

DEVELOPMENTS IN THE HORTICULTURAL SUPPLY CHAINS IN ZAMBIA

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Reducing Losses and Improving Quality in Fruits and Vegetables in Eastern and Southern
Africa

Background

Commercial horticulture in Zambia developed in the 1980s, launched by commercial farms that needed foreign currency to import equipment for their main activities (cattle and cereal). During the 1990s it grew quickly with the support of the European Investment Bank and Export Development Project, which provided long-term credit to some investors, cold storage at the airport, allowed producers to import necessary inputs, and partly subsidized air freight. About 95% of the flowers exported are roses while vegetable production for export is more diversified including green beans, baby corn, carrots. The development of export horticulture was being spearheaded by the Zambian Export Growers Association (ZEGA) which was created in 1984 as a non profit making association to promote the interests of all growers wishing to export fresh horticulture produce. According to www.zambiaexportgrowers.com, it has a paid up membership of 50 with 35 being direct exporters.

As a professional and independent body, its aims are chiefly to provide an efficient and adequate air freight service to exports; co-ordinate the buying of inputs and the organization of technical assistance under the EU Export Development Programme; advise on sources of finance; assist with information on marketing opportunities; lobby Government and other bodies on behalf of grower-exporters; and provide technical support services and training to members. Thus its members are very specialized with their challenges and these are well articulated and addressed.

Horticulture including floriculture has for long been regarded as highly promising non traditional export sectors of the economy of Zambia. These sectors are 100 per cent export-oriented and they experienced financial losses as a result of the appreciation of the kwacha against major currencies in the last few months of 2005. In order better to exploit the potential of the horticultural sector, much needs to be done to improve the domestic horticultural value chains as well.

While much is known about the successes and failures of export horticulture in Zambia, much less is known about the performance of the domestic horticultural system. Yet we *do* know that this system is much larger and involves many more people than does the export system. Nearly all export vegetables are produced by medium- and large-scale farmers under outgrower schemes in limited geographical areas. For example, the defunct Agriflora, the largest vegetable exporter before its demise, used to contract growers only within a 50 km radius of its Lusaka operations (The IDL Group, 2002). In contrast, 21% of small- and medium-scale farmers (about 300,000 households) throughout the country sold an average of about US\$209 per annum of fresh produce in the years 2001 to 2008, nearly all of it into the domestic market. In addition, the 2007 World bank Value Chain Analysis-Zambia Value Chain Management Report, domestic horticulture sector earnings amount to US\$116 million

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compared to US\$55 million for export horticulture which was also less than that of the cotton (US\$81 million), sugarcane (US\$65 million) and tobacco (US\$63 million) sectors. In addition, millions of consumers in Lusaka, Ndola, and other cities and towns consume fresh produce on a daily basis; the cost, quality, safety, and reliability of supply of these items has a major influence over their real purchasing power and quality of diet. It is, therefore against this background that this analysis will focus more on the domestic horticultural sector which affects a larger part of the population, has been neglected and has greater potential for alleviating the widespread poverty in the country².

Importance of the sector in rural income generation and urban consumption

It is widely acknowledged the world over that smallholder farmers growing and selling horticultural produce (or fresh produce) are more likely to get out of poverty than cereal growers. The mean household per capita income among small and medium scale farmers who sell fresh produce in Zambia is estimated at US\$183 compared to US\$103 among non-sellers (based on analysis of the first, second and third nationally representative CSO/MACO/FSRP³ Supplemental Surveys). The figure rises from US\$103 for the lowest one-fifth of sellers to US\$387 among the highest one-fifth of sellers. Fresh produce account for 18% of the household total income and 39% of the total household cash income.

Fresh produce is an important component of the diets of urban households in Zambia as well though they do not usually produce their own. According to the CSO/MACO/FSRP Urban Food Consumption Survey (UCS) of 2007/8, fresh produce account for 21% of the food budget of urban households in Lusaka, coming second only to cereals and staples at 24%. The share of household total consumption of fresh produce from own produce is only 7% which means that over 90% of the value passes through marketing channels as purchases.

