses
- Promote financial schemes that enable farmers to invest in appropriate irrigation
- Promote high input, high value tomato production for selected farmer
- Support price information dissemination mechanism
- Built farmers' business skills through tailor made training and exposure
- Assist farmers to organize themselves for the purpose of post harvest management, bulking and marketing

Tomato for Seed Value Chain

The so-called 'tomato for seed' supply chain, in which Red Gold is setting the price and quality parameters, could be strengthened by supporting Alpha Seed to source and deliver more tomatoes consistently. Obviously, the transition to a value chain in which Alpha Seed and Red Gold have a more mutual benefiting relationship requires a deliberate effort by the main actors and supporting agencies like e.g. FAIDA MaLi. It also requires additional funds to finance investment in the outgrowers' scheme and distribution system (including better packaging material).

Forward Integrated Value Chain

In this proposed value chain Alpha Seed will become the chain leader by supporting it in its forward integration ambitions and enabling it not only to continue process and market seed but also produce tomato (pulp) based products, e.g. ketchup and juice. Alpha Seed is looking for new investors to join them in their expansion plans and some interested parties are identified but the deal is yet to be sealed. Also, it is still to be determined if the (growing) market demand warrants a new player in the market.

Dried Tomato Chain

Another potential value chain is the dried tomato chain in which River Cottage Industry wishes to play a crucial development and commercial role. It is part of a broader chain development – labelled the SME model -, which is more in-depth explained in the dried fruits and vegetable sub sector report.

Organised Marketing Value Chain

The most promising value chain in the sense of potential outreach and impact but at the same time the most challenging one is the so-called 'organised marketing' value chain. All the processors expressed their concern about the short supply of tomatoes during the rainy season, starting from December until June but to organize a consistent supply of a good quality product is quite tasking as it implies that farmers must have access to water the whole year around but moreover, are well organised and are able to bulk and store the product for collection by the processor. It will require a lot of capacity building at the level of the farmers' groups but also market facilitation and sometimes mediation between the processors and the farmers' groups.

Vegetable Basket Value Chain

Also potential to be further developed is the outsourcing of vegetables production, including tomatoes, by large-scale producers such as Poverty Girls to medium scale farmers. As explained earlier, there us a huge demand for high quality vegetables by hotels, lodges, restaurants and supermarkets like Shoprite Dar es Salaam. Obviously, the sub contracted farmers have to

understand and appreciate the nature of such a relationship and hence, training and exposure is a necessity.

Cross Border Value Chain

Another great opportunity is to strengthen the export value chain, i.e. the farmers of Ngarenanyuki produce tomato who produce in large quantities for the Mombassa market. Mombassa market welcomes the Tanzanian tomatoes because of their availability throughout the year. Because of the difference in climate and seasons, the produce of tomato from Tanzania is complementary to the tomatoes from Kenya. The greatest concern of the farmers is that due to lowering yields, the occurrence of pest and disease and the volatility of the prices (offered by the brokers) they do not always make profit.

The tomato sub sector has many opportunities for short, medium and long term interventions and these will be summarised below.

Short term interventions

- Organize a stakeholders workshop to validate the findings and recommendations as well as to discuss the way forward
- Meet the processors and agencies/programmes like FAIDA MaLi and SHOP to review their experiences and lessons learned with organised marketing and explore institutional arrangements such as contract farming to link the producers with the processors.
- Assist Alpha Seed to develop and negotiate a win-win growth strategy with Red Gold, based on the planned expansion of their outgrowers' scheme.
- Engage transporters in exploring ways of packaging and transporting that will reduce the losses (in volume and quality) on the road.
- Enable River Cottage Industry to have access to solar drying food and packaging technology information.
- Support the public – private partnership between WUR and MF, i.e. the Agriveg project, by availing its knowledge and resources in post harvest handling, including packaging and by promoting training packages like 'Farming is a Business'

Medium term interventions

- Identify and assist farmers' groups, particularly by engaging organisations that can build their business skills, to enable them to become reliable and consistent suppliers to processors.
- Support market linkages facilitation, including the development of interesting business proposition, between farmers' groups and (interested) processors
- Engage a business service provider to assist Alpha Seed to develop a distributor model for its tomato seed
- Support Alpha Seed to conduct a feasibility study in tomato product market so that can assess if diversification into processing is a viable option
- Facilitate match making between Alpha Seed and potential (local) investors.
- Support market linkages between medium scale farmers and Poverty Girls
- Identify and support financial scheme that will enable (selected) farmers to produce high quality tomatoes (e.g. by procuring better seeds, by applying pest control, by irrigating their farms, et cetera)

- Identify and support financial schemes that enable processors to expand their operations and assist their suppliers of tomatoes.
- Support market linkage facilitation between River Cottage Industry and farmers in Kwa Orgoro village
- Engage a business service provider to support River Cottage Industry to undertake a regional market survey in sun dried tomatoes

Long term interventions

- Enable farmers' groups to explore value adding activities through storage and processing
- Assist processors to penetrate export markets, i.e. enabling them to comply with health and food safety standards, setting up of traceability systems and by improving packaging

1.3 High Value Vegetable for EU market

In comparison with the Kenyan industry, attempts to get the horticultural export industry off the ground in Tanzania have over a long period of time been relatively slow and sporadic. The market for green beans is perhaps the most obvious and recent success story but at the moment only Serengeti Fresh (see box below) is exporting. Gomba Estate, which was Tanzania's largest fresh vegetable exporter, ceased its operations in 2007 due to financial constraints. The majority of high value vegetable exports from Tanzania go to the UK – and it is only the UK and the Netherlands that have any significant, growing and regular trade in these vegetables with Tanzania.

Serengeti Fresh Ltd is an independent company that is part of the Sunripe Group, based in Nairobi. Serengeti Fresh is based in Arusha, Tanzania and has 5-6 EUREPGAP certified units that supply a BRC accredited (Higher Level) packhouse. Serengeti Fresh produces Extra Fine & Fine Beans, Mangetout, Sugar Snaps, Baby Leeks, Passion Fruit, and Okra that are exported out of Kilimanjaro, Dar es Salaam and Nairobi (Jomo Kenyatta International Airport).

The total 275 ha site of production area under Serengeti Fresh which enables it to guarantee whole year round supply of quality products. In total the group exports 25-30 tonnes per week of ready packed vegetables. Production will increase in 2008 with the expansion through the high care facility between 40 -50 tonnes packed vegetables.

Currently Serengeti Fresh employs an average of some 800 people directly and indirectly with over 80% female workers. These are employed in the farm, packhouse/export operation and offices

The horticultural sector in Tanzania is very much in the picture by various donors, support organisations and local institutions. The various organisations/programmes and their services are extensively described in the Vegetable Sub Sector report that was also produced by MMA in the context of these SCF studies. It will not be repeated here but special reference is made to the USAID-funded SHOP Project, implemented by ACDI/VOCA that has a strong interest to support Serengeti Fresh for the purpose of promoting the export of high value vegetables by small holders.

Consultants contracted by Development Assistance International (DAI) conducted interviews with some leading UK and Continental EU importers and distributors in order to identify the strengths, weaknesses, opportunities and threats (SWOT) of the Tanzanian high value vegetable sub sector. The table was updated with the inputs from Serengeti Fresh and is shown below.

