

Development of commercial field vegetable production, distribution and marketing for the East African market

Literature review Kenya



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1 Introduction

For 2007 the Dutch Ministry of Agriculture, Nature Management and Food Quality (LNV) commissioned Wageningen UR to commence a project to contribute to a vital rural economy of Tanzania and Kenya through the development of effective and integrated field vegetable chains for the domestic and regional market in East Africa.

The purpose of the project is to support the development of a restricted number of pilot product-market chains with a high market potential in close co-operation with relevant private and public actors as well as generating and dissemination relevant information for the development of the regional vegetable market in East Africa. This will be realised through:

- participatory development and implementation of innovative, economic feasible and sustainable production methods in line with market demands,
- empowerment of public institutions to sustain the foregoing and
- generate policy relevant information and recommendations.

This literature review is the first activity in the project and has the following objectives:

- Review of general relevant literature on vegetable production and chain development processes for domestic and regional markets in East Africa
- Identification and review of on-going related activities in Kenya and Tanzania
- Identify major actors and stakeholders in the vegetable industry in Kenya and Tanzania

Based on the results of the literature review and telephone/e-mail interaction with major actors, a pre-selection of potential vegetable chains for Kenya and Tanzania is made using the following criteria:

- High market potential in the country or neighbouring countries
- Potential profit margins for various actors in the chain
- Existing challenges at production and distribution and marketing level
- Diversity in marketing channels

2 Importance of the horticultural sector in Kenya

The rural economy and, in particular, agricultural production, is of primary importance to the livelihoods of most Kenyans. The population is predominantly rural (80%) and the majority of households (70%) rely directly on the agricultural sector for their livelihood. Agriculture contributes 25% to Kenya's GDP and is estimated to account for 60% of total exports and 45% of government revenue. Unlike many other Sub-Saharan African countries, Kenya already has a relatively advanced and highly diversified agricultural sector, including well established export commodities such as tea, horticulture, coffee and pyrethrum, and one of the best developed dairy sub-sectors on the continent. However, overall performance in the sector has been poor during the past decade, with average annual growth rates of 0.4% during 1990-1995 and 1.1% during 1996-2000 (IFAD, 2004)

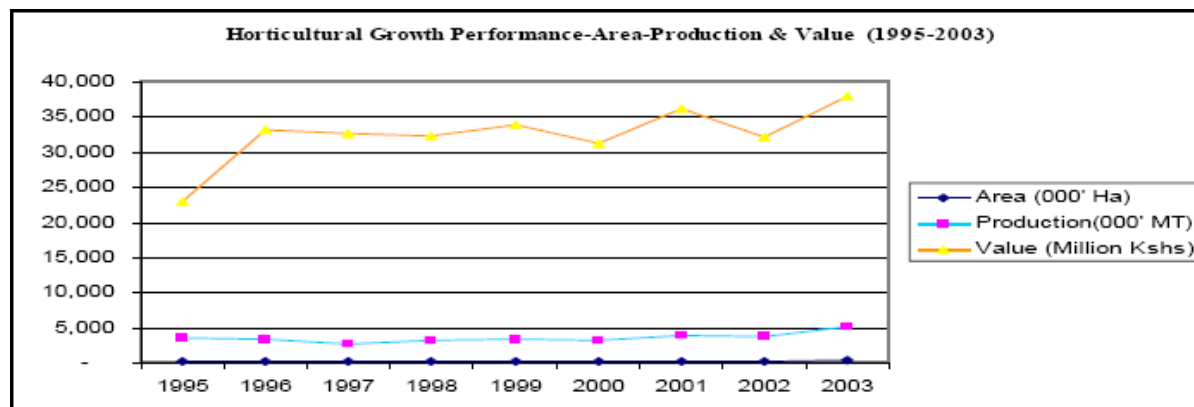
Smallholder production dominates the sector, in terms of the production of food crops and livestock products for the domestic market, as well as the production of crops for processing and exports to regional and overseas markets. However, there is considerable variation between sub-sectors and products: while smallholders produce more than 80% of Kenya's milk and account for 70% of horticultural production, less than 20% of export vegetables and only about 25% of marketed maize is produced by smallholders. The majority of Kenya's smallholders are market-oriented to some extent: it is estimated that as much as 80% of all rural households sell some crops, although the degree of commercialization can range from less than 10% in relatively low-potential districts to 80% in high potential districts.

Horticulture in Kenya has been an important foreign exchange earner and contributes to employment and farm incomes for the rural population. It has undergone dramatic growth over the years with several players getting involved in export and sale to local markets. In terms of sub-sectoral contributions to GDP, horticulture has ranked top five for several years. Over the last four years the sub-sector has grown by over 10% per annum for last four years with an estimated value of local and export earnings of 7.5 million US dollars. Horticulture exports in 2001 were valued at about 25 million US dollars. Growth in the fresh fruits, vegetables have indeed contributed significantly to the success of the horticultural growth in Kenya. Fresh fruits and vegetables are produced by a large number of smallholder producers, who are spread all over the country who also depend on these commodities for incomes, food security and employment. The horticultural sub-sector particularly provides incomes to smallholder producers on regular basis. (Nyoro, 2004)

Kenya's horticultural sector has received a great deal of attention from local and international researchers, government, and donors over the past decade, due to the rapid and sustained growth of its export sector. From a very low base, Kenya's horticultural exports (defined here to include fruit and vegetables but not flowers) grew 9% per year in the first decade after independence, then 17% per year from 1974-1983 (Minot and Ngigi 2002). Growth slowed over the 1980s and 1990s, but still averaged about 4% per annum over the past decade. By the year 2000, fruit and vegetable exports amounted to US\$270m, or 15% of Kenya's total export economy. This impressive growth has undoubtedly contributed to increased rural incomes and reduced rural poverty, through both direct production effects and linkage effects, as horticultural incomes from export are re-spent in rural areas.