Main market channels

We have seen that over 90% of fresh produce consumed in urban households (Lusaka) pass through the marketing system involving wholesale as well as retail markets. Soweto market is at the center of this system. Soweto is a sprawling retail market – by far the largest in Lusaka and the country -- that also serves as the dominant wholesale market in the city. Yet the market has almost no infrastructure specifically suited for fresh produce wholesaling; nearly all such wholesaling currently takes place in an uncovered dirt field at one end of the market complex with no dedicated entry and exit points, very limited storage capacity, and no cold storage of any kind. The area is in fact owned by a private individual and City Council considers that the traders operating there – who form the linchpin of horticultural marketing in the country – are squatting. The Urban Markets Development Program, funded by the EU, has made substantial investments in several retail markets of the city, including Soweto, but due to the legal status of this wholesale trading area, the program has ended without making any improvements in the area.

² The ZEGA Chief Executive Officer was out of the country at the time of this write up, and in fact details about their exports could not be obtained

³ CSO stands for Central Statistical Office; MACO, Ministry of Agriculture and Cooperatives; and FSRP, Food Security Research project.

The vegetable retailing system is made up of the “*traditional system*” composed of open air markets and the “ka sector”, the multitude of small vendors outside of organized market places that pursue sales by locating along busy pedestrian walkways and in residential neighborhoods⁴. The other component of the fresh produce retailing system is the so-called “*modern system*”, composed of supermarkets, minimarts and grocery shops. Analysis by Tschirley and Hichaambwa (2010) has shown that the “*traditional market system*” has a market share of 95-96% of the staple vegetables (tomato, rape and onion” leaving the “*modern system*” with only 4-5%. Further analysis showed that the “*traditional system*” is largely supplied by Soweto market accounting for 91% for onion, 78% for tomato and 59% for rape.

Tschirley and Hichaambwa (2010) further estimated annual average flow of tomatoes through Soweto market over the two year period January 15 2007 to January 15 2009 as 30,148 metric tons; that of rape as 5,946 metric tons’ and onion as 14,664 metric tons. The overall importance of Soweto market can be underlined by these large quantities and values of these vegetables that flow through it annually. This is worth a total of K 66 billion or US\$ 13 million at wholesale prices of these three vegetables bear in mind that a lot more types of fresh produce and other types of commodities pass through there.

The FSRP started addressing the lack of knowledge on fresh produce supply chain by studying in detail those of tomato, rape and onion. Apart from being staple vegetables being consumed on a daily basis by most households in East and Southern Africa, these vegetables show varying characteristics in terms of perishability and seasonality and hence can represent the variety of products available on the market⁵.

Most tomato into Lusaka comes from large farm areas with a market share of 45% by volume followed by medium farm areas (44%) and lastly small farm areas (12%). The independent rural farm sector provides 97% of the tomato marketed in Lusaka, with the remaining 3% likely coming from urban and peri-urban production and sold directly to households⁶. Only 35% of production from the independent rural farm sector is sold through traders or rural assemblers for sale to Soweto. Forty-four percent is sold by farmers directly to this wholesale market while 4% is sold by farmers to other smaller wholesale markets such as Bauleni market and Old Ngoma market and 7% is sold directly by farmers to retail markets.

Of the quantity flowing into Soweto, 39% goes into open air retail markets and the ka sector with 31% going to institutional buyers such as restaurants, schools, hospitals, etc and 24% being exported out of Lusaka to places such as Livingstone, the Copperbelt and the DRC. Some tomato from Freshmark is supplied into supermarkets as is the case with processed tomato from Freshpikt and Rivonia, which is also exported. Thus a total of 31% of tomato is shipped out of Lusaka.

