ORANGE SUB-SECTOR STUDY

Prepared by:

Ebony Consulting International (Pty) Ltd

Maple Place North
Momentum Park
145 Western Service Road
Woodmead, 2148
Tel: 011 802 0015
Fax: 011 802 1060
Email: eci@eciafrica.co.za

DEVELOPMENT ALTERNATIVES INC

PRIVATE ENTERPRISE SUPPORT ACTIVITIES PROJECT TANZANIA

FINAL REPORT
APRIL 2003

TABLE OF CONTENTS

List of Tables

List of Figures

List of Annexes

List of Acronyms

DALDO	District Agricultural and Livestock Development Officer
DAI	Development Alternatives Inc
GTZ	German Technical Development Agency
MSEs	Micro and Small Enterprises
MVIWATA	National Network of Small Scale Farmer Groups
MEDA	Menonite Economic Development Agency
NGO	Non Governmental Organisation
PESA	Private Enterprise Support Activities
RALDO	Regional Agricultural and Livestock Development Officer
RAS	Regional Administrative Secretary
TFA	Tanzanian Farmers Association
TAFOPA	Tanzanian Food Processors Association
TSH	Tanzanian Schilling
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

OVERVIEW OF THE SUB-SECTOR

Fruit growing in Tanzania is less developed compared to other crops such as vegetables, grain and plantation crops (eg coffee, tea, cashew and sisal). However, the orange sub-sector is probably – although production and price statistics are not collected or published for fruit crops in general – one of the leading fruit sub-sectors in Tanzania..

In spite of fairly low levels of orange production, Tanzania is self-sufficient in oranges for domestic consumption. Oranges are available throughout the year, although seasonality of production is a problem with over supply during the peak production season and under supply during low season. Exports to neighbouring Kenya are becoming an important marketing avenue of surplus oranges during high season, however there are **no** exports to countries (outside Africa) as the orange cultivars and the quality of the fruit are not currently suitable for the international market. Take up of oranges by the processing sector is negligible in spite of the availability of surplus capacity.

Production levels are relatively low, as no inputs (eg fertiliser, weedkiller and pesticides) are used and few crop husbandry practices (eg pruning, bud removal) are applied. Production takes place under rain fed conditions that affect yields, quality of the fruit, and the varieties that are suitable to be grown. Access to additional land is not a factor limiting the growth of the sub-sector.

DRIVING FORCES

The export and the high season domestic channels are both growing with the Kenyan export market recording the most significant growth in the last decade. Currently up to 60 % of oranges produced during the high season are finding their way to Kenya. Due to economic and population growth, the high season informal domestic channel is also a growing channel. The formal retail channel currently comprises an insignificant portion of the domestic market, however economic growth and the development of a larger middle and upper class is likely to lead to expansion of this channel.

Medium and large scale farmers are doing better financially than the smaller farmers, as they are often located closer to the main roads and thus in closer proximity to markets. This can ease the marketing challenges and provide a stimulus for farmers to expand. Medium and large-scale farmers in these areas also find it easier to attract buyers and often receive higher prices. Achieving economies of scale is also a driving factor of profitability in this sub-sector.

Despite the availability of excess capacity in the processing sector, growth been limited due to low local demand and the inability to compete against cheaper imports.

OPPORTUNITIES

The sub-sector provides many assets that can be built upon to stimulate production and small business involvement. The assets include:

- The long orange production season, with availability of oranges throughout the year.
- There is plenty of suitable land for orange production available to farmers.
- There are many small and medium farmers who are expanding production and who specialise in orange production. These farmers can expand more but are in need of basic technical and business skills to improve their farming operations. The networks and skills to provide the training exist in Tanzania. These farmers should be the target of project activities.
- Existing market associations expressing a need for better communication and interaction between each other.
- Regional and district council management who have identified the orange sub-sector as an important sub-sector for the development of micro and small enterprises (MSEs) within their region or district.
- Orange production taking place in geographic areas in close proximity to markets. These areas also have the additional benefit of good road infrastructure.
- There is excess processing capacity either through under utilization of existing private sector operations or several (donor-funded) but non-operational government owned processing plants.
- Current production practices do not include any pesticides or fertilisers, which means that the oranges can be labelled as “organic”.

CONSTRAINTS

The following are regarded as constraints in improving income and employment opportunities for MSEs in the orange sub-sector:

- Poor extension services at producer level.
- Poor crop husbandry practices.
- Production that is totally reliant on rainfall.
- Unreliable supply of good quality trees.
- Poor quality fruit and cultivars that are not competitive on the international market.
- Cash flow problems during the production season at farmer level.
- Lack of quality sensitivity in domestic markets.
- The unavailability of reliable production statistics.
- Poor distribution of price and market information.
- Poor business skills and lack of management capacity of market association leaders.

- Although farmer networks are in place at farmer association level, relative uncertainty regarding; involvement of medium and large scale orange producers within current available networks.
- Weak domestic demand for processed products, which is regarded as an inhibiting factor for the growth of a dynamic processing sector.
- Inability of local juice to compete against cheaper imports.
- Insufficient knowledge of the dynamics of the Kenyan market.

INTERVENTIONS

There are different scales of interventions that can be pursued. First is focused support at a producer level and second is support at the larger, macro level, including market generic transfer of market information and market research.

- At the local level, we propose a pilot project that will initially focus on medium and large-scale farmers in the Muheza district. If the project proves to be successful it could be rolled out to other high growth areas. The pilot project should focus on the following aspects:
    - Facilitation of the provision of appropriate extension services through direct training of farmers by trainers or by training extension officers. This could possibly be done in conjunction with Sokoine University, farmer association networks or suitable NGO or private sector partners. Extension services must be focused on home nurseries and larger farmers.
    - Facilitation of the marketing of good quality trees (with reliable varieties) to home nurseries.
    - Facilitation of capacity building within market associations. This could take place through business skill training courses as well as visits to other markets to enable leaders to exchange ideas. Facilitation of sustainable communication channels between different associations in different regions should be a priority.
    - Facilitation of formation or capacity building of farmer associations in conjunction with networks already active in the area. MVIWATA is seen as a possible partner.
    - Facilitation of the introduction of a price and production information format on a pilot basis in Muheza district; in collaboration with the District Council. After a pilot phase this could be expanded to other orange producing regions.
    - Facilitation of the distribution of price and production information via a radio bulletin, possibly in conjunction with one or several private sector partners.
    - Investigation of possible collaboration with Sokoine University and the Food and Vegetable Producer Association in Muheza on the pilot project aimed at enhancing household nutritional intake through the processing of food at household level.
    - Investigation of possible collaboration with other aid and development organisations like Irish Aid and MEDA (Mennonite Economic Development Agency) who have shown a specific interest in becoming involved with supporting the development of the processing sector.

- Market research on the Kenyan market to understand why the Kenyans are buying from Tanzania and how and where the product is being consumed in Kenya.
- Investigation of the possibility of organic juice production and export.
- Investigation of the role that private sector partners like Shoprite and food processors could play in the process. The starting point of this exercise should be an in-depth discussion and needs assessment of the private sector companies.
- Analysis of the cess[1] policies and the transport sector in Tanzania to understand the impact of cess on transporter behaviour and how to reduce transport costs.
- Under Phase II of the Tanzanian Agricultural Research Programme, Sokoine University of Agriculture is implementing a pilot project to support small scale orange processing focused on enhancing household nutritional intake. Participants have formed four processing groups in Muheza as well as an Association for Food and Vegetable Producers. Technical assistance and capital are provided by SIDO, but business training need are not being met. Follow-up meetings with Sokoine University as well as the Processing Association are needed to investigate future collaboration.
- Collaboration with other aid and development organisations like Irish Aid and MEDA (Mennonite Economic Development Agency) who have shown a specific interest in becoming involved with supporting or facilitating private investors interested in orange processing or supporting Savings and Credit Co-operative Organisations involved with market development.
- Since transport is an important cost of moving all agricultural produce, research and the analysis of the Tanzanian transport sector may provide some helpful insights into ways to reduce transport cost. Good analysis will indicate the different costs associated with transport, the impact of other government policies (such as the cess) on transporter behaviour, and opportunities for lowering the cost of transport.
- Orange farmers experience cash flow problems during land preparation and weeding. Currently these activities are often financed by orange brokers at very high interest rates. Training on cash management with a focus on building a savings culture will assist in alleviating the problem. Investigation of credit needs and available options and solutions need to be conducted.

[1] Cess is a levy paid at district level and is levied as a percentage of the value of the produce sold.

1. INTRODUCTION

The four year Private Enterprise Support Activities (PESA) project in Tanzania commenced in October 2002. The project aims to improve income and employment opportunities for micro and small enterprises (MSEs), including farms, through market links and information, policy changes, strengthened associations and business skills training, focusing on the Tanga, Morogoro, Iringa, Mbeya, Ruvuma and Rukwa regions. PESA Tanzania is funded by the United States Agency for International Development (USAID) and implemented by Development Alternatives Inc. (DAI).

Sub-sector analysis offers a tool that can facilitate the development of MSEs by focusing on growth opportunities within a sub-sector. A sub-sector is delineated by a particular final product and includes all firms engaged in raw material supply, production and the distribution of the product. Sub-sector analysis also offers a framework for rapidly evaluating MSE dynamics, and the prospects for cost effective interventions which can have the most widespread impact on small firms in the sub-sector. As such it forms an integral part of the DAI PESA Project in Tanzania.

A number of sub-sectors have been identified as important focus areas for the project. The orange sub-sector is one of the first sub-sectors to be analyzed as part of this program. This study will focus on the orange sub-sector in Tanzania, and will identify sub-sector dynamics, constraints, highlight the implications thereof and investigate options for interventions.

2. OVERVIEW OF THE SUB-SECTOR

Citrus sp. are native to eastern Asia and were introduced by Arab traders into the Mediterranean region. They were brought later to tropical Africa by either Arab traders or Portuguese navigators.[2] It is believed that Anglican Missionaries introduced the first oranges to Tanzania (Muheza District) in the early 1900s. After finding oranges to be well adapted to Tanzania's climatic conditions, other suitable areas for orange production were identified and trees distributed by the missionaries and some sisal estates. Soon after, individual farmers also started distributing plant material among each other.