Despite the recent sluggish and declining performance of overall economic growth, the Kenya's horticultural sub-sector has continued to exhibit impressive growth performance in production as shown in the figure below.

Fig 1 Horticulture growth performance in area, production and value for the period 1995-2003



Source: Based on Data from HCDA/MOA

Factors underlying this impressive performance include: (a) the large local market (b) the lucrative and growing export market for a few high value horticultural products; (c) the relatively high product value per unit of land and labour inputs for most of the subsector's products that enables farm households to derive significant incomes from the already small farm sizes; (d) the relatively quick maturing period for most of the subsector's crops, enabling the poor farmers derive quick returns to factors of production; (e) the high adaptability of the various crops to a wide range of growing conditions; and (f) the "free-hand" environment

accorded to the sector by the Government enabling the private sector to undertake investments without fear of regulation.

Yet despite its rapid and sustained growth, exports remain a small fraction of Kenya's overall horticultural sector. For the past decade, over 90% of all fruit and vegetable production was consumed domestically, either on-farm or through domestic markets. Despite higher percent growth rates in the export sector, the absolute amount of growth has come overwhelmingly from the domestic sector: between 1992/93 and 2000/01, the domestic market accounted for 98% of the total growth in quantity of fruit production and 91% of the total growth in vegetable production (Muendo et al., 2004). Even allowing for higher prices of export commodities, the dominance of the local market is clear. This dominance is reflected at the farm level. While over 90% of smallholder farmers in all but the arid regions of Kenya produce horticultural products, fewer than 2% do so directly for export (Bawden et al, 2002).

The horticultural subsector is particularly important in terms of income and employment generation, foreign exchange earnings, food security, supply of raw materials to the agro-industrial processing sector and support to overall poverty alleviation:

- **Income Generation:** In 2003, the whole subsector generated about 4.35 million MT locally valued at Kshs 37.8 billion, equivalent to about 3.5% of overall Gross Domestic Product (GDP) and 14.5% of Agricultural Gross Domestic Product (AGDP)
- **Employment:** Direct and indirect employment generated by the subsector is currently estimated at 2 million people. Of this total, some 250,000 Wakulima Market – Nairobi are farmers who are actively involved in production and marketing of a variety of horticultural crops. Approximately 200,000 are smallholder farmers. Approximately 115,000 or nearly 60% of these smallholder farmers and their families solely depend on the domestic market for livelihoods.
- **Export Earnings:** In 2003, the subsector earned Kshs 28.8 billion, ranking only second to tea which earned KSh 33 billion, and well ahead of coffee which earned around Kshs 6.3 billion. Today, the subsector accounts for 21% of total principal domestic exports which was estimated Kshs 136.7 billion in 2003.
- **Food Security:** Fruits and vegetables are important sources of food for a large number of Kenyans. Out of the total volume of national output of fruits, vegetables, herbs and spices produced in 2003 amounting to approximately 4.35 million MT, some 3.8 million MT or about 88% was consumed domestically.
- **Raw Materials:** The sector is also an important source for raw materials for the relatively small, (but growing) horticultural processing subsector in Kenya. Although it appears to be an underestimation, the Ministry of Agriculture estimates that some 400,000 MT or 9% of total horticultural production is processed annually.

Vegetables dominate the sub-sector in terms of cultivated area (58.6%), volume of output (54.8%) and local value (57%). Fruits and vegetables combined account for 99% of cultivated area, 99.8% of total volume of output, and about 89% of total local value of output. However, in terms of value of exports, cut flowers dominate the subsector accounting for about 57% in 2003, while fruits vegetables together accounted for about 43% (HDC, 2004)

3 The Vegetable production sector

The horticultural industry began to develop in the late 1950s, and was left largely in the hands of the private sector after independence. The HCDA identified an export potential for specific fruits and vegetables to European countries, and promoted the growing of those crops by selected farmers. Export companies were formed and initially assisted with packaging material and airspace booking services. Kenya has developed a certain comparative advantage because of favourable climatic conditions, experienced and well-established producers, reasonable access to growing areas, and good air cargo services. Another key aspect is low labour costs, since both growing and post-harvest handling of various horticultural crops is labour intensive. These factors have allowed the private sector to flourish and have contributed to horticulture becoming the most dynamic and fastest growing sub-sector in the country, and the second biggest foreign exchange earner after tea.

It is estimated that smallholder farmers account for some 70% of total horticultural production, but this is mostly for the domestic market. Horticulture does not have registration of growers through factories such as in the tea sub-sector or out-grower organizations such as in the sugar sub-sector. A 2001 study estimates that there are no more than 6,000 smallholder out-growers producing vegetables for exports, while another study indicates that more than 80% of export vegetables come from exporters' own farms, leased land and large commercial farms. It is generally acknowledged that fruits for export are mostly produced by smallholders, but there are no clear indications of the number of farmers involved (IFAD, 2004).

