

FRESH HORTICULTURE SUB-SECTOR STUDY

**Development
Alternatives Inc**

**Private Enterprise Support
Activities Project
Tanzania**

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List of Acronyms

BRC	British Retail Consortium
DAI	Development Alternatives Inc
DALDO	District Agricultural and Livestock Development Officer
EUREP-GAP	European Retailers Protocol for Good Agricultural Practice
GOT	Government of Tanzania
GTZ	German Technical Development Agency
FAWETA	Federation of Associations of Women Enterprises in Tanzania
MAFS	Ministry of Agriculture and Food Security
MCM	Ministry of Cooperatives and Marketing
MSEs	Micro and Small Enterprises
MVIWATA	National Network of Small Scale Farmer Groups
MEDA	Menonite Economic Development Agency
NGO	Non Governmental Organization
PASS	Private Agricultural Sector Support Ltd
PESA	Private Enterprise Support Activities
RALDO	Regional Agricultural and Livestock Development Officer
RAS	Regional Administrative Secretary
SUA	Sokoine University of Agriculture
TAFOPA	Tanzania Food Processors Association
TANEXA	Tanzania Exporters Association
TFA	Tanzanian Farmers Association
TSH	Tanzanian Shilling
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

OVERVIEW OF THE SUB-SECTOR

Tanzania's national production of fruits and vegetables is estimated at 1.1 million MT, but the potential is to produce up to 2.0 million MT¹. Over 95% of horticultural production comes from small-scale farmers who cultivate small plots of less than one acre. These small-scale farmers supply over 80% of fruits and 90% of vegetables consumed in the domestic market. Production occurs under both rain fed and furrow-irrigated systems. Utilization of improved inputs is low and average realized yields for most crops are 50% of achievable potential.

About 99% of fruits and vegetables produced in the country are consumed in the domestic market, with Dar es Salaam being the single largest urban market. The fresh exports and processed products channels are very small together accounting for less than two percent. Citrus and onions are the two main fresh horticultural exports. Domestic market prices are highly variable between the dry and wet seasons with prices in the wet season (December-April) rising by as much as 140% over the average dry season prices. This is mainly due to due to low supply during the wet season. Post harvest losses are high sometimes reaching 40% of production during the wet season due to poor road conditions and poor harvesting and post harvest handling techniques.

In the case of vegetables, tomatoes, cabbages and onions together account for over 98% of the total national volume of production while in the case of fruits, orange, mangoes and pineapples together account for 96%. The main horticultural producing areas are the Northern and Southern coast regions, Central Plateau Region, Lake Region, and the Northern and Southern highlands. The study focused on onions and tomatoes in the four PESA regions of Morogoro, Iringa, Mbeya and Rukwa, which are situated in the Southern highlands. Except the Rukwa region, the rest of the regions are important producing areas for tomatoes and onions with a large number of MSEs participating in various activities. The aforementioned regions in the study area are also significant producers of cabbages, oranges, bananas, pineapples and mangoes. Rukwa has little horticulture production but has a large number of MSEs involved in beans and sunflower production, which in our opinion should be DAI-PESA target crops in this area.

SUBSECTOR CHANNELS

There are four channels through which produce flows from the farm to the markets:

- The integrated farmer small-scale farmer channel, where small farmers produce

¹ Horticulture in Tanzania has never been accorded prominence in government policy, as has been the case for staple crops. Consequently data is largely unavailable and unreliable.

primarily for home consumption, transport and sell for cash, any surpluses to local household consumers or retailers;

- The wholesale trader channel, where the wholesaler buys fresh produce mainly from dedicated commercial farmers at collection centers and sell to retailers in regional urban through commission agents;
- The contracted fresh supplier channel, where a farmer or trader supplies under short term contracts to institutions such as supermarkets, schools, department of defense, hotels and restaurants; and,
- The fresh exporter channel, where the exporter buys produce mainly from the commercial farmers and exports to regional and international export markets.

DRIVING FORCES

The three main forces driving the growth of the subsector are:

- High reliance on the Dar es Salaam urban market consuming over 50% of regionally marketed output;
- The emerging use of irrigation technology that has resulted in increasing output during the dry season;
- The Tanzania-Zambia transport route which has provided stimulus to commercial farmers to sell to regional traders using trucks on the back haul from Zambia and who are able to offer competitive transport charges for transport to Dar es Salaam.

KEY CONSTRAINTS

The full list of constraints is provided in chapter 14, but the main constraints hindering growth of the fresh horticulture subsector are:

- Poor and unspecialized extension services at producer level with subject matter specialists (SMS) sometimes available only at the district level;
- Poor accessibility to inputs and their high cost to farmers;
- Lack of strong and effective farmer organizations, resulting in the traders dictating prices;
- Lack of sufficient and relevant market information among producers and traders;
- High reliance on the distant Dar es Salaam urban market for most regions resulting in high transport costs and hence low producer prices to farmers; and,
- Poor rural road conditions leading to high costs, product quality deterioration and physical losses, which when combined with other aforementioned constraints such

as lack of markets and poor packaging materials lead to losses of up to 40% in some cases.

OPPORTUNITIES

In addition to business opportunities that would address the aforementioned constraints other subsector opportunities include:

- The increasing number of dedicated small-scale farmers who are enthusiastically adopting the production of horticultural crops within their current farming systems as an important source of income;
- The accessibility to the great north road corridor and the TAZARA railway line which provides producers in the study area with good means for reaching the large and growing Dar es Salaam market as well as regional markets such as Malawi, Zambia and the Democratic Republic of Congo (DRC);
- The availability of land for expansion, the varied climatic conditions and possibility for irrigation, which provides an opportunity to produce a wide range of horticultural products throughout the year;
- Increasing interest among micro to medium level entrepreneurs in the business of fruits and vegetable processing coupled with the availability of excess processing capacity in the country;
- The significant practice of producing using organic fertilizers, which could interest international buyers and;
- The possibility for Tanzania to find a window for exporting to the EU market when import tariff preferential treatment for key regional suppliers such as Kenya under the LOME Convention expires in January 2008. This will however be subject to compliance with the EUREP-GAP and BRC requirements pertaining to product traceability, fertilizers and chemicals usage, conservation of water and other natural resources, post harvest treatment, environmental and social welfare issues among others.

RECOMMENDED INTERVENTIONS

- 1) Concentrating PESA efforts on commercially oriented producers of onions, tomatoes and cabbages in geographic concentration areas of Mkuyuni and Mgeta (in Morogoro), Ilula, Makambako, Mbuyuni, and Mahenge (in Iringa), Mbarali and Mbozi (in Mbeya);
- 2) Improving productivity through increased and appropriate use of input and promotion of pests and disease resistant seed varieties for the wet season and appropriate irrigation techniques for production during dry season. This could be

done in collaboration with the Horticulture Section of MAF, regional authorities and research institutions with the focus being on the following:

- Facilitating farmer field days concentrating on commercially oriented producers in the geographic clusters mentioned above with a view to providing appropriate extension services through direct training of farmers by trainers or by existing training extension officers, retired agricultural extension officers, progressive farmers, and input suppliers where possible. This could be done in conjunction with Sokoine University, farmer association networks or suitable NGO or private sector partners;
- 3) Building organizational and operational capacities of farmer organizations, through:
- Facilitating and sensitizing demand driven formation of strong and sustainable farmer associations in the identified clusters, which could be done in close collaboration with MVIWATA and other relevant farmers organizations;
- 4) Establishing appropriate systems and organizational structures for market and production information collection and assessment of implications of produce cess to business growth. In this regard PESA should undertake a brief study with a view to achieving the following:
- Assessing information needs especially for producers and traders in onion, tomatoes and beans in the identified clusters initially focusing on Makambako, Mkuyuni, Ilula and Mbarali collection points. This should be done in very close collaboration with relevant stakeholders to determine the agents and mechanisms of collection and with priority being given to commercial sustainability and efficiency.
 - Designing appropriate formats for collection and presentation of production and market price information data for onions, tomatoes and beans again in close collaboration with farmers and farmer associations as well as traders in the identified geographic clusters;
 - Facilitating the establishment of commercially driven, cost effective and efficient systems for collection and dissemination for market information;
 - Facilitating the establishment of price and market information systems via channels as email, SMS, radio bulletin, and local Swahili newspapers.
- 5) Studying the regulatory issues pertaining to market cess, its application and collection, to gain a better understanding of the actual impact on marketing and market prices.
- 6) Promoting product quality and establishing alternative market linkages through:
- Facilitating the establishment of contacts for regional importers, and facilitating visits by representatives of farmer organizations in regional

countries such as Zambia, Malawi, Kenya and the DRC, with a view to entering into medium to long-term business association; and,

- Facilitating the development of appropriate and affordable packaging materials (e.g. plastic containers) to gradually replace the tengas, which not only have a short life span but also cause damage to products especially tomatoes. The possibility for this should be assessed in collaboration with relevant private and public sector organizations.
- 7) Advocacy on policy, cess and taxes.
- Facilitating advocacy for explicit government recognition of the importance of horticulture as a potentially important subsector in poverty alleviation in the rural areas;
 - Advocate for support in data collection and analysis, and mainstreaming the development of the subsector in the overall agriculture public sector support (especially in extension service and transport).
 - Advocate for reduced taxes on inputs, local government cess and external trade tariffs.
- 8) Institutional Collaboration
- Facilitating the establishment of a consultative and collaboration framework between public, private, donors and NGOs stakeholders in the subsector.
- 9) Credit Issues
- Investigating the possibilities for introducing innovative credit systems e.g. group guarantee based credit in close collaboration key stakeholders.

1 INTRODUCTION

The Private Enterprise Support Activities (PESA) project in Tanzania is funded by the United States Agency for International Development (USAID) and implemented by Development Alternatives Inc. (DAI). The ultimate aim of this four-year project, which commenced in October 2002, is to improve income and employment opportunities for micro and small enterprises (MSEs), including farm enterprises through market linkages and information, policy changes, strengthened associations and business skills training. The geographic coverage of the project comprises Tanga, Morogoro, Iringa, Mbeya, Ruvuma and Rukwa regions.

The sub-sector analysis approach is an integral part of the DAI PESA Project in Tanzania. A sub-sector is defined as a network of related firms that transform raw materials into finished products and distributes them through supply channels to final consumers. Thus a subsector can be defined by a particular finished product or service, which for example means that fresh vegetables (e.g. tomatoes) and processed vegetables (e.g. tomato sauce) may be treated as two different products. The approach offers a tool for analyzing and understanding in as great detail as possible all aspects and issues pertaining to a subsector. It offers a framework for rapid and systematic evaluation of subsector constraints and opportunities, subsector dynamics, driving forces, and leverage points, with a view to establishing cost effective interventions to achieve the intended project objectives.

Subsector studies on orange and paddy/rice were undertaken in April 2003. This particular report entails the fresh horticulture subsector study, which was carried out between 1st, and 19th July 2003, by a team comprising Stanley Karuga (ECI Africa consultant-Team Leader), Joel Strauss and Rodgers Masha both of DAI PESA Project.

The study methodology comprised the review of relevant document and field interviews of key horticultural subsector stakeholders. It is worth mentioning here that the depth of analysis in this report was limited by lack of horticultural data and information and the short time available for the study, especially in view of the wide geographical spread of the regions that were covered. The analysis is also limited to only the four PESA regions, namely, Morogoro, Iringa, Mbeya and Rukwa.

Horticulture in Tanzania consists of a range of products comprising vegetables, fruits, flowers and herbs and spices². This study focuses on fresh vegetables with special emphasis on **onions** and **tomatoes**. In our opinion these two crops have the highest potential for generating income and employment for a large number MSEs. These are two

² Although beans (*maharage*) have good potential to generate income and employment in the studied PESA regions, they were not considered as horticulture and have therefore not analysed in this report. It is however recommended that more information and data on beans be collected and analysed with a view to determining possible interventions.

different products and may not strictly constitute a subsector as conventionally defined, but the functions and product flows, right from production to consumption is generally the same and have therefore been treated as a subsector.

2 OVERVIEW OF THE SUBSECTOR

Available data indicate that Tanzania produced approximately 1.1 million MT of horticultural products in the year 2001/2002. Of this total, vegetables accounted for nearly 550,000 MT while fruits accounted for about 533,000 MT³. Both these horticultural commodity subgroups accounted for about 92% with cut flowers, herbs and spices accounting for the rest.

According to available literature and opinion of informed subsector stakeholders, Tanzania has a much higher potential to produce vegetables and tropical fruits than it is currently producing. The availability of land for further expansion, the varied ecological and climatic conditions which allow for the production of fruits vegetables almost all year round, the availability of water resources and the access to water transport in almost all sides of the country provide a good base for the country's potential to produce adequately to meet domestic demand and even export. A donor-funded company by the name Private Agricultural Sector Support limited (PASS) that has been promoting primary agricultural and agribusiness development in Tanzania since the year 2000, estimates that the country has the potential to produce 2.0 million MT of fruits worth US\$ 1.0 billion annually and approximately 1.2 million MT of vegetables worth approximately US\$ 0.62 billion annually. This implies that the country is achieving only about 45% and 30% of vegetables and fruits production potential respectively.

Small farmers dominate horticultural production in Tanzania. It is estimated that over 95% of production comes from small-scale farmers, most of them cultivating small plots ranging from 1/8th to ½ of an acre. These small-scale farmers supply over 80% of fruits and 90% of vegetables consumed in the domestic market. Production occurs under both rain fed and furrow-irrigated systems, but the latter has been on the increase in the last few years. Vegetable supply peaks are now experienced during the dry seasons, which in the PESA regions occur during the months of May to November. Most farmers use traditional methods such as the use of hand hoes, but almost all of them use a combination of organic and inorganic fertilizers as well as agricultural chemicals. They grow indigenous local fruits and vegetables that are not suited to international market requirements particularly in terms of color, sizes and physical appearances. Use of own-generated seeds and planting materials has been practiced by a significant number of farmers, especially for potatoes, onions and bananas. Utilization of improved seeds, fertilizer and chemicals is also generally low, which most farmers attributed to their high costs. In relation to this, the study team was informed that the government was planning to introduce subsidies on inorganic fertilizers in the main horticultural producing areas, some of which cover the DAI-PESA designated regions⁴.

³ Based on data from MAFS-Horticulture Section.

⁴ This is planned to take place during 2003/2004 fiscal year.

Average realized yields for most crops are low compared to what has been regarded as is potentially achievable. For example a study done by the MAFS observed that average yields for tomatoes in Morogoro region were about 12.5 MT per hectare while the potential is around 25 MT per hectare. In the Iringa region, average yields for tomatoes are 36 MT per hectare as opposed to an average potential of 43 MT per hectare⁵. In addition, onion yields have the potential to be more than doubled from 12.5 MT to 30 MT per hectare. In Morogoro, average yields for cabbages were about 9 MT per hectare as opposed to an average potential of 30 MT. Thus except for tomatoes in the Iringa where average realized yields were approximately 84% of potential, average yields for the rest of the crops were about 50% of the potential.

Marketing of horticultural products is driven by the private sector and has never been under the control of government. The main government intervention is on taxation, where local governments charge cess on per bag or tenga (basket) basis, at the market place. These taxes are often layered, with the same product being charged cess more than once before it reaches the consumers. For example, a visit the Kariakoo market in Dar es Salaam revealed that a wholesaler pays a cess of Tshs 300 per 70 Kg tenga of tomatoes and Tshs 400 per 150 Kg bag of onions. Once sold to the retailer, cess is payable at the market destination at the rate of Tshs 250 for onions and Tshs 200 for tomatoes. Thus the same produce may be charged more than once depending on the number times it passes through a market place.

Vegetables and fruits are transported to major markets such as Dar es Salaam mainly on hired lorries of 4-7 tons, though often overloaded by as much as 30-40% to minimize cess charges. Sacks, wooden boxes and baskets are the commonest packaging materials. Major problems associated with the marketing of horticultural produce are the high transport costs due to poor roads; long haulage to Dar es Salaam which the main market; lack of appropriate packaging materials; lack of market information especially with regard to supplies, demand and prices; and lack of product assembling facilities closer to the production areas forcing small farmers and traders to transport uneconomical consignments. The general poor conditions of roads and the inappropriate packaging in particular have for a long time adversely affected the quality of produce, besides causing physical losses amounting to as much as 40% of production.

Processing of horticultural products in Tanzania is still underdeveloped and is limited to tomato and chilli sauce and a bit of juices by just a few small to medium sized companies. The Dabaga fruits and vegetables processing company in Iringa is the only significant processor, though it is often operating under capacity due to lack of consistency in supply and high prices during the low season. Currently, the factory is processing 3-4 MT of

⁵ Market Review of Horticulture –By R. J. Mbelwa-Policy and Planning Department and Agricultural Information Services, Ministry of Agriculture and Cooperatives (GOT).