In the early 1970s the Ministry of Agriculture embarked on a five year plan to improve fruit production in Tanzania. Actions focused on the establishment of district nurseries for the production of planting materials, the introduction of new cultivars and the establishment of mother orchards. During the project new cultivars were budded on lemon rootstocks and distributed to farmers free of charge. However, these nurseries did not operate on a commercial basis and were unsustainable; the last nursery closed down three years after the project came to an end in 1977.

It is generally considered that orange production in Tanzania grew to major economic importance during the late 1970's. Accumulation of surplus fruits, which could not be marketed and were pilling up along the roadsides, was observed as early as 1980. This surplus production led to the establishment in the early 1980s of processing plants in Korogwe, Muheza and Morogoro. While the plant in Korogwe did play a significant part in providing a market for oranges, the processing plants in Muheza and Morogoro failed to operate on a commercial basis due principally to lack of working capital. During 1986-1993, a Horticultural Expansion Project, financed by GTZ, focused on increasing production in the lowlands of Tanga. Nurseries were opened, but failed to distribute a significant number of trees to farmers. These nurseries were also not managed on a commercial basis and closed after the project came to an end.

Fruit growing in Tanzania is less developed compared to other crops such as vegetables, grain and plantation crops (coffee, tea, cashew and sisal). In spite of fairly low levels of orange production Tanzania is self-sufficient in orange production for domestic consumption. Although oranges are available throughout the year, seasonality of production is a problem with oversupply during the peak production season and undersupply during low season. Exports to neighbouring Kenya are becoming an important marketing avenue of surplus oranges during high season, however there are **<u>no</u>** exports to countries (outside Africa) as the orange cultivars and the qualities of the fruit are not currently suitable for the international market.

[2] Mbiha, E. R. & Maerere, A. P. (2002) '*Problems and Potentials for Marketing of Oranges produced in the Muheza District*.'

PRODUCTION ZONES

The major production areas in Tanzania can be grouped into five zones:

1. The Northern Coast – comprising the Dar es Salaam, Coast and Tanga regions. The main fruits grown in this area include orange, mango, pineapple and lime. The Tanga and Coast regions are known for fruit exports to Kenya.
2. The Southern Coast – consisting of Mtwara and Lindi regions. Important fruits grown are orange, tangerine, mango and lime.
3. The Central Plateau – this zone is covered by Dodoma, Singida and Tabora regions. The potential of a greater part of this zone is limited due to low variable rainfall. Dodoma is almost unique in the country for the production of grapes, while Tabora is a major producer of mango.
4. The Lake areas – these are the areas around the lakes Tanganyika and Victoria consisting of Kigoma, Kagera, Mwanza and Mara regions. The areas have high and reliable rainfall. They are well linked with the Democratic Republic of Congo, Rwanda, Burundi, Uganda and Kenya through the lakes. The main fruit crops grown are banana, mango, orange and pineapple.
5. The Northern and Southern Highlands – this zone consists of the Arusha, Kilimanjaro regions and parts of the Tanga region in the north, Iringa, Mbeya, Rukwa, Ruvuma and Morogoro. The areas in this zone experience very reliable rainfall. Due to the effect of the high altitude, these areas are famous in the country for the production of temperate fruits, mainly pear, peach, plum and apple. They are also major producers of banana, avocado and passion fruit. The Kyela district in the Mbeya region, which borders Lake Nyasa, is generally a low altitude area. In the district, orange is the major fruit crop. Morogoro region, which is close to the coast, is a more diversified ecologically and constitutes both highlands and lowlands. Besides being a major producer of temperate fruits, it is also a major producer of tropical fruits such as orange, tangerine, mango, pineapple and jackfruit.

Although oranges are produced in most of the Tanzanian regions this study focused on orange production in the Tanga and Morogoro regions which are regarded as the main orange production regions of the DAI PESA regions.

PRODUCTION SEASON

Oranges are produced through out the year in the Muheza and Morogoro regions. The main production season is between June to October with peak production between June and August. The period from November to February is regarded as a minor production season in the Tanga region (Muheza district), while March to May is considered a period of fruit scarcity with a small number of farmers producing very low volumes of oranges. The Morogoro region has a shorter production season, but has the advantage of earlier harvest, which enables them to produce higher volumes oranges in the very low supply period between April to May when prices are highest. Table 1 graphically depicts the orange production seasons of the two regions.

The introduction of new varieties during the 1970's and 80's with different ripening times, resulted in a lengthening of the orange production season. Table 2 provides more details of the most common cultivars.

It is estimated that about 65% of oranges produced in Tanga are produced during the main production season (June to August), at least 25% in the minor production season and less than ten percent in the low production season between March and May.

In Morogoro it is estimated that between 60-70% of oranges are harvested during the main production season (June to August) with the remainder being harvested before and after the main season.

Table 1: Seasonality of production

District	Jan	Feb	March	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Tanga (Muheza)												
Morogoro												

ORANGE HUSBANDRY PRACTICES

Oranges are produced organically in Tanzania, without any fertiliser, pesticide or weed killers. Fruit growing takes place under rain fed conditions and no evidence was found of oranges grown under irrigation. During our research it became clear that farmers also apply minimal crop husbandry practices as there is no spraying, pruning, or removal of surplus flowers. Where oranges are grown in monoculture, slashing of undergrowth and grass takes place once or twice a year. Where intercropping with cash crops occur, husbandry practices designed to improve production of the annuals also benefits the oranges.

In some areas farmers indicate that disease and pests pose a problem. Ants that damage the trees as well as gummosis and foot rot are cited as the most common problems. Ant infestations are mostly removed manually and diseased trees pruned or removed to prevent the spread of disease. Extension services focused on husbandry practices is for all intents and purposes non-existent.

ORANGE VARIETIES GROWN

Farmers and traders in the study area were able to identify seven orange varieties. Most farmers reported growing a mixture of the following varieties, Msasa, Nairobi (also known as Matombo Sweet), Valencia, Pamba, Jaffa, Washington and Zanzibar. Different varieties are grown in a bid to lengthen the production season, although farmers clearly showed a preference for certain varieties. The preference varied between the two study areas. Farmers interviewed in the Muheza district indicated that the Msasa (29.3%), Valencia (23.8%) and Nairobi (20.4%) varieties are the most popular, while farmers in the Matombo district preferred the Matombo Sweet (Nairobi) variety. An important characteristic of the more popular varieties are that they do not have to be picked immediately when ripe, but can last some time (in a ripened state) on the tree. This is an important attribute that will be discussed later in the report under harvesting.

Table 2: Common orange varieties

Varieties	Season	General characteristics
Msasa Valencia	Muheza: May to August Muheza: January to March	• Late maturing, medium size, thin and smooth skin • Long storage time on tree • Sweet and juicy when ripe • Robust to transport • Most popular varieties
Jaffa Washington Nairobi (Matombo Sweet)	Muheza: May to July Muheza: July, March, April Muheza: May to July Matombo: April – July	• Jaffa, juicy but not sweet, soft fruit, not robust to transport, big size fruit • Washington poor juice content, not sweet, thick skin, robust to transport, late maturing. Seedless, therefore remained a distinct variety. • Nairobi also called Matombo Sweet in Morogoro region. Sweet, medium sized popular in the Kenyan mark. Produced in Matombo when supply of oranges is low. Long storage time on tree.
Pamba	Muheza: November to January	• Very sweet, soft fruit, late ripening variety • Slow maturing tree, 5 years to bearing
Zanzibar	Not known	• Sweet, skin slightly thick

The Jaffa, Valencia, Washington and Zanzibar varieties are true commercial varieties known by those names internationally. Varieties Msasa, Nairobi (Matombo Sweet) and Pamba are local names and therefore not known in the world orange industry.

We have noted that there is often confusion by farmers and traders between the different varieties. Distinction is often based on the characteristics and ripening period of the fruit and seldom on the plants themselves. Msasa, Nairobi (Matombo Sweet) and Pamba are probably not distinct varieties, but rather a mixture of seedlings and buddings from seedlings. Farmers indicated that when they ordered trees from small nurseries they tend to order a range of varieties as they are never sure of what they will actually receive. They indicated that this is due to small home nurseries not labelling trees adequately when budding, as well as perceived dishonesty when nurseries sell less popular varieties under the name of more popular varieties.

AGE OF ORCHARDS

Most varieties will supply a small harvest three years after planting, although some varieties (most notably Pamba) will only bear fruit from Year 5. Orange trees in tropical areas usually achieve mature production from year 8 to 20 and should be replaced by Year 30.

Survey results in the Muheza district indicate that about 22% of orange trees are younger than ten years.[3] The majority of trees (69%) are between 11 and 20 years old, while old trees (21 and 30 years) constitute 7% of all trees. The fairly high percentage of young trees could be indicative of orchard expansion or high replacement percentages due to disease. Our observation is that the bias towards younger trees is due to fairly rapid expansion, as many newly established orchards were evident. However, casual observation during research gave the

[3] *ibid*

impression that the very young orchards (typically younger than three years) do experience severe drought stress during the dry season due to the immature and shallow root systems of the trees. This leads to fairly high replacement percentages in young orchards and also stunts growth and delays optimum production of those that survive.

Farmers interviewed in the Matombo district in the Morogoro region indicated that the age spread of trees in this region is less optimal. Trees seemed to be older than the Muheza district with a smaller percentage of trees in the mature (optimum production) category. Some farmers indicated that as much as 50% of trees can be regarded as old trees. Our observation is that farmers in this area are generally smaller farmers (1-5 acres planted to oranges) who do not specialise in orange production and regard orange production simply as one of their income streams. This observation supports the age structure of the trees as farmers who are less focused on orange production will tend to replace trees on a less than optimum level.