Strengths	Weaknesses
Favourable climate, available water	Insufficient direct air freight links to support high export volumes
Long and good experience of exporting to the UK and EU (by Serengeti Fresh)	Currently a fringe player in a highly competitive market
Presence of conducive micro climates around Mt Kilimanjaro and Mt Meru	No clear differentiating factor or strategic advantage at present
Possibilities to export via Kenya and other countries for logistics reasons	Small holder farmers lack modern business and farming knowledge for export markets
Opportunities	**Threats**
Growth in overall speciality vegetable consumption in the EU	Downward pressure on costs and further rationalisation of the supply chain make it difficult for new suppliers to enter
Consumer trends point at further growth of exotic and baby vegetable consumption	Increasingly high standards raise barriers to entry especially for small growers
Production in Zimbabwe which was a significant supplier to UK and EU has collapsed	With increasing export of high quality vegetables, grade II will increasingly been sold on the local market
Growing niche markets in organics and Fairtrade	Consolidated markets and increasing power of supermarkets: exports tend to be in high volumes by big exporters. Growth in "sole sourcing".
Adding value through pre-preparing and packing	Established long-term relationships with more sophisticated exporters.
At the end of 2007 Kenya has lost its preferential status (Lowe convention) thus driving up the costs of Kenyan product	The new minimum wage law is driving up labour costs while productivity remains generally low

It is likely hard for new entrants in the Tanzanian high value vegetables for export sub sector to compete – at least in the short term - with the long established exporters like Kenya. However, it is possible as the case of Serengeti Fresh shows to gain market share in a few niche areas for high-value (and value-added) vegetables in the UK and EU market. Building on long established contacts and trade relations of the Sunripe group in the UK and EU market made it possible to grow but now that the sub sector has become much more competitive and the client more demanding, including compliance with health and food safety standards, replication of the Serengeti Fresh success will be challenging, particularly if strong trade relations does not yet exist.

Specialising in the supply of baby vegetables may fill a growing gap in the EU market. Not only are these products sold for a far higher value at retail in the more developed European countries, there are also significant opportunities for adding value through pre-preparing, bundling (having more than one variety in one packet) and packaging. This should return more revenue to Tanzanian farmers and exporters and may therefore require less volume as the market and infrastructure in Tanzania develops. Serengeti Fresh is exactly applying this strategy.

In terms of other market opportunities to add value and differentiate, Tanzanian producers/exporters should be as a minimum looking at the following:

- retail ready packaging/ labelling/ bar coding (being done by Serengeti Fresh)
- pre-preparation: trimming, slicing etc (being done by Serengeti Fresh)
- organic production

- Fairtrade accreditation
- new products (perhaps new ideas on preparation or growing the first organic or Fairtrade products for a certain variety)
- the use of more certification schemes for higher standards

The market in the UK and other EU countries will continue to change over the next 5 years – interest in organic and FT products will increase. Consumer demands for products that are deemed to be "convenient" will continue to grow – in this context the opportunities for baby vegetables, pre packed products and snack based products will also continue to develop. A growing market for all these products exists in the EU.

Sub sector development can be stimulated both by **generic interventions** that address the constraints in the sub sector, mostly executed by supporting and service delivery institutions, and **value chain development interventions** that explore the opportunities in the sub sector in a collaborated and coordinated effort driven by the private sector. Regarding the first, DAI had developed an overview of what need to be put in place to develop a successful horticulture sector in Tanzania. A number of actors, particularly Tanzania Horticulture Associations with support of FINTRACT and the earlier mentioned ACDI/VOCA SHOP project (both financed by USAID) are working on a number of key interventions. They can be contacted for an up to date overview of their activities. In the next paragraphs the focus is on the value chain interventions.

Serengeti Fresh Export Value Chain
Serengeti Fresh and the Global Gap certified medium scale farmers, who produce on specification of Serengeti Fresh, are collaborating closely. These farmers have received much support – inputs, extension, business and financial support - from Serengeti Fresh and it is ongoing to enable them to expand their operations. New small scale farmers, some of whom were producing for Gomba Estate before, are also supported but in order to upgrade them to Global Gap standards more support is needed. Also, Serengeti Fresh is currently exploring production and export of avocado and this venture has even more potential for outsourcing to small scale growers.

Market Intermediary Model Value Chain
MIM is building the capacities of initially 8 co-operatives in a very comprehensive and coherent manner. These co-operatives differ substantially from the usual ones as they consist of 4 to 8 clubs and each club is having around 25 family groups. These groups designate a certain percentage of their land for the production of high value (export) vegetables. They need to have available 0.15ha and this should not be more than 40% of their land. Some of these co-operatives are already EUREPGAP compliant through their earlier interaction with Gomba and support by MIM.
The linkage to the market is provided by WIMBO Export; it is a locally registered company with two individuals and one institutional shareholders. WIMBO has contracted MIM to enable the producers (in the family groups) to produce a high quality product, i.e. baby corm, fine beans and peas, and though volumes may initially be low (11 tons is targeted for 2007- 2008), it is projected to increase rapidly to over 1,000 tons in 2008 -2009 and above 2,000 tons in 2009 -2010.

Though the 'high value vegetables for export' is a currently a small sub sector with only few actors, it has ample opportunity to grow with the right support from programmes like SCF (II). The proposed interventions are in brief presented below.

Short term interventions

- Team-up with Serengeti Fresh for the purpose of supporting the expansion of operations by the current contracted medium scale producers as well as to enable the inclusion and upgrading of medium scale producers.
- Support SHOP and Serengeti Fresh to develop an market linkage scheme with ULT, i.e. certification of farmers and input finance scheme

Medium term interventions

- Assist MIM to link the co-operatives with high value market niches, such as the fair trade market
- Assist Serengeti Fresh to develop a business proposition for venturing into the avocado export chain.
- Based on the above analysis develop a support package that will enable Serengeti Fresh to include many small holder farmers in the avocado export chain

Long term interventions

- Identify and support other investors/entrepreneurs that are able to transform the comparative advantages of the Tanzanian horticultural sector into lasting competitive advantages and replicate the successes of Serengeti Fresh.

SECTION TWO: FRUIT SUB SECTOR STUDIES

2.1 Dried Fruit and Vegetables for urban and export market

Fruit and vegetables, consisting of more than 80 percent of water, are dried in order to stop the multiplication of micro-organisms. These organisms obtain the water and nutrients they need for growth from the fruit or vegetable in which they grow. By drying or dehydrating fruit or vegetables, the water is removed from the food and from the bacterial cell, thus ending the multiplication. The dried fruit and vegetables described in this study are whole, cut, sliced, broken or powdered, but not further prepared. Dried fruit can be divided into vine fruit and tree fruit. The best-known vine fruit species are raisins, sultanas and currants, whereas apples, apricots, bananas, pineapples, mangoes, dates, figs, papayas, peaches, pears and prunes are the most important tree fruits. Dried fruit is mainly used as a snack or a constituent for breakfast cereals, muesli, bakery products, dairy products and desserts. Although some vegetables are sun-dried or field-dried, most vegetables are dehydrated industrially. The main dehydrated vegetables are onions, tomatoes, garlic, carrots and olives.

Dried fruit and vegetables production and marketing worldwide and in Tanzania

Dried fruit is used in consumer or food service packing, mainly consumed as a snack and as an ingredient for breakfast cereals, healthy ready-to-eat snacks and desserts. Bakeries and breakfast cereal mixes are one of the largest end users of dried fruit. The market for bakery products in the EU had a value of € 70.3 billion and a volume of 26.8 million tonnes in 2003. Considering the imports of dried fruit, sultanas are the most popular (mainly for industrial use) dried fruit in the EU,

accounting for more than a quarter of the total imports by EU member countries of dried fruit. Sultanas, other raisins, dates, prunes, apricots and figs are the major imported dried fruit species.