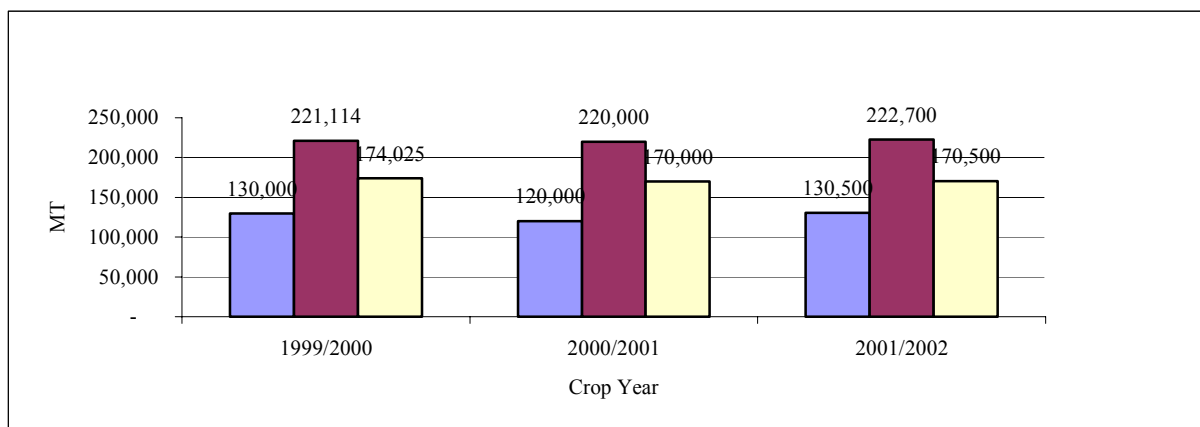
tomatoes and fruits each per day. The current high supply season prices are Tshs 70 per Kg of tomatoes, though they can go as low as Tshs 40 per Kg. During the low season, the prices can be as high as Tshs 300-400 per Kg. Processed products are often of low quality, which probably explains the reasons why they are not able to compete effectively with imports such as those from South Africa.

There is a market in Europe for horticultural produce from Africa. Unlike Kenya, which over the years has achieved significant penetration into this market, Tanzania has no experience in providing the required high quality fruits and vegetable products demanded by this market. Official government estimates of horticultural export volumes seem to indicate that the current share of exports is a mere 0.1% of total output. PASS Ltd however indicates that exports are slowly gaining momentum with foreign exchange earnings estimated at Tshs 10.3 billion or approximately US\$ 11 million in the year 2000.

3 KEY HORTICULTURAL CROPS GROWN

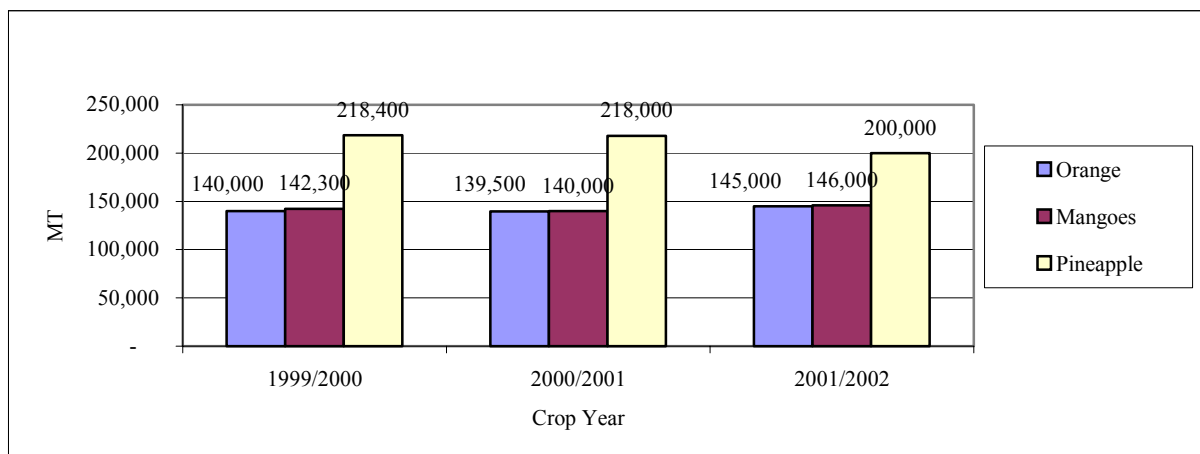
The main vegetables produced in the country are tomatoes, cabbages, and onions which together account for about 98% of the total national volume of production. Figure 1 below shows production of these key vegetables in the recent past.

FIGURE 1: NATIONAL PRODUCTION OF MAJOR VEGETABLE PRODUCTS (1999-2002)



As depicted in fig 2 below, the main fruits are orange, mangoes, and pineapples, which together account for approximately 96% of the total volume of fruits production. There is very little commercial fruit production, with the exception of citrus fruits around Tanga.

FIGURE 2: NATIONAL PRODUCTION OF MAJOR FRUITS PRODUCTS (1999-2002)



4 MAIN HORTICULTURAL PRODUCTION ZONES

Although most of the vegetables and fruits are grown in a wide range of ecological zones in the country, the main producing areas can be grouped under the following five regions:

- **Northern Coast Region**-covering Dar es Salaam, Coast and Tanga with the main horticultural crops consisting of oranges, mangoes, pineapples, coconut, lime, chillies, sweet potatoes, eggplant, tomatoes and okra.
- **Southern Coast Region**-comprising Mtwara and Lindi, with the main horticultural crops consisting of tomatoes, oranges, tangerines, mangoes, okra, cabbages and leafy vegetables.
- **Central Plateau Region**-which covers Dodoma, Singida, Shinyanga, and Tabora. This region has limited potential owing to the low and variable precipitation. In the region, Singida produces the largest amount of onions. Dodoma has the highest potential for the production of tomatoes and grapes while Tabora has high potential for the production of mangoes.
- **Lake Region**- with Kagera, Kigoma, Mara and Ukerewe Island areas (in Mwanza) being the main key areas. The region has high and reliable rainfall and have good transport network on lakes Victoria and Tanganyika linking the area to the potential export markets in Kenya, Uganda, Rwanda, Burundi and Zaire. The main horticultural crops grown in this region are sweet potatoes, cabbages, tomatoes, onions, mangoes, bananas, pineapples and the leafy vegetables.
- **Northern and Southern Highlands**- The northern highlands consisting of Arusha, Kilimanjaro area, and Usambara Mountains (Tanga), while the southern highlands consists of Iringa, Mbeya, Rukwa, and Ruvuma, which are by the far the most important areas for horticultural production in the country. Morogoro is also an important area. The main vegetables produced in these areas are tomatoes, cabbages, onions, carrots, and round potatoes. Owing to the fairly good reliability of rainfall and high altitude, the region produces temperate fruits such as pears, peaches, plums, and apples. This region has other ecological attributes that also support the production of mangoes, pineapple, jackfruit, tangerine and oranges (especially in the lower attitude district of Kyela in Morogoro region). Bananas and avocados are also produced in the area.

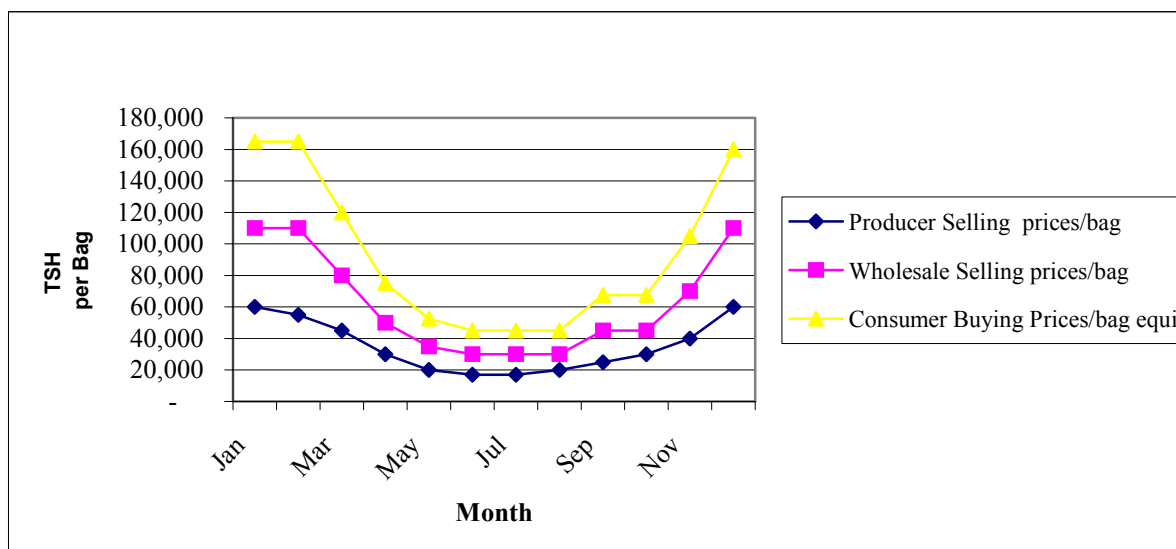
5 SEASONALITY OF PRODUCTION AND PRICE TRENDS

The study covered Morogoro, Mbeya, Iringa, and Rukwa regions. The following sections provide a brief overview of price trends, which closely follow production seasonality.

5.1 AVERAGE MONTHLY TRENDS FOR ONIONS

In the study regions, rainfall patterns are unimodal, with the wet season occurring during December-April and the dry season during May-November. An important characteristic of the domestic fruits and vegetable market is the very high market price fluctuations between the low and high supply seasons with average prices during the wet season being as much as 140% above the average prices in the dry season⁶. Figure 3 below indicates the general trends of producer, wholesale and consumer prices for onions based on data collected from farmers in the field and traders at the Kariakoo market in Dar es Salaam. Prices vary from year to year, but the figure below provides an approximation of the general price trends per bag of 150 Kg, which is commonly used for packaging.

FIGURE 3: PRICE TRENDS FOR ONIONS



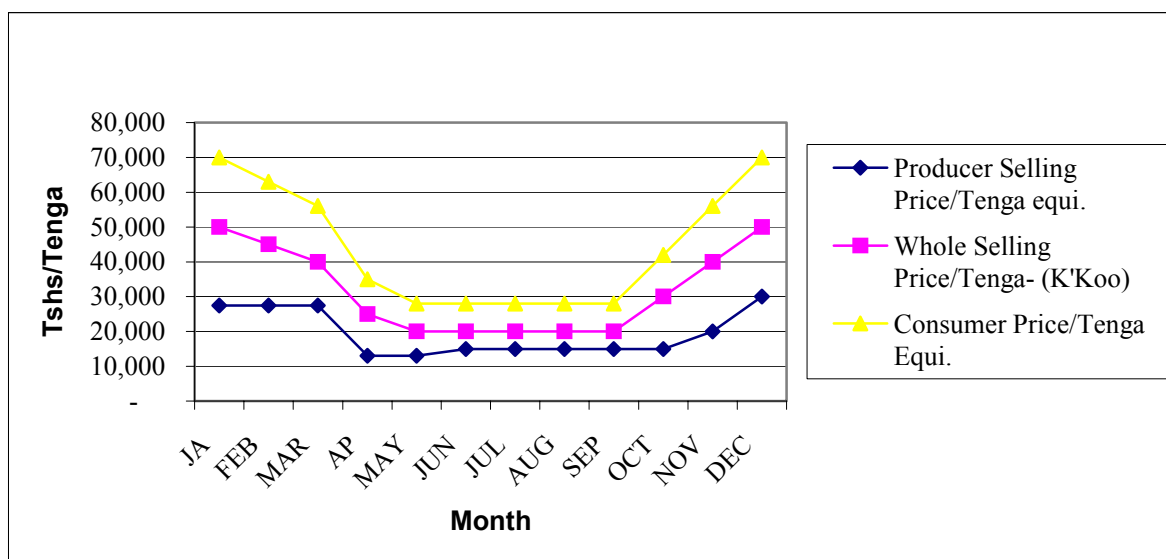
Source: Derived by the Study Team based on data collected from farmers and traders

⁶ The wet season is short (5 months) compared to the dry season (7 months), with a lot of produce during the wet season failing to reach the market due to the poor condition of rural roads.

5.2 AVERAGE MONTHLY PRICE TRENDS FOR TOMATOES

As shown in Figure 4 below, the trend in monthly prices for tomatoes per tenga (70 Kgs) are similar to those of onions, although the low supply/wet season prices go up to about 75% higher than in the dry season.

FIGURE 4: THE TREND IN MONTHLY PRICES FOR TOMATOES PER TENGA



Source: Derived by the Study Team based on data collected from farmers and traders

6 OVERVIEW OF PRODUCTION BY STUDY REGION

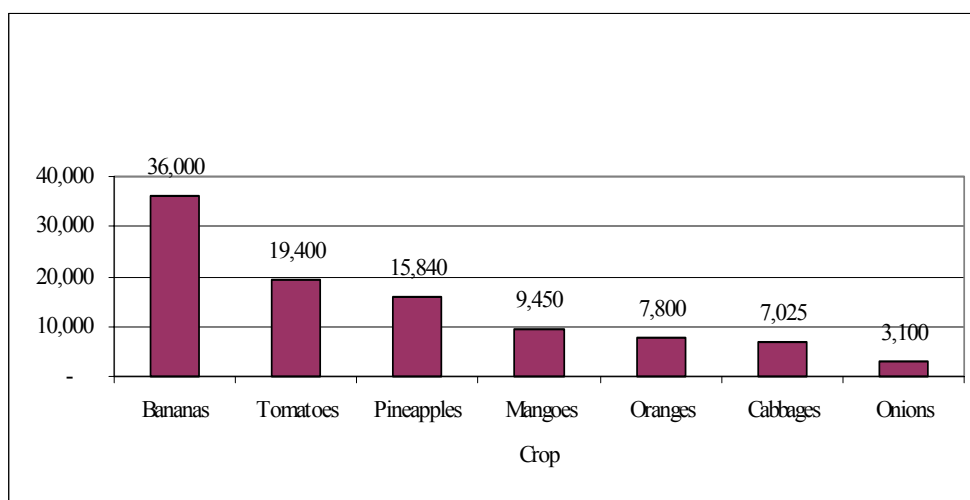
The following sections provide a brief overview of horticultural production for each of the four study regions.

6.1 MOROGORO REGION

6.1.1 Production

Morogoro region is a major producing area for tomatoes, cabbage, onions, oranges, bananas, pineapples and mangoes. Production takes place under small-scale systems, with about 60% of production occurring under rain fed systems while 40% is under furrow-irrigation systems. In 2000/2001, Morogoro district⁷ produced a total of 115,700 MT of fruits and vegetables. Oranges, bananas, pineapple, and mangoes accounted for approximately 85% of total fruits production, while tomatoes, cabbages and onions together accounted for about 86% of all vegetable production. Among vegetable products, tomatoes are by far the most important, having accounted for nearly 56% of total output of vegetables in this region in 2000/2001. The key production areas include Matombo, Mkuyuni, Kisasi, Msagati, Mlali, Turiani, Mgeta (around the Uluguru mountains), and Mikese. Fig 5 below shows the relative importance of the key horticultural commodities grown in the area:

FIGURE 5: MOROGORO REGION KEY HORTICULTURAL CROPS PRODUCED IN MT (2000-2001)



⁷ Includes the newly carved out district of Mvomero

Production seasons for key horticultural commodities are distributed as follows:

TABLE 1: SEASONALITY OF PRODUCTION IN MOROGORO

CROP	PRODUCTION SEASON	PEAK PERIOD
Tomatoes	August-December	October
Onions	August-November	September
Cabbages	June-August	July
Bananas	January-December	October

6.1.2 Supporting Environment

This region has no organizations specifically involved in horticultural marketing and provision of market information. Most farmers normally gather market information through traders and friends. There are few processing facilities and the team was informed that an Asian-owned company known as UNNAT Fruit Processors (with contact in Mwanza) has already started construction of a vegetable and fruit processing plant in Morogoro around Kinguruwira area, and has so far spent about US\$ 1.5 million. Although there are micro-credit organizations operating in the area such as Pride, FINCA SIDO and NMB farmers still face credit constraints. Key MSE business development associations in the area include the TCCIA, National Network of Small-scale Farmer Groups in Tanzania locally known as *Mtandao wa vikundi vya wakulima Tanzania* (MVIWATA), Tanzania Food Processors Association (TAFOPA) and FAWETA.