AGRICULTURAL STATISTICS

Agricultural production statistics are available on a regional basis for the major crops produced in Tanzania. However, fruit production in general seems to be the exception as there is very limited data available. This seems to be a factor of the wide distribution of fruit trees in Tanzania. As most farmers produce at least one fruit crop (either for home consumption or for commercial marketing) it often seems to be regarded as a way of life and not as a specific farming enterprise. It appears that production statistics on fruit production are generally not included in agricultural or general surveys.

We obtained specific orange production figures for 1997/98 from the Muheza district as well as the Morogoro region in the report produced for the Muheza District Council by the Sokoine University of Agriculture. However, comparison with other data sources shows some discrepancy in the data and the data should be interpreted with caution.

Table 3: Fruit production data in the major fruit production regions of Tanzania, 1997/98

Fruit Crop	**Morogoro region**	**Coast region**	**Tanga region**
	Production in tons		
Banana	150,000	15,000	56,400
Orange	53,832	20,000	85,500
Pineapple	40,825	23,000	155,000
Mango	56,680	9,000	120,000

Source: Muheza District Council – Study report on orange marketing , Sokoine University, 2002.

3. MARKETS

DOMESTIC

The domestic orange market can be divided into (1) fresh rural and urban household consumption purchased through both the informal markets and (2) the formal retail channel, institutional consumption and (3) processed consumption (juice, marmalade). Oranges purchased for fresh consumption from informal markets is regarded as the largest market. Fresh consumption purchased from formal retailers (Shoprite) is estimated to account for less than 2% of the total fresh consumption market. Processed consumption is considered to be negligible, while the relative size of the institutional market is not known.

Fresh Rural Household Consumption

Fresh rural consumption can be divided into own-consumption by farmers and consumption by people in small towns and villages who do not produce their own oranges. Farmers indicated that they generally sell the best oranges to traders and consume some of the oranges left on the tree that are considered to be too small to be marketed. Own consumption is regarded as being less than 5% of the fruit that remains on the tree and therefore comprise a negligible portion of the total market.

Rural inhabitants who do not have access to their own oranges usually purchase oranges from rural markets and street vendors. Consumption seems fairly seasonal with the majority of consumption taking place at times of peak production when oranges are relatively inexpensive and available. Interviews with rural traders and retailers indicated that oranges are supplied to rural markets throughout the year and, where necessary, fruit are moved from one region to the other to meet demand. Our research took place during March, which is considered to be the month in which supply is at its lowest level. In all the rural markets visited oranges were sold emphasising the relative efficiency of the rural distribution system for oranges. All oranges purchased in rural areas are purchased from informal markets as the retail channel has yet to extend to the rural areas.

Fresh Urban Household Consumption

Fresh Urban Household consumption accounts for the bulk of commercial domestic orange consumption. Recent statistics on fruit consumption were not found, however, it is clear that the effective domestic demand for fruit (and more specifically oranges) lies mainly in Dar es Salaam and other urban centres.

Oranges are largely produced in rural areas, transported to urban areas and sold through informal retailers in the cities. Oranges are mostly consumed as fresh fruit, although there is some indication of a tendency to process oranges into orange juice at household level. This is mainly due to the unavailability and relative high cost of commercially supplied juice (mostly imported) in general.

For the purposes of this study Shoprite is regarded as the only formal retail channel of fresh fruit as it is the only large retail chain operating in the cities of Tanzania. Shoprite management indicated that they try to source local fresh products when possible, but that they often experience insufficient supply of good quality fruit. They tend to stock both local and imported oranges. During a visit to a Shoprite branch we only found imported oranges at 2,500 TSH/kg or approximately 250 TSH per orange. Shoprite estimates that they have less than 2% of the market share of the Tanzanian fresh produce market. Informal markets in the city areas are therefore regarded as the main marketing channel of urban consumption.

Institutional market

The institutional market comprises consumption in the defence force, hospitals, schools, tertiary education institutions, restaurants and hotels. We have been unsuccessful in obtaining information that will enable us to grasp the relative size of this market, but indications are that it is probably a more significant part of consumption than the formal retail market channel.

Suppliers on contract basis supply the defence force, hospitals, schools and tertiary education institutions. Depending on the institution, the tender either originates from the National Tender Board or different Departments at Local Council level. Consumption at institutional level is largely fresh, although some consumption of juice also takes place.

The larger hotel chains in Dar es Salaam indicated that they make use of a variety of channels. Most hotels have contract suppliers that provide them with fresh fruit on a daily basis, although some of the smaller hotels purchase directly from the wholesale or retail markets. Imported fruit are sourced through Shoprite. The majority of the hotels indicated that they squeeze juice fresh on the premises, although there is some indication of the utilisation of imported juice from South Africa and sourcing juice from small household level juice processors. One hotel indicated that they previously used juice supplied from small household level processors, but changed to processing juice themselves after experiencing problems with the quality due to poor quality water used for dilution purposes.

Processed consumption

The Strategies and Action Plan of the Industrial Development Department of the Commonwealth Secretariat (1998) estimated that production of canned fruits and vegetables has been declining over time from a high of 1,850 tons in 1985 to 1,287 tons in 1995. They estimated that processing capacity utilization for the period 1990-1995 averaged only 22%.

Several factors contribute to explaining the weak performance of the manufacturing sector in Tanzania. These include, among others, the failure to closely coordinate industrial plans and policies with investment plans in other supportive sectors such as power, water, finance, transport and telecommunication networks. In most cases, industrial supportive services have fallen short of demand, hence compromising performance of manufacturing industries. Another important factor underpinning performance of Tanzanian manufacturing industries is the weak domestic market in demand for processing foods – a driving force for industrial production and development.

Our research indicated that the processing sector in Tanzania remains in its infant state. A number of small processing factories are operational. Most noticeable are factories in Iringa and Korogwe and two factories in Dar es Salaam. The Iringa factory was established in 1976 to produce fruit juices, jams, canned products, sauces and pickles. Its focus seems to be on tomato and chilli sauce as well as pickles. It is estimated that overall the plant only utilises 30% of its capacity of which a small percentage is used to manufacture orange juice that is apparently exported to Finland and the Netherlands. The food processing factory in Korogwe has recently been privatised. It focuses on tomato products (canning and sauce). One factory in Dar es Salaam produces orange juice concentrates and juices for domestic consumption, although there is some indication that finished products do not conform to lay down standards. The other Dar es Salaam company indicated that although they produce fruit juice concentrates and orange squash they cannot compete against cheap imports and have therefore moved their focus to crunchy snack foods and synthetic drinks.

A new food processing plant is in the process of being established on the outskirts of Morogoro. It is estimated that the plant will be operational in 2004 and will focus on fruit processing. We were unable to talk to the factory owner, but he seemed to be gearing his operation towards a contract growing scheme that will provide inputs to farmers who will sell their products to the factory. No other details are known about this venture.

We have come across a number of small women groups that have been trained in making jams, juice and canned products. The off-take to these avenues is currently negligible and the growth of these industries seems to be constrained by the availability of a suitable work area meeting hygiene requirements at household level. These small processing groups are organised into an association called the Tanzanian Food Processors Association (TAFOPA) which operates at the local level.

INTERNATIONAL

Our analysis indicates that the Kenyan market is a very important export market for the Tanga region. Transporters estimate that as much as 60% of oranges produced in the Tanga region are exported to the Kenyan market during the peak production season. When asked a similar question transporters in Morogoro indicated that they were not in a position to make a judgement regarding export percentages. However, the team’s own observations are that a lower percentage of oranges are exported from Morogoro to Kenya, due to the increased distance to the markets in Nairobi and Mombassa – transport cost per load of oranges from Morogoro to Nairobi is 900,000 TSH and 550,000 TSH from Tanga to Nairobi. Relative export percentages from Morogoro will however increase in the periods when Morogoro is the main supplier of oranges.

Information from the phytosanitary reports at the Horohoro Border Post indicate that about 44% of all orange exports take place in the peak production season (June to August), 28% from September to October, 20 per cent from November to December and only 8% from March to May. It is generally assumed that export data is fairly inaccurate due to under reporting of loads for tax evasion purposes. However, three year data shows that exports through the Horohoro border post nearly doubled from the 1999/00 to the 2001/02 season.

4. THE SUB-SECTOR MAP

Sub-sector analysis centres on a schematic map that describes the economic system of the sub-sector. The map summarizes the economic relationships between MSEs and other actors in the system, It traces system flows and within them, the options available to MSEs. The sub-sector map serves as the focus of discussion and is a basis of displaying key information

In the following sections we will firstly discuss the different participants and their functions within the orange sub-sector. This will be followed by a graphic depiction of the map and a discussion of the different marketing channels.

THE FUNCTION AND THE PARTICIPANTS

Various functions take place from the producer to consumer level. In most instances these functions are fulfilled by different participants as most of the producers are not vertically integrated.

Supply of trees

Young trees used for replacing old or diseased trees as well as trees required for expanding orchards are either produced by the farmers themselves or purchased from other farmers that have small home nurseries. Local orange varieties are raised from seedlings. Seedlings can either be obtained from uprooting spontaneous seedlings or by planned sowing of seed. Some farmers have mastered the budding[4] technique for the vegetative propagation of citrus. Rough lemon, a vigorous and high yielding rootstock, but which is prone to *Phytopthora sp.* (gummosis and foot rot disease) is always used as a rootstock. These rootstocks are either purposefully raised in small home nurseries or collected as spontaneous seedlings. The rootstock seedlings are often taken bare rooted and transplanted in the permanent field, where they are mostly budded with the different well-known cultivars after one year of growth. This unusual practice has developed as a measure against plant theft. Plants budded in a nursery are considered to be prone to theft, while those budded on rootstocks which are already established in the field can not be easily uprooted without compromising their survival. Farmers who bud their trees themselves are also in the fortunate position that they are sure of the cultivar they have selected. Farmers who buy seedlings from small home nurseries commented that they can not be sure that the cultivar they ordered will be supplied to them. Some farmers indicated that to reduce the risk of receiving the wrong cultivar they order a variety and in this way are sure of at least receiving some of the trees they prefer.