Cabbages, kales, tomatoes, onions, carrots, French beans, garden peas and traditional vegetables are prominent among the vegetables produced, in terms of area and total output. However, cabbages, tomatoes and kales have predominated in vegetable production for at least the past decade. Trends in production for most vegetables show a slight increase. However, cabbages show a sharp drop in 1993 and stagnation since that time, while carrots show steady decline in output, with partial recovery in production in 2001. Kales, tomatoes and traditional vegetables show steady increases in output.

Table 1 Area and production shares of vegetable crops in Kenya in 1992 and 2001

Fruits	Area shares		Production Shares	
	1992	2001	1992	2001
Cabbages	25	17	32	22
Kales	21	25	25	31
Tomatoes	17	18	22	24
Onions	6	6	5	5
Carrots	6	4	6	5
French Beans	8	6	2	2
Garden Peas	8	7	2	2
Traditional Vegetables	5	10	3	5
Other Vegetables	4	7	3	4

Data Source: MoALRD

The yield of most vegetables has been stagnant. Only French beans and indigenous vegetables showed a slight increase. When compared to the top five producers of each crop in the world, the yield of vegetables in Kenya is the lowest in all crops. In most of the developed countries, production of vegetables is highly capital and technology intensive. It is usually characterized by use of newly developed technologies such as fertigation in green

houses e.g. in Israel. Hence, most weather factors are made controllable, production is evened out through the year and output per unit of land is relatively high. This is in contrast with production conditions in Kenya where it is usually rain-fed and takes place at almost one point in time. Most farmers also lack knowledge and skills on production techniques. This has resulted in low yields compared to other world producers as well as frequently low quality produce.

Central followed by Rift Valley are the main sources for vegetables accounting for about 71% of total national production in 2003 (HDC, 2004) But Table 2 shows that, throughout areas of Kenya where cropping is practiced, nearly all households grow horticultural crops. The partial exception to this pattern is in areas of the Western Lowlands sampled in the 2000 survey. The Western Lowlands also has the lowest mean production value among those growing, the lowest percentage of households selling, and the lowest mean sales value among those selling. Eastern Lowlands, Western Highlands, and Central Highlands stand out for high production values, high proportions of households selling, and high mean sales values among those selling. Sukuma wiki also stands out, being among the three most widely grown in four of the zones and among the three most widely sold in all but one zone (Coastal Lowlands).

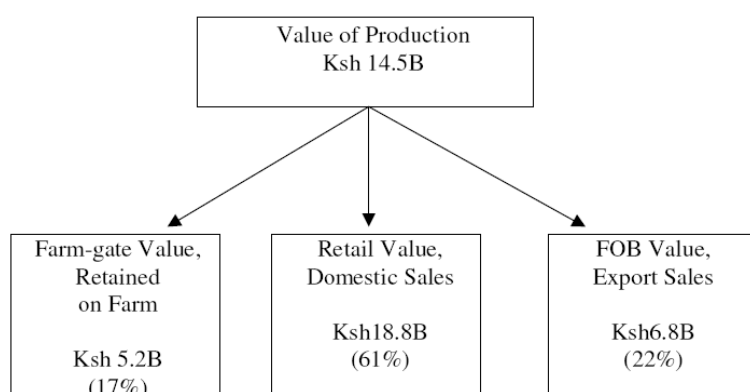
Table 2 Percent of households growing and selling horticultural crops, and average value of horticultural production and sales, by geographical area in selected “high potential” areas of Kenya

Geographical Area	% of Households Growing	Mean value of production among those growing	% of Households Selling	Mean value of sales among those selling
Coastal Lowlands	96.2	18,614	65.8	10,386
Eastern Lowlands	99.4	27,762	80.7	18,577
Western Lowlands	82.5	4,898	51.4	3,879
Western Transitional	100.0	13,972	87.3	7,328
High Potential Maize Zone	97.5	10,001	70.7	7,778
Western Highlands	100.0	19,730	90.1	12,673
Central Highlands	100.0	21,349	83.0	16,148

4 Domestic and Regional Marketing of fresh fruits and vegetables

The vegetable production sold and then consumed domestically over the past five years has been at least four-to-five times as large as the value exported in fresh and processed form (52% compared to 12%). If produce consumed on the farm is included, the domestic share rises to seven-to-eight times that of the export market. The total value added in domestic vegetable markets is nearly three times that in vegetable export markets. Vegetable exports are an important component of the vegetable supply chain, absorbing about 20% of all sold production by value, and accounting for about one-quarter of all value added after the farm gate. Second, domestic markets nonetheless remain the primary outlet for vegetable production and generate much more value added than do export markets (Tschirley, 2004)

Fig 2 Total value added in farm, local sales and export sales channels for vegetables on Kenya