Dried vegetables are mainly consumed by the dried soup industry. It uses most types of dried vegetables, especially potatoes, onions, tomatoes, leek, carrots and peas. A few large multinational companies dominate the soup industry in the EU. These are Unilever (Knorr, Unox), and Nestlé (Maggi). In most markets, the ratio is moving towards higher relative usage by the industrial sector, reflecting the growing popularity of ready-to-eat healthy snacks, muesli, and processed foods using more healthy ingredients like dried fruit.

It has been recently established that EU importers are less interested in sun-dried product and industrially dried products are very competitive overall. The perception is that the product from small scale processors in developing countries will have too many foreign products (insect fragments, defects, spoilage, microbiological problems, and bacteria) and will not pass hygiene and food safety regulations. Some EU importers are willing to look at the sun dried product and see whether it meets specifications however, all stressed that the market is well supplied and that new entrants must have some comparative advantage in terms of price or presentation.

There is a growing demand for organically certified product that is also low in sugar (natural levels). Organic products can reportedly sell for several times the price of regular product. Although growth of organic foods reached double digit figures in percentage in 2000 and 2001, since 2002 the markets have tended to grow much more slowly (3-4 percent). A remained fact is that because of its nature, organic production is highly suitable for small and medium-sized farmers working in areas which may not be suitable for large-scale food production. Dried fruits like apricots, bananas and pineapple are important organic products within the preserved fruit and vegetables segment for industrial use. While the organic market absorbs at least half of the volume of natural dried tropical fruits (about 500 tons), it also uses a significant but unknown volume of deep-fried banana chips. As yet, there are no organic pendants of the dominant conventional category of candied dried fruits. It is uncertain if there would be demand for these products, since the inherently low quality may form a constraint. If there is a market at all for candied organic fruit, the food industry would be the most likely candidate, using it in breakfast cereals or snack bars.

Organic dried fruits are used primarily as snack, while the portion that is used by the food industry as an ingredient is small. One factor explaining this is the relatively high price of these natural dried fruits. But limitations in diversity, quality and reliability of supply will also play a role. Organic deep-fried banana chips do find a market in the food-industry, for one reason since these are more competitively priced. They are also sold in single product packages, as a snack. Like the organic market, the fair trade markets uses natural dried tropical fruit and deep-fried banana chips. These products are offered to the consumer mainly in single product packages. At global level there is limited demand for tropical dried fruits as an ingredient for fair trade products. The size of this market is an approximate 50 tons, which is bought directly from source by Alternative Trading Organizations.

Furthermore, a recent ITC study revealed that after some years in the early 2000s of relative pessimism (at least in most European markets), most major dried fruit and vegetables markets seem again to be enjoying healthy growth with very positive outlooks for the years to come, although recent years' growth rates of about 20% in Canada and the USA and even higher in the

UK, for example, are unlikely to continue. Many industry leaders seem to believe that a growth rate of about 10% annually on average is sustainable in most major markets and perhaps even possible for the world market as a whole. This is a fairly enviable situation, considering that the conventional food business is mostly stagnant or, at best, experiencing very little growth. Most of these products as mentioned earlier are vine dried fruits and not tree dried fruits which mainly come from developing countries.

Various studies have revealed that apple bananas, pineapples and mangoes were the major fruits dried in Africa. For instance, in Uganda the fruits to be dried were mainly sourced from central Uganda, followed by western and northern regions. Banana production in Uganda is high and is most competitive within the region. In Uganda banana takes about 95% of the fruit production. Pineapple production also showed to be competitive with a share of 27% in comparison with Kenya and South Africa. The market size of the dried fruit from Uganda alone is estimated at 90 Metric tonnes per annum. This output is mainly from 5 companies involved in fruit drying and export, with Fruits of the Nile enjoying a 76% share, AMFRI Farms Ltd 10%, Masaka Organic Producers 9%, Tefu Ltd 4% and Flona Commodities 1%.

In Tanzania there have been attempts by different R&D organisations to modify the currently available fruit and vegetables solar drying technologies aiming at either the requirements stated in the potential market or adaptability by potential users. Research in this area has established various choices of technologies which in return influence what the role of the actors will become; which organisation structure is most suitable and in which location in Tanzania (context) the solar driers will be most suitably placed. Most of current initiatives in Tanzania are still revolving around these R&D activities and are driven by donor/project support. Consequently, the private sector actors are still reactive to these initiatives. Several actors in Tanzania are more or less involved in the dried fruit and vegetables sector through production, processing and provision of various services including training, information supply and credit. Generally, during this study it has been established that most of the initiatives around dried fruit and vegetables in Tanzania are geared towards domestic food security. Most technology transfer initiatives have put emphasis on household processing technologies. There is no locally produced drying machine which can have viable throughput for commercial drying of fruit and vegetables. Two initiatives to commercialise the sector has been attempted by international development agency UNIDO and a private company in north western Tanzania called Matunda Mema.

The driving force and Sub sector actors and channels

Healthy eating established itself as a driving force behind many sectors of the world's food market, a trend which has benefited demand for premium nuts, mixes and dried fruit, and given rise to the emergence of seeds as a mainstream snacking food. Retail sales of nuts, seeds and dried fruit in UK for instance has increased by 34% between 2001 and 2005 to stand at £449 million and exceeded £500 million by the end of 2006. To date dried fruit and vegetables manufacturers have focused on achieving growth through NPD[2] and improvements in merchandising and distribution.

Global markets are becoming more sophisticated but equally volatile. For instance the U.S. nuts and dried fruit market showed strong growth from 2001 to 2006, riding favourable health and diet trends. Manufacturers also contributed to growth with successful product innovation that sustained

[2] The NPD Group, is a leading consumer and retail information company

consumer interest as health trends shifted and evolved. The effect of media promoting recent scientific research supporting nuts and dried fruit as functional foods; portion-control packaging, promotional efforts and, most importantly, health-related positioning claims to stimulate consumer interest, consumers' desire for healthier lifestyles, and how that correlates to rising sales and opportunities for occasion-based marketing.

In Tanzania currently the driving force is technology transfer (project driven) and emphasis is still revolving around food security and income generation activity for poor women and self help groups. Most organisations active in this sub sector are engaged using project/research fund to promote skills (SIDO, TIRDO, FADECO), drying technologies (SUA, TIRDO, TDTC-CoET, TATEDO, FADECO), design and piloting drying equipment (TIRDO, UNIDO, TATEDO, CoET – CPE, FADECO) and promote food preservation for the purpose of food security and food nutrient (TFNC, TIRDO, TATEDO, FADECO). Even the emerging entrepreneurs – Matunda Mema, Claphijo Enterprises and KNFC have received initial support from project fund i.e. Matunda Mema (EPOPA); Claphijo Enterprises (Rockfeller Foundation – UDSM CPE) and KNFC (AMKA – APT/DFID and now KWIECO). Contrary to regional counterpart – Uganda, the private sector in Tanzania has been very much inactive in this sub sector. During this study it was evident that dried vegetables are not exported from Tanzania so far and insignificant volumes of banana and pineapples are the only dried fruit exported. Local urban market attract pineapples, banana, mangoes (dried fruit) and mushrooms (dried vegetable). Tomatoes, onions and green vegetables are not popularly dried in Tanzania at commercial level.