Production

Oranges are produced by farmers that could be categorized as small, medium or large scale farmers. *Small scale farmers* are farmers that have 1-5 acres of orange orchards and who are typically diversified fruit and cash crop farmers. Oranges are only one of the many fruits grown and they typically also produce bananas, mangoes, coconuts and pineapples. They are also cash

[4] Budding is another terminology for grafting. As the documentation in Tanzania uses this term, it has been used throughout the report in lieu of the word grafting.

crop producers and often grow paddy, maize and cassava. Cash crop production either takes place as intercropping between the orange trees or in different fields. These farmers often have to divide their labour between the various enterprises and focus labour and inputs on the most profitable enterprises. Where possible they will make use of family labour, but will employ contract labour when clearing under the orange trees or during peak production season. Old or diseased trees are not always replaced and this often leads to decline in the area under orange production.

Although assisted by their wives in their farming operation most of the *small scale farmers* are male; by exception some female decision makers will be found. Given that farming in the orange growing areas of Morogoro is generally very diversified, the majority of farmers in the Morogoro region fall in the small farmer category. It is estimated that a maximum of 70% of the farmers in Kwabada (Muheza district, Tanga region) fall in this category.

Medium scale farmers are typically also diversified fruit and cash crop farmers with 5-15 acres allocated to orange production. Due to the relative importance of their orange enterprise they tend to focus more attention and resources to orange production. Some of the medium farmers regard orange production as one of their most profitable enterprises and will (if possible) endeavour to enlarge the area allocated to oranges. In time they will become large scale orange producers. *Medium scale farmers* make use of family labour in low season, will make use of contract labour during the peak season, but will not employ permanent labourers. Although assisted by their wives in their farming activities, the decision makers are rarely females. Within the Morogoro region a very small number of farmers fall in the medium scale category. It is estimated that approximately 23% of farmers in Kwabada fall in this group.

Large scale farmers are less diversified fruit producers with more than 15 acres allocated to orange production. These farmers are, however, often diversified cash crop farmers and typically have additional fields planted to cash crops. Large farmers historically identified orange production as one of their most profitable enterprises and thus actively expanded their orange orchards. A fairly large percentage of their orchards can be regarded as young or mature trees and old or diseased trees have been replaced by young orange trees. Farmers in this category are expanding fairly rapidly and it is estimated that the expansion rate is between 0.25 to 0.5 acre per annum. They mostly make use of contract labour although some of the larger farmers in this group might employ permanent labour. Although assisted by their wives in their farming business, all the decision makers in the *large scale* category are male. It is estimated that only by exception would orange farmers in this category be found in Morogoro, while approximately 7% of the number of farmers in Kwabada fall in this group.

Brokers

Within the orange marketing channel, brokers operate on village level. Brokers charge a brokerage fee for bringing orange traders and producers together. They fulfil different roles during the peak production and low production seasons. During peak production season they provide a brokerage service between the local orange producers and the Kenyan traders. This service is necessary as the Kenyan traders require a bulking service (filling a 4-7 ton load) and do not have access to a local network of orange producers. Brokers typically charge a brokerage fee of 1 TSH per orange, but they often also make a margin on the price. The price margin is due to them communicating a higher price to the trader than the farmer settled for. Information regarding the price margin is not readily available as farmers are often unaware of the price that the traders pay and the brokers are protective of that information. In some instances the Kenyan traders merely arrive in orange producing areas and announce a price they are willing to offer. In these cases, farmers will supply the traders directly avoiding the broker.

During low production season, exports to Kenya drop significantly. During this period the domestic market becomes the main source of income for village brokers. During low production season orange volumes are low and traders use the brokers as a mechanism bulk orange supply before they hire transporters to haul the oranges. They consider it too costly and time consuming to remain in the area with transporters until sufficient supply is collected. Brokers still charge a brokerage fee of 1 TSH per orange, but often take a much higher margin on the price. The higher price margin is due to relative high prices and a larger price variance between different areas due to an undersupplied market. Although we were not able to obtain specific information regarding this margin it is probable that the margin could be greater than 2 TSH per orange during the low production season.

Harvester/ packers

Orange farmers indicated that traders or brokers will come to them and negotiate a price while the oranges are still on the tree. This practice is an factor of the perishability of oranges as well as the ability of the more popular varieties to provide some "storage time" on the trees by ripening slowly. Once the trader (directly or through a broker) has become the "owner" of the tree full of oranges, a harvesting contractor/s will be employed to harvest the oranges. The contractors, in conjunction with the trader and farmer or farmer's wife, will count the oranges as they are packed in the basket. In most instances packing and counting are included in the harvest fee. Some selection based mainly on size takes place at both the harvesting and packing stage. After selection and counting has been completed the farmer and harvest contractor will be paid on a per orange basis. Harvesting fees range between 1-1.5 TSH per orange.

In rare instances a small farmer will harvest his oranges before agreeing a price with a trader. This will happen in cases when the farmer is vertically integrated and fulfils the role of a small hawker or when large numbers of traders (often from Kenya) are coming to an area during peak season. However, due to the perishability of oranges farmers will only follow this practice when assured of a market. In these instances farmers are considered to be the "owners" of the oranges and will therefore harvest the oranges themselves or pay contractors to do the harvesting.

In even rarer instances, cash strapped farmers will sell oranges to traders while a tree is blossoming or before the oranges have ripened. In these instances the trader will negotiate a price on a per orange basis per tree and pay the farmer 25% of the purchase price up-front. Reconciliation then takes place once the oranges are harvested and the farmer then receives the remainder of the money due to him. These transactions only take place in cases where farmers are in dire need of cash; this happens more frequently in the small farmer category. As most farmers are offered 1 TSH per blossom compared to an average 3 TSH per ripe orange in peak season it is a practice that is avoided by farmers when possible.

Although some small scale farmers (and family labour) will fulfil the role of harvest contractor, most orange producers will utilize local contract labour to harvest and pack oranges in baskets. Local contractors are often other small farmers, family members of neighbours or local youths. During low production season a larger proportion of small and medium scale farmers and their families will fulfil the role of contract harvesters as the volume of oranges harvested decreases substantially. All large-scale farmers indicated that they make use of contract labour to harvest oranges.

Farmers indicated that they always make use of contract harvesters (mostly youths) when harvesting local cultivars. Local cultivars are very high when mature and harvesting is left to those willing to climb the trees. Local cultivars, older and severely neglected trees have a low harvesting percentage. Farmers in Matombo in the Morogoro region only harvest and sell an estimated 40% of total available oranges from local cultivars. The remainder of the oranges are considered to be too small to be marketed by the traders. These oranges are left to rot on the trees. The marketing percentage of the other varieties seems be higher, although we were not able to obtain an estimate.

Oranges are packed in basket. Baskets come in two sizes, with the smaller round baskets containing 500 oranges per basket and the larger elongated basket taking up to a 1,000 oranges. Baskets are usually purchased by traders at the beginning of the season at a cost of 300-500 TSH per basket depending on the size. Baskets usually last for a season and a trader will purchase five baskets per season. If additional baskets are needed for a bigger than usual load baskets can be rented, but due the relative high cost of renting, baskets are rarely rented.

Some selection on size is evident during harvesting, counting and packing. The oranges that are considered too small are not purchased and are left on the farm. No price differentiation is evident on cultivar, size or quality and farm or trader level. Different cultivars and qualities will be mixed in a load or basket.

Local Transporters

In more remote areas, oranges have to be transported from the orchards to the nearest road that is accessible by truck. Local transport mostly takes place by baskets carried on the head or transported on a bicycle. Often the harvesters will also transport the oranges to the roadside. In some instances the local transport price will be included in the harvesting/packing/counting fee, while in other instances this will be negotiated separately. The relative cost is dependent on the distance involved.

Collecting/bulking

Traders most often bulk oranges although some bulking is also facilitated by brokers. Bulking mostly takes place at the roadside when oranges are loaded onto a truck. Larger traders (wholesalers) will accumulate a truckload of oranges, while smaller wholesalers typically only purchase 3-4 baskets at a time. Most trucks used for transporting oranges are 3-4 ton trucks and traders estimate that a load will contain anything from 35,000 to 55,000 oranges. The number of oranges loaded is not only dependent on the size of the truck, but also the extent to which the transporters will allow it to be overloaded. Traders pay transport fees as well as local council levies (cess) on a per truck basis and will therefore endeavour to fill the truck as full as possible.

Small traders will often share a load with other traders and these loads often comprise a variety of fruits (not just oranges).

During peak season a trader will be able to fill a truck with oranges from one large farmer or two to three medium farmers. A truck will be fully loaded in less than a day. During low season truckloads will often comprise oranges from many farmers and it could take a trader up to four days to fill a load. During low supply periods traders could assist in bulking as it would reduce standing time and cost for traders and transporters.

Regional transport

Regional transport occurs when oranges are transported from the production areas to larger towns or cities. In some instances oranges are also transported across the Kenyan border. Regional transport occurs almost exclusively in 3-4 ton trucks although larger trucks (up to 7 ton) and pick-up trucks (1 ton) are sometimes used. Drivers are employed by truck owners and truck owners most often own between two and four trucks. Every truck will have a driver and a helper and in most cases the trader will accompany the truck to the production area and back to the market. Drivers earn 6,000 TSH per day and helpers 3,000 TSH per day. Drivers will collect per diem of 3,000 TSH per day when they overnight away from home. When transporting oranges within Tanzania the traders pay the per diem, while across border the per diem is paid by the truck owner. Helpers often sleep in the trucks and do not collect per diem.