MVIWATA was founded in 1993 as a farmer-to-farmer information exchange forum and is by far the most active player in the area. The organization currently operates in 18 regions countrywide including five of the six DAI-PESA regions⁸. The current countrywide membership comprises 5,200 individual farmers and 1,056 network groups. The annual fee for membership is Tshs 1,000 for an individual member, Tshs 10,000 for a group, Tshs 20,000 for a local network and Tshs 50,000 for institutions. The aim of MVIWATA is to develop a strong representation of farmers' interests in solving their own problems mainly through participatory communication, lobbying and advocacy, organization strengthening in the provision of agronomic services and marketing strategies. The aim is to mainstream small-scale farmers in the socio-political and economic development agenda in Tanzania.

MVIWATA's main activities include organizing exchange visits, workshops on specific topics, documentation and broadcasting on relevant issues, networking with relevant institutions, and soliciting funds for income generating projects. Under the organization, farmers (individually or under their regional networks) also operate village banks, undertake marketing promotions, road construction and development of income generating

⁸ MVIWATA is not operating in Ruvuma.

activities such as fruits and vegetable processing, general food processing and dairy projects. So far, the organization has trained 156 farmer promoters. MVIWATA is also collaborating with Agriterro of Netherlands, Sokoine University of Agriculture (SUA), Development Organization of France (AFD), Trias at Monduli, and the Government of Tanzania. They are also about to start collaborative initiatives with Enterprise Works on post harvest technology around Iringa. Based on the relevance of the organization's activities and regional coverage to those of DAI-PESA, the institution is potentially an important collaborator in a number of interventions.

Under the umbrella of TAFOPA, an association known as Community Food Processing and Training Center (CFPTC) is also operating small scale processing of tomato sauce, fruit juice and banana wine in Morogoro. The center, which is currently processing 400 liters of wine and 150 liters of fruit juice per week, is providing training to MSEs on food processing and business planning at fee.⁹ The organization indicated that the demand for their services is high but the stringent, bureaucratic and costly certification process by the Tanzania Bureau of Standards (TBS) has been a major stumbling block. The organization informed the study team that one requires about Tshs 1.0 million to get a TBS certificate for a small scale tomato sauce processing (400 liters/day), while certification of an equally small fruit juice and wine processing plant one is required to pay Tshs 10 million and Tshs 15 million respectively. The organization also faces problems with local fabrication of plants and has to import from abroad.

The Sokoine University of Agriculture is an important institution in this region in terms of the subsector's development. Besides offering graduate level training in horticultural production, it is also involved in fruits and vegetables seed development or breeding, and promotion of cultural practices among farmers in the neighborhood¹⁰. The university has one of the largest fruit tree nurseries project in the country with an annual output of 10,000 seedlings especially for citrus fruits and mangoes. The institution reported that this is only meeting 50% of effective annual demand in the area. The university is also planning to commence a program for breeding, multiplying, and distributing tissue culture bananas, which are said to have a high demand in the area.

As in other regions, inputs supply is a problem and are characterized by high cost and unavailability as well as lack of suitable crop varieties. Extension services are inadequate and poor, while credit is generally lacking. Markets are a problem and farmers often have to sell their produce to traders on credit sometimes stretching to 3 months¹¹. According to a study by MAF under the ASMP project (1999), 50% of the farmers used inorganic fertilizer, but 90% of them were using it at rates of around 50% of the recommended level.

⁹ About Tshs 115,000 per a group of 5 for a three-day intensive course conducted in their laboratory, which is said to lack adequate space and equipment.

¹⁰ Due to lack of resources and low demand for training in horticulture production, the university has produced less than 100 graduates since it was started.

¹¹ As observed by the Crops and Food Study undertaken by MAF under the ASMP project in October 1999.

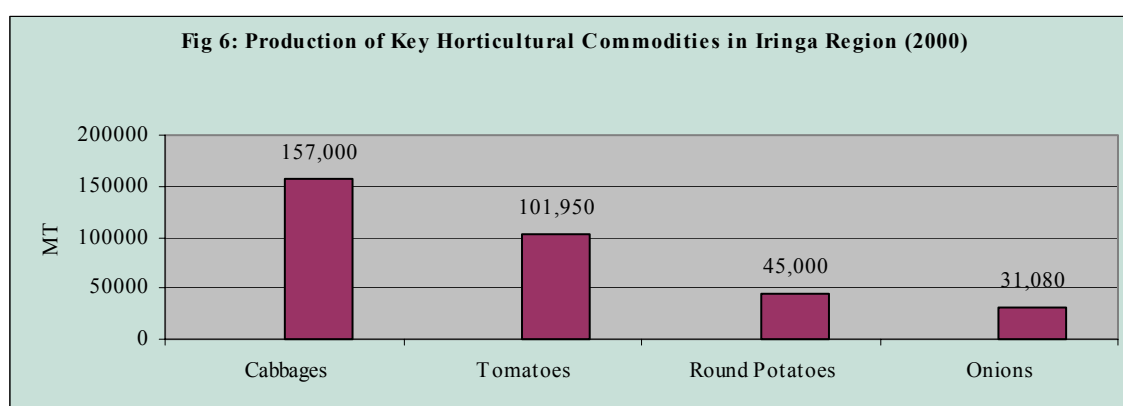
The study further observed that an increasing number of farmers were using retained tomato seeds.

6.2 IRINGA REGION

6.2.1 Production

Iringa is an important production area for horticulture for onions, tomatoes and cabbages¹². The main production areas are Ilula, Makambako and Mahenge divisions. Ilula division is a particularly an important geographic cluster for onions as well as for the Roma tomato variety, which is in greater demand compared to the moneymaker variety. This area has a few large farmers cultivating around 2.5 acres with yields of up to 7.3 MT per acre. Makambako area is particularly important for tomatoes. At the peak periods, the wholesale market in Makambako town receives approximately 28 MT daily during the dry season and 70 MT during the wet season. According to the Sokoine University of Agriculture, production for the main horticultural crops in 2000 was as indicated Figure 6 below:

FIGURE 6: PRODUCTION OF KEY HORTICULTURAL COMMODITIES IN IRINGA REGION



Source: Survey on Horticultural Production (by Sokoine University)

Dar es Salaam wholesale markets especially Kariakoo, form the single largest market outlet for produce from this region, with Iringa and Mbeya towns taking the second position. Farmers in this area have no associations and each farmer depends on his or her broker contacts for information on supply, demand and market prices. Some of the tomatoes from this area were reported to be going to as far as Zanzibar and the Seychelles. The quality of onions from Ilula and Mbuyuni is of good quality and taste and therefore regularly command premium prices in the Dar es Salaam up markets. Cabbages are important mainly in Kilolo and Mahenge. Other areas of importance for horticulture include Mazombe, Kalenga, Mlolo, Nzihi, Kidamali, Mgama, Ihimbo and Kiwele. The region's production seasons for key horticultural commodities are distributed as follows:

¹² Although official production statistics for various horticultural products were not available,

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TABLE 2: SEASONALITY OF PRODUCTION IN IRINGA

CROP	MAIN PRODUCTION PERIOD
Tomatoes	May-November (dry season)
Cabbages	July-November (dry-season)
Onions	May-August (dry-season)

6.2.2 Supporting Environment

Dabaga, the country's largest horticultural processing factory is located in Iringa. This factory is currently processing about 3-4 MT per day for each of tomatoes and fruits, producing mainly tomato sauce, pickles and a variety of fruit juices. Due to occasional lack of supplies and high market prices during the low supply season, the company operates for approximately 200 days in a year, which translates to a maximum of 1,600 MT of raw materials per annum year. The company buys raw materials on cash basis but sometimes on one or so week's credit from farmers. The current producer price for tomatoes is Tshs 70 per Kg, but the price can sometimes swing from Tshs 40 to Tshs 300 per Kg. Iringa supplies most of the tomatoes, while Morogoro is the source of supply for mangoes and pineapples.

A study carried out by the MAFS under the Agricultural Sector Management Project in 1999, observed that 40% of all tomatoes grown in the in Iringa region were purchased and processed by Dabaga. According to farmers, the problem is that prices offered are relatively low during the high supply season/dry season (May-November). When the flow of tomatoes is low, the factory undertakes the processing of fruits into lime and mango pickles, mango sweets and fruit juices.

6.3 MBEYA REGION

6.3.1 Production

The main horticultural crops grown in this region are bananas, onions, cabbages, and tomatoes. While there are no reliable production statistics available, Mbarali was noted to be particularly important for onions and tomatoes, while Rungwe division is important for tomatoes. Other areas including Mbozi and Ilenje produce a significant amount of these key commodities. The main constraints reported by farmers were lack of adequate extension services, lack of credit, low utilization of fertilizer, lack of market and price information and poor crop husbandry. According to the MAF's district Integrated Agricultural Survey of 1998/99; it was observed that only about 54% of the households used some fertilizer with approximately 62% attributing this to its high costs.

A visit to Igomero irrigation scheme, which has 285 farmers, revealed that prices for tomatoes and onions varied by as much as 400% during the year. For example, it was reported that prices for onions range from Tshs 10,000 per bag at the harvest season to as high as Tshs 50,000 per bag during the wet/low season in December-April. The study team

was informed that the three most serious constraints are high cost of inputs, lack of capital and high market price fluctuations. Most farmers have been relying on the Dar es Salaam market for their sales. The study team was however informed that of late there is growing export trade of onions, tomatoes and potatoes to Malawi through the Kasumulo border. One large farmer currently cultivating about 50 acres of bananas in Rungwe district also informed the team that there is a growing demand for bananas in Zambia and the Democratic Republic of Congo (DRC), with exports of onions picking up in the latter.

6.3.2 Supporting Environment

The Uyole Agricultural Research Institute (UARI) is an important organization in Mbeya. The institute has been undertaking the development and promotion of production of improved vegetable varieties, post harvest technologies, and preservation of vegetables through sun-drying.¹³ The institution also observed that there is a big problem with awareness regarding the improved crop husbandry practices, but they too have yet to develop awareness creation and material distribution systems.

Tanganyika Farmer's Association (TFA) is an important source of inputs such as pesticides, herbicides and fungicides, which they import directly. For fertilizer, they are currently relying on Premium Agro-chemicals importers in Dar es Salaam. Since TFA has only one branch in Mbeya with no accredited small retailers/stockists, many small-scale farmers in the region find it difficult to access the facility.

6.4 RUKWA REGION

6.4.1 Production

This region has very little horticultural farming, and the main agricultural activities relate to the production of maize, beans, finger millet, paddy/rice, round potatoes, sunflower, wheat, coffee, groundnuts and tobacco. However, it was observed during the study that small-scale farmers in Isesa, Katumba and Ulinji areas are beginning to cultivate onions and tomatoes although in a small way. A few very small-scale farmers in this area cultivate a ¼ to ½ acre of tomatoes, cabbages and onions combined. This is done both under rainfed and irrigated systems. As in other regions, these farmers use a combination of organic and inorganic fertilizers, albeit in amounts much lower than the recommended level resulting in low yields. According to farmers interviewed, the reason for low inputs use was the high cost of inputs and lack of technical know-how with regard to improved crop husbandry. It was also reported that the high incidence of pests and diseases in the wet season especially for tomatoes, was a big problem to the farmers.

Although statistics were not well established the study team was of the opinion that beans and sunflower could be important target crops under the DAI-PESA project. Production of

¹³ Preservation though sun-drying was said to be picking up in the Rukwa region.

sunflower appeared to be picking up as an important source of income and employment to a significant number of people in the area. Farmers who produce it were enjoying good demand from local hand press millers who in turn indicated they were not able to meet demand. The Dar es Salaam market seemed to be the main driving force of the sunflower subsector. Mohamed Enterprise, the largest agricultural commodity trading company in the country has appointed Sumry Enterprise in Sumbawanga to purchase sunflower seeds or the oil on their behalf. This inputs trader reported that he was not able to purchase enough due to the high demand even in the local markets. Sunflower in the area has the advantage of having strong forward linkages to the poultry and dairy industry whose demand for the sunflower by-products (e.g. cakes) is said to be quite high. Dry beans are also an important crop in the area. The study team recommends that sunflower and/or beans should be considered for support under the DAI-PESA project.

6.4.2 Supporting Environment

There are about 5 active small to medium agricultural input suppliers in Sumbawanga town, which mainly serve farmers within a radius of 15 kms from the town¹⁴. Business related associations providing credit and/or market linkages in the region include TCCIA with nearly 200 members of which an eighth are women, Federation of Association of Women Enterprises of Tanzania (FAWETA) which is weak financially and has seen its membership decline from 76 in 1999 to 50 members at present, Small Enterprises Foundation, which is a small credit organization, and Rukwa Association of Non-Governmental Organization (RANGO), which has been providing credit to its members currently about 600 of which one-third are women.

¹⁴ The main ones are Japai enterprises, Sumry and Kirangi agro-chemicals. The farmers further a field find it difficult to access these input suppliers due to high transport costs.

7 MARKETS FOR FRUITS AND VEGETABLES

Broadly speaking, the markets for fruits and vegetables can be divided into three broad categories: (i) Fresh domestic consumption, which accounts for over 99% of annual output. (ii) Fresh export market, which is rather very small constituting about less than one percent of total annual output, and (iii) Processed fruits and vegetables consumption, mainly for fruit juice, jam, marmalade, tomatoes and chili sauces. This market is also small accounting for less than one percent as well¹⁵.

7.1 FRESH DOMESTIC MARKET

A number of informed subsector stakeholders conceded that fresh domestic consumption accounts for about 99% of total annual production¹⁶. It is likely that this percentage estimate is close to reality given that available statistics on export and processing seem to be very low.

There are three identifiable local fresh consumption markets.

- *Local household fresh consumption* purchased directly by consumers or retailers from small producers who produce, deliver and sell to neighbors or others along the road side or at retail markets in nearby areas;
- *Regional household fresh consumption* being wholesale or retail sales to consumers in regions outside the production areas, mainly Dar es Salaam;
- *Urban household and institutional fresh consumption* being mainly sales in Dar es Salaam to consumers through supermarkets, institutions such as hotels and restaurants, hospitals, schools and the department of defense.

7.2 LOCAL HOUSEHOLD FRESH CONSUMPTION

This market is served by the small-scale non-commercial oriented farmers who grow primarily for home consumption but sell any surpluses to consumers either across the fence to a neighbor, along the roadside to passers-by, or to consumers and retailers in nearby market centers. The proportion that goes through this market is not well known but is about 10% of total marketed fresh horticultural produce as reported by MAFS.

¹⁵ Processed fruits and vegetables constitute a different subsector from fresh horticulture and this report does not deal with it in detail.

¹⁶ Statistics on fruits and vegetables consumed through the various market channels are not available.

7.2.1 Regional Household Fresh Consumption

The sources of produce for this market are the retailers who receive the produce from regional wholesale traders. These wholesale traders will in turn have purchased the produce directly from farmers at the farm gate, collection points or retail markets in the main producing areas. They then transport the produce to regions outside the area of production and sell to retailers at key market centers such as Dar es Salaam, Iringa, Mbeya, Morogoro, Tanga, and Dodoma. The retailers in turn transport the purchase to their kiosks and sell to consumers on per piece or per kg basis, depending on the type of buyer and the nature of the product.

7.2.2 Urban Household and Institutional Fresh Consumption

This market mainly constitutes consumption in Dar es Salaam. Consumers purchase the produce from retailers who in turn will have purchased from wholesaler in big markets such as Kariakoo and Tandale in the case of Dar es Salaam. The bulk of the sales to these retailers are commonly through agents commissioned by wholesalers at an agreed fee. According to some informed respondents, Dar es Salaam alone accounts for over 50% of all fresh produce consumed by the urban households in the country, with the Kariakoo market handling over 80% of marketed fresh horticulture produce. Sales going to other institutions such as schools, hotel industry, hospitals and defense are not well known, but the main sources of supplies are the retailers who buy from wholesalers.

Only a few large formal retailing institutions exist in the country of which the Shoprite supermarket chain with 5 branches countrywide is best known¹⁷. Shoprite informed the study team that they source their supplies through contracted agents who currently supply 65% of their purchases with the rest being purchased directly from farmers, but they aim to increase the proportion sourced directly from farmers to 70%. They also indicated that they imports of fruits such as apples, pears and citrus from South Africa. These imports are meant to cater for the off-season, though this may be partly due to the poor quality of local varieties at least for the up market consumers in Dar es Salaam. The poor quality of round potatoes has in some cases also forced them to import. According to this organization, their total sales for tomatoes, onions and potatoes average 900 Kgs per week per branch. With four branches countrywide, this implies that Shoprite, the largest supermarket chain in the country is selling less than 600 MT per year. They indicated that probably only about one percent of all fruits and vegetables consumed domestically are channeled through the supermarkets.

¹⁷ Shoprite has 4 branches in Dar es Salaam and 1 branch in Arusha). Imalaseko is said to be the second largest.