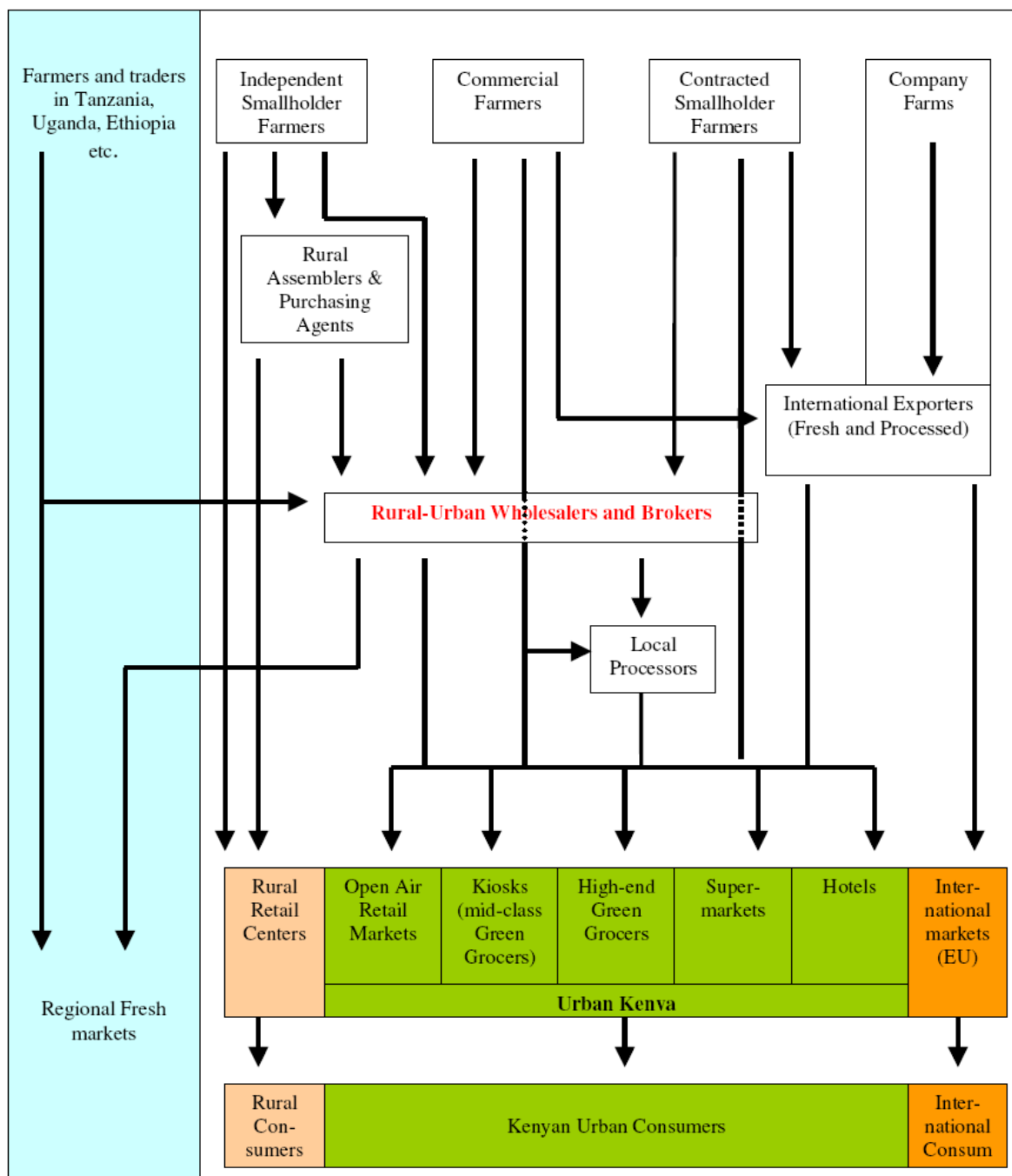
Source: Derived from Tegemeo/MSU 2000 household survey data, production data from MoALRD, and export data from HCDA

Figure 3 shows the various local, regional and international marketing channels for horticultural produce in Kenya, emphasizing the actors involved in the process. The export market is served by a few large-scale own company farms, an increasing number of contracted commercial horticultural farms, and a declining but still significant number of contracted smallholder farms (Dijkstra and Magori, 1995). Independent smallholders produce the bulk of the vegetables and fruits for domestic markets. The main traders in the regional markets are the wholesalers. Wholesalers as a group are divided into collecting wholesalers and distributing wholesalers. The former specialize in collecting produce from farmers in the region. They travel long distances to purchase commodities in spot markets from the producing areas and towns in Kenya, Tanzania, and Uganda. To facilitate operation, collecting wholesalers frequently employ purchasing agents who work in the production areas on their behalf. Purchasing agents reduce costs by identifying produce for sale, carrying out the negotiations, accumulating, assembling and carrying the produce to a nearby earth road for ease of collection. Hence, they streamline the procurement process (Dijkstra, 1996; 1997). Once enough product is obtained, collecting wholesalers then transport the commodities to the main cities/towns generally using lorries with a minimum of seven tons.

These professional collecting wholesalers sell primarily in urban wholesale markets to distributing wholesalers. For example, oranges are fetched from Tanga and Morogoro in Tanzania and sold in Moshi, Arusha, Mombasa, Nairobi and Kisumu; onions are obtained from Arusha/Mang'ola in Tanzania and sold in Mombasa, Dar es Salaam and Nairobi.