Transport fees are charged per load or per basket and rates are set on a destination basis. A cartel has been formed by a number of larger fleet owners and fixed tariffs are set on an annual basis. The following transport fees have been quoted:

Table 4: Transport fees

From	To	Distance	Load	Fee (TSH)	Shillings/km
Muheza	Dar es Salaam	276 km	4-5 tons	220,000-250,000	851
Muheza	Tanga	71 km	4-5 tons	70,000-80,000	1,056
Muheza	Nairobi	611 km	4-5 tons	500,000-550,000	859
Matombo	Morogoro	64 km	4-5 tons	100,000-120,000	1,718
Matombo	Nairobi	1225 km	4-5 tons	900,000-950,000	755
Matombo	Dar es Salaam	258 km	4-5 tons	180,000-200,000	736

The transport fee range reflects the different rates that apply during high and low season. The higher rates charged during high season are not only due to an undersupply of trucks, but also due to poor feeder road conditions in the rainy season. Shorter distances and dirt road travelling on a poor feeder road (Matombo to Morogoro) are clearly more expensive than longer trips on tar roads.

Trucks based in the Muheza district indicated that they specialise in the transport of oranges during peak season. During the low season they would diversify and include other products. Transporters based in Morogoro seem to transport more diversified fruit loads, as the supply of oranges is lower. In peak season trucks transport oranges on a daily basis, while they could experience idle periods of four to five days between loads in the low season. They very rarely carry return loads and this has been taken into account when setting a fee.

The loading and off-loading of the trucks are often done on a contract basis. The same people who transport oranges locally mostly provide these services. When oranges are transported in bulk (specialised load), oranges are tipped from the baskets into the truck. Grasses are cut and used as packing material between oranges to minimise bruising. Contractors are usually paid 5,000 TSH per load and grass are provided at a cost of 2,000 TSH per truckload.

When oranges are transported as part of a diversified load, they are most often transported in baskets. Produce based cess are paid on a per trader basis. In the case of a full load a large trader would pay 5,000 TSH for a 3-5 ton load of oranges. In the case of a small trader each trader that forms part of the load pays 200 TSH cess per basket. Large and small baskets pay the same cess and it is thus in the interest of the trader to use larger baskets when possible. Cess are however often negotiable.

Transporters estimate that 80% of oranges are traded in peak production season. They further estimate that less than one percent of oranges will be damaged or rot while transporting at the beginning and end of the season when the oranges are more robust. However, during the rainy (and peak) season this could increase to 10-15%. Different cultivars also have different wastage percentages as some are more robust travellers.

Wholesale

Most traders sell their produce at wholesale markets. Wholesalers tend to specialise in a single product and one would rarely find a wholesaler who sells a diverse range of products. Big towns would have both wholesale and retail markets while cities will generally have more than one wholesale market. Traders either deliver their stock in bulk to the wholesale market, to be sold to individual retailers, or deliver directly to retailers at retail markets who had placed orders in advance.

Traders pay an off-loading fee at the wholesale market. Off-loading is mostly paid on a per bag or basket basis at 200 TSH per bag or basket or 10,000-12,000 TSH per load in the cities. In rural towns off-loading costs between 4,000-5,000 TSH per load. Traders also pay a municipal levy in the town or city. These levies are mostly paid on a per truck basis and are often 3,000 TSH per truck, but seem to be negotiable. At wholesale level traders must also pay a hygiene levy of 1,000 TSH per truck. This levy could either be paid to the municipality or the market association depending on who provides the market cleaning and refuse removal service.

Large traders are usually able to sell a load of oranges in less than a week. If loads are organised on a pre-order basis from retailers, the stock turnaround time is drastically reduced. During the low season oranges have a shelf life of around two weeks from harvesting, which reduces to one week in the rainy season.

Wholesale markets are managed by associations. Associations usually have an executive committee comprising an executive secretary, chairman, vice-chairman and treasurer. Members of the association buy shares in the association and sometimes also pay an annual subscription fee. The cost of shares varies from market to market; some associations ask 2,000 TSH per share, while others charge 5,000 TSH per share. The function of the associations varies considerably from market to market; some associations are responsible for collecting levies while other local councils collect the levies themselves. Local levies vary between 100-200 TSH per stand per day. Some associations (at the larger markets) provide limited refrigeration facilities at a fee and pay the electricity bills from these fees. Other associations focus on providing cleaning and security services. These services are usually provided at a fee of 50 TSH per vendor per day.

Retail

Retailers either conduct their business from retail markets in cities, towns or villages or otherwise are fixed or mobile street vendors. In most instances retailers obtain their stock from traders or wholesalers who conduct their business from stalls at wholesale markets or are considered to be mobile as they deliver directly from the truck to retailers. Retailers will purchase their oranges either on a per order basis from wholesalers or on a more unstructured basis by going to a trader when needed. Prices are fixed on a per orange basis and no price differentiation takes place on type or size. Retailers at retail markets mostly purchase their products from wholesale markets, while fixed and mobile vendors tend to purchase from either wholesale markets or other retailers.

Retailers sell to the end consumer who could buy single oranges (peeled or unpeeled), groups of five, ten, fifteen or twenty. Some selection takes place on size and type as consumers are often offered a choice of different types (when available) and sizes. Groups of larger sized oranges sell for a substantial higher price than smaller oranges and retailers often make their margin on the size differentiation as they pay the same price for smaller and larger oranges, but sell larger oranges for a substantial higher price.

THE MAPS

We have compiled two sub-sector maps. The high season map depicts the marketing channels during the peak production season, while the second low season map highlights the marketing channels during low supply. In essence the difference between the two maps lies in the relative importance of the export channel and village level brokers during the two different supply scenarios.

Figure 1: High Season Map

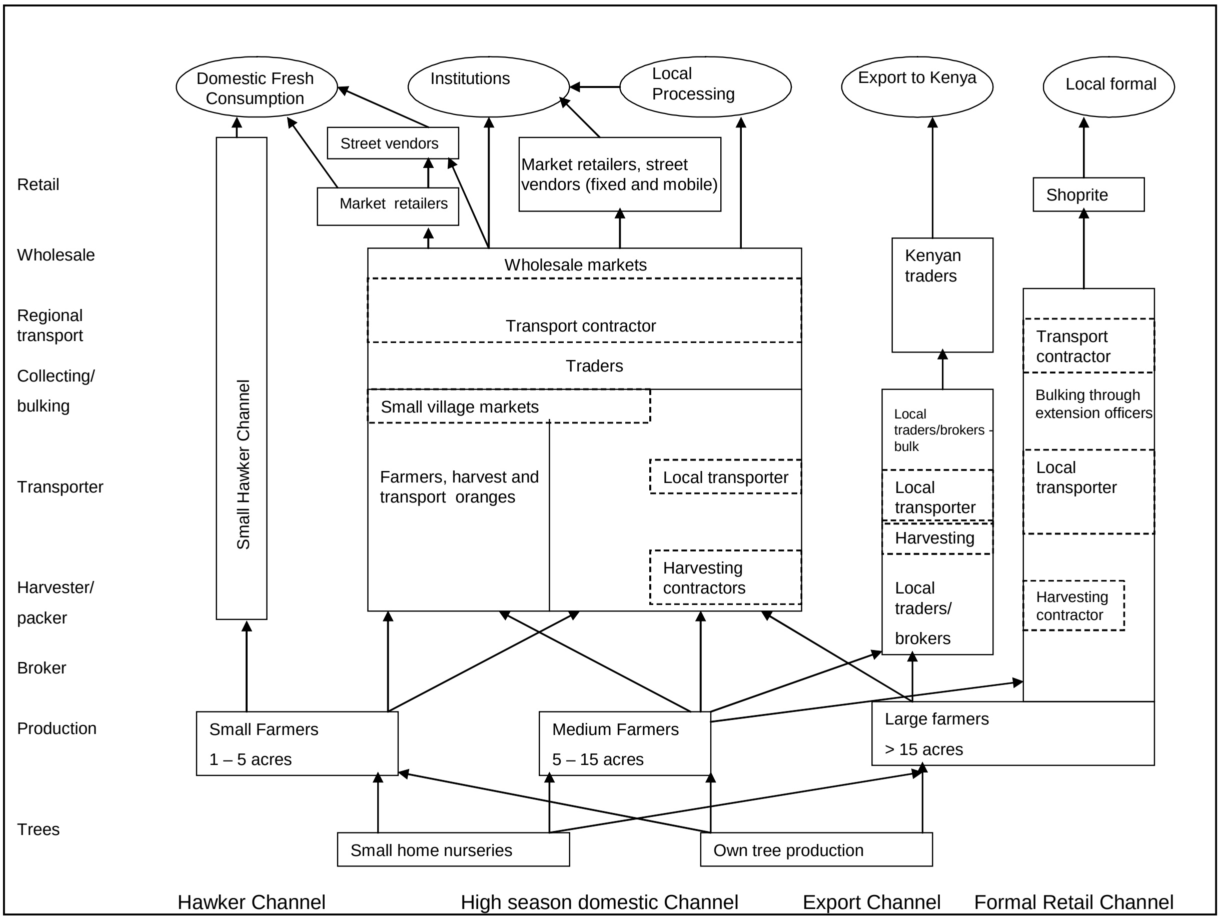
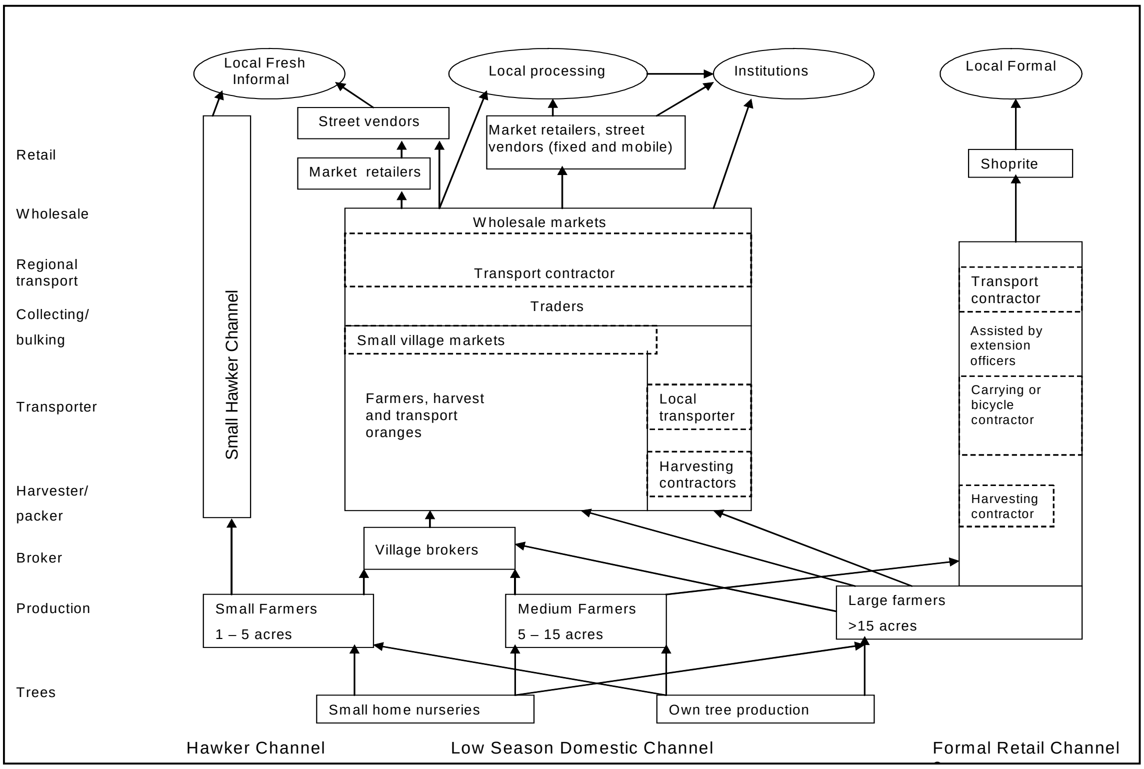