7.3 DOMESTIC PROCESSED CONSUMPTION

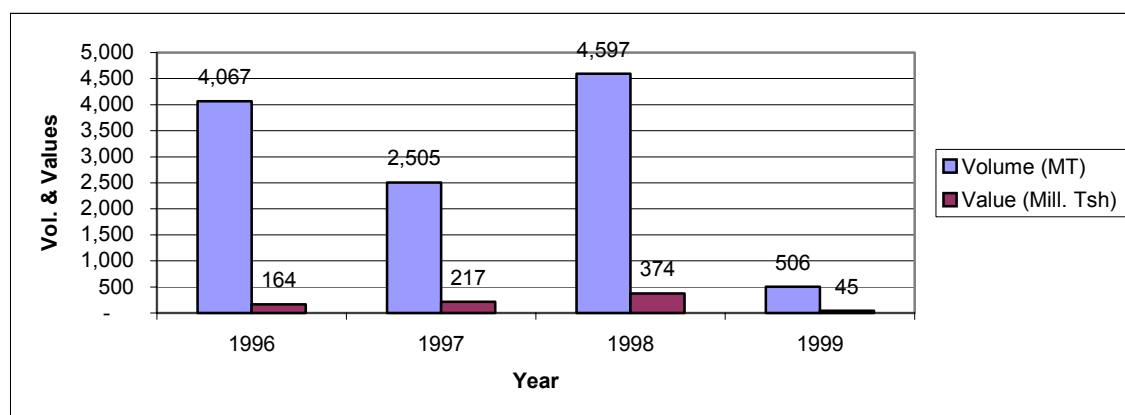
Most Tanzanians are aware of the good health implications in consuming fresh produce, thus the consumption of processed fruits and vegetables in Tanzania is small. Even in Dar es Salaam, the majority of the people depend primarily on fresh produce. This market outlet is estimated to account for less than one percent of total fruits and vegetable produced in the country. In comparison with countries such as Kenya horticultural processing is still very underdeveloped and the supply of processed produce from local sources is low. Even for Dar es Salaam, which has higher consumption levels, the market depends heavily on imports mainly due to the low supply of quality-processed products from local sources. According to observations made in the orange subsector study, production of processed fruits and vegetables has been on the decline having fallen from 1,850 MT in 1985 to 1,287 MT in 1995. Additionally, the report observed that processing capacity utilization was a mere 22% during the period 1990-1995. This decline was attributed to lack planning and coordination of industrial strategies and policies with investment plan in other supportive sectors (e.g. electricity, water, transport and telecommunication), and lack of effective demand for processed food in the domestic market.

7.4 INTERNATIONAL MARKETS

Despite the popularization of horticultural exports that began in 1980s, it is admitted in a number of government documents that international trade for horticultural produce in Tanzania is still underdeveloped in comparison with her neighboring countries such as Kenya. The study team was not able to establish the number and specific key players in this function but it is believed that this largely involves individual businessmen, and a few companies.

According to the statistics in the MAFS report entitled *1998/99 Market Review of Horticulture (2000)*, horticultural exports amounted to 4,600 MT in 1998, but declined by 89% to a mere 506 MT in 1999 (see fig. 7 below). In 1998, citrus and onions were by far the most important among the fresh horticultural exports having accounted for 69% and 21% of total volume respectively. In 1999, onions accounted for about 99% while fruit juices accounted for one percent. According to the aforementioned attributed the decline to poor quality of produce, poor packaging materials, and poor transport system from the farm to the point of exit.

FIGURE 7: TANZANIA’S HORTICULTURE EXPORTS (1996 – 1999)



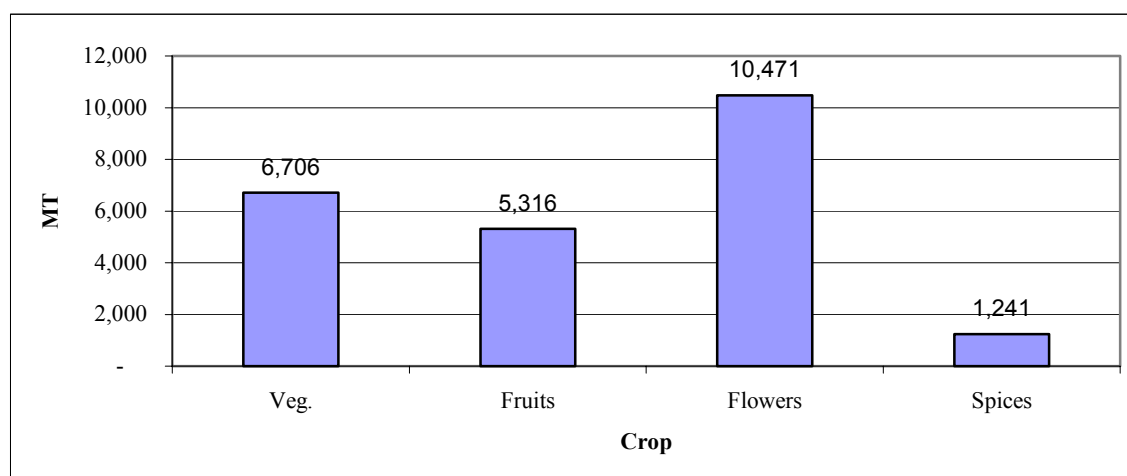
Source: Derived by Author from data provided in the report entitled “1998/99 Market Review of Horticulture (2000)” by MAFS

The main export markets for onions are Kenya, Rwanda, Zambia, Uganda, Zaire, India, USA and Thailand while the main export markets for citrus are Kenya, Uganda, UAE, and Switzerland (see annex table 2)¹⁸.

For purposes of comparisons with more recent data, our report includes some estimates by a local company dealing with the promotion of horticulture in Tanzania known as PASS Ltd (see fig 8 below). The organization estimates that in the year 2000, the country exported horticultural exports amounting to 23,734 MT worth about Tshs 10.3 billion. Of this volume, fruits and vegetables were estimated to account 12,022 MT or about 51% of total exports. If spices are included, non-flower horticultural exports accounted for 13,263MT or 56%. This level of exports accounts for about 2% of total estimated national production.

¹⁸ As indicated by Annexes V-IX of the MAFS’s report entitled “1998/99 Market Review of Horticulture (May 2000). The data was not disaggregated by country of destination but it is believed that the neighbouring countries account for the bulk of it.

FIGURE 8: ESTIMATED EXPORT VOLUMES OF HORTICULTURE PRODUCE (2000)



Source: Derived by Author from data provided by PASS Ltd

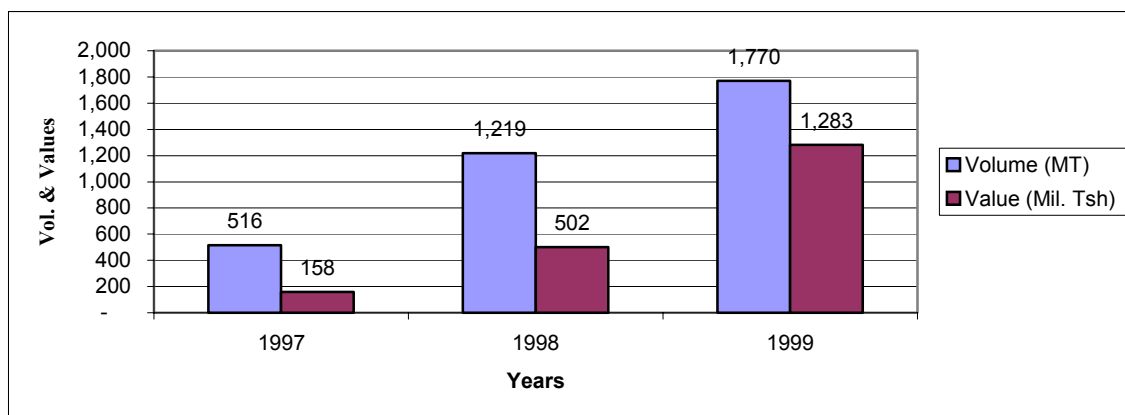
During the study, it was observed that exports of onions, bananas and tomatoes to Zambia, Malawi and the DRC are also picking up. Efforts to establish the quantities were unsuccessful, but according to traders in the Uyole market in Mbeya, it is approximately the amounts are one lorry of 3 tons per week for 2 months in a year for tomatoes which translates to 24 tons, and for onions about 10- 20 bags of 120 Kgs per week for three months in a year which translates to an average of 22 tons annually. The exact volume of exports through this point may be difficult to get, but the study team believes the above estimates are understated.

Based on official statistics from the Tanzania Revenue Authority as provided in the *1998/99 Market Review of Horticulture (May 2000)*” the 506 MT of fruits and vegetables exported in 1999 accounted for 0.1% of estimated national output of 1.1 million MT. Based on the average for the period 1997-1999, the country exported 2,536 MT or 0.2%. Based on the 12,022 MT estimated by PASS, fruits and vegetable exports accounted for 1.1% of national production in 2000. Thus the amount of exports is rather unclear but based on these two sources, it would appear that it is somewhere between 1% and 2% of total output

Imports of fruits and vegetables have increased three-fold from about 516 MT in 1997 to 1,770 MT in 1999 (as shown in fig 9 below)¹⁹. In 1999 fruit juices and dates accounted for 41% and 42% respectively, while jellies, jams and marmalades accounted for 7% of all imports of horticultural products. The main sources for dates are UAE, Dominica, UK, India, Japan, Iran, Oman, Pakistani USA and Saudi Arabia, while import sources for fruit juices are UAE, Italy, Kenya and the Netherlands. Jellies, jams and marmalades mainly come from UAE.

¹⁹ Data for 1996 was not available.

FIGURE 9: TANZANIA'S HORTICULTURE IMPORTS (1997 – 1999)



Source: Derived by Author from data provided in the report entitled "1998/99 Market Review of Horticulture (2000)" by MAFS

8 THE SUB-SECTOR MAP

The subsector map is a schematic representation of the structure of a subsector, essentially showing how products flow through the subsector systems. The map presents the various functions and markets, and distinguishes alternative supply channels where a channel is a vertical chain of firms that transforms raw materials and ultimately delivers to consumers as finished goods. In other words, a subsector map traces the product flow and the transactional relationships between various actors in a subsector right from inputs supply and production to the consuming markets. The following sections discuss different participants and their functions within the vegetables and fruits subsector, followed by presentation of a graphic depiction of the map and brief discussions of the identified subsector marketing channels.

8.1 SUBSECTOR FUNCTIONS AND PARTICIPANTS

The main functions in the fruits and vegetables subsectors in Tanzania are (a) Input supplies-mainly fertilizers, seeds, water, pesticides, herbicides, fungicides, farm tools, equipment and labor; (b) Production (c) Collection/Assembling; (d) Transportation- local and regional; (e) Exports, (f) Wholesaling; and (g) Retailing.

8.1.1 Inputs Supply

The country relies heavily on imports for inorganic fertilizers, hybrid seeds, pesticides, herbicides, and fungicides. There are only a few large input suppliers in the country, which according to key informants supply about 85% of inputs. The study team was not able to establish the complete list but was informed of the main companies such as Tanganyika Farmers Association-TFA with 14 branches countrywide, Pop Vriend and Burka coffee estates in Kilimanjaro area supplying vegetable seeds, and Premium Agro-importers in Dar es Salaam. These large input suppliers import in bulk directly from manufacturers abroad and retail mainly through their own managed, but few outlets which are located in the major towns.

The small input suppliers are those who purchase small quantities of inputs (say a carton or two) and sell directly to farmers from their own small family business shops in the regional towns. They mainly deal in the less bulky inputs such as chemicals and seeds. It was observed that these inputs are sometimes re-packed in small units to meet the needs of small-scale farmers who are their main clients. Their sources of supplies are the dealers/importers either in Tanzania or in the neighboring countries such as Kenya²⁰. The number these suppliers was not established, but those interviewed such as Japai and Sumry enterprises in Sumbawanga estimated that they account for about 14% of total input supply

²⁰ Such as Kenya Seed Company and Regina Seed.

business in the country.

The brief case supplier is the smallest of the suppliers and operates more or less sporadically depending on occasional orders from small input suppliers or end users. These are mainly businessmen or transporters who often go across borders into the neighboring countries purposely for other businesses but may have a chance to come back with small quantities of inputs on specific order.

8.1.2 Production

Production of fruits and vegetables occurs both under non-commercialized and commercialized systems. Many of the non-commercialized producers who cultivate between 1/8th and 1/4 of an acre were said to be the majority.²¹ Production by this category of farmers is primarily for home consumption with any surpluses being sold for cash. Such production is done alongside staple crops mainly during the rainy season, although it is also a common practice for farmers to plant horticultural crops after harvest of staple crops. Commercial-oriented production is done by a smaller number of farmers many of them cultivating 1/2 to 1 acre. In the study regions, this occurs in a few geographic concentration areas, where there is availability of water for irrigation. These areas include Matombo, Mkuyuni, and Mgeta (in Morogoro), Makambako, Ilula, Mbuyuni, and Mahenge (in Iringa), Mbarali and Mbozi (in Mbeya). For farmers in this category, production is primarily for sale to generate cash for the family and production occurs both during the wet and dry seasons.

The study team was informed by MAFS that at the national level, production systems comprise a combination of irrigated (furrow/canal systems) and rain fed. According to MAFS, 60% of tomatoes, 40% of onions and 50% of cabbages are produced under irrigation. In both commercialized and non-commercialized systems, farms are commonly operated jointly as a family enterprise using ox-plough or hoes for ploughing and family labor for planting, weeding and harvesting. In some cases, and more so for the commercialized systems, hired labor is used for the more critical operations like planting and harvesting, which in some instances may be paid for by the farmer or trader where price has been negotiated before harvest. Produce leaving the farm is often packed in small bags, plastic buckets or debes (e.g. 14 Kgs for tomatoes) and carried on human head, or transported using oxen-carts or bicycles. Both women and men undertake weeding and harvesting, though in Iringa, Mbeya and Rukwa it was reported that women provide about 65% of all family labor expended to the production of horticultural produce.

8.1.3 Collection and Packaging

A very important function in the commercialization of horticulture produce is the

²¹ Though it was not possible to establish the approximate numbers in the area of study or the country as a whole.

collection points found at regional markets where farmers bring their produce to sell to regional wholesalers come to these points. Collection points are characterized by a beehive of activities involving many actors including farmers, brokers, wage earners, transporters, packing material traders, and store owners. Wholesale traders purchase fruits and vegetables either at the farm gate or at designated collection points. Some collection points are in the local market centers such as Makambako, Matombo and Uyole markets, while others are closer to the production points. At the collection points, the produce is re-packaged commonly in baskets (*tengas*), sacks and sometimes-wooden boxes. *Tengas*, which are packing materials made locally using coconut grasses and bamboo, are the commonest mode for packaging tomatoes and fruits while onions and potatoes are normally packed in sisal bags or jute bags. Either farmers or traders own the packing materials. The business of buying and selling horticultural produce is commonly on cash basis, though in a few instances the seller may extend short terms credit to the trader to the extent they know each other well enough.

8.1.4 Regional Transport

Regional transport is the movement of produce from the assembly point to larger towns or cities such as Dar es Salaam, or other regional capitals around the country. The commonest mode of transport by these regional trade merchants is by lorries of capacities ranging from 4 to 7 tons. There are few transport companies with fleet of lorries and those used are commonly owned by local individual truck owners, hired and paid for by the buyer. Transport using trucks without back haul from Zambia also takes place, with the potential benefits of offering competitive transport charges to Dar es Salaam²². Albeit still relatively small, the use of trucks with no back haul to Zambia and Malawi for the transportation also takes place, especially for onions and bananas. Transport costs vary with the road situation and distance but the average cost from the Makambako to Dar es Salaam is Tshs 2,700 per *tenga* of tomatoes and Tshs 3,250 for a bag of onions. A common practice observed was the tendency to overload the trucks by as much as 40% to minimize costs of the district council cess, which are normally on per bag or *tenga* basis irrespective of the weight or value.

In undertaking regional transport, wholesale traders play the important role of off-loading any excess supply in any given region, which in some way helps in regional price stabilization

8.1.5 Wholesaling

Wholesaling is the function of buying and selling commodities in large volumes and consequently selling to retailers on smaller volumes e.g. bag or *tenga*. The wholesale traders commonly sell to retailers through commission agents who are paid on sale value percentage (10%) or Tshs 1,000 as may be agreed and depending on the market supply situation. Wholesaler traders tend to specialize in a single product and it is rare to find a

²² Though the study team did not establish the comparative charges.

wholesaler who is transporting a diverse range of products at the same time.