Coconuts are obtained from Mombasa and sold in Dar es Salaam, Moshi, Arusha, Nairobi and Kisumu. Bananas are obtained from Mbale in Uganda and and Kisii in Kenya and sold in Nairobi.

Fig 3 Domestic, regional and international marketing channels for fresh horticulture produce in Kenya (Tschirley, 2004)



Collecting wholesalers operate in such a way as to allow distributing wholesalers to focus entirely on their urban clientele. This is important in large regional urban centres such as Nairobi, Mombasa, Dar es Salaam and Kampala where wholesale and retail markets are

operational six days a week. The urban clientele that these distributing wholesalers serve are highly diverse. They include traders in traditional open-air retail markets, green grocers serving middle-class clientele in roadside kiosks, high-end green grocers mostly in established retail centres, supermarkets, and hotels. Supermarkets have attempted to expand their participation in horticultural markets over the past three years, but their market share remains quite low. The two major chains – Uchumi and Nakumatt – each carry upwards of 80 horticultural products in the produce section of their Nairobi stores, including fresh whole produce from Kenya, imported produce, and prepared vegetables ready for cooking. Each has ambitious expansion plans, with Uchumi planning to reach 50 stores within five years from 30 currently (Weatherspoon et al, 2003). However, as of March, 2003, these plans appeared to be stalled due to financial difficulties that this firm is having. Urban wholesale market places continue to play a key role in the domestic horticultural marketing system as the dominant source of supply for open-air retail markets, kiosks, and small stores. The two largest supermarkets are attempting to by-pass these markets. Each relies primarily on brokers and secondarily on direct procurement with an assortment of contracted commercial farmers and some organized small- and medium-sized farmers.

It is known that brokers obtain some of their produce in wholesale markets, though detail is lacking on the volumes and specific commodities that they tend to procure in this manner. The largest supermarket chains state that they intend to phase out brokers over the next five years as they develop their “preferred grower” programs. Whether in fact they are able to do so will depend on whether these systems are able to provide appreciably better quality produce at comparable prices to the traditional system.

The export records of the Customs Department indicated that there is very little cross border export of fresh horticultural produce from Kenya to Tanzania and Uganda. However, there was a substantial amount of recorded fresh coconut exports to Tanzania through the Lunga Lunga and Taita Taveta borders. It was further observed at the Loitokitok border, that minimal unrecorded quantities of tomatoes, onions, cabbages, kales (sukuma wiki) and indigenous vegetables are sold to Tanzanian residents around Tarakea border point for local consumption. These commodities do not reach the main township areas in Tanzania. The customs officers said that there is very little export of fresh horticultural produce from Kenya to Tanzania and Uganda. Thus, most of the official trade flow of fresh horticultural produce and raw agricultural commodities is from the neighbouring countries i.e. Tanzania and Uganda to Kenyan domestic markets. The direction of formal trade flow was assumed to be an indication of the direction of flow for informal trade for the same commodities. With this kind of scenario, it was concluded that Kenya’s fresh horticultural produce have not yet developed the required competitive advantage to claim space in the regional markets.

The domestic market in Kenya consists of five main marketing channels (HDC, 2004):

- **Fresh Rural Market Channel**

This channel accounts for a significantly large share of total fruits and vegetables consumption given that 80% the country’s population live in the rural areas. Such consumption often constitutes own production and purchases from the rural markets (about 40% as shown in the subsector map) and significant share of total sales by kiosk and roadside traders (i.e. of the total 45% as shown in the subsector map). Key players in this channel include the smallholder subsistence, semi and commercial farmers, with subsistence farmers comprising about 80%, small local/roadside traders with women accounting for about 90%, local and regional brokers, transporters, wholesalers, market level retailers and rural household consumers.

- **Fresh Urban Markets Channel**

This channel consists of both open air fresh produce wholesale/retail markets and green kiosks. The main urban markets include Nairobi (which according to key observers account for about 40% of urban consumption); Mombasa, Nakuru, Kisumu, Nyeri, Eldoret and Meru. An urban survey on consumption of fruits and vegetables conducted by

Tegemeo Institute in 2003 indicates that both wholesale/retail retail markets and kiosks are the most important channels in the urban areas accounting for 55% and 33% of sales respectively.

- **Processed Market Channel**

This is a relatively small market channel as compared to the fresh market channel. As indicated earlier total processed fruits and vegetables amounted to about 400,000 MT in 2003 of which about 260,000 MT was consumed domestically. The key players in this channel are a large but unknown number of artisanal processors (household level and small *Jua Kali* processors) and about 30 large industrial processors. Other players include input suppliers, and processed product retailers mainly comprising small retail shops and the supermarkets.

- **Fresh Urban Open Markets Channel**

This channel consists of both open air fresh produce wholesale/retail markets and green kiosks. According to key observers the segment accounts for about 40% of urban consumption). Sourcing of produce in this channel mainly constitutes purchases directly from farmers by traders or through their local or regional brokers; purchases directly from importers by traders for onward sale mainly to retailers, green grocers, supermarkets and institutional consumers.