Figure 2: Low Season Map



THE CHANNELS

There are four main channels through which product moves from the farm to the consumer.

The small hawker channel

The small hawker channel comprises a very small portion of the informal local fresh market channel. Some small farmers, located fairly close to rural markets or along major roads, represent a vertically integrated channel in which the producer fulfils the role as harvester, transporter, wholesaler and retailer who markets directly to the consumer.

Small farmers located further away from marketing sites will not be vertically integrated. Medium and large scale farmers, due to higher production volumes and the fact that they see themselves as farmers and not traders, will typically also not be vertically integrated.

The high season domestic channel

During high season a large percentage of oranges produced by small, medium, and large scale farmers is marketed through traders/wholesalers and retailers to the informal fresh consumption, institutional and local processing markets.

The larger small-scale farmers and most medium and large scale farmers negotiate a price with traders while the oranges are still on the tree. Traders then contract harvesters for harvesting, counting and pack selected oranges in baskets. Farmers are paid once the oranges are counted. Once paid farmers will no longer be involved in the marketing chain. This channel is the most common domestic marketing channel used by farmers located in areas like Kwabada that focus on orange production.

From the farm, oranges are transported in baskets to trucks after which the transporters and harvesters are paid for services rendered. Traders pay a local council levy (cess), usually on a per truck basis at district level. Oranges are loaded on the trucks and transported to wholesale markets in rural town or cities. Upon reaching their destination oranges are unloaded by contractors. Unloading will either take place directly to retailers who placed an advance order, or in bulk at the wholesale market to be sold to retailers who frequent the market. At wholesale level traders are responsible for paying a local council levy per load. Wholesalers are furthermore required to pay a daily fee for the stall space from which they sell and a hygiene level used to remove refuse (mostly packing material) from the market site.

Retailers based at retail markets purchase oranges from wholesales and either sells directly to the different consumer markets or sell to smaller mobile and fixed street vendors. Some of the larger mobile and fixed street vendors will however buy directly from the wholesale market.

The smaller small scale farmers with low volumes of production will harvest oranges themselves and take it to small village markets that are active for two to three days per week. Traders will use the small village markets as a bulking mechanism instead of going to the farmers and negotiating a price while the oranges are still on the tree. Once the oranges are bulked at village market level, the marketing channel remains the same as the channel used by traders that purchase oranges from medium and large-scale farmers. The village market channel is more prominent in areas where fruit production is more diversified like Matombo.

Tables 5-8 provide more details regarding the relative profit margins of participants in the channel during the high season.

The low season channel

During the low season all available oranges are marketed to domestic consumers. Due to the low supply of oranges the role of the village brokers becomes important as they fulfil the role of bulking the low supply from different areas. Brokers are important to the traders as they save time and costly stays in remote villages while sourcing enough oranges to fill a load or meet his requirements. Village brokers located in the area are familiar with the farmers and the relative number of oranges that farmers can supply. Once the broker has filled an order from a trader he contacts the trader and requests him to come and fetch his load. Most brokers will set a price with the farmer and tell the farmer when to deliver oranges to the local market. He then "delivers" the oranges to the trader and often communicates a higher price to the traders. This allows him to make a brokerage fee of 1 TSH per orange as well as a margin on the price. Brokers do not take ownership of the oranges and merely act as bulking agents. Once the trader or wholesaler has entered the picture the market channels remains the same than the high season channel. Gross margins of participants during the low season however differ greatly from the high season as most participants make substantial higher profits during low supply. Tables 5–8 provide more details regarding the relative profit margins of participants during low season.

The export channel

The export channel is the most prominent channel during the peak production or high season. Kenyan traders work through village level brokers or traders to source oranges in bulk, mostly from medium and large scale producers. The Kenyan traders pay a brokerage fee to the village traders that assisted then in collecting and bulking sufficient supply. They then employ contractors to harvest and transport the oranges to the trucks. In most instances they make use of Tanzanian trucks, although Kenyan transporters are used in some instances. Local levies are paid to councils and the oranges are then exported to Kenya. Most of the oranges from the Tanga region go directly to Nairobi, with a lower percentage going to Mombassa. A much smaller percentage of oranges from Morogoro go to Kenya. This is due to the fact that the distance from Morogoro to Nairobi is double the distance from Muheza to Nairobi.

It is estimated that as much as 60% of oranges produced in the Muheza district during the peak season are exported to Kenya. Kenyan traders seem fairly protective of their market and very few Tanzanian traders have been able to sell oranges directly in Kenya. In the same way local traders/brokers are protective of their market and do not allow the Kenyan traders to gain knowledge of local supply. It seems that some Kenyan traders will arrive in a time of over supply and simply inform the grapevine that they are buying oranges at a fixed price. Farmers who are battling to market their oranges or who find the price acceptable will supply the Kenyan traders directly. During the low season the export channel decreases in importance, as the supply is not sufficient to supply the Tanzanian market and prices increase.

During our research we did not have time to investigate the Kenyan export market in any detail. We currently do not have any information regarding Kenyan consumption or markets nor the applicable prices. Further research on this topic is seen as an important aspect of gaining a more complete understanding of opportunities for the Tanzanian orange sub-sector.

The formal retail channel

For the purposes of this study Shoprite is regarded as the only formal retail channel of fresh fruit as it is the only large retail chain operating in the cities of Tanzania. They currently have four branches in Dar es Salaam, and one in Arusha. However within the region they have two shops in Uganda and Malawi, 20 shops in Zambia and three in Mozambique. Shoprite estimate their market share of the total fresh produce market in Tanzania to be less than 2%. Informal markets in the city areas are therefore regarded as the main marketing channel of urban consumption.

Shoprite currently sources fresh produce directly from farmers with the help of local government extension officers. Extension officers approach a number of farmers in an area and facilitate the bulking of the products. Farmers have to deliver the produce to Shoprite and they therefore have to organise and pay for their own harvesting, local transport, loading and regional transport. Shoprite then pays them a market related delivered price taking the delivery cost on a per kilometre basis into account. Farmers are paid a week after delivery and are usually issued one cheque per load. Farmers cash the cheque and divide the proceeds (after deducting costs) among themselves. Shoprite prefers to work through the extension officers as they feel that brokers often take large margins at the expense of the producers. It seems as if the produce in this marketing channel is mostly sourced from medium and large scale farmers.

GROSS MARGIN ANALYSIS

A gross margin is defined as the margin available after direct or variable costs have been deducted from the income. A gross margin does not equal a profit margin as it does not take overhead, capital investment cost or cost of borrowed capital into account. Most of the participants in the market channel will generally have very low overheads, capital investment costs as well as cost of borrowed capital. The examples in Tables 5-8 do not take into account family or own labour or the opportunity cost of this labour, nor do they reflect on the relative period required for stock turnover or production. These margins have been calculated to provide the relative margins different participants expect during different periods in the production season. Various combinations and variances within each marketing channel as well as proximity and economies of scale factors mean that these margins could differ significantly between two similar participants within a channel.

Table 5: Gross margin analysis – Average Kwabada Farmer

Description	**Assumption**	**Low Production**	**Medium Production**	**Peak Production**	**Total/average**
Number of trees per acre	150				
Number of fruit sold per tree	800				
Total number of oranges per acre	120000	12000	30000	78000	120000
Price per orange (Tsh)		8	5	2	
Income per acre (Tsh)		**96000**	**150000**	**156000**	**402000**
Harvesting+ transport to road (Tsh)		12000			12000
Orchard cleaning (Tsh)		1500	3750	9750	15000
Gross Margin per acre (Tsh/acre)		**82500**	**146250**	**146250**	**375000**
Gross Margin per orange (Tsh/orange)		**6.875**	**4.875**	**1.875**	**3.125**

In the above calculation we have assumed that 10% of oranges are marketed during low season, 25% during medium season and 65% during peak season. Orchards are cleared with contractors and the cost was weighted according to the different production percentages

The above margins highlight the fact that farmers make larger profits on a per orange basis during the low season, but that the bulk of income is generated during the medium and peak production periods. High profits in the low season are due to supply driven pricing. Rational producers will therefore endeavour to spread their production season as far as possible into the low production season. This can be accomplished with the introduction of slow ripening cultivars.