In the Tanzanian horticultural subsector, wholesalers carry out the functions in a number of ways. *Firstly*, they may buy produce directly from farmers at the farm gate depending on circumstances such as availability of the product in adequate volume or when profit maximization motives dictate, as may be the case during scarcity periods. This is often done through visiting a number of farmers in an area, establishing the amounts available, and negotiating the price. Once the required volumes have been located and prices agreed upon, the wholesale/traders then calls for transport which is often on hired basis. In other cases one may use a pick up-sized vehicle to collect and deliver to designated assembling points. In some cases, the wholesale trader or his agents may negotiate the price for unharvested crops and directly hire labor from local sources (about Tshs 1,000-1,200 per day) to harvest and load. In some rare cases, the wholesaler may extend an advance or credit to a farmer during planting time to enable the farmer purchase inputs with such credit being recovered at the time of harvesting. *Secondly*, and most commonly, the wholesaler may buy the produce from farmers at the market collection points and transport to the regional markets. *Thirdly*, the wholesalers may buy from traders in local markets centers depending on the market situation, and deliver the produce to regional markets. The wholesaler trader channel is the most dynamic and informed subsector observers contend that it accounts for about 88% of total marketed horticultural produce.

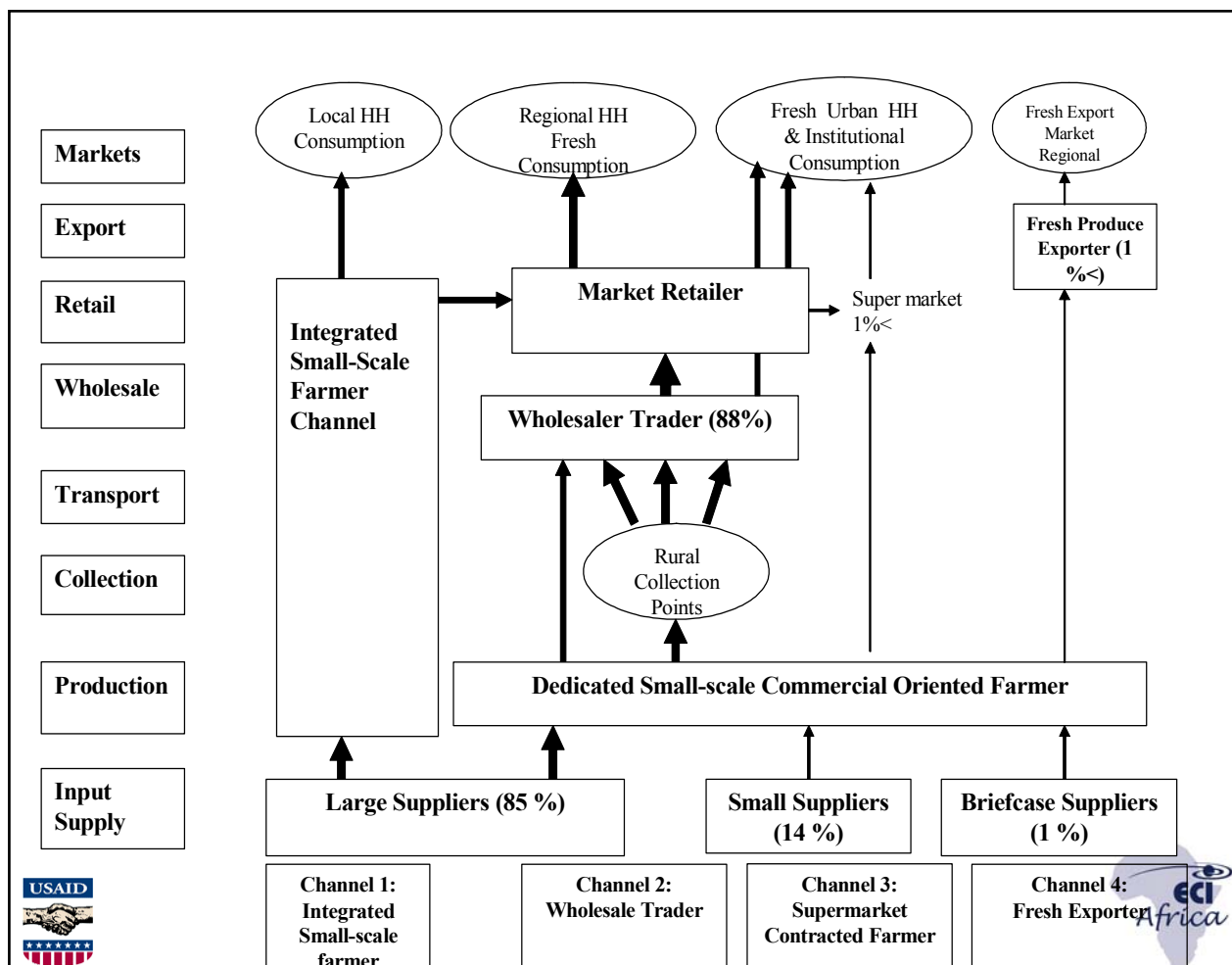
8.1.6 Retailing

Retailers go to the urban wholesale markets to purchase produce from wholesalers who sell through their commission agents (*dalalis*) at negotiated prices. The main urban centers where these wholesale markets are to be found include Dar es Salaam, Morogoro, Mbeya, Iringa, Tanga, Arusha, Moshi, Dodoma and Tabora. The retailers then transport the supplies on buses or other passenger vehicles, handcarts or bicycles to their kiosks and sell to consumers at varying amounts in accordance to the needs of the consumer. There are cases where retailers from an area jointly hire pickups and share the transport costs from the wholesale market to the retailing point. In Dar es Salaam for example such costs will typically be about Tshs 700 per bag of onions, while loading and off-loading will each cost about Tshs 250. The retailers may in some cases deliver the produce to hotels, restaurants, schools, hospitals and even the department of defense whenever orders have been secured.

8.2 FRESH HORTICULTURE SUBSECTOR MAP

Horticultural production is almost wholly under small-scale production system and the map in Figure 10 provides a fair representation of how the fresh horticulture subsector operates.

FIGURE 10: FRESH HORTICULTURE SUBSECTOR MAP



8.3 SUBSECTOR CHANNELS

There are four channels through which horticultural products move from the farm to the consumer.

8.3.1 Channel 1: Integrated Small-Scale Farmer Channel

This channel consists of non-commercial oriented small-scale farmers who cultivate horticultural crops not purely as a cash crop, but as a source of extra income whenever surpluses beyond family needs are realized. They will commonly be cultivating horticulture alongside other crops such as maize and beans. These farmers operate an integrated system in the sense that they undertake production, harvest and transport to the selling points in small quantities (by bicycles, handcarts or on human heads). Those located close to rural market centers or along major transport routes e.g. the great north road also sell to small retail markets or directly to the passers-by consumers. Small farmers located further away from marketing sites will not be completely vertically integrated. The main

reasons for transporting the produce in these small through various modes are the poor state of roads in most parts of the producing areas, lack of well organized farmer groups to facilitate bulking functions, and the uneconomical loads of most individual small scale farmers as far as the vehicle owners are concerned. According to a survey published by MAFS in May 2000, this channel accounts for approximately 10% of marketed produce.

8.3.2 Channel 2: Wholesaler Trader Channel

This is the biggest and most dynamic channel, accounting for approximately 88% of total marketed volume²³. Most wholesalers tend to deal in one horticultural product at any one time, though there are exceptional cases where different commodities may be purchased depending on market demand. Wholesale markets are to be found in major towns. Dar es Salaam has ten wholesale markets with alone Kariakoo handling about 80% of total marketed volume of fruits and vegetables in this city²⁴. Wholesale traders operate either as members of an association who in the case of the Kariakoo market handle about 75% or as individual wholesale traders who handle 25% of the traded volume. Dar es Salaam has 4 wholesale associations, though only one is handling a significant volume of business in terms of purchases from farmers in the study region and selling to retailers within Dar es Salaam. The main sources of produce for these wholesalers are the dedicated small-scale commercial oriented farmer who often cultivate larger areas, use more improved inputs and will have larger volumes and better quality products.

Taking the example of Makambako, the farmers deliver the tomatoes to Makambako town collection point using ox-carts, bicycles and sometimes pick-ups²⁵, off-load using hired labor at a cost of about Tshs 100 per *debe* or plastic bucket, sort and package at Tshs 500 and Tshs 300 per bag of onions and tenga of tomatoes respectively, pay a cess of Tshs 300 for a tenga of tomatoes and Tshs 400 per bag of onions.

Several wholesale traders will normally go to the collection point, pay the farmers for his/her produce on cash basis (sometimes on short-term credit), pay hired labor for re-packing and loading are done at about Tshs 600 and Tshs 250 respectively, and pay for loading at Tshs 250 per tenga for tomatoes and Tshs 300 for onions. The wholesaler will then transport the produce to regional and urban wholesale markets, which in the case of Makambako to Dar es Salaam will cost about Tshs 3,250 per bag of onions and 2,700 per tenga of tomatoes. At the market destination, the wholesale traders will then pay hired labor to off-load Tshs 300 tomatoes and Tshs 350 for onions, pay cess at Tshs 300 and Tshs 400 per tenga of tomatoes and bag of onions respectively. Finally, the wholesale

²³ According to MAFS's subsector review dated May 2000.

²⁴ The rest of wholesale markets in Dar es Salaam include Tandale (mainly staple crops), Mabibo, Mburuguni, Tandika, Vinguti, Ngongo la mboga, Kigamboni, Wasiki and Makumbusho (all of which deal with some limited amount of fruits and vegetable trade).

²⁵ The costs will vary according to distance but in Makambako bicycles are commonly used at Tshs 500 per *debe*.

traders has also to pay commission of either 10% of the sales value or a flat rate of Tshs 1,000 per tenga of tomatoes or bag of onions to the agent (*dalalis*) who undertakes the role of selling to retailers. It is rare for wholesalers to retail the produce directly to retailers but where a supply contract has previously been secured with institutional consumers or retailers (e.g. Shoprite), the wholesaler will invariably sell directly without involving the *dalalis* as shown in the subsector map.

Individually, the market retailers will normally buy a bag/tenga or less. There are cases two or more retailers will jointly buy a bag or more and share the costs accordingly. After buying, the retailer (s) will transport the produce to the kiosk by carts, bicycles and passenger vehicles where the consignment is small or by a hired pick-up where larger and often jointly owned cargo is involved. The costs will vary with the load and distance, but a tenga of tomatoes will typically cost Tshs 700 for an average distance from Kariakoo market to other parts in Dar es Salaam. In the event the retailer takes the produce to another market, a cess of Tshs 300 per tenga and Tshs 400 per bag is paid to the council for tomatoes and onions respectively. The market retailers then sell their produce on a piece or kg basis urban household and to institutional consumers such as hotels and restaurants, schools and hospitals where orders are secured. The relative size of these market outlets was not established but informed stakeholders estimate that household consumers account for over 90% of total retailer sales.

8.3.3 Channel 3: Contracted Fresh Supplier Channel

The supermarket retailers, particularly Shoprite have in the recent past contracted a few agents to supply fresh fruits and vegetables. In this regard, the supermarkets enter into short-term contracts of three or four months based on pre-agreed amounts, quality standards and buying prices. The contracted agents are often retail traders or dedicated commercial-oriented farmers who are likely to have better quality of produce than the non-commercial farmers. Shoprite informed the study team that 65% of their purchases come from contracted traders with the rest being purchased directly from farmers, though they aim to increase the proportion sourced directly from farmers to 70%. Shoprite estimated that this market outlet to accounts for than one per cent all fresh fruits and vegetables consumed in the domestic market. Some institutions such as hotels and restaurants, schools, hospitals and the department of defence also contract retailers to supply fresh fruits and vegetables under similar arrangements.

8.3.4 Channel 4: Fresh Exporter Channel

The only difference between this channel and the contracted fresh supplier channel is that the exporter goes to the farm to buy, while the contracted supplier delivers to the contracting agency. During the study, it was gathered that exports are often procured directly from dedicated small-scale commercial oriented farmers who are more likely to provide better quality and consistent

products in terms of size and color²⁶. This channel is also relatively small and accounts for less than 1% of total fresh horticultural produced in the country.

²⁶ Although the study team was not able to locate and interview exporters to international markets except two to the regional markets.

9 KEY SUBSECTOR SERVICES & SERVICE PROVIDERS

Production and marketing of horticulture involve a large number of actors. These actors include policy makers, researchers, extension service providers, credit institutions; farm input suppliers, farmers, transporters, packaging materials suppliers, processors, and storage facility providers. These actors are sellers and buyers various types of goods and services. The suppliers of such goods and services are known as business service providers and may be individuals, private for-profit firms, NGOs, parastatals, associations, community based organizations, regional or central government agencies.

The smooth functioning and development of the subsector critically depend on the ability to supply quality and affordable goods and services required in the subsector. An important opportunity for the DAI-PESA project is to work closely with these business service providers to help them undertake their business in a better and more sustainable way with the ultimate aim of enabling them to deliver quality and affordable goods and services to MSEs in the subsector, including small-scale farmers. Table 3 below summarizes key services and types of service providers with whom the project could work with to support the growth of MSEs in this regard.

TABLE 3: KEY SERVICES AND SERVICE PROVIDERS

Functions	Key Services	Key Business Service Providers
Exports	Loading, transporting, unloading, repackaging, packaging materials, labeling, warehouse renting and shipping.	Exporters (individual businessmen, companies and association e.g. TANEXA)
Wholesale and retailing	Loading, unloading, assembling, re-packaging, storage, and selling.	Individual wholesalers, wholesaler associations, and retailers.
Transport	Movement of products from farm to local markets and to collection centers for regional markets.	Sellers of transport facilities e.g.. Pick/ups/trolleys, bicycles, ox-carts and transport facility owners.
Collection points	Off-loading, re-packaging, and storage	Owners of trading and storage space, and sellers of packaging materials, loaders and packers.
Production	Land preparation, planting, weeding, spraying, and harvesting.	Retailers of farming tools and equipment, chemicals, fertilizer; owners of water pumps and sprayers for hire, and family members and wage earners.
Input Supply	Selling of chemicals, fertilizer, tools, packaging materials-bags and tengas, and water pumps (e g. Enterprise Works).	Input suppliers (mainly seeds, fertilizers, pesticides, herbicides, farm tools and equipment), and labor.

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Seeds development	Research services	Uyole, SUA, Tengeru & Asian vegetables research Centre
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10 GROSS MARGINS AND TRANSACTIONAL COSTS

The horticulture subsector is characterized by a large number of transactional activities that involve the exchange of cash between buyers and sellers of goods and services. This is particularly so between the point of delivery to the collection center and the retailing level. Services provided from the point of production to retail include, nursery preparation, land preparation, purchase of inputs, planting, weeding, spraying, harvesting, packaging, loading, transport (from farm to collection point and collection point to wholesale markets), off-loading, cess payment, sale of packing materials, sorting and repacking. In the case of tomato production and marketing at the Makambako, we were able to identify about 9 main transactional activities from crop planting stage to the point of delivery to the collection center. From the collection center to the point of retailing in Dar es Salaam, we were able to identify 15 main activities involving cash transaction in exchange for goods and services²⁷.

Gross margins in this case simply refer to revenue minus direct or variable costs. It does not take into account overheads, capital investment, or cost of borrowed capital. This is partly because micro level enterprises especially small-scale farmers do not often incur much of these costs and partly because such information is often not readily available. Thus data provided below should not be misconstrued to represent profits, but rather its proxy. However, in the case of tomato production in Makambako, land leasing is common and has been included in the calculations of costs²⁸. Family labor was costed where data on local wage rates was provided. The gross margins derived below should be treated with caution for the following reasons, which could influence the accuracy. First, the data is based on interviews conducted separately with farmers in the field and wholesalers and retailers at Kariakoo market. There were cases where the average monthly or seasonal selling prices reported by the farmers were significantly different from the average monthly or seasonal buying prices reported by the wholesalers even for the same period and collection point like Makambako. Second, all the respondents had no records and the responses were based on recall memory. Third, discrepancies could arise from the fact that different respondents could have been referring to different times of the seasons.

10.1 GROSS MARGINS FOR TOMATOES

Table 6 below provides an indication of the transactional activities involved and estimated costs along the marketing chain, as well as estimated gross margins for tomato in both dry and wet seasons²⁹. The calculations in table 6 are based on *one-acre plot* of tomato in Makambako area producing an average of 1,615 debes of 14 kg each (or 323 tengas)

²⁷ The study team was not able to collect such information for onions, but the two crops involve similar transactions.

²⁸ Thus care should be exercised when comparing with other regions.

²⁹ With regard to details of farmers' costs from farm level to the collection point refer to annex table 3.