Profitability analysis

During this study it was established that simplified gross margin fro processing of dried fruit can be range between 40 - 60% but due to high utilities and labour costs the SGM could be negative. The drying of fruit and vegetables is labour intensive and requires efficient operation and management systems. The main variable costs of production in drying fruit and vegetables include: purchase of raw material; labour (for washing, cutting, and placing in and removing from solar drier); packaging; utility and transport. Processors should also budget for solar drier maintenance costs and replacement of cutting tools. Exporters may have further costs in meeting buyer specifications, including application of sugar and/or sulphur dioxide, repackaging, and other items.

Sub sector constraints and opportunities

The main market and product development constraints in this sub sector include absence of local standard which makes Tanzania dried fruit and vegetables of varied qualities. Currently the only overriding standard for dried fruit and vegetables is Codex Alimentarius Commission - CAC standard which is very stringent for smallholder processor to comply. Almost all initiatives in Tanzania are farm-level/homestead 'small scale' processing which cannot be commercialised. Most initiatives were not scaled up after pilot stage. Furthermore, there is absence or limited access to marketing information which makes it difficult for entrepreneurs to be interested in dried fruit and vegetables for local and export markets. This absence of market information may be influenced by low entrepreneurial drive among Tanzania SMEs, though further study could be conducted to validate this observation.

Main Opportunities include the fact that fresh mangoes market is becoming stringent due to quarantine fruit fly '*bactrocera invadens'* affecting fresh mangoes, oranges, paw paws and guava. According to research by SUA and RMCA - drying mangoes is an opportunity to kill all pests and

could be exported. Tanzania produces most tropical fruit and vegetables which could be dried for urban and export markets. Various drying technologies have been successful piloted and ready for scaling up (commercialisation). Successful supply chains of dried fruit and vegetables have been established in Uganda and recent in north-western Tanzania – this shows possibility of exploring export opportunities. UNIDO drying facility is Muheza is underutilised – there could be a possibility to engage an entrepreneur to manage and operate the facility commercially.

Which way forward?
Based on analysis of this sub sector and drawing experiences from an emerging outgrower scheme in Kagera region (Matunda Mema) and experience from Uganda it is proposed to explore possibility of developing local exporter, foreign exporter and SME value chain models. The challenge will be to identify private sector companies ready to undertake the role of bulking, drying, conditioning and packaging of dried fruit and vegetables for local urban and export markets. The companies should be medium sized or large so that they are able to invest in state-of-the-art solar driers and follow processing procedure to comply with international hygiene and food safety standards. For the processors, it might be effective for these companies to be based in the vicinity of the producers so as to maintain quality of fruit and vegetables prior to processing. Exporter can be based elsewhere but preferably Dar es Salaam for logistical reasons.

Based on study findings the following short and medium term interventions are recommended:

Short term (immediate) interventions for SCF and its partners could include:
Dissemination of study finding and emphasise on the opportunities
Campaign to change/influence consumer behaviour and perception in local urban areas.
Developing local market of dried fruit and vegetables (both models could be pursued i.e. exporter model and SME model). Tanzania will be going through a very steep learning curve and could not be competitive enough to access more sophisticated markets especially EU and USA. The initial focus should be on local urban up market and tourism consumers, and once that market segment is successful served, some of the entrepreneurs will explore export markets.
Medium and large scale local food (fruit and vegetables) processors could be motivated to invest in few drying facilities along Tanzania northern corridor. One way of motivating processors is linking them to support facilities which will help them to set up outgrower scheme and certify farmers and their processing facilities. Another equally important support to processors could be linking them to buyers abroad. Promote and support development of a ***joint venture between local processor and foreign exporter***. Amfri Farms Limited of Uganda is the emerging partner in this respect. Amfri Farms Limited of Kampala Uganda is ready to give Tanzania processors supply contracts for certain volumes of dried fruits (especially mangoes) and vegetables (especially dried tomatoes).

Medium term interventions could be achieved within two years from now and these could include but not limited to the following areas;
Exporting may also provide opportunities though this is not likely to be a short-term gain; Kenya and Uganda are ahead of Tanzania in terms of producing dried fruits and on the EU and US market there is (stiff) competition with other dried products. It is yet to be seen if Kavu Natural Food, Claphijo Enterprises and Bonde la Chem Chem will mature; the (market) potential is there, the technology is developed, the (supply chain) ideas are good but what seem to be lacking is an entrepreneurial drive and vision. An entry point for SCF could be to assist them the ***development of strategic business plans*** based on identified and committed buyers and on basis of such

plans, program for follow-up interventions like rolling out the technology and setting-up protocols and quality assurance systems.
SCF together with TBS and other development practitioners active in this sub sector should work together ***to spearhead development of Tanzania standard for dried fruit and vegetables.***
Support entrepreneurship education and training development - Tanzanians are less entrepreneurial compared to their counterparts in the region. SCF can support studies, which could look on ways to enhance entrepreneurship among SMEs in Tanzania. Conventional entrepreneurship education and training in vocational colleges and institutions of higher learning seems to give no significant positive results. May be what is needed is much more 'hands on' entrepreneurial skills development. This could include supporting SMEs' to gain marketing skills and marketing intelligence (MI).

2.2 Fresh mangoes for Middle East market

Mango is one of the common fruit baskets in most continents in particular Asia, Central and South America and Africa. In Tanzania mango is on the list of five top most fruit basket i.e. bananas, oranges, pineapple, mangoes and pea. There are number of products produced from mango like mango juice, mango pulp, mango flavour, mango kernel oil, mango pickles, achari and powder, etc. which have been well introduced and accepted in different market segments in the world. In Tanzania and Africa at large processing of mango is less developed and varieties grown are most suitable for local markets. The **focus of this study is on fresh mangoes**.

Global Overview

Mango makes up 50% of all tropical fruits produced worldwide[3]. Global production of mangoes is concentrated mainly in Asia and more precisely in India which produces an average of 12 Million MT in a year which is about 50% of total world production. India is also the major consumer of mangoes which underscores a common phenomenon that most mango producing countries consume most of their mangoes domestically.
There are so many mango varieties in the world today. For example, Thailand grows over 100 native mango cultivars. The challenge is to produce cultivars appropriate for processing or for raw or ripe consumption. One of the persistent problems in mango is damage caused by insects and diseases. Organically grown mangoes are currently produced in South Africa and India and exported in fresh frozen form.

World demand for mango is ascertained to be increasing, particularly from temperate countries, where mangoes are rapidly gaining popularity. International trade of mangoes is dominated by varieties like **"Keitt" and "Tommy Atkins"**. World imports of fresh mangoes was expected to increase by 53 percent to 459 000 tonnes by 2005 due to the increasing consumption worldwide. Processed tropical fruits are increasing led by Asia who accounts who for over 85 percent of the world exports of processed tropical fruits. Major suppliers of mango pulp and concentrates are Peru, India and Ecuador. Other processed mango products: dried, jam, jellies, syrup and other retail-packed products are fast gaining markets and commanding better prices than other tropical fruits.

[3] University of Hohenheim, Agricultural Marketing in the Tropics and Subtropics, Stuttgart, Germany: "An Analysis of the World Market for Mangos and its Importance for Developing Countries"

Access to the EU and USA market is guided by stringent standards and certification requirements (GLOBAL GAP, HACCP and other Ethical Trading Initiatives (ETI) which makes exports of mango from some countries including Tanzania literally unattainable.