Table 6: Large wholesaler – Buys oranges in Kwabada and sells the wholesale market in Dar es Salaam

Description	**Low production**	**Medium production**	**Peak production**
Number of oranges sold per load	39,600	38,800	368,00
Selling price (Tsh)	20	15	10
Total income per load (Tsh)	**79,2000**	**582,000**	**368,000**
Purchase price (Tsh)	10	5	2
Purchasing cost per load (Tsh)	40,0000	200,000	800,00
Broker fee per load (Tsh)	40,000	40,000	0
Harvest and local transport cost (Tsh)		40,000	40,000
Loading cost per load (Tsh)	5,000	5,000	5,000
Regional transport cost per load (Tsh)	20,0000	210,000	220,000
Packing material cost per load (Tsh)	2,000	2,000	2,000
Off-loading cost per load (Tsh)	4,000	4,000	4,000
Village and city cess per load (Tsh)	6,000	6,000	6,000
Total costs per load (Tsh)	**657,000**	**50,7000**	**357,000**
Gross margin/load (Tsh/load)	**135,000**	**75,000**	**11,000**
Gross margin/orange (Tsh/orange)	**3.375**	**1.875**	**0.275**

The above calculation assumed that the broker takes a 2 TSH price margin during the low production season. It also assumes that the trader only loads 40,000 oranges on the truck and that he markets from a wholesale market that does not ask a daily fee for a marketing stall.

The calculation emphasises that profits are made during the low production season, while traders are more or less at a break even point (before overhead) during peak production periods. Our observation is that traders are well aware of this fact but tend to stay in the market during these times as they know that they will reap higher profits later in the season. An important consideration will be the number of truck loads per week that a trader can sell, and this appears to vary little between the peak and low seasons (assuming the trader uses a broker to source the oranges).

If the trader however overloads the truck to 45,000 oranges in the medium period and 50,000 oranges in the peak period they will be in a position to increase his margin to 2.81 TSH per orange during the medium season and 1.83 TSH per orange during the high season. This clearly shows how sensitive margins are to economies of scale and to the fact that most costs are paid on a per load basis and not on a per orange or ton basis.

Table 7: Small wholesaler buys in Matombo and sells in Morogoro

Description	**Low production**	**Medium production**	**Peak production**
Number of oranges sold per basket	1,000	1,000	1,000
Selling price per orange (Tsh)	20	14	10
Total income per basket (Tsh)	**20,000**	**14,000**	**10,000**
Purchase price per orange (Tsh)	10	5	3
Purchasing cost per basket (Tsh)	10,000	5,000	3,000
Broker fees per basket (Tsh)	1,000	1,000	1,000
Harvest and local transport cost per basket (Tsh)	1,500	1,500	1,500
Loading cost (Tsh)			
Regional transport cost per basket (Tsh)	2,000	2,000	2,000
Packing material cost (Tsh)			
Off-loading cost (Tsh)			
Cess per basket (Tsh)	200	200	200
Total costs per basket (Tsh/basket)	**14,700**	**9,700**	**7,700**
Gross margin per basket (Tsh/basket)	**5,300**	**4,300**	**2,300**
Gross Margin/orange (Tsh/orange)	**5.3**	**4.3**	**2.3**

Small wholesalers obtain larger gross margins on a per orange basis. However, due to the small quantities sold, they probably only make a margin of 20,000-30,000 TSH per month. Capital needed for stock purchasing purposes is often seen as the most limiting factor in expanding their business. Large numbers of wholesalers all trying to sell oranges is also a limiting factor as it divides available purchasing power and decreases stock turnover.

Table 8: Retailer at retail market in Dar es Salaam

Description	**Low production**	**Medium production**	**Peak production**
Number of oranges sold per batch	1,500	1,470	1,425
Selling price per orange (Tsh)	25	20	12
Total income per batch	**37,500**	**29,400**	**17,100**
Purchase price/orange (Tsh)	20	15	10
Total purchase cost per batch (Tsh)	30,000	22,500	15,000
Stall cost (Tsh)	150	150	150
Assistants (Tsh)	160	160	160
Total costs/batch (Tsh)	**30,150**	**22,650**	**15,150**
Gross Margin per batch (Tsh/batch)	**7,350**	**6,750**	**1,950**
Gross Margin/orange (Tsh/batch)	**4.9**	**4.6**	**1.4**

Retailers obtain a fairly high margin on a per orange basis, although turnover is generally low. Monthly margins are probably similar to small wholesalers. Access to capital, as well as the large number of other retailers selling the same product, are seen as the most limiting factors.

5. INSTITUTIONAL AND REGULATORY FRAMEWORK

INSTITUTIONAL

Regional and district councils

Agricultural and market development at Regional and District level falls under the authority of the Co-operative as well as Agricultural Department. At Regional level all technical matters fall under the authority of Regional Administrative Secretaries (RAS). Most technical officers are appointed at district level under the authority of the District Executive Director (DED). At District Level each department is headed by a Development Officer reporting to the DED with a number of technical subject matter specialists (ie irrigation, horticultural or livestock specialists) reporting to the Development Officer at district level. However, crop marketing falls under the authority of the District Co-operative Officer, while extension services are under the District Extension Officer. These officials are responsible for strategic planning and implementation of regional and district development projects. As such their views, objectives and strategies can either provide a stimulus or a restriction to a specific sub-sector.

REGULATORY

District Produce Cess

Officially District Produce Cess is levied as a percentage of the value of produce sold. Although no upper limit for cess has been described, it usually does not exceed 10%. The actual amount levied varies widely, with an average for most crops reported to be about 6% of the sale price.

In practice cess is often levied as a fixed amount per basket or load, which seems to be negotiable. Levying cess on a per load basis often leads to overloading of vehicles as this has a significant effect on the profit margin obtained per load. Small traders pay cess on a per basket basis. On average small traders pay 0.2 TSH District Produce Cess per orange while larger traders typically pay 0.06 TSH to 0.1 TSH per orange, depending on the number of oranges they haul per load. This practice penalises small traders.

Traders pay a District Produce cess when purchasing the oranges, a market levy when off-loading at the wholesale market and a daily fee or levy paid to the local council for the market stall at the wholesale market were they trade. Levies have a significant impact on profitability, especially for small traders that do not have the benefits of economies of scale.

Market Levies

Local Councils or municipalities collect market levies from wholesaler and retailers at local markets. These levies are often charged on a daily basis (often 100 TSH per stall per day) and are either collected by the council themselves or by the market association leaders. This seems to be running smoothly in cases where the councils collect the fee themselves. However, it is our observation than when collected by market associations it leaves room for development of unnecessary conflict. An example has come to our attention were a conflict situation has arisen between the council and the market leaders regarding the monthly levies collected. The council has provided the association for a monthly budget that has been calculated based on the number of available stalls and the number of days in a month. The basic assumption is that all the vendors will be present every day. At market level this has however proven impractical as vendors are not at the market on the days they source their products. This has led to the market association falling short of the budget supplied and consequently the development of conflict between the parties themselves. In spite of negotiations and requests that the council should "come and see for themselves" the parties have been unable to resolve this issue. This has placed the market association in a precarious financial position that could lead to the total collapse of market management structure. It is proposed that the collection of these fees should be standardised or that budget should take daily realities into account.

6. SUB-SECTOR DYNAMICS

Both the export and the high season domestic channels are growing. The Kenyan export market has shown the most significant growth in the last decade. As much as 60% of oranges produced during the high season are finding their way to Kenya. Due to economic and population growth the high season domestic channel is also a growing channel. The formal retail channel currently comprises an insignificant portion of the domestic market. Economic growth and the development of a larger middle and upper class will lead to the expansion of this channel.

Medium and large-scale farmers are doing better than small-scale farmers. Geographic areas close to main roads and in close proximity to markets provide the stimulus for farmers to expand. Medium and large-scale farmers in these areas attract buyers and often receive higher prices. Economies of scale are a driving factor of profitability. There has been steady growth among those farmers that desire and are adept to grow, creating them as a target of opportunity.

Despite the availability of excess capacity in the processing sector, growth has been limited due to low local demand, the overall shortage of raw material for processing, and an inability to compete against cheaper imports.

DRIVING FORCES

Local market demand

Growth in local market demand for basic fresh products like oranges is mostly a factor of population growth and increases in disposable income within a given area or population group. The start of the Economic Recovery Program in 1986 has opened the doors for sustained growth. Sustained economic and population growth will increase the demand for basic foodstuff and fresh produce before having an impact on products that focus more on the more affluent portion of the population. Currently local market demand is not met during the low supply months. Focus on lengthening the low and medium production season will assist in balancing the varying seasonal supply with a less seasonal demand.

Supply of oranges during low production season

Matombo ward in the Morogoro region has the advantage of a micro-climate that enables orange producers to deliver a fair supply of marketable oranges at times when most of the other regions are not able to produce significant volumes. Substantially higher profit margins at farmer level during the low supply season should theoretically lead to farmers in those areas specialising in profitable orange production. Farmers in this area are, however, still very diversified and specialisation in orange production has failed to materialise. This could be due to other constraints, like relative proximity to high demand markets and poor feeder roads. These constraints should be identified and addressed.

Economies of scale and specialisation at farmer level

Medium and large-scale farmers are often in a better position to negotiate a higher price or to obtain a larger part of the wholesale price by accessing the market more directly. For example, an individual farmer with 25 acres of orange orchards will be able to fill a number of trucks from his orchards within a season. Larger wholesalers/traders prefer to go directly to the larger farmers as they can save time in acquiring a load which enables them to increase their turnover. This provides farmers with some negotiating power. These farmers are often also more financially independent and can sometimes hold on for a better price while their oranges are still on the trees.

Proximity to markets

Farmers located closer to main roads or markets are in a better price negotiation position. Transport cost as well as rate of turnover are important drivers of wholesaler profitability. Transport cost per kilometre is substantially higher when travelling on poor feeder roads. A rational wholesaler will therefore only access these areas at times when it is the only supply source or when the price paid for oranges off-sets the relatively higher transport cost. Orange producing areas in the Muheza district have a clear proximity advantage with respect to both the Kenyan and Dar es Salaam markets. This is reflected in the fact that orange production in this district is expanding.