- **Fresh Green Grocer/Kiosk Channel**

This channel constitutes sale of fruits and vegetables through green grocer and general shops (mainly catering for medium to high income consumers), roadside kiosks (*Kibanda*) and hawkers (very often strategically positioned in areas where it is easy to catch the eyes of consumers such as business terminus). Compared to the open air wholesale and retail fresh produce markets, this channel is relatively more recent but has nevertheless experienced very spectacular growth, especially over the last decade or so, to the extent that it now threatens the survival of the open air retail markets which hitherto were the main market outlets to consumers. According to the recent survey by Tegemeo Institute in 2003, this channel was the source for fruits and vegetables for 38% of those interviewed, with kiosk accounting for 33%, hawkers for about 3% and green grocer and general shops for 1% each. It should be noted that these figures are indicators based on data collected in Nairobi alone.

- **Fresh Produce Supermarkets Channel**

Based on size of floor space, variety of products sold and volume of businesses handled, categorizes of supermarkets in Kenya can be summarized as follows: (a) *Large locally-owned hyper/supermarket chains dominated by Uchumi and Nakumatt*; (b) *Independent minisupermarkets*; (c) *Small family business-sized stores*; and (d) *Foreign-owned multinational hyper/supermarket chains* such as Metro Cash & Carry and Woolworth. Except for Nakumatt, Uchumi and the Pioneer branch (Nairobi) of Tusker Mattresses), it is safe to say that the rest of the supermarkets do not (regularly) deal in fruits and vegetables. Even where this occurs, it is occasional and in very insignificant scale.

All these results point to the persistence for the foreseeable future of a highly diversified system, especially in FFV. Supermarkets will be one part of this, but we anticipate that their share of the FFV market in Kenya in 10 years' time will at most be, 10-20%. Traditional marketing channels will continue to dominate. There is thus an urgent need to focus on improving the traditional marketing system: modernize the whole supply chain; rethink the role of traditional market intermediaries; improve the wholesale, retail, and assembly market places, and establish vertical linkages up and down the chain that allow farmers more easily to know what consumers and traders need and want, and to satisfy that demand more efficiently (Ayieko, 2004)

5 Vegetable Consumption

Fresh fruits and vegetables are consumed on a regular basis by nearly every household, rural and urban, in Kenya. They play an important role in nutritional balance, as they are rich in vitamins and other nutrients that are vital in controlling diseases (WHO/FAO 2003). Out of the total volume of national fruits, vegetables, herbs and spices produced in Kenya in 2003, amounting to approximately 4.35 million MT some 3.8 million MT or 88% was consumed domestically (Karuga, 2004).

Fresh fruit and vegetable consumption in urban Kenya is very important in household food expenditure, accounting for about one-quarter of the household food budget. This share second only to staples and is stable across the income groups. Within fresh produce, the vegetable expenditure share has been shown to decline while that of fruit increases with income. However the actual quantity consumed of each group rises with income, the greatest increase being in fruit consumption.

Kenya consumers take less fruits and vegetables as compared to FAO/WHO recommendations. Notably, the poorest people are also the lowest consumers of fresh fruits and vegetables. Thus there is potential in increasing the consumption of this group of commodities, considering their nutritional status. The major factors that influence consumption of fresh produce include income, education of the head of household and whether or not the household is female-headed.

Markets play a major role in this consumption: about 70% of rural households sell some amount of fresh produce, and over 90% buy an average of about Ksh400 of additional produce every month in markets. In urban areas, nearly 100% of households spend an average of over Ksh1,000 each per month on market purchases of fresh produce. Total market sales of fresh produce in urban and rural areas of Kenya likely average Ksh50 billion, or nearly US\$700 million per year.

In terms of quantities purchased among those purchasing, Irish potato, cooking banana and *sukuma wiki* are the most important vegetables purchased by Nairobi consumers. Mean Irish potato purchases per household purchasing are 23kg, while cooking banana purchases average 13kg. Among the leafy vegetables, *sukuma wiki* is the leading item purchased by Nairobi consumers, with an average monthly household purchase of 13kg followed by cabbages. The average tomato and onions purchases are 10kgs and 5kgs respectively. Households spend twice as much on tomato purchases as they spend on onions and *sukuma wiki*, and about three times as much as they spend on cabbages. Thus among vegetables, tomatoes and Irish potatoes are important in terms of both the percent of household purchasing and the mean household expenditure, followed by onions and *sukuma wiki*.

Overall, households in Nairobi spend 15% of their basic food budget on vegetables, 8% on fruit, and 3% on Irish and sweet potato. In comparison, they spend 18% on dairy products, 14% on beef, 12% on wheat products, and 11% on maize products. Thus for the low-income households, vegetables are actually the meal of choice, a necessity. With higher incomes, consumers include more meats and animal products in their diets and change the types of produce they consume to include fruits.

Table 3 Household purchases of major vegetables in Nairobi

Item	% of hh purchasing	Quantity (kg) per month	Value (Ksh) per month
Tomatoes	96	9.8	239
Onions	94	4.5	121
Sukuma wiki	82	12.7	121
Cabbage	77	3.8	88
Irish potatoes	77	22.7	187
Carrots	67	5.0	91
Cooking bananas	35	13.3	136
Sweet potatoes	24	6.7	97
French beans	16	3.9	84

Source: Ayieko et al, 2004

6 Policy environment

The Horticultural Crops Development Authority (HCDA) of the Ministry of Agriculture regulates the horticultural sub-sector. In 1966, the government created the Interim Horticultural Development Council, which was replaced when the HCDA was established under the Agriculture Act, by promulgation of the HCDA Order, 1967. The HCDA is run by a board of directors appointed by the Minister for Agriculture, and has income from levies on exports; export licenses; and charges on imported produce. The mandate of the HCDA currently includes:

- regulating the industry through licensing and application of rules;
- providing advisory services to the government and the industry for planning purposes;
- providing marketing information to the industry;
- organizing provision of inputs on cost recovery basis to farmers and assistance in grading, storage, collection, transportation and warehousing of produce;
- undertaking limited marketing on cost recovery basis.