Middle East market

Middle East is one of the fastest growing and developing markets in the world economy today. Trade flow analysis of mangoes into the Middle East Market in 2005 revealed the following picture:
Total Middle East imports of mangoes, 2005: US$ 40.2 million compared to US$ 36.2 million in 2004, showing an import growth p.a. in value of 23% in the period 2004 – 2005. Mango varieties demanded in the Far East includes **Alphonso, Apple, Tommy Atkins** and many others.

The top two importers of mangoes in the Middle East in 2005 were Saudi Arabia (US$ 13.2 million up from US$ 10.8 million in 2004). United Arab Emirates (US$ 12.8 million slightly down from US$ 13.3 million in 2004); and Oman (in 2005 with US$ 6.6 million)

Leading exporters to Middle East in 2005 are Pakistan (56%), Yemen (15%), India (6%), United Arab Emirates (4%). Kenya exports to the region fell from 10% in 2004 to negligible levels in 2005, a yet unexplained fall and Uganda and Tanzania have a negligible presence in the market.

The Tanzanian mango season (February to April) is considered a comparative advantage to access Middle East market since during this time there is a gap in the supply from the giants (India, Pakistan, Malaysia, Philippines and Thailand etc) who dominate in this market from April onwards. During this period it is not only that there is a market gap in the Middle East but also in India which is also a main consumer of mango. Furthermore Tanzania has cheaper freight charges to these markets than South America, and land is cheaper in Tanzania than in Kenya.

Tanzania is yet to have a critical mass of mango export varieties. The Tanzanian mango growers have started planting Asian varieties, for example Alphonso and the Apple mango, which are in demand in the Middle East target market. In addition, there have been some efforts to plant Floridian varieties, such as Tommy Atkins. Critical success factors for mango entry into the Middle East market have been established to include the following thresholds: Free from weevil infestation; Clean and fresh; Year round supply; Taste and size (big & sweet or small but tasty); Standard size and trade mark; Standard packaging; and Competitive prices.

Regional markets

The COMESA import market for mangoes is very small. Total COMESA imports of mangoes in 2005 were US$ 1.15 million, up significantly from the previous year. The leading exporters of mango to COMESA countries are India (82%), South Africa (9%), and Brazil (7%). The market is highly concentrated in Egypt who is also a significant exporter of mangoes products.
East African exports of mangoes to COMESA are negligible.

Tanzania position in the mango production map

Tanzania is an insignificant player when considered worldwide, however when placed in the African context it comes out among the top six producers. Nigeria is the highest producer of mangoes, followed by Egypt, Madagascar, DRC and Sudan. Tanzanian production figures reflect over 99% local varieties which are consumed in the country with very limited export potential.

Fresh mango sub sector dynamics in Tanzania

Mango is produced across a large latitude range in Tanzania, under widely varied environments, soils and management conditions. This widespread production brings with it a range of special problems or challenges. Mango production in Tanzania is predominantly a smallholder crop, often produced at subsistence level with minimum inputs in terms of crop management. Mango orchards are normally small, not exceeding two to five hectares of land. Mango is one of the rather traditional fruit crop grown mainly in Coastal Zone (Dar es Salaam, Coast, Tanga) and Morogoro and Tabora regions. In North Eastern Tanzania, which is the study area, mango is mainly grown in the Tanga and Kilimanjaro regions. In Mombo area a model farm (Mr Shebuge) of improved / export quality varieties exist since 1996. In this farm 18 different varieties have been tested and are at production stage. Apart from mango production the farm produces and sells planting materials. Agricultural Research Institute (ARI) Mlingano in Tanga and Sokoine University of Agriculture (SUA) are also producing seedlings of improved variety.

Production of fresh mango has been growing steadily in Tanzania in the last 10 years. While in 1990/91 Tanzania mainland produced only 61,680 metric tones, by 2004/05 production had increased to 254,550 MT an increase of over 300%. Production for export was insignificant and was essentially to the Middle East markets. In 2003, the Ministry of Agriculture reported that Tanzania exported only 49 metric tons, which was less than 0.05% of that year's total production. The situation has not changed on the export trends. Common upcoming mango export varieties grown in Tanzania include Apple, Palma, Boribo, Dodo, Haden, Keitt, Kent, Van Dyke, Tommy Atkins, Ngowe, Hadijar and various other local landraces. **Apple and Ngowe** have high demand by the export market sub-sector.

Mango exports from the Zanzibar and Pemba islands which are at its peak in February to April, have been consistently rising from 16 metric tons in 1992, then metric 36 tons in 1994 to about 100 metric tons in 1995. Mango exports in the Islands are projected to reach 2,000 metric tons worth $1 million by the year 2007. Unguja Island is the main mango production area in the islands.

Insect pests and diseases threat

Since 2003 Tanzania is invaded by Bactrocera invadens a quarantine fruit fly. This is the main threat in mango production particularly for the export market. Fortunately, Sokoine University of Agriculture (SUA) has been implementing a project titled: "Fruit Fly pest control in small scale orchards in Tanzania from 2004-2008". The university has assessed the situation in the country and have established that almost all areas have been invaded *by Bactrocera invadens*. To combat *Bactrocera invaden*s it is recommended to use cultural prevention mechanisms and use of technical traps and baits. According to farmers who have tried the proposed prevention methods they indicated that it can work given sufficient access to required inputs. However, SUA strongly recommended that to be effective the prevention campaign should be national wide rather than region specific intervention.

Support organisations

To revamp the sub sector the government is providing quality limited amount of planting materials and pests control chemicals and trapping methods (netting, lure traps, bait traps) through selected farmers fields; training and extension services, agricultural shows and dialoguing with representative bodies and stakeholders such as the Horticulture Development Council -HODECT and the Association of Mango Growers. The government is also encouraging public private

partnership (PPP) in starting up export initiatives in the sub sector. A project led by Trans Zambezi Industries (TZI) of Zimbabwe with financial support from Common Fund for Commodities (CFC) would start up a state of the art processing facility for mango and passion fruit concentrates in Nkuranga (Coast region) and plans to establish over 4 years period starting from 2007, a linkage with around 600 smallholder outgrowers. There are limited non governmental organisations which are explicitly targeting the sub sector. A few NGOs are currently focusing on horticultural products lines in response to a recently launched USAID programme may consider supporting the mango sub sector (ADCI VOCA- SHOP Project and TAHA.

Fresh Mango supply chain analysis

Three supply channels have emerged.

- **On farm (rural/semi urban) market channel**.

This is the traditional channel characterised by farmers who sell part of their produce on farm or road side markets. Periodic rural markets too are visited by these farmers cum traders. This channel handles the traditional varieties and during peak season, the number of traders increases tremendously.

- **Urban market biased channel**.

This channel is driven essentially by traders who in turn use rural middleman / brokers to connect them with farmers. This channel handles most of the mango crop during the season. In the urban markets of Dar es Salaam and Arusha, main wholesale markets of Tandale and Kilombero respectively handles the bulk of fresh fruit from upcountry, from which sub wholesalers and retailers buy and sell to consumers. Some few medium to large farmers do directly supply the urban markets. The main urban consumers are green grocers /kiosks and urban dwellers. During the high season when market is flooded with mangos literally all segments of market (low to high income could afford mangoes). During the lean season (June to Sept) prices are quite comparatively expensive and middle to high income champion the fruit. During these times occasional imports (fibreless varieties) are imported into the market by supermarkets such as Imalaseko and Shopritte mainly from South Africa but also from Kenya and Zambia.