Unlike tomato, the medium farm areas are the most important suppliers of rape, accounting for 50% of the total quantity supplied during the study period. The large farm areas accounted for 40% while the small farm areas accounted for only 10%. The flow of rape from all these areas through traders or rural assemblers to Soweto is insignificant (0.1-0.2%). About 96% is

⁴ “ka” is the diminutive in Bantu; thus kashop is a small, rudimentary shop, katable is a small table on which a vendor sells her wares, kantemba is a small “ntemba” or kiosk. Note that small retail shops are also considered part of the broader traditional marketing system, but these sell almost no fresh produce.

⁵ The simplified channel maps for the systems of these three vegetables serving Lusaka are shown in the annex.

⁶ In all the maps, this value is approximately equal to the value in the “private hh” box at retail level.

supplied by the independent farm sector and 65% of these volumes are directly sold by farmers to retail markets while 30% and 5% is supplied by farmers to Soweto market and to other smaller wholesale markets, respectively. There is no flow of rape through Soweto and then outside Lusaka and supplies to institutions are insignificant; institutions prefer cabbage, which is more convenient to handle and stores better.

Unlike the other two vegetables, most of the onion (58%) is imported from South Africa and Malawi. Within the local areas, onion is supplied mostly by medium (27%) followed by small (14%) and then large farm areas (2%). The independent rural farm sector supplies 42% of the onion flow into Lusaka. Out of this, 25% is sold directly by farmers to Soweto market while only 14% is supplied to this market through sales to traders. Another 3% is supplied by farmers directly to retail markets. From the onion reaching Soweto market, 37% moves to retail markets, 21% to institutional buyers and 38% is shipped out of Lusaka to places such as Livingstone, the Copperbelt and the DRC.

The Domestic horticultural system operates in a regional market

We have seen above that the domestic horticultural system also operates in a regional market. Considerable quantities of onion coming into Lusaka are imported from South Africa and Malawi and are also, later, exported to other parts of the country and neighboring countries (DRC). Some onion also comes from Tanzania, but this onion is mainly distributed to the northern parts of the country. Though tomatoes are not imported into the country, considerable amounts are exported to countries such as the DRC and Namibia via Livingstone. Most of this trade, however, is informal and official statistics are not available.

In addition to the above, other fresh produce imported into Zambia are oranges, bananas, apples and pears mainly from South Africa by private traders who charter transport from there (refrigerated in case of perishables). Some oranges are also imported from Zimbabwe. These traders nowadays rent warehouses in Lusaka a few of which have cold rooms. From Lusaka these fresh produce are also redistributed to other parts of the country including exports to the DRC as is the case with onion. Freshpik is the largest fresh produce processing company in Zambia and produces processed tomatoes, pineapples, onions, etc for the domestic as well as regional markets (South Africa, Zimbabwe, Tanzania and DRC). Transportation of these, being processed, does not require refrigeration.

The private traders who engage in the fresh produce local or regional trade use any type of available transport for this purpose, and there are no known customs clearing procedures applicable to fast moving cargoes such as refrigerated perishable produce or freight forwarding companies specializing in perishable cargoes. In addition:

- There is no data on any existing sea-export of fresh produce.
- The latest situation with regard to refrigerated truck capacity can not be assessed due to absence of data. There are a few private businesses that own a few refrigerated trucks that can be hired to transport any perishable product. Large organizations such as beef and dairy processing organizations own refrigerated trucks for their own use, distributing products to their network of outlets or wholesale clients.
- There is not yet any trend for modern wholesale markets to incorporate cold storage for longer shelf life of stored products. The newly constructed Soweto market has completely no provision for fresh produce wholesaling and a number of stakeholders are concerned about this and are beginning to engage in dialogue on the way forward.

- The only facilities available for handling fresh produce are those developed and owned by ZEGA with support from the European Union at the airport largely for their own use.