Following liberalization of the economy in the 1990s, the Horticultural Crops Development Authority Order, 1995 revision, removed controls on cultivation, picking, purchase and sale of crops and planting materials; crop inspection; transportation and marketing of horticultural crops; and establishment of processing factories. This paved the way for rapid expansion of the private sector. The HCDA (Export) order (1995) does require anyone who exports horticultural crops to have a valid export license issued by the HCDA.

The policy paper on the horticultural industry was finalized in March 2001. It is designed to encourage stakeholders to perform their roles in developing the horticultural industry, and lays down strategies for development of infrastructure, irrigation development, credit facilities, agricultural inputs, specialized extension services, appropriate research, marketing and processing. The overall objectives of the policy are to:

- facilitate increased production of high quality horticultural produce;
- earn foreign exchange for the country, to generate more employment opportunities;
- enhance irrigation development in ASALs;
- contribute to income generation and help to alleviate poverty.

The policy paper contains a draft Horticulture Bill (2001), which would lead to establishing a new-look HCDA under an Act of Parliament. The draft bill envisages restructuring of the HCDA and strengthening its advisory and regulatory functions, in order to ensure well-coordinated development of the industry. The bill proposes establishment of a subsidiary trading company under the HCDA, to deal with export marketing. The authority would oversee the implementation of a National Code of Practice and Code of Conduct. The HCDA would not receive direct government funding but would cover its costs through fees charged on services. The board of directors would include representatives of consumers, processors and exporters, as well as government.

The policy paper highlights various issues. Rural access roads in areas with potential for horticultural production need to be developed and maintained, together with those connecting to market outlets. Frequent power rationing and blackouts adversely affect horticultural production in areas of irrigation, cold storage and processing. The availability of water is insufficient for irrigation and processing, and its quality is currently not assured. Protection of water supplies against pollution should be enhanced together with preservation of water catchment areas. Reliable and efficient transport facilities must be available for high-value exports and perishable produce.

Development of small-scale irrigation in marginal areas should be encouraged, to make off-season production possible and a steady supply of horticultural produce all year round.

Adequate financial resources are crucial for investment, but only about 160,000 out of four million farmers have access to commercial credit or cooperative loans. Smallholders account for only 20% of the AFC's credit. The policy paper proposes to create a favourable environment for the private sector and NGOs to develop viable credit schemes such as group lending systems and contract farming.

Farmers rely on costly imported seeds and planting material due to a shortage of high-quality local seeds. Horticultural research would be strengthened through a horticultural research fund, to breed for high yielding and locally adapted varieties. Strict inspection would be enforced to curb the practice of merchandising poor quality seeds. Duties on fertilizer and other agrochemicals have already been removed, and safe handling and use of these inputs would be promoted, including organic fertilizer and pest control products, integrated pest management, and organic farming. The Kenyan Bureau of Standards (KBS) would regulate stockists to curb adulteration of fertilizers and other agrochemicals.

The KBS, HCDA and KEPHIS would introduce quality control and standards for locally marketed produce and ensure that farmers adhere to international MRL standards. HCDA would use various media to disseminate market information among traders and producers. Through an envisaged national growers association, farmers would be sensitized in planning production to coincide with market demand. Contract farming and group formation would be encouraged to curb the proliferation of market cartels and middlemen.

Local authorities and private investors would be encouraged to erect markets in urban centres and equip them with pre-cooling and cold storage facilities. Cess collected from market centres would be used for market development. The paper recommends abolition of road barriers, fees, and charges on horticultural produce. The trend in processing is shifting from canned to frozen products, and establishment of facilities for freezing of vegetables and of micro-processing plants near production areas would be encouraged. Duties would be imposed on imported horticultural products to protect processing factories from unfair competition.

The policy paper on horticultural industry development in a liberalized environment is comprehensive in outlining the strategies needed to uplift the horticultural industry. It identifies needs, constraints and areas for investment and then argues for stakeholders to make their contributions. However, the paper falls short of coming up with an effective institutional framework that would ensure coordinated development of the industry. It will be important to more clearly define the division of responsibilities among various service providers in the industry and to seek the general agreement of stakeholders, including producers, traders and exporters.

Various other institutions are important for the horticultural sector. The National Horticultural Research Centre in Thika District is the KARI centre with the national mandate to conduct research on horticulture. Besides research programmes, the centre provides planting materials for legumes and fruit seedlings, and basic seed to seed companies for bulking and onward sale to farmers. It has released bean varieties for various agro-ecological zones, as well as macadamia nut, mango, avocado and banana varieties.