- **Emerging export market**.

During this study two exporters were identified who have started exporting activities while many others are still building up production base of export quality and varieties. The present exporters are NatureRipe Kilimanjaro Ltd and Global Fruits and Vegetables Supplies Ltd. The export volume is still very small (3-5 tons a year) usually by air to the Middle East markets. NatureRipe is a member of Tanzania Horticultural Association (TAHA) and also a founding member and chair of AMAGRO. This channel involves vertical integration of farming to exporting functions with limited outsourcing from other producers. The aim of AMAGRO is to eventually organise joint export marketing for its members. With growth prospects established for Middle East market and other countries, this channel has great potential to grow.

Profitability analysis

Fresh mango, if grown according to good agronomic practices is generally profitable for different actors in the sub sector. Farmers (majority of whom are smallholder), should however be able to go through a period of investing for a minimum of three years before seeing the first returns. From fourth year onwards it was established that farmers are able to attain gross margin of above 60%.

Traders buying from the farm and selling directly to final consumers were realising a gross margin of around 40%. This margin is lower than that of farmers but also is confronted with great challenge of handling, over-ripening and spoilage losses which is a typical phenomenon during peak seasons. With exporters the gross margins and actual profitability can only be maximised with increased economies of scale. Their margins fluctuate with seasonality. Exporter indicated that with exports to Middle East market a net margin of between 50% and 100% is possible per mango compared to the local up market. The same conclusion was arrived at by sub sector analysis made in Kenya where they concluded that export margins are higher than in local market. However, given the very small volumes and high freight costs (currently Tanzania uses airfreight) it would not make a business case to continue at this scale.

Major Constraints and Opportunities

The major constraints which are currently hindering the development of the mango supply chain can be categorized according to the basic stages in the supply chain as shown below.

	Constraints	Opportunities
Production and Productivity	• Lack of clean planting material, incidences of pest & diseases and inadequate technology transfer support affects farmer's production & productivity capacity. • Length of the production cycle affects farmers capacity to expand • Inadequate post-harvest handling facilities affecting profitability.	• Presence of research and development projects at SUA (pests & diseases)
Marketing	• Poorly developed transport infrastructure (roads, air, sea) limits marketing initiatives • Farmers are not organized with collection, grading and packaging facilities • Underdeveloped alternative uses limits market access	• Growth prospects and the fact that Tanzania could build on its comparative advantage during certain seasons • AMAGRO members building a production base • Export experiences of Natureripe Ltd etc
Organisation &Infrastructure/ Management Technology	• Insufficient plant capacity and organization of supplies • Relatively cheaper imported mango juices are available on the market from Kenya, Mauritius, South Africa and Egypt. Enjoying COMESA tariff advantages	• Newly launched PPP project -Trans Zambezi Industries with CFC for export of mango & passion concentrates
	• Mango farming as business not yet articulated • Farmer organisations are still weak.	• Possibility to Build on AMAGRO and its extension to new areas
Policy Regulatory	• High entry barriers and risks for private sector to get into the sub sector.	• Government policy support & priority in the crop

The following major features of the mango subsector are apparent:

- Over 95% of mango production in Tanzania is of the local varieties and for the local consumption.

- Initiative to grow export exotic varieties like Alphonso, Tommy, Keith, and Red Indians is at its inception and on the increase and is supported by the private and public sector.
- Apart from the seemingly growing international market demand, access to EU/USA may not be feasible for Tanzania in the short run, but an alternative is to build on existing links with Middle East market where Tanzania may have some comparative advantages to build upon.
- The main challenge is for the smallholder farmers to step up from traditional practices to commercialisation of mango production for the export market. It involves among others adapting improved varieties, overcoming the pests and disease threat, organisational capacity for exporting, technical and infrastructural upgrading.
- Opportunities for sub sector development could arise from building on current export initiatives under AMAGRO umbrella for fresh mangoes and diversifying to upcoming processing of export quality concentrates.

Sub sector development leverages

Based on the above analysis, the mango sub sector could be stimulated for its growth and competitiveness by concerted efforts to address the constraints and capitalising on the opportunities. The logical way to move forward in promoting competitiveness and growth in the fresh mango sub sector is by focusing on growth potential supply chains. Two apparent supply chains have been identified.

Supply chain for fresh export to Middle East

The emerging supply channel for export market is the one that connects medium/large scale farmers who have started integrating export activities. Through these exporters as potential market leaders, more small scale producers (preferably members of mango growers association) could supply to the same channels. The main challenge is to have a collaboration strategy among the willing farmers and exporters whom could address together issues of becoming competitive in the export market. Bottom line is that export varieties of sizeable volumes are initiated and that the issue of pest and disease barrier to export market is addressed[4].

Supply chain for processing of mango for export market

The other supply chain opportunity is to link up smallholder mango growers with the emerging processing and export facilities for mango and passion concentrates. Trans Zimbabwe Industries with support from Common Fund for Commodities are planning to set up state of the art processing facility and will basically be contracting smallholder farmers. This upcoming supply chain is worth monitoring and support. In 2008 TZI has entered into contract with AMAGRO[5] for supply of 100 MT for processing of concentrates. This is a good beginning of supply chain development.

Bottom line in both supply chain is organisation of farmers for critical mass production of export quality mangos. The AMAGRO is a good base to build upon. Its constitution has provided for incorporation of new members as branches as long as 25 and above mango growers have come together. Farmers in lower North-East Tanzania starting from Mombo have the potential to be co-opted to AMAGRO in order to be linked to the market.

[4] Refer to the critical success factors for the export market identified in chapter 2

[5] Information on details available with AMAGRO Secretary M Millinga

In order to implement the supply chain development proposed above a number of recommendations have been highlighted. These are categorised into short, medium and long term.

Short- Term leverage interventions

The thrust in the short run is to facilitate setting up of a commercialized market linkage base for export quality varieties. Following short term measures are proposed:

- **Promotion of SUA research findings through documentation and demonstration** events on how to continue combating pests and disease infestation of mango varieties in a sustainable manner. SUA project comes to an end in 2008. Sub sector support agencies should facilitate identification of the actual demand pesticide and other inputs that is needed in order to stimulate private sector response to supply such inputs on the long run. Ministry and development partners should play a leading role in the initial phase.
- **Capacity building of interested farmers in the North East corridor** to enter into **contract farming arrangement between Natureripe Kilimanjaro Ltd.** Farmers in Mombo and Korogwe who have started on export varieties were ready to start; the same interest has been indicated by AMAGRO Association in Dar es Salaam.
- Support **upgrading and dissemination of food processing and packaging technologies** initiated by organisations like SIDO to a higher level. Promote BDS services related to sorting, grading, labelling etc to improve quality of products.
- The second is the emerging **contract farming arrangement between TZI Ltd and AMAGRO** for processing of concentrates and other juices for export and local market. Already in 2008, TZI has contracted AMAGRO members to supply 100 MT of mangoes for processing.
- Support to improve in extension services provided to mango farmers. With AMAGRO initiatives to train and link its members to sources of inputs is ongoing. AMAGRO with support from development partners should maintain the **link with SUA and ministry to improve plant breeding particularly for hybrid and improved varieties.** In some areas, better quality could be achieved by adapting existing varieties, but developing new locally-adapted varieties in the long run should be explored.