Post harvest challenges

Within the supply chains, post harvest losses have been experienced through:

- Transport related losses which include damage due to careless handling during loading and unloading, vibration or shaking arising from poor state of either the vehicles or the roads or both, long distances to markets, squeezing of packages to maximize revenue by transporters, and use of inappropriate vehicles (using whatever is available).
- Poor quality markets often provide little protection for produce against the elements leading to rapid produce deterioration.
- Supply glut leading to supply greatly exceeding demand such that produce stays longer on the market without refrigeration facilities and hence reducing in quality and eventually going to waste.
- Poor hard market infrastructure, without the basic concrete slab and allowance for drainage, sanitation, and coordinated human and traffic flow with designated entry and exit points. This entails selling produce from the ground which is usually muddy in the rain season and greatly dusty in the dry season.
- Lack of soft market infrastructure such as:
 - Grades and standards to enhance quality
 - Market and other information across the supply chain to coordinate or harmonize supply and demand
 - Low capacity of brokers for efficient brokerage leading to slower sales
- Inherent poor quality produce from harvest due to poor crop management
- Limited or lack of cold chains
- Lack of storage capacity
- Limited processing capacity leading to great wastage of fruits such as guavas and mangoes when they are in season.

Opportunities in alternative freight ways

Zambia being landlocked all fresh produce exported to Europe is transported by air through chartered freights most facilitated by ZEGA which has quality fresh produce handling facilities at the Lusaka International Airport. It's up to the members or exporter to transport the produce in refrigerated trucks from their farm or production area to the airport. Exporters have faced a number of challenges which include high flight chartering costs making the produce less competitive on the European market. The exporters try as much as possible to respond through lowering production costs as they really do not have much alternative to this way of freight. The sector had become unprofitable following the over valuation of the local currency in 2005/2006 period. And more recently, it was reported in the press that ZEGA was losing about US\$150,000 per day due to cancelled flights as a result of restricted flights in Europe following the eruption of volcanic ash.

On the domestic and regional scene apart from imports from South Africa which are transported by well designated vehicles from there, transportation is achieved by whatever is available and affordable. Quite often fresh produce has been physically damaged as a result of improper packing in unsuitable vehicles. A case in point is that of Freshpikt (a food

canning company) receiving badly crushed pineapples from Mwinilunga in Northwestern Province about 1000 Km away because they were just packed any how in any vehicle available. These are normally the same vehicles that are used for transporting grain, tubers, livestock and even people. In addition, to these challenges, the transport costs are quite high due to the high cost of fuel and bad state of rural feeder roads.

Anticipated future trends

The vision for Zambia's horticultural sector emphasizes continued growth in exports, an increase in the smallholder share of this market (from negligible levels currently), and reduced costs and improved quality in domestic horticultural marketing. Emphasis is on the essential complementarity between the export and domestic systems, manifested in at least two ways. First, helping smallholders participate in the export system will increase the supply of high quality produce reaching the domestic market. It will do this directly through diversion into the domestic market of produce not quite meeting the very high export standards, and indirectly by increasing awareness and skills for producing high quality produce among the exporting smallholders and those they influence through a demonstration effect. Second, investing in hard and soft marketing infrastructure (transport; assembly, wholesale, and retail markets; improved marketing information and grades and standards) for the domestic market will improve quality and reduce costs in that system, thus expanding the share of fresh produce potentially meeting export standards.

Thus possible investments, primarily based on the fact that only about one-fifth of small and medium scale farmers in Zambia sell fresh produce, that those who sell are more likely to have income growth, and that it is the markets that stimulate production and not the other way round, are:

1. developing within the public-public partnership framework proper fresh produce wholesale markets in selected major cities of the country starting with Lusaka, Livingstone or Choma in Southern Province and the Copperbelt Province. These need not be elaborate and expensive and expensive structures but should have the basic requirements of fresh produce wholesaling which include shelter, concrete slab, drainage, sanitation, orderly and uncongested human and vehicular traffic with dedicated entry and exit points, cold storage facilities, etc). The cold storage facilities to be linked with refrigerated trucks to service necessary points in the supply chain;
2. building capacity of managers of these markets through training and visits to relevant successful markets within the region;
3. providing for proper brokerage services through legally institutionalizing the concept as well as training would be brokers so that they behave in a manner that enhance market efficiency;
4. investing in soft market infrastructure such as market information and grades and standards. The FSRP has developed a market information system for fresh produce at Soweto market which is to be implemented by the Zambia National Farmers' Union but has not yet been due to lack of financing. It is envisaged that once the system is implemented, it can later be replicated at other markets in Livingstone/Choma and the Copperbelt in order to facilitate price spatial arbitrage. The market information system could also be used for information flow in order to enhance coordination among players along the supply chains. Information on availability as well as cost of inputs and crop field management practices could also be channeled through the system. FSRP has also started developing informal grades and standards for tomato, rape and onion at the same

market in close consultation/collaboration with farmers and traders. This needs further development, strengthening and implementing;

5. the rehabilitation of major road links in the country is addressed under the Road Sector Investment Programme II. Enhancement of railway links is planned through the Chipata/Mchinji rail link (connecting to Malawi), a part of the Nacala Corridor, and the pending Kasama/Mpulungu rail link (connecting to Tanzania). The Beira Corridor through Zimbabwe (road) and the opening of the Nacala Corridor for rail transport (the latter stretching from the Port of Nacala in Mozambique via Malawi to Lusaka), are of particular interest for alternative routes to sea ports. However, the rehabilitation of feeder roads that link the major roads to production areas need to be addressed as well;
6. there is need to invest in vehicles specially made refrigerated vehicles for transportation of fresh produce to maintain quality along the chain;
7. there is need to improve processing capacity to process excess seasonal fresh produce for sale/consumption when the same are not in season.