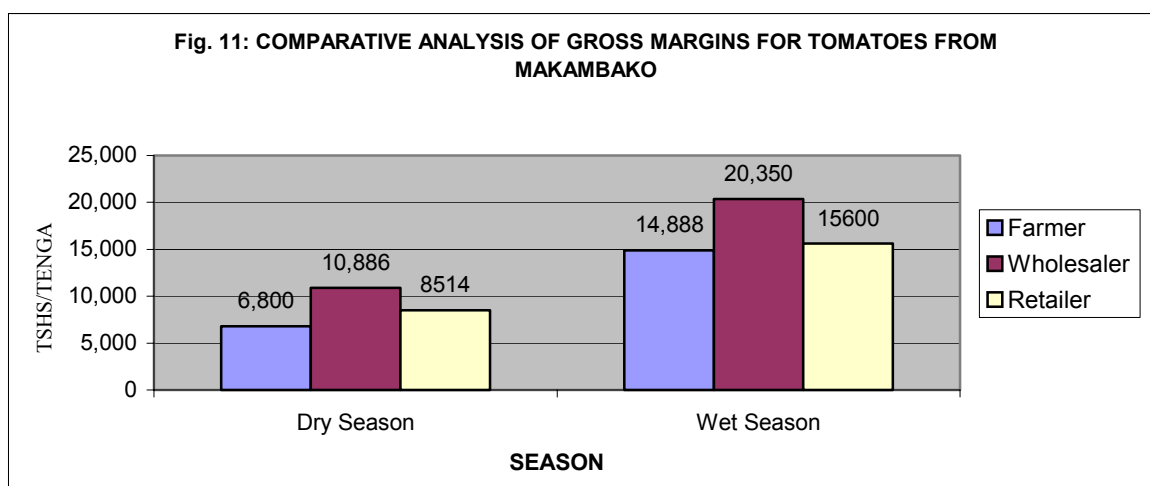
during the dry season, and 1,710 debes (or 342 tengas) during the wet season.

TABLE 4: AVERAGE COSTS AND GROSS MARGINS PER 70-KG TENGA OF TOMATO FROM MAKAMBAKO AND SOLD IN DAR-ES SALAAM.

	Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season
Average tengas per acre	323	342	323	342	323	342
FARMER	Cost (Tshs/Tenga)		Cumulative Costs (Tshs/Tenga)		Item Cost as % of Cumulative	
Cost/Tenga up to Collection Point	1,200	1,362	1,200	1,362	15%	17%
Farmer's Selling Price/tenga	8,000	16,250			-	-
Gross Margins/tenga	6,800	14,888				
WHOLESALER						
Buying Price/Tenga	8,000	16,250				
Packaging	300	300	1,500	1,662	4%	4%
Repacking	600	600	2,100	2,262	8%	8%
Loading on to truck	250	250	2,350	2,512	3%	3%
Transport to Dar es Salaam	2,700	2,700	5,050	5,212	35%	34%
Off-loading from Truck	250	250	5,300	5,462	3%	3%
Cess	300	300	5,600	5,762	4%	4%
Commission to agent	1,000	1,000	6,600	6,762	13%	13%
Total Wholesaler Cost	13,400	21,650				
Wholesaler Selling Price	24,286	42,000			-	-
Gross Margins/Tenga	10,886	20,350				
RETAILER						
Buying Price/Tenga	24,286	42,000				
Loading to Pick-up/other	250	250	6,850	7,012	3%	3%
Transport to retail shop	700	700	7,550	7,712	9%	8%
Off-loading at retail shop	250	250	7,800	7,962	3%	3%
Cost to Retailer	25,486	43,200				
Retailer's Selling Price	34,000	58,800				
Gross Margin/Tenga	8,514	15,600				

For ease of reference, comparative gross margins for tomato farmers, wholesalers and retailers are also depicted graphically in Figure 11.

FIGURE 11: COMPARATIVE ANALYSIS OF GROSS MARGINS FOR TOMATOES FROM MAKAMBAKO



The following are key observations arising from the above analysis:

- In both seasons, wholesalers receive the highest margins followed by retailers and then farmers. Although having the average lowest gross margins in both seasons, farmers attain the greatest increment during the wet season of approximately 119% followed by wholesalers (87%), and retailer (83)%.
- Transport to Dar es Salaam is the single largest transactional cost item accounting for 34% of the cumulative cost up to the retail point. This is followed by farmers' production costs (17%), and agents' commission (13%).
- Farmer's production cost during the wet season is 20% above the cost incurred during the dry season. This is primarily because of the need to use more pesticides during the wet season due to the high prevalence of pest-related diseases. Despite increases in the cost of pesticides (about 44%), the farmer is still able to earn higher gross margins in the wet season because of higher selling prices and slightly better yields per acre.

10.2 ONIONS

The transactional activities for onions were found to be the same as those of tomatoes except that in the Igomero Irrigation Scheme where the data was gathered, the farmers interviewed sometimes store the produce and sell latter to wholesalers at their homesteads. This is made possible by the longer shelf life of onions compared to tomatoes. Table 7 below provides estimations of farmer's, wholesalers and retailers gross margins per bag of 150 Kg of onions in both dry and wet seasons³⁰. The calculations are based on one-acre plot of onions in Igomero Irrigation Scheme in Mbeya, with the average production during the

³⁰ With regard to farm level production and transactional costs, refer to annex table 4.

dry and wet season being 80 bags and 83 bags respectively. The table also provides the transactional costs along the production-marketing chain.

TABLE 5: AVERAGE COSTS AND GROSS MARGINS/150-KG BAG OF ONIONS FROM MBEYA AND SOLD IN DAR-ES SALAAM.

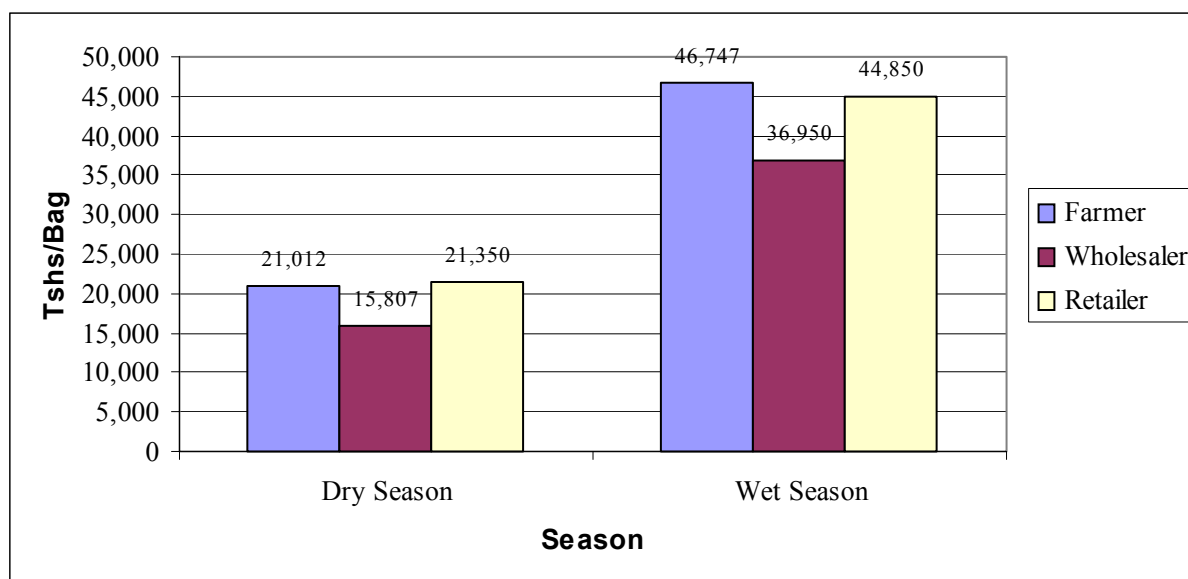
	Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season
Average Number of Bags/Acre	80	83	80	83	80	83
FARMER	Cost (Tshs/Bag)		Cumulative Costs (Tshs/Bag)		Item Cost as % of Cumulative	
Farmer's Cost/Bag	3,131	3,253	3,131	3,253	34%	34%
Selling Price	24,143	50,000	-	-	-	-
Gross Margin/Bag	21,012	46,747	-	-	-	-
WHOLESALER						
Buying Cost/Bag	24,143	50,000	-	-	-	-
Loading at Farm gate	100	100	3,231	3,353	1%	1%
Transport cost (Mbeya-Dar)	3,250	3,250	6,481	6,603	35%	34%
Off-loading	300	300	6,781	6,903	3%	3%
Cess/ bag	400	400	7,181	7,303	4%	4%
Commission to agent	1,000	1,000	8,181	8,303	11%	11%
Total Cost/bag	29,193	55,050	-	-	-	-
Average Selling Price/bag	45,000	92,000	-	-	-	-
Gross Margin/Bag	15,807	36,950	-	-	-	-
RETAILER						
Buying Price per Bag	45,000	92,000				
Loading on Pick/up or Hand Cart	250	250	8,431	8,553	3%	3%
Transport by P/up (to Kiosk)	700	700	9,131	9,253	8%	7%
Off-loading at Kiosk	200	200	9,331	9,453	2%	2%
Total Cost	46,150	93,150	-	-	-	-
Selling Price/Bag equiv.	67,500	138,000	-	-	-	-

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Gross Margin/Bag	21,350	44,850	-	-	-	-
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Again for ease of reference, comparative gross margins for onions for farmers, wholesalers and retailers are provided graphically in Figure 12.

FIGURE 12: COMPARATIVE ANALYSIS OF GROSS MARGINS FOR ONIONS FROM MBEYA TO DAR ES SALEM



For onions, the following are the key observations arising from the above analysis:

- During the dry season, retailers and farmers attain the highest gross margin, followed by the wholesaler;
- During the wet season, the farmer gets the highest gross margin (more than double the margins in the dry season), followed by the retailer and then the wholesaler;
- In both seasons, onions are more profitable than tomatoes, due to the relatively higher market prices;
- Transport to Dar es Salaam and farmers' cost of production per bag each account for 34% of total cumulative cost up to the retailing point, followed by agents' commission (11%).

Scarcity of supply during the wet season is the main cause of high spikes in prices. From a market stabilization point of view, this suggests that promotion of appropriate and affordable technology for production during the wet season, and improvements of rural roads would greatly enhance the capacity of MSEs operating in the subsector in terms of increased income earnings and employment. Development and promotion of disease and pest resistant varieties is also an essential element with regard to productivity during the wet season. These interventions would also help in stabilizing market prices and would go a long way in reducing investment risks, which now face most subsector MSEs during the wet season.

11 INSTITUTIONAL AND REGULATORY FRAMEWORK

11.1 INSTITUTIONAL

11.1.1 Government Ministries and Departments

There are seven Government Ministries that have a significant role to play in horticultural development and marketing. These are: (i) Ministry of Agriculture and Food Security (MAFS), which is charged with the overall policy on production, research and extension. (ii) Ministry of Cooperatives and Marketing, which is charged with the development of farmer cooperatives and marketing associations, as well as collection of all relevant information pertaining to these functions. (iii) Ministry of Water & Livestock Development, which is charged with livestock development and water resources management including irrigation for horticultural crops. (iv) Ministry of Community Development and Gender, which is responsible for overall rural development issues. (v) Ministry of Regional Administration and Local Government under which the local authorities fall. (vi) Ministry of Trade and Industry (MTI), which is responsible for export trade and industrial development including agro-processing and product quality standards through the Tanzania Bureau of Standards (TBS). (vii) Ministry of Health, which plays an important role on food hygiene and safety issues.

MAFS has the most critical mandate in the subsector and the responsibility squarely lies in the office of the Permanent Secretary under whom the Crop Production Section directly falls. Policy proposals may start at this level, and after deliberations with relevant stakeholders the results are passed on to Parliament through the responsible Minister for subsequent discussion and possibly legislation. Once passed, it may be implemented by the either the research, extension and training units of the ministry depending on which areas the policy falls into. From these units, the top-down organizational structure is as follows: The Regional Agricultural Advisors (RAA) –District Agricultural and Livestock Development Officers (DALDO)-District Agricultural Extension Officers (DaEO)-Subject Matter Specialists (SMS) either in horticultural development, irrigation, marketing and general crops- Ward Agricultural & Livestock Extension Officer (WALEO) and ultimately the Village Extension Officer (VEO) and who has direct contact with the village council and farmers. At the ward level, WALEO works closely with the Ministry of Regional Administration and Local Government under which the Regional and District Councils fall.

The TBS has a very important role to play in the horticultural industry, particularly that of certifying quality standards which is authenticated by the organization's stamp on all processed products. Most respondents interviewed complained that the process is stringent, bureaucratic and costly. This has been a major stumbling block to the development of horticultural processing in the country.

The study team was not able to interview the above-mentioned institutions, with the exception of the Horticulture Section in MAFS. Nevertheless, the general impression was that there is lack clear subsector policy and commitment as well as coordination between these organizations. More detailed analysis regarding their effectiveness in promoting the subsector is certainly required to enable DAI-PESA determine the appropriate point of entry.

11.1.2 Regional and District Councils

At the 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 the Food Security and Cooperative departments are each headed by a Development Officer who report to the DED. Various agricultural related subject matter specialists posted to the district in turn support the District officers. However, crop marketing falls under the authority of the District Co-operative Officer, while extension service is under the District Extension Officer. These officials are responsible for strategic planning and implementation of regional and district development projects. Indeed, policy proposal could also originate from the district councils and passed on to Parliament through the Permanent Secretary and the Minister responsible for the Ministry of Regional Administration and Local Government. As such their views, objectives and strategies if implemented can either support or stifle the sub-sector's development. MAFS is responsible for all technical and policy matters pertaining to research, extension, production and training. In addition the ministry currently hosts the Agricultural Sector Management Program (ASMP), which can be an important project to collaborate with DAI-PESA. In theory, the agricultural staff employed by MAFS at the regional and districts levels are strategically placed to provide support to the subsector and the PESA project could investigate ways of involving them as strategic allies in matters pertaining to the horticulture subsector development. Unfortunately many of them are few in number and rarely go out to interact with the farmers.

11.2 REGULATORY

The fresh horticulture subsector is not faced with heavy regulations. This is perhaps because fruits and vegetables have never been regarded as strategic commodities in terms of national food security. However, district cess levied at the market place, the location and facilities provided at the market centers, and Government policies play a crucial regulatory role in the subsector. These three regulatory issues are briefly discussed below. Other regulations that could have important implications on the subsector's development include import duties on inputs such as fertilizer and chemicals, import duties on fresh and processed horticultural products, and the general policies on road development and transport. The study team did not have adequate time to investigate these policies and

regulations and this may need to be pursued under the policy component of the DAI-PESA project.

11.2.1 District Produce Cess

Previously the District Produce Cess was levied as a percentage of the value of produce sold at a level not exceeding 10% though the actual amount levied varied widely, with the average for most crops amounting to approximately 6% of the sale price. During August 2003 Parliamentary Budget Session, a directive was issued by the Minister for Finance that all taxes and produce cess applied at local government should not exceed 5% of farm gate price. However, in practice the cess seems to be on a flat rate irrespective of the value (a bag or tenga which are standard cessable load units). It appears that the district councils are now charging independently cess and as such the cess varies widely between councils. In Matombo market in Morogoro region for example, the council is currently collecting Tshs 100 per load brought into the market for purposes of trading. The problem with the levy system is that it has no relation to the value and is therefore inequitable in the sense that it tends to penalize small traders as well as low value produce dealers.

11.2.2 Market Facilities and Trade Controls

The district councils do also determine the location of markets, facilities installed and what products are to be traded in a given market center. The district council decides on the site for markets and the facilities to be provided. Depending on what the council decides, it may promote or deter the growth of the horticultural subsector. In many of the markets visited in Dar es Salaam, Iringa, Morogoro and Mbeya, members of market associations and individual traders complained of lack of adequate and appropriate trading space, water and storage facilities.

11.2.3 Government Subsector Policy and TBS Regulation

Experience in some of the countries that have been successful in horticultural production and exports, suggests that lack of clear policies and strategies may be as bad as policies that inhibit subsector growth. During the study, there was no evidence of clear government strategies and policies to assist in propelling the subsector towards a strategic position. Yet production of horticultural crops and penetration into export requires private sector effort supported by enabling environment much of which has to do with the public sector. For example, some of the enabling environments that are lacking include the inadequacy of subject matter specialists and support to research and development, which at the early stages requires government support.

The bureaucratic and costly procedures of certification by the TBS have a lot to do with the current underdevelopment of the horticulture-processing subsector. Many small processors are operating without the quality standard certificates (TBS stamp) because of the financial

and economic costs associated with procuring them. In Morogoro for instance, a small processor informed the team that the certificate costs as much as Tshs 1.0 million for an MSE producing just 400 liters of tomato sauce per day. For other products like wine this may cost as much as Tshs 10 million-15 million. These high costs, coupled with other lengthy district council requirements has hindered MSE business development in horticultural processing, resulting in significant reliance on imported products.

Additionally, the study team received a lot of complaints from farmers that the cost of inputs, especially for fertilizers and chemicals were too high. This may partly imply that import duties on inputs are high in relation to the ability of most farmers. The study team was not able to assess this claim and it may require further analysis to determine the best way of resolving it.