Interregional demand

The Kenyan export market has grown significantly in importance during recent times. After superficial research it seems as if this export market has not had a significant effect on increasing orange prices at farm gate level during the low season, but rather fulfils a role in supporting prices during periods of over supply. Interregional demand is strongly focused in areas that are in relative proximity to the Nairobi and Mombassa and can provide easy road access. The Muheza district has a comparative advantage compared to Morogoro in this respect.

Identification at district council or regional level of the sub-sector as a growth sector

Once identified as a growth sector, district or regional resources and manpower can be allocated to support growth in the identified sub-sector. The Muheza district council identified the orange sub-sector as a growth area and has commissioned research aimed at identifying the constraints and opportunities of orange production within the district. The pro-orange development mindset at council and regional level could serve as an important driving force when facilitating the improvement of income and employment opportunities for MSEs in the orange sub-sector. This will make them an easy partner to collaborate with.

POINTS OF LEVERAGE

Points of leverage are those points where working with a few individuals or organizations will provide outreach to a much larger number of smaller actors. Traditionally points of leverage are either nodes in the channel (where one operator will deal with a large number of other operators), a geographic cluster or concentration of enterprises, or government policies. In this case, we are looking for points of leverage that will enable the majority of medium and large scale farmers in the orange growing areas of Morogoro and Tanga to improve the quality and quantity of their production, to build capacity at farmer and market association level and to provide easy access to market and price information to all the participants in the different identified marketing channels. These can either be nodes in technical advice and research services, geographic concentration, input suppliers, farmer and market associations and private sector partners

Nodes in the channel

Market associations

All the wholesale markets are managed by market associations. Wholesalers are either members of the associations or are in daily contact with the association management. These associations clearly represent a node that could easily be accessed when facilitating an outreach to a large number of wholesalers.

Market associations interviewed during the analysis identified a need to obtain appropriate practical business skills, establish contact with similar organisations that will enable them to learn from each other as well as access to price and production information to distribute to their members.

Farmer Associations

Both the Tanzanian Farmers Association (TFA) and the National Network of small scale farmers' Groups in Tanzania (Mtandao wa vikundi vya wakulima Tanzania – MVIWATA) have been identified as farmer associations that have farmer networks in place that could provide points of leverage.

Home nurseries

Existing home nurseries could be identified and used as leverage points when facilitating the education of a large number of farmers on the positive aspects of planting good quality trees of the most suitable varieties.

Other projects

All other projects and research that has an implication on the DAI PESA project and more specifically on the orange sub-sector (encompassing the whole marketing channel) should be identified in a bid to maximise possible leverage points and prevent counter productive duplication.

Sokoine University

The Horticultural Department and the Sokoine University of Agriculture have a supply of good quality mother plants and have a commercial nursery that can supply good quality young trees. They can also assist in the provision of technical training capacity to train extension officers or trainers.

Private sector partners

Private sector support and partnerships from companies that can benefit from a more continuous supply of a better quality oranges and improved access to market information should actively be encouraged. This could include Shoprite, established and new processors and other stakeholders.

Geographic concentration.

The Muheza district provides the highest concentration of medium to large scale orange producers. Some specialisation in orange production is already taking place and these farmers have a comparative advantage in easy access and proximity to the major markets.

Policies

The main policies affecting the orange subsector revolve around the municipal cess that is charged to the traders and general transport policies. Further analysis is required to determine the real impact of the cess on the exporters depending on rates and the way that they are levied and collected. In addition, cess has an impact on the way that transporters and traders behave with overloading of vehicles (leading to road deterioration). A more in depth study of government transport policies would be a very useful exercise for the PESA project.

7. CONSTRAINTS AND OPPORTUNITIES

CONSTRAINTS

The following are regarded as constraints in improving income and employment opportunities for MSEs in the orange sub-sector:

- Poor extension services at producer level.
- Poor crop husbandry practices.
- Production that is totally reliant on rainfall.
- Supply of good quality trees.
- Poor quality fruit and cultivars that are not competitive on the international market.
- Lack of quality sensitivity in domestic markets.
- The unavailability of reliable production statistics.
- Poor distribution of price and market information.
- Poor business skills and lack of management capacity of market association leaders.
- Although farmer networks are in place at farmer association level, relative uncertainty regarding involvement of medium and large scale orange producers within current available networks.
- Weak domestic demand for processed products which is regarded as an inhibiting factor for the growth of a dynamic processing sector.
- Uncompetitiveness of local produced juice against cheaper imports.
- Insufficient knowledge of the dynamics of the Kenyan market.

OPPORTUNITIES

The following are regarded as opportunities in improving income and employment opportunities for MSEs in the orange sub-sector:

- Existing farmers who are expanding production and who specialise in orange production. These farmers are in need of basic technical and business skills to improve their farming operations. The networks and skills to provide the training exists in Tanzania.
- Existing market associations expressing a need for better communication and interaction between each other.
- 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.
- Orange production taking place in geographic areas in close proximity to markets. These areas also have the additional benefit of good road infrastructure.
- A long orange production season, with oranges available throughout the year.
- Access to land suitable for orange production is not a limiting factor.

- The availability of excess processing capacity.
- Current organic orange production practices.

IMPLICATIONS AND OPTIONS FOR ASSISTANCE

- We propose a pilot project that will initially focus on medium and large-scale farmers in the Muheza district as an entry point for PESA support. The pilot project should focus on the following aspects:
  - Facilitation of the provision of appropriate extension services through direct training of farmers by trainers or by training extension officers. This could possibly be done in conjunction with Sokoine University, farmer association networks or suitable NGO or private sector partners. Extension services must be focused on home nurseries and larger farmers.
  - Facilitation of the marketing of good quality trees to home nurseries.
  - Facilitation of capacity building within market associations. This could take place through business skill training courses as well as visits to other markets to enable leaders to exchange ideas. Facilitation of sustainable communication channels between different associations in different regions should be a priority.
  - Facilitation of formation or capacity building of farmer association in conjunction with networks already active in the area. MVIWATA is seen as a possible partner.
  - Facilitation of the introduction of a price and production information format on a pilot basis in Muheza district; in collaboration with the District Council. After a pilot phase this could be expanded to other orange producing regions.
  - Facilitation of the distribution of price and production information via a radio bulletin, possibly in conjunction with one or several private sector partners.
- Carry out market research on Kenyan exports
- Investigate the possibility of organic juice exports.
- Investigate the role private sector partners like Shoprite and food processors could play in the process. The starting point of this exercise should be an in-depth discussion and needs assessment of the private sector companies.
- Under Phase II of the Tanzanian Agricultural Research Programme, Sokoine University of Agriculture is implementing a pilot project to support small scale orange processing focused on enhancing household nutritional intake. Participants have formed four processing groups in Muheza as well as an Association for Food and Vegetable Producers. Technical assistance and capital are provided by SIDO, but business training need are not being met. Follow-up meetings with Sokoine University as well as the Processing Association are needed to investigate future collaboration.
- Collaborate with other aid and development organisations like Irish Aid and MEDA (Menonite Economic Development Agency) who have shown a specific interest in becoming involved with supporting or facilitating private investors interested in orange processing or supporting Savings and Credit Co-operative Organisations involved with market development.

- Since transport is an important cost of moving all agricultural produce, research and the analysis of the Tanzanian transport sector may provide some helpful insights into ways to reduce transport cost. Good analysis will indicate the different costs associated with transport, the impact of other government policies (such as the cess) on transporter behaviour, and opportunities for lowering the cost of transport.
- Orange farmers experience cash flow problems during land preparation and weeding. Currently these activities are often financed by orange brokers at very high interest rates. Training on cash management with a focus on building a savings culture will assist in alleviating the problem. Investigation of credit needs and available options and solutions need to be conducted.

Annex 1 List of people interviewed

Name	Region	Position/specific area
Mr Ronnie Ferreira Shoprite	Dar es salaam	Manager: Freshmark,
Mr Brett Marshall Shoprite	Dar es salaam	Purchasing Manager:
Retailers	Dar es salaam	Kariakoo Market
Retailers	Dar es salaam	Tandala Market
Mrs Getrude Mpaka	Tanga	RAS
Mr G.P. Msanga	Tanga	Reg. Planning Officer
Various traders market	Tanga	Uzunguni and Ngamiani
Market Association leaders	Tanga	Mgandini market
Various Transporters	Tanga	Muheza roadside
Various traders	Tanga	Muheza market
Three farmers (small, medium and large)	Tanga	Kwabada village
UBIRI Co-operative leaders	Tanga	Lushoto
Member of Women Processing Group	Tanga	Lushoto
Mr Paulo Chikira	Morogoro	RAS
Dr Abdu A Hayghaimo	Morogoro	Agric. District Exec. Dir.
Mrs E Shayo	Morogoro	Regional Agric Officer
Mrs Ishuza	Morogoro	District Agric Officer
Mr Kambo	Morogoro	Extension Officer
Agricultural Officer	Morogoro	Crop Mechanisation
Three farmers (all small farmers)	Morogoro	Matombo village
Various wholesalers	Morogoro	Sabasaba market
Various retailers	Morogoro	Morogoro Retail market
Various transporters	Morogoro	Morogoro Retail market
John Musami, Ernista Mboya, Lesuma Jaco	Morogoro	Rural Market Project
Mr Mwadhini Myanza	Morogoro	MVIWATA
Officers	Morogoro	Chamber of Commerce

Annex 2: Bibliography

1. A field manual for sub-sector practitioners. Tools for Microenterprise programs: Nonfinancial Assistance Section”. Steven J. Haggblade, Matthew S. Gamser.November 1991.

2. Problems and potentials for marketing oranges produced in Muheza District. Emamanuel R. Mbiha and Amon P Maerere. Sokoine University of Agriculture. December 2002.

3. The Strategies and Action Plan of the Industrial Development Department of the Commonwealth Secretariat (1998).

4. Internal Regional Document. Fruit production in Tanga region.

5. Report of the Task Force on Rationalisation of Central and Local Government Taxes. March 1999. Ministry of Finance.