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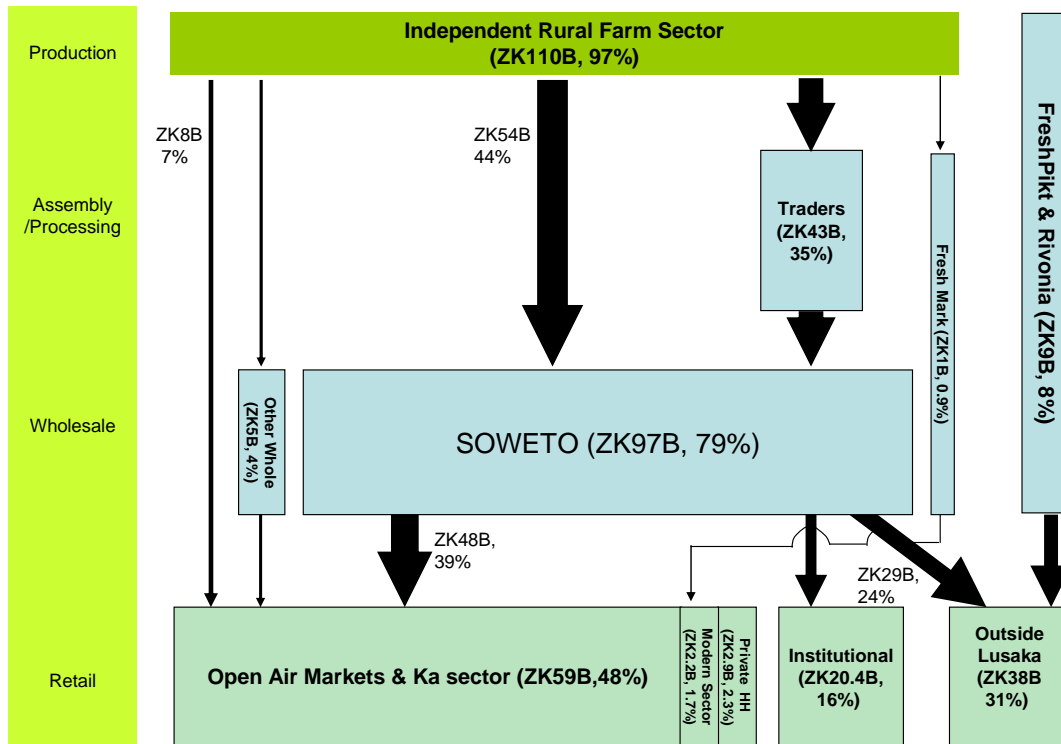
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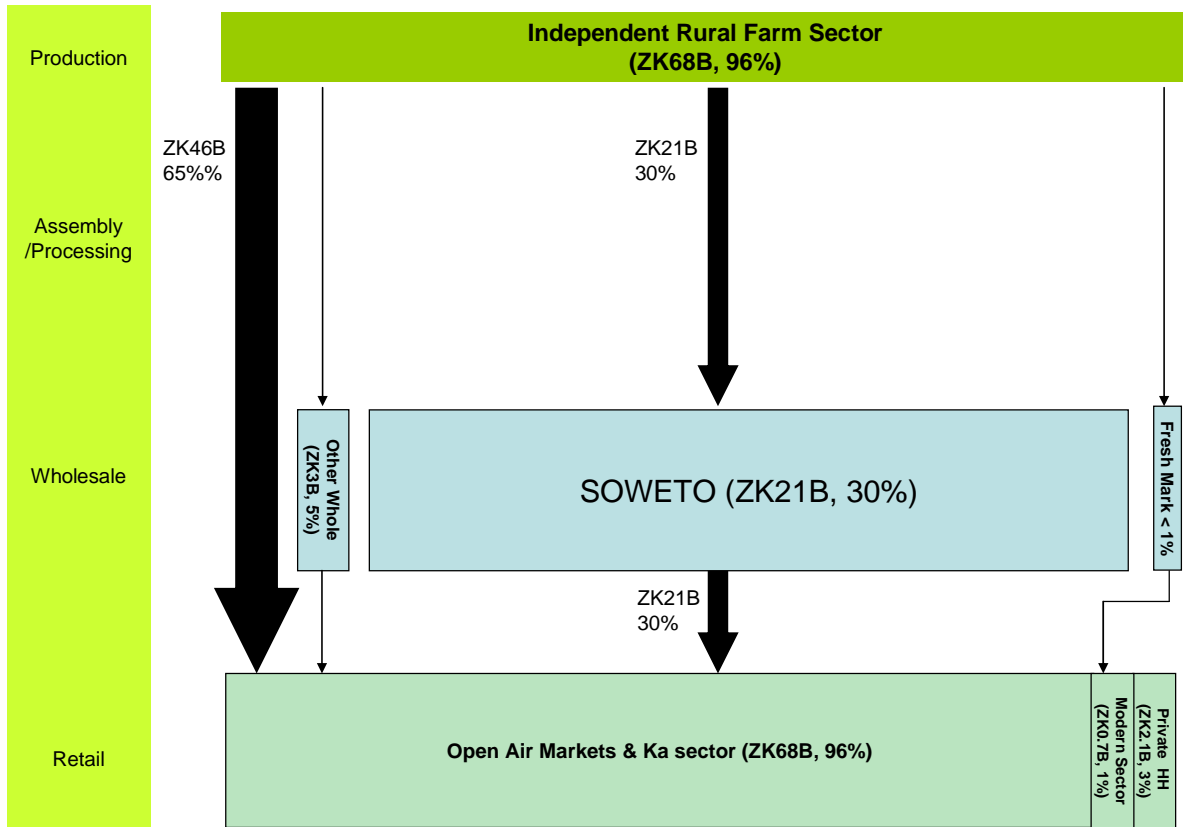
ZEGA website: www.zambiaexportgrowers.com

Annex: Market channels of tomato, rape and onion system supplying Lusaka

Tomato



Rape



Onion