Medium Term Interventions

- Provide support to the **development of processing capacities in Tanzania** particularly for export (concentrates), given that shipping and handling costs are lower for processed products.
- **Awareness rising on the opportunities** (markets & technologies) for mango commercialization in Tanzania. AMAGRO should be supported to host mango promotional events e.g. mango testing or mango national congress) and to open its branches in more areas where mango is grown in Tanzania. Reference could be made to best practice cases from the Philippines as shown in text box 1 below.

Long Term Interventions

- **Infrastructural development to support the sub-sector**. In the area of physical infrastructures, particular emphasis should be given to storage facilities and to transportation. Concerning institutional infrastructure, the development of adequate credit facilities and other services required by the supply chain and setting up collective farmers' bodies, responsible for marketing and for the interaction with other stakeholders in the chain, must be examined.

2.3 Fresh Citrus for local and regional market

This quick scan focuses on fresh citrus for the local and regional market. In the citrus fruit group, orange is the largest crop, but also grown in rather small volumes are lemon, lime, mandarin and grapefruit. Hence in this study a specific focus is made to oranges. Tanzania is generally self-sufficient and citrus fruit are available all year round. Despite the favourable conditions for citrus fruit in Tanzania, farmers still do not take advantage of it and very limited value addition takes place hence the main outlet for citrus is the fresh market.

Citrus fruit are grown in most parts of Tanzania. The research for this report however has focused mainly on the northern eastern corridor of Tanzania. Orange production is largely concentrated in the North East Coast, with Tanga and Coast region having the largest planted area. This is followed by Morogoro, Mwanza and Ruvuma regions.

Overview of Orange sub sector in Tanzania

There are several varieties of oranges which are grown in Tanzania including Msasa, Nairobi, Valencia, Pamba, Jaffa, Washington naval and Zanzibar. The most common varieties grown commercially in Tanzania are Msasa, Washington naval, Valencia and Nairobi.

The agricultural census of 2003 established that the total production of oranges by mostly smallholders in Tanzania was around 194,978 tons per annum, harvested from 23,062 ha resulting in 8.5 t/ha yield. A total of 109, 413 households are estimated to be involved in orange production, with an average of 0.4 ha per household. Of the total planted area of oranges in the country only 0.2 percent is by medium to large scale farms.

Market trends and dynamics

Regional market

The Regional market for Tanzania citrus consists mainly of Kenya. Orange export to the other East African countries is very insignificant and exports outside Africa are negligible. Tanzania supplies Kenya with mostly the **Washington Naval variety.** During the study it was established that Kenya imports citrus and in particular oranges from Tanzania for local fresh consumption and for processing but also for re-export to other regional markets. Exact data of re-export were not available.

The regional export market for Tanzanian oranges has been growing over the last years. The export to Kenyan market has nearly doubled in last few years and has remained an important market for Tanzania. Data available showed that export of oranges to Kenya has doubled from 1999/00 to 2001/02 season. During the study it was established that around 60% of the oranges produced in Tanga region are exported to Kenya, mainly during the peak production season from June to September. It has also been established that the export of citrus from Tanzania to Kenya accounts for approximately 44% of all the oranges they import.

Domestic market

The domestic market for citrus is growing and it is expected that the growth will continue. The growing health eating habits and population account for this growth. During the study it was established that three different domestic market segments could be distinguished.

The first and the one which is considered to be the largest market segment is the rural and urban household consumption supplied through informal markets. The consumption of oranges follows

seasonality; most of it is consumed when there is peak in production, abundant availability and at low prices. Fresh urban consumption of oranges is mainly purchased through informal trading channels after being transported to urban areas from rural areas where the production is being done. Most of the oranges that are consumed in Tanzania are obviously consumed in urban areas.

The second is the formal retail channel and institutional consumption. Formal fresh citrus market channels (Kariakoo/Buguruni/Tandale and supermarkets) in urban areas are growing but deals only with a small percentage of the citrus sold in urban areas. Institutional consumption includes governmental and private institutions such as defence force, hospitals, schools, tertiary education institutions, restaurants and hotels. The institutional markets are becoming significant market segment.

The third one is the market for processed products such as concentrates, juice, marmalade and other orange products. Since our focus of this study is in the market of fresh citrus fruit, the processed products have not been analysed in detail. But it suffices to put in record that processing of citrus is mainly done at domestic level and industrial processing is not yet mature. But also processed juices face stiff competition from cheaper and well packaged (tetra packs) imports. The market is full of fruit juice imports from Egypt, South Africa, and Kenya etc. There are however, promising recent initiatives in Morogoro and Dar es Salaam to launch processing of concentrates for export market and juices for local market but yet fully operational at the time of writing this report. UNNAT Fruit Processors Ltd based in Morogoro is at advanced stages of commissioning its concentrates and juice making factory which view to become the model and state of the art processing facility in Tanzania with installed capacity of processing 250,000 tons of fruits per year, 80% of which is concentrates and 20% juices.

The citrus sub sector involves a diverse number of actors performing different functions. Input suppliers of young trees are essentially farmers from their own nurseries. There is very limited use of pesticides and fertiliser which are supplied by general agricultural input suppliers. Farming is done by essentially smallholders with upcoming of some medium and large scale farmers. Intercropping with other cash and food crops is common. Brokers play a key role of linking buyers /traders from urban and from Kenya with producers. In some areas, local by-laws prohibit traders to buy directly from farmers. Harvesting is done by farmers and casual labourers often paid by traders. Transporters are performing the logistics functions. At the end of the channel are wholesalers and retailers.

Profitability Analysis

The profitability in orange farming depends to a large extent on the number of oranges produced per ha and per tree and the price farmers receive for their crops. The Simplified Gross Margins (SGM) indicates when there is average to high prices in the market all supply chain participants are making profit. In a good year, the farmer can gain up to 80% SGM. However, for the farmers to reach that level, many things should go well, both high prices and a good harvest, which require a lot of organisational capacity. Farmers who have a poor harvest may have a negative SGM with the average prices. This underscores the importance of good agronomic practices to attain high productivity levels. Market place retailers have the lowest SGM.

The emerging supply chains in citrus sub sector

During the research period three principal supply channels has been identified. Two of the channels reaching the domestic market in Tanzania and one for the regional export market to Kenya.

On-farm (Smallholder) farmer channel

The on farm smallholder farmer channel represents the smallest portion of the market and consists of smallholder farmers and hawkers who sell directly to consumers. Farmers are often located near rural and urban markets, around roads and junctions, and places where a number of people move. The participants in this channel have vertically integrated the functions of production, harvesting, transporting, wholesaling and retailing. Often this channel employs the children of farmers or others who sell to rural consumers or directly to passengers commuting on the highways.

Domestic market channel (high & low season)

The domestic market channel has different features for low and high seasons. In the high season, the channel handles abundant oranges in the market and traders are travelling to main production areas e.g. Tanga region and purchase oranges from farmers. The crop is then brought to different wholesale market places and sold to different retailers, hotels, restaurants and institutions for consumption. Most of the farmers sell their oranges on the tree, after which the trader takes over and contract different actors for harvesting, counting and packing, bulking and transporting. At the wholesale market, retailers are buying from wholesaler before selling to restaurants, hotels and institutions. Few farmers usually medium to large delivering to the supermarkets are on contract.

The other domestic channel takes care of the low production season, where the actors are the same but their assignments are different. The amount of oranges available in the market is low during this season and therefore broker's job is to track available oranges in different places and bulk these for transport. During this period brokers are important and charge a high fee. After the trader has taken ownership over the oranges, process is the same as the above channel.