12 SUB-SECTOR DYNAMICS

This section is essentially concerned with answering questions such as which channels are dying and which ones have the most secure prospects for growth, and therefore having the prospects for generating income and employment? What role can subsector MSEs play in those channels and how can their ability be enhanced to participate effectively in the market that has prospects for growth?

The *dedicated commercial farmer/wholesaler channel* has experienced the most spectacular growth among all the three channels. Since early 1980s, the commercial farmer/wholesale trader channel has expanded becoming the most important in terms of marketing of fresh fruits and vegetables. The channel now account for an estimated 88% of total marketed fresh fruits and vegetables in Tanzania. This channel now heavily depends on the dedicated small-scale commercial oriented farmers who specialize in fresh horticultural produce mainly as a business using improved inputs and irrigation technology. Geographic areas close to main roads and in close proximity to markets provide the stimulus for farmers to expand. For the wholesale traders, economies of scale are a major factor in profitability, and therefore the geographic clusters attract them often-paying higher prices. The number of farmers in this channel is growing in a few key geographic clusters. With this and their apparent desire to expand, it makes them an important target group for business service support.

The *small-scale integrated farmer channel* is small and currently accounts for about 10% of marketed fresh fruits and vegetables. This channel has experienced moderate growth and future prospects will very much depend on income growth in the rural areas, profitability of local sales visa viz sales to the regional markets, and the availability of medium sized trucks without back-haul either to Zambia or to Dar es Salaam to the extent they continue to offer competitive transport charges.

Export of fresh fruits and vegetables is still very small in the Tanzanian case with current estimates below one per cent of total output. The reasons for the poor performance have mainly been the low quality of produce and lack of policy support geared towards horticulture development, as has been the case for staple crops. Nevertheless, the study regions have the potential to export to the regional countries such as Zambia, Malawi, and the DRC³¹.

Processing of fruits and vegetables is still very underdeveloped in Tanzania and at the same time the consumption of processed products account for less than one per cent of total output. There are very few processors in the country with Dabaga and Sunvita being

³¹ It was observed that exports to Zambia and Malawi especially for onions and bananas are picking up, albeit slowly. Regions in the North and North Eastern parts of the country have the potential to export to Kenya and Uganda.

the significant players, though they are operating at capacities as low as 22%. The main reasons for the underdevelopment of this channel has been the low local demand for processed products especially in the rural areas where incomes are low, unstable supply of raw materials and high market prices, which make it economically unfeasible to undertake processing during the low supply/wet season. Other key factors are the stringent competition from better quality and cheaper imports, barriers to entry as a result of the bureaucratic and costly licensing and food safety certification procedures by the Tanzania Bureau of Standards (TBS) and the Ministry of Health.

12.1 DRIVING FORCES

The driving forces refer to those factors that are at the root of the dynamics and change within the subsector. These often relate to market demand, technological change, barriers to entry, input supply, profitability of different niches, risks or policies. The following sections summarize the main driving forces for the fresh fruits and vegetables in Tanzania.

12.1.1 Heavy Reliance on the Dar es Salaam Urban Market

Local market is an important driving force of the subsector and is currently consuming about 99% of total annual production. The urban markets account for the lion share in total marketed output. *Heavy reliance on in the Dar es Salaam urban market*, which consumes over 50% of urban consumption, has been a very important driving force in the subsector. This market heavily determines traded volume, prices and quality standards, which is increasingly being demanded by medium to high-income household consumers and retail institutional, especially the supermarkets. Other urban centers also play a significant role, though they are less sensitive to quality.

Increasing and broadening effective demand for fresh fruits and vegetables will largely depend on population growth and increases in disposable income among the local population. Growth especially of the middle to high-income consumers in the main urban centers, and the increases in the overall national per capita income that is likely to occur through initiatives under the Economic Recovery Program which were commenced in 1986, is likely to result in increased domestic demand. Currently local market demand is not met during the low supply season (December-April) and there is need to promote production during this period.

At the market level, activities geared towards increasing supply during the wet season and off-loading through exports and/or processing during the dry season should be the main focus of DAI-PESA project initiatives. These may include the development and promotion of disease and pest resistant varieties to enhance production during the wet season, promotion of affordable storage for the less perishable products like onions and potatoes

with a view to reducing production costs and risks associated with losses³². Lobbying with government for improvement of feeder roads would also be an important complementary activity.

12.1.2 Irrigation Technology

Irrigation technology through furrow and water pumps (mainly foot water pumps) is an emerging driving force for the growth of commercially oriented production in a number of geographic clusters, resulting in increased production during the dry season. The use of this production irrigation technology is confined to areas with ground water resources. The dedicated commercial oriented farmers are the main users of this technology and their share of marketed output has been increasing quite rapidly in the recent past.

12.1.3 Tanzania-Zambia Transport Route

In the study regions, the dedicated commercial farmers (channel 2 in the subsector map) play a notable role in the marketing of fresh vegetables. This has been especially among farmers closer to the urban market centers such as Iringa, Mbeya, and Morogoro and the Tanzania-Zambia highway. These farmers are achieving better profit margins because of the lower transport costs to both the seller and the buyer and lower product losses. Because of their proximity to market outlets, these farmers are at least able to spread out their patterns of harvesting and delivery to the market especially for the less perishable products such as onions and potatoes.

12.2 KEY LEVERAGE POINTS

Leverage is the ability to reach large numbers of MSEs at a single stroke. Points of leverage are those points where working with an established group of subsector players or organizations can achieve high outreach or the so called critical mass. These points of leverage are either system nodes along the subsector channels, institutions, geographic clusters or government policy and regulation.

12.2.1 System Nodes

Rural Market Collection Centers

Rural market collection points are centers where a large number of producers, especially the commercial oriented farmers deliver their produce for sale to a number of local and regional wholesale traders. These collection centers provide an important contact point between household and institutional consumers, input suppliers, farmers, local and regional and wholesale traders and trader associations. These centers therefore form important

³² The high incidence of pest and diseases during the wet season necessitates high use of chemicals, which happen to be very expensive.

system nodes for outreach to a wide range of subsector players in terms of exchange of information regarding, product supply and demand, market prices, product quality issues, technology on production, storage and transport among others.

12.2.2 Institutions

Wholesaler Associations

Most urban markets have wholesaler associations who purchase produce from a wide range of areas depending on supply availability and market demand. These wholesalers often travel to rural market collection centers or farmers' fields to buy their produce. They then transport to urban markets for onward sale to retailers. There are four wholesale associations in Kariakoo market (handling 80% of fresh fruits and vegetables in Dar es Salaam). One wholesale association known as Kariakoo Market Vegetable Supply Association (*Mkombozi wa Wakulima*), is particularly strong and is handling produce worth more than US\$ 270,000 annually. In carrying out these intermediary functions, wholesaler associations interact with a large number of producers and retailers and as such provide an important node for exchange of market information. The DAI-PESA should explore the possibility of collaborating with these associations, perhaps starting with the above referenced association.

Farmer Associations

There are only a few well-established farmer associations in the country. The only reasonably well established organizations are the Tanzanian Farmers Association (TFA)-an important player in agricultural inputs supply through 14 retail branches countrywide, and the National Network of Small scale Farmers' Groups in Tanzania (*Mtandao wa vikundi vya wakulima Tanzania – MVIWATA*)- an important forum for farmer-to-farmer information exchange in 18 regions countrywide which includes all DAI-PESA regions except Ruvuma. TAFOPA is also a potentially important player in the horticultural processing industry. These three organizations have real potential for leveraging DAI-PESA project interventions on policy and regulation advocacy, marketing and capacity building among others.

Research, Training and Seed Development Organizations

Other organizations, which could provide good leverage points to the subsector, include the following: (a) Sokoine University of Agriculture, (b) Uyoale Agricultural Research Institute and (c) Tengeru Research center in Arusha. These institutions are involved the development of improved seeds and planting materials, training of technical staff in various aspects of horticultural production.

12.2.3 Geographic Clusters

A geographic cluster is a region characterized high concentration of Micro and small enterprises (MSEs). In the study area, a number of geographic clusters and the respective key crops have been identified as follows:

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TABLE 6: GEOGRAPHIC CLUSTERS AND KEY COMMODITIES

Region	Geographic Cluster	Fruits	Vegetables	Others ³³
Morogoro/ Mvomero	Matombo, Mkuyuni and Mgeta	Oranges, Bananas and pineapple,	Tomatoes, cabbages and onions.	-----
Iringa	Ilula, Makambako, Mbuyuni, and Mahenge.	-----	Cabbages, tomatoes, onions	-----
Mbeya	Mbarali, and Mbozi,	-----	Bananas, Onions, Cabbages, and Tomatoes	-----
Rukwa	-----	-----	-----	Sunflower and beans

12.2.4 Subsector Policy and Regulation

The main policy related leverage points in the fruits and vegetables subsector revolve around four main areas:

- The districts and municipal cess that is charged to the traders on per bag tenga-basis rather than on product value-basis thus discriminating against lower value products. This practice is responsible for the over-stacking of produce in bags or tengas and the generally observed over loading of vehicles, which leads to deterioration of road conditions. It has also been reported that the municipal cess may be charged on the same product several times along the market chain depending on the number of times the consignment enters the market place before it reaches the consumer. In the small rural markets, smaller traders (some of them farmers) also pay on per consignment basis regardless whether it is bag, tenga or other unit. It appears that these cess charges are not *pro rata* as compared to charges levied on wholesalers, implying that the smaller traders are charged more unfairly.
- The bureaucratic and costly procedures of certification by the TBS, which has inhibited the development of fruits and vegetable the processing in the country.
- Import tariffs on inputs that are said to be too high, which require to be examined further.
- Leverage in a negative sense-the lack of policy commitment and strategy for subsector development, which underlies the low subsector support activities and lack of subsector data and information necessary for proper analysis and planning.

³³ Best alternative given that horticulture very small or non-existent.

13 SUBSECTOR CONSTRAINTS AND OPPORTUNITIES

Constraints refer to factors that inhibit MSEs in a given subsector from performing their business in the best way. Opportunities refer to the prospects of businesses that can be undertaken as part of resolving those constraints. Thus behind every constraint there is an opportunity or opportunities for business. Thus, against each of the subsector constraints listed below there are opportunities for commercial business for the profit motivated enterprises as well as facilitative services for the non-profit motivated agencies.

13.1 CONSTRAINTS

13.1.1 Production Constraints

- Low utilization of inputs primarily due to the high cost to farmers, resulting in poor crop husbandry practices and hence low yields.
- Poor and unspecialized extension services at producer level with subject matter specialists (SMS) sometimes available only at the district level.
- High incidence of pests and diseases, especially during the wet season, resulting in low productivity and supply.
- Poor accessibility to inputs and their high cost to farmers.

13.1.2 Marketing Constraints

- Poor quality of fruits and vegetables produced locally leading to non competitiveness on the international market and therefore growth in imports.
- Lack of adequate and reliable horticultural production and trade statistics necessary for analysis and planning and lack of relevant market and price information, especially to farmers.
- Lack of effective farmer organizations, resulting in the traders dictating the price.
- High market price fluctuations due to the high seasonality of supply.
- High reliance on the distant Dar es Salaam urban market for most regions resulting in high transport costs and hence low producer prices to farmers.
- Poor business skills and lack of management capacity of market association managers and lack of knowledge regarding export market potential and requirements.
- Poor packaging materials (e.g. tengas, wooden crates and bags), which are not suited to the protection of produce from damage and lack of appropriate storage and pre-cooling facilities.

- Multiple cess charges along the market chain

13.1.3 Transport Constraints

- Poor rural roads leading to high costs, product quality deterioration and physical losses, which when combined with other aforementioned constraints such as lack of markets and poor packaging materials lead to losses of up to 40% in some cases.

13.1.4 Processing Constraints

- Underdeveloped and underutilized horticultural processing capacity mainly because of low local demand, competition from imports due to low quality of local products, and the bureaucratic and costly government business licensing and TBS product standards certification procedures.

13.1.5 Policy and Regulation Constraints

- Lack of serious policy support to the subsector, in most cases treating it as secondary to the staple crops subsectors.
- Bureaucratic and costly procedures for Government business licensing and TBS Product certification procedures.

13.2 OPPORTUNITIES

Other opportunities or favorable factors that can render the subsector to grow and improve income and employment for MSEs include the following:

- An increasing number of dedicated small-scale farmers who are enthusiastically adopting the production of horticultural crops in the current farming systems as an important source of income. Low use of improved inputs due to high costs, lack of technical skills and market information, lack of appropriate extension services and the concomitant poor crop husbandry are however constraining progress in this direction, yet some amount of networks and skills to provide the training exists in the country.
- Production of fruits and vegetables along the great north road corridor and the TAZARA railway line which provides means for reaching the large and growing Dar es Salaam market as well as regional such as Malawi, Zambia and DRC.
- The availability of land for expansion, varied climatic conditions and possibility for irrigation, which provides an opportunity to produce a wide range of horticultural products throughout the year.

- The significant part practice of producing organic fertilizers, which could interest international buyers.
- Increasing interest in micro to medium level processing business enterprise.
- Possibility for Tanzania finding a window to export to the EU market when import tariff preferential treatment for key regional suppliers such as Kenya under the LOME Convention expires in January 2008. This will however be subject to compliance with the EUREP-GAP and BRC requirements pertaining to Traceability of the Product, Fertilizer usage, water resources utilization, Environmental Issues and use of chemicals, post harvest treatment and social welfare issues among others.

14 RECOMMENDED OPTIONS PESA ASSISTANCE

The ultimate goal of the DAI PESA project is to increase income generation employment for MSEs involved in the subsector through facilitating business services that address the constraints, which in this case relate to production, marketing, processing, transport, policy and regulation. The three strategic interventions identified by the DAI-PESA project, namely; marketing, capacity building and policy are well placed to address the some of the aforementioned constraints. Based on our analysis, it is recommended that PESA activities to be focused on the following:

- (i) The following geographic clusters and commodities:

TABLE 7: CONCENTRATING PESA EFFORTS ON COMMERCIALLY ORIENTED PRODUCERS IN THE FOLLOWING GEOGRAPHIC CLUSTERS AND ON COMMODITIES SHOWN:

Region	Geographic Cluster	Vegetables
Morogoro	Mkuyuni and Mgeta.	Onions and tomatoes
Iringa	Ilula, Makambako, Mbuyuni, and Mahenge.	Cabbages, onions and tomatoes
Mbeya	Mbarali and Mbozi.	Onions and tomatoes

- (ii) Improving productivity through increased and appropriate input utilization and promotion of pests and disease resistant seed varieties for the wet season and appropriate irrigation techniques for production for the dry season. This could be done in collaboration with the horticulture section of MAF, regional authorities and research institutions.

- Facilitating subject focused farmer field days concentrating on commercially oriented producers in the geographic clusters mentioned above with a view to providing appropriate extension services through direct training of farmers by trainers or by existing training extension officers, retired agricultural extension officers, progressive farmers, and input suppliers where possible. This could be done in conjunction with Sokoine University, farmer association networks or suitable NGO or private sector partners.

- (iii) Building organizational and operational capacities of farmer organizations.

- Facilitating and sensitizing demand driven formation of strong and sustainable farmer associations in the identified clusters which could be done in close collaboration with MVIWATA and other relevant farmers organizations;

- (iv) Establishing appropriate systems and organizational structures for information collection
- PESA to undertake brief and focused assessments of information needs for producer and traders in onion, tomatoes and beans in the identified clusters initially focusing on Makambako, Mkuyuni, Ilula and Mbarali markets or collection points. This should be done in very close collaboration with relevant stakeholders with priority being given commercial sustainability and efficiency.
 - Designing appropriate formats for collection and presentation of production and market price information data for onions, tomatoes and beans again in close collaboration with farmers and farmer associations as well as traders in the identified geographic clusters;
 - Facilitating the establishment of commercially driven, cost effective and efficient systems for delivering market information;
 - Facilitating the establishment of price and market information systems via channels as email, SMS, radio bulletin, and local Swahili newspapers;
- (v) Promoting product quality and establishing alternative market linkages, which could be done through:
- Facilitating the establishment of contacts for regional importers, and facilitating visits by representatives of farmer organizations in regional countries such as Zambia, Malawi, Kenya and the DRC, with a view to entering into medium to long-term business association.
 - Facilitating the development of appropriate and affordable packaging materials (e.g. plastic containers) to gradually replace the tengas, which not only have a short life span but also cause damage to products especially tomatoes. This possibility for this should be assessed in collaboration with relevant private and public sector organizations.
- (vi) Advocacy on policy, cess and taxes issues.
- Facilitating advocacy for explicit government recognition of the importance of horticulture as a potentially important subsector for poverty alleviation in the rural areas, and therefore provide the necessary support in ways data collection and analysis, mainstreaming the development of the subsector in the overall agriculture public sector support (especially in extension service and transport), taxes on inputs, local government cess and export tariffs. Another important aspect to be addressed is the bureaucratic and costly procedures licensing micro businesses in processing by TBS, which at the moment is inhibiting growth of this industry.