Kenya channel

The third channel which we have named Kenya channel is the export channel. The only export of citrus fruit from Tanzania is to Kenya. This is quite significant channel in volume and destination as approximately 60% of the oranges from Tanga region goes to the Kenyan market. This channel is only active during the high production season when Kenya has a shortage of oranges and Tanzania a surplus. For oranges to be exported to Kenya, a Kenyan trader contacts a local broker from the area where the purchase of oranges is going to happen. Tanga supplies most of the oranges but also Morogoro and Coast regions. Very few traders from Tanzania have successfully penetrated the Kenyan market. Likewise, the brokers in Tanzania are protective of their market and they do not give market knowledge to traders from Kenya. The export market is also more complex with taxes, levies and border crossing regulations. When oranges cross the border to Kenya, the identity and traceability is generally lost. Tanzania orange business is not branded.

Support organisations

The regional and local government authorities provide regulatory, research as well as extension services. Agricultural Research Institutes (ARI) is also involved in research and dissemination activities. Sokoine University of Agriculture is quite active in research and development work in citrus subsector. Various research projects have been carried out although dissemination of such findings is minimal. Farmer's lobby and advocacy organisation such as MVIWATA and TCCIA are also providing a voice for citrus farmers. In Tanga region TCCIA has organised citrus farmers into

SACCOs and providing financial services. In terms of value addition, UNIDO and SIDO are supporting women groups involved in fruit drying and juice processing in Muheza District in Tanga region.

Major constraints and opportunities

There are various constraints hindering growth of the sub sector as summarised below.

	Constraints	Opportunities
Production/ Management	• Lack of specialisation on orange varieties by farmers in Tanzania, leads to mismatch with market demands and lower prices for oranges domestically and regionally. • Poor crop husbandry practises and limited extension services & incidences of pests & diseases leading to low yields and lower incomes for farmers. • Inadequate management skills in farmer associations lead to loss of advantages of economies of scale. • Seasonal over production of oranges in Tanzania goes without value addition infrastructure • Production that is totally reliant on rainfall inhibits attainment of maximum productivity.	• Suitable growing conditions country wide offer possibility to grow oranges all year around. • Available training facilities exist to improve farmer's husbandry practices. • Possibility exists to grow more than one citrus crop in order to diversify markets. • Regional and district council management who have identified the orange sub-sector as an important sub-sector for the development of MSEs within their region or district.
Marketing	• Lack of transparency in the market systems between traders and farmers limits win-win benefits • Farmers do not have enough market information which makes them unable to find markets without brokers. • Associations are not strong enough to negotiate with own clients making them dependent on local brokers and traders. • Oranges from other regional countries are better branded and get a higher price • Poor quality fruit and cultivars that is not competitive on the international market limits access to other export markets • Limited understanding of Kenyan market dynamics creates dependency of trader's terms	• Proximity of Tanga region to several large markets as DSM, Arusha, Mombassa and Nairobi. • The upcoming Farmer associations stand a chance to create direct linkages with markets. • Existence of support agencies ready to improve farmers marketing skills and make them more aware of market opportunities. • Growing economy and population in other regional markets than Kenya could create an opportunity for export.
Infrastructure/Technology	• Poor roads & other infrastructure increases transaction costs of farmers and inaccessible during rainy season. • Weak domestic demand for processed products and technology capacities which is regarded as an inhibiting factor for the growth of a dynamic citrus sub sector	• Emergence of public-private sector initiatives in outgrower schemes (UNNAT Fruit Processing in Morogoro, Trans Zambezi Industries) • R& D on Dried fruits is available
&Finance & Risks	• Associations are not able to get loan through their SACCOS and can not avoid "desperate" farmers selling cheap citruses. • For an average farmer the SGM is low and low prices or poor productivity makes it negative and farmer's loose money.	• Model for Farmer associations linked with SACCOS has proven success in some areas. • With good prices and good harvest citrus is a good business proposition for farmers.
Social cultural Others	• Lack of discipline to enforce local by laws and regulations e.g. trading practices • Incidences of theft on farms inhibiting social cohesion • Fear for group organisation due to past failure • Gender (women) not active enough in decision making over business venture	• Local authorities still has room to pass and enforce by laws for favourable business practices • Contract farming modalities may instil long term business relationships

Citrus Sub Sector development strategies

This subsector could be stimulated for growth and competitiveness by employ a two pronged strategy. One is to focus on generic areas of intervention that cuts across constraints affecting the sector at large. Secondly is to focus on specific value chain development strategies.

The following **generic interventions** have been identified:

- Strengthening of networks and relationship in the sub-sector i.e. between farmers (Associations) and between actors in the sub-sector.
- Enhancing farmers' access to improved farmer husbandry practices
- Facilitating public – private investments in improving basic local infrastructure (irrigation, agricultural implements, marketing centres/ pack-houses, cooling facilities).
- Facilitating improved traceability, use of organic pesticides so as to access fair-trade and organic markets which would bring more lucrative returns.
- Supporting diversification between more citrus crops and local processing or value addition for local and export markets.

The following two **specific value chains** for further development have been recommended:

- **Supply chain development for the regional market**

Kenya market is growing. With stronger farmer associations and forging closer relationship with selected Kenyan traders could help farmers to export without the interference of local brokers. This new way of working from transaction based relationship with Kenyan traders to more long term relationship would need facilitation.

- **Contract farming arrangement with processors and institutional markets.**

UNNAT Fruit processors Ltd, is looking forward to forge contract farming arrangements with organised citrus farmers. A model of collection centres is under preparation and supported by various organisations. Other industrial processors of juices like Bakheresa and Azam Ltd have already started soliciting contracting arrangements with some farmer's organisations in Muheza. These are opportunities to build upon.

The proposed way forward for subsector development to be pursued by sub sector support agents includes the following:

Short term leverage interventions

- Support to improve existing farmer associations in citrus growing areas such as Muheza district. **SCF could award matching grant to deserving farmers association to access BDS services in market linkage and managerial skills**
- Support UNNAT to establish the **supply chain based on organising farmers around Collection Centres or pack house.** UNNAT has indicated willingness to champion the model.
- SUA and other R & D institutions have developed packages for agronomic practices which require support for dissemination to farmers. Enterprise Works in Iringa has tested several varieties of citrus and all that is needed is **to make the farmers aware and able to acquire such technologies.**

Medium Term leverage interventions

- Expand and replicate successes from the short term interventions e.g. **strengthening of farmer associations around collection centres in new areas,** and supply chain linkages between farmers and upcoming processors in Tanzania.

- SCF could consider supporting further **market research on** citrus products. Research is required on market potential for **other citrus crops than oranges.**
- **Support documentation on fruit and vegetables sector.** Data on fruit and vegetables is outdated and no structured system is in place. Data from the Ministry is incomplete. SCF could support/lobby for better data management within the fruit & vegetables sub sector

Long term leverage interventions

- Support to expand commercialisation of citrus into modern medium to large scale farms in order to create a good base for export. This will include growing new varieties, good husbandry practices, and instilling traceability regime that would allow **access to fair trade and possibly organic markets**.

- **Facilitation of branding initiatives of the citrus exported** from Tanzania to the regional markets. With growth in market linkages with Kenya and other regional markets foreseen, there is a need to instil a regime to recognise the identity and traceability of Tanzanian citrus brands into the export markets.