- Studying the regulatory issues pertaining to market cess, its application and collection, to gain a better understanding of the actual impact on marketing and market prices.
- (vii) Institutional Collaboration
- Facilitating the establishment of a consultative and collaboration framework between public, private, donors and NGOs stakeholders in the subsector. Private sector institutions that would have much to offer include PASS Ltd and Shoprite among others.
- (viii) Credit for production
- Investigating the possibilities for introducing innovative credit systems e.g. group guarantees in close collaboration with farmer groups, NMB and NGOs involved in this field. SACCOs in PESA regions could be supported through the project to promote linkages to Micro-credit institutions and the larger banks.

ANNEX 1: PRODUCTION OF FRUITS AND VEGETABLES 2001/2002 (MT)

VEGETABLES			
Cabbages	221,114	220,000	222,700
Onions	174,025	170,000	170,500
Amaranthus	14,000	13,500	14,600
Leafy vegetables	760	700	850
Bamia	150	120	200
Carrots	1,900	1,500	2,000
Peas	250	230	280
Swiss chard	559	580	570
Egg plant	1,870	1,880	1,900
Sweet Pepper	3,000	3,100	3,300
Broccoli	20	21	30
French beans	1,700	1,710	1,750
Subtotal	549,348	533,341	549,180
FRUITS			
Orange	140,000	139,500	145,000
Mangoes	142,300	140,000	146,000
Pineapple	218,400	218,000	200,000
Fruit Tree Tomatoes	17,300	16,000	18,000
Paw paws	2,500	2,300	3,000
Bananas	554	450	550
Guavas	500	400	600
Lemon	1,000	700	1,200
Passion Fruits	1,500	1,200	1,700
Tangerine	1,200	1,000	1,300
Avocado	5,100	4,800	5,500
Stafeli	100	90	120
Jack Fruit	3,700	3,200	3,800
Pears	1,700	1,500	1,750
Maapo	4,000	3,900	4,020
Loquarts	150	135	170
Feness	120	100	150
Subtotal	540,124	533,275	532,860
Grand Total	1,089,472	1,066,616	1,082,040

Source: MAFS-Horticulture Section.

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ANNEX 2: EXPORT AND IMPORTS OF HORTICULTURAL PRODUCTS (1998-1999)

Exports 1998			
Crop	Country of Destination	Quantity (Kg)	Value (Tshs)
Onions, Shallot, Leeks	Denmark, Kenya, Rwanda, Uganda, Zaire	987,360	93,463,693
Leeks	Kenya	3,600	570,240
Kohlarabi, Kale	Rwanda	28,700	2,229,041
Lettuce	AE	45	10,000
Dates	Malawi	450	159,998
Figs	Belgium, France, Netherlands	58,029	73,476,975
Pineapple	Kenya, Saudi Arabia	7,250	999,874
Citrus	AE, Switzerland	3,193,425	179,183,102
Apples	AE, Kenya, Oman, Uganda	4,166	8,491,325
Pears and Quinces	Kenya, Oman	254,312	12,981,619
Plums and Sloes	Kenya	60,000	2,784,596
Exports 1999			
Onions, Shallot, Leeks	India, Kenya, Rwanda, Thailand, US, Zaire	499,250	42,543,204
Leeks	US	40	1,788,721
Jellies, Jams, Marmalades	Zaire	250	98,144
Fruit Juices	Japan, Rwanda	5,380	193,944
Carrots turnips, beetroot	Kenya	1,300	110,000
Imports 1998			
Onions, Shallot, Leeks	UK, Japan, Kenya, SA	14,707	10,120,718
Garlic	AE, India	2,140	1,309,054
Leeks	AE, Japan	1,213	120,260
Dates	AE, china, Germany Egypt Iran, Japan, Oman Pakistan, Saudi Arabia, US, SA	726,845	255,580,649
Figs	Iran, Pakistan	2,557	166,617
Pineapple	Italy, Japan	418	217,642
Citrus	Kenya, AE, UK, Canada, India, Saudi Arabia	3,840	3,336,304
Apples	UK, Kenya, SA	22,962	7,872,846
Apricot	UK	252	67,749
Jellies, Jams, Marmalades	Canada, Pakistan	99,746	56,361,751
Fruit Juices	AE, UK, Kenya, Netherlands	344,563	169,097,067
Imports 1999			
Onions, Shallot, Leeks	AE	1640	835,819
Garlic	AE, SA	18,999	5,690,368
Cabbage, Cauliflower, Kohlrabi, Kale	Kenya	2000	200,412
Dates	AE, Dominica, UK, India, Japan, Iran, Oman, Pakistan, US, Saudi Arabia	737,743	215,560,428

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Citrus	AE, Kenya	51,443	4,360,822
	Imports 1999		
Pears and Quinces	Kenya, Oman, Saudi Arabia, Sweden, SA	490	281,813
Apricot	AE	4,450	2,266,556
Strawberries	AE, Canada	16,554	16,354,042
Jellies, Jams, Marmalades	AE	124,553	61,834,634
Fruit Juices	AE, Italy, Kenya, Netherlands	727,471	387,275,509

Source: 1998/99 Market Review Report (Ministry of Agric. & Cooperatives)-May 2000

ANNEX 3: COSTS AND GROSS MARGINS FOR TOMATOES FROM MAKAMBAKO & SOLD IN DAR ES SALAAM

TOMATOES	Dry Season (May-Nov)	Wet Season (April-Dec.)
AVERAGE FARMER'S GROSS MARGIN		
Leasing of land per year	15,000	15,000
Land Preparation/labor	14,400	14,400
Seeds (100 grams)	7,000	7,000
Nursery Preparation	4,000	4,000
Manure-Nursery	250	250
Planting	14,400	14,400
Manure	45,000	45,000
Weeding (3 times)	43,200	43,200
Sulphate ammonia (SA)+CAN	16,000	16,000
Pesticides (Novalthane/Banko)	178,000	256,000
Harvesting (Labor)	49,600	49,600
Transport to collection point	500	500
District Council Cess	300	300
Off-loading	100	100
Sorting and Packaging	500	500
Total Cost	388,250	466,250
Yields (14 kg debes)	1,615	1,710
Yields (70 Kg tenga equivalent)	323	342
Average cost per Tenga	1,200	1,362
Average Price per Tenga equivalent	8,000	16,250
Gross Sales Revenue	2,584,000	5,557,500
Gross Margin/Tenga	6,800	14,888
Gross Margins/acre	2,195,750	5,091,250
AVERAGE WHOLESALER'S MARGINS		
Buying Price/Tenga	8,000	16,250
Packing	300	300
Re-packaging	600	600
Loading on to truck	250	250
Transport to Dar es Salaam	2,700	2,700
Off-loading from Truck	250	250
Cess	300	300
Commission to agent	1,000	1,000
Total Cost	13,400	21,650
Selling Price to Retailer	24,286	42,000
Gross Margin/Tenga	10,886	20,350
AVERAGE RETAILER'S MARGINS		
Average Buying Price per Tenga	24,286	42,000

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Loading on Pick/up or Hand Cart	250	250
Transport to retailing point	700	700
Off-loading at Kiosk	250	250
Total Cost	25,486	43,200
Selling Price/Kg	486	840
Selling Price per Tenga Equivalent	34,000	58,800
Gross Margin/Tenga	8,514	15,600

Source: Based on farmer, wholesaler and retailer interviews by Horticulture Subsector Study team

ANNEX 4: AVERAGE COSTS AND GROSS MARGINS FOR ONIONS FROM IGOMERO IN MBEYA REGION AND SOLD IN DAR ES SALAAM

	Dry Season	Wet Season
FARMER'S MARGIN/BAG	Units	Units
Yields-bags/acre)	80	83
	Tshs	Tshs
Average Selling Price	24,143	50,000
Gross Sales Revenue	1,931,429	4,150,000
Seeds @ 2 Kgs per acre	14,000	14,000
Nursery preparation	3,000	3,000
Land Preparation	36,000	36,000
Manure and transport-7 tons	10,000	10,000
Urea (50 Kgs)	17,000	17,000
Planting	36,000	36,000
Weeding	66,000	66,000
Pesticides	8,000	20,000
Harvesting	18,000	20,000
Packaging materials to transport to homestead	2,500	3,000
Transport to homestead	40,000	45,000
Total Cost	250,500	270,000
Gross Margins/Acre	1,680,929	3,880,000
Gross Margins/Bag	21,012	46,747
WHOLESALE'S MARGIN/BAG		
Annual Average Buying Price/Bag	24,143	50,000
Loading at Farm gate	100	100
Transport cost to Dar (From Iringa/Mbeya)	3,250	3,250
Off-loading	300	300
Cess/ bag	400	400
Commission to agent	1,000	1,000
Average total cost	29,193	55,050
Annual Average Selling Price/bag	45,000	92,000
Gross Margin/Bag	15,807	36,950
RETAILER'S MARGIN/BAG		
Annual Buying Price per Bag	45,000	92,000
Loading on Pick/up or Hand Cart	250	250
Transport by P/up- (Wholesale-Kiosk)	700	700
Off-loading at Kiosk	200	200
Total Cost	46,150	93,150
Selling Price per Bag	67,500	138,000
Gross Margin/Bag	21,350	44,850

ANNEX 5: LIST OF PEOPLE INTERVIEWED

Date	Name	Place	Position/Organization
July 1, 2003	Joseph Burke	Dar es Salaam	Chief of Party –DAI PESA (HQ)
July 1, 2003	Abel Lyimo	Dar es Salaam	Associations Advisor -DAI-PESA (HQ)
July 1, 2003	Rodgers Marsha	Dar es Salaam	Field Officer -DAI-PESA (Mbeya)
July 1, 2003	Peter Kikoka	Dar es Salaam	Project coordinator -DAI PESA (Tanga & Morogoro)
July 1,2003	Joel Strauss	Dar es Salaam	Project Coordinator -DAI-PESA (Rukwa)
July 2, 2003	Said Lumuli	Dar es Salaam	Secretary-Tandale Market Traders Association
July 2, 2003	C. K. Chiza	Dar es Salaam	Director (Ag) Ministry of Agriculture & Food Security
July 2, 2003	Merius Nzalawahe	Dar es Salaam	Crop Devt. Division/Promotion Services Section
July 2, 2003	Tabu Likoko	Dar es Salaam	Crop Devt Division/ Promotion Services Section
July 2, 2003	Judith Kitivo	Dar es Salaam	Crop Devt Division/ Promotion Services Section
July 2, 2003	A. N. Munisi	Dar es Salaam	Director-Tanzania Exporters Association (TANEXA)
July 2, 2003	Ronnie Ferreria	Dar es Salaam	Manager-Shoprite Supermarket
July 3, 2003	Amon Maerere	Morogoro	SUA-Department of Crop Science and Production
July 3, 2003	Theodos Msogoya	Morogoro	SUA-Department of Crop Science and Production
July 3, 2003	Andrew Tarimo	Morogoro	SUA-Department of Engineering/Irrigation
July 3, 2003	Dr. E. S. Munkio	Morogoro	Morogoro Regional Office
July 3, 2003	Raphael Laiser	Morogoro	Agric. Officer - Morogoro Regional Office
July 3, 2003	Chambua	Morogoro	Regional Administrative Secretary
July 3, 2003	Joseph Kitangalala	Mbeya	Mbeya Regional Office
July 4, 2003	M. Magaya	Mbeya	Mbeya DALDO Office
July 4, 2003	Kayusi Musigusa	Mbeya	Large banana farmer/Trader
July 4, 2003	M.A. Msabaha	Mbeya	Zonal Director -R & D: Uyole Agri. Research Institute
July 4, 2003	Agnes Ndunguru	Mbeya	Researcher-Horticultural Sub-program-Uyole
July 5, 2003	Eliezer Mlimbila	Mbeya	TFA-Branch Manager (Mbeya)
July 5, 2003	Rashidi Muya	Uyole market	Uyole Market Manager
July 5, 2003	P. Subuko	Uyole Market	Market Secretary
July 5, 2003	Emanuel Paul	Uyole Market	Onion trader
July 7, 2003	Manfred Munguli	Sumbawanga	Farmer
July 8, 2003	Alfan Mohamed	Sumbawanga	District Agricultural Extension Officer (DAEO)
July 8, 2003	Japai Enterprises	Sumbawanga	Input supplier
July 8, 2003	James Ndalasia	Sumbawanga	Extension officer
July 8,2003	Raurent Bernard	Sumbawanga	Horticultural Farmer
July 8, 2003	Charles Lwinda	Sumbawanga	Horticultural Farmer-Onions/tomatoes
July 8, 2003	Korenel Kasuku	Sumbawanga	Horticultural Farmer-Onions/cabbages
July 8, 2003	Ezekiel Kasuku	Sumbawanga	Horticultural Farmer-Tomatoes

FRESH HORTICULTURE SUB-SECTOR STUDY
DAI PRIVATE ENTERPRISE SUPPORT ACTIVITIES-TANZANIA
FINAL REPORT

Date	Name	Place	Position/Organization
July 8, 2003	Daniel Thomas	Sumbawanga	Horticultural Farmer- Onions/tomatoes
July 8, 2003	Elias Masumbuko	Sumbawanga	Extension officer
July 8, 2003	Winfred Rujumba	Sumbawanga	Horticulturalist//MAFS
July 9, 2003	M.A. Msabaha	Mbeya	Director of R & D –Uyole Agric. Research Institute
July 10, 2003	Mrindi Kindimba	Mbeya	Farmer-Igomero Irrigation scheme
July 10, 2003	Stephen Biko	Iringa	Tomato farmer/trader
July 11 th , 2003	Moses Logani	Iringa	CEFA (European Committee for Agric.& Training)
July 12 th , 2003	Bendantunguka T.	Morogoro	SUA- Head of Food Science & Technology Dept.
July 12 th , 2003	Mwadhini Myanza	Morogoro	Coordinator-MVIWATA
July 12 th 2003	M. Gohil	Dar es Salaam	Managing Director Dabaga (on phone from Morogoro)
July 12 th 2003	Yahaya Chande	Matombo	Fruit Farmer
July 12 th 2003	Everest Mkunde	Matombo	Fruit Farmer
July 15 th 2003	Michael Fredericksen	Dar es Salaam	Country Director-Enterprise Works
July 15 th 2003	Kuzacha Ibna	Dar es Salaam	Wholesale Trader (Kariakoo Market)
July 15 th 2003	Stephen Raphael	Dar es Salaam	Mkombozi Veg. Association (Kariakoo Market)

ANNEX 6: ITINERARY

Date	Activity
June 30 th , 2003	Travel from Nairobi to Dar es Salaam
July 1 st , 2003	Meet DAI-PESA staff in Dar es Salaam for briefing and review Documents
July 2 nd , 2003	Interviewing subsector stakeholders in Dar es Salaam
July 3 rd , 2003	Traveling from Dar es Salaam to Iringa for field interviews
July 4 th , 2003	Travel to Mbeya for field interviews
July 5 th , 2003	Interviews in Mbeya -TFA, horticultural product traders, transporters etc)
July 5 th , 2003	Travel to Sumbawanga
July 6 th , 2003	Rest in Sumbawanga
July 7 th , 2003	Interviews in Sumbawanga-Urban
July 8 th , 2003	Interviews in Sumbawanga-urban & Rural
July 9 th , 2003	Travel to Mbeya & Undertake interviews (Gross Margins)
July 10 th , 2003	Interviews in Mbeya and Travel to Iringa
July 11 th , 2003	Dabaga Veg & Fruits processing factories, interview farmers and travel to Morogoro
July 12 th , 2003	Interviews in Morogoro Prof. Bendantunguka Tiisekwa of SUA Food Science & Tech. Dpt/Community Food Processing and Training Center (CFPTC)-Morogoro
July 12 th , 2003	Travel to Matombo in Morogoro and undertake interviews with fruit farmers
July 13 th , 2003	Travel to Dar es Salaam
July 14 th , 2003	Draft report writing
July 15 th , 2003	Interviews in Dar es Salaam/Draft report writing
July 16 th , 2003	Draft report writing
July 17 th , 2003	Draft report writing
July 18 th , 2003	Debriefing Session and Presentation of Study Findings
July 19 th , 2003	Travel from Dar es Salaam to Nairobi.
July 21 st , 2003	Draft report writing
July 22 nd , 2003	Draft report writing
July 23 rd , 2003	Draft report writing

ANNEX 7: BIBLIOGRAPHY

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6. Investment Potential in the Horticultural Industry in Tanzania -by Private Agricultural Sector Support Limited (PASS).
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9. District Integrated Agricultural Survey Results 1998/99-Mbeya Report (Feb. 2001).