Since 1996, Kenya Plant Health Inspectorate Service (KEPHIS) has had responsibility for seed certification and phytosanitary control of crops and produce. KEPHIS coordinates all matters relating to crop pests and disease control, has the national mandate for pesticide residue analysis in agricultural produce, and administers plant breeders' rights. KEPHIS is also responsible for phytosanitary certification, to ensure that all exported plants and plant products are in conformity with the requirements of the importing country. This involves visits by plant inspectors to commercial growers and farmers during the active growing period as well as inspection at exit points.

Two associations, the Fresh Produce Exporters Association of Kenya (FPEAK) and the Kenya Flower Council (KFC), represent the interests of horticultural companies. FPEAK was established in 1975 with seven members, as an association for horticultural produce exporters. At present, the membership comprises some 55 growers and exporters of fresh flowers, fruits or vegetables. Activities of FPEAK are carried out through its secretariat and are governed by a board of directors consisting of nine members actively engaged in exporting fresh produce. The association provides members with market information; maintains a directory of fresh produce exporters; participates in trade events; promotes exports through overseas exhibitions and trade missions; networks with public and private sector, local and international organizations; and provides technical support and training services for exporters and their outgrowers. To ensure that Kenya's export horticulture meets accepted international standards of responsible production, quality and safety, FPEAK has formulated a Code of Practice (IFAD, 2004)

7 On-going donor-funded activities

In the following table an overview of the on-going donor funded activities with relevance to the vegetable sector in Kenya are presented:

Project / programme	Activities
USAID-funded Kenya Horticulture Development Project/Fintrac	Targeting Passion fruit (fresh and processed); Chili products (fresh, processed and dried); Vanilla and spices; Smallholder flowers; Tree crops for processing (mango and cashew) and local market vegetables (onion, carrot, cabbage, tomato, and indigenous vegetables).
DFID-Funded Business Services Marketing Project (BSMDP)	Focused on promotion business services and market access support.
Japanese-funded Horticultural Produce HandlingFacilities Project (HPHFP)	Focused on horticultural storage facilities and marketing.
IFAD-funded Eastern Province Horticultural and Traditional Food Crops project (EPHTFC)	Focused on productivity increases through irrigation, and marketing of horticultural produce as well as promotion of processing traditional food crops.
Dutch-funded horticultural partnership programme	Capacity building and processing fruits and vegetables.
CARE-Kenya	Commercial Activities for Small Holder farmers (CASH) addressing access to credit, availability of agricultural inputs, technical expertise and quality control

8 Challenges and strategic interventions

Based upon the above the following list of major challenges and its related required interventions can be identified:

Challenge	Interventions
Expensive imported seeds, limited availability and adapted varieties	More liberalized seed legislation; industry-driven participatory breeding programmes
Inappropriate farm management practices at smallholders production leading to low quality products	Practical industry-driven research and development programmes focusing on improving farm management practices; practical training programmes in supply chains; Farmers Field Schools
Low quality products due to inappropriate post-harvest handling	Post-harvest training in supply chain; packaging
Seasonality and fluctuation in prices	Technology development to increase growing season (irrigation; storage; farm planning); transparency in market operations and price information
Low purchasing power and low profits	Increase productivity; awareness raising at consumers level
Lack of traditional vegetables	Breeding programme; development programme jointly with supermarkets and traders
High cost of transport due to poor road conditions	Infrastructure improvement
Poor market conditions and facilities (congestion, unhygienic conditions, insecurity)	Modernize whole supply chain, rethink role of intermediaries, improve wholesale, retail and assembly market places; improve cleanliness and progressiveness of traditional marketing system; increase logistical efficiency; garbage collection, sewerage and other hygienic improvements; information on prices and volume by grade of product for increased transparency Partnership between government, private sector and donors; Running markets needs business approach
Standards, food safety and traceability	Sensitizing transporters and traders, supporting Kenya Bureau of Standards
Lack of market organization	Improve efficiency of traditional marketing system; invest in supply-chain via supermarkets
Lack of market information	Support MOA and others to collect and provide market information to stakeholders through radio, mobile etc.; sensitize farmers and traders to work as common-interest groups to collect and disseminate market prices
Processing capacity	Link producers to processors (contracts); promote and develop small-medium level technology of processing
Unequal duties at border points hindering the access of Kenyan produce to Tanzanian markets..	Harmonization of duties in EAC. Kenya Revenue Authority should also harmonize the levies charged on various horticultural commodities traded across the border points

Research and extension	Transform Thika Horticultural Research Center to a position with closer linkages to the industry (see Tea and Coffee Research Foundations of Kenya)
Smallholder farmers'organisation	Government to create legal and regulatory framework to facilitate commercially oriented cooperation among smallholders; support NGO's already active

9 Conclusions

Despite the very high growth rates in export horticulture in Kenya, the domestic market continues to absorb at least 4-5 times more produce, by value, than does the export market. If produce consumed on the farm is included, the domestic share rises to 7-8 times that of the export market. In addition the value added after the farm gate is at least three times greater in the domestic than in the export supply chain. At the same time, the domestic horticultural system is relatively uncompetitive in regional markets: while the country imports a substantial share of some horticultural crops, its exports of fresh produce to the region are negligible. This contrast with the vegetable export sector of commercial farmers and some organized smallholder farmers closely linked to export companies which are competing successfully in the highly competitive and quality conscious European market.

The domestic horticultural system is also subject to strong forces of change at the present time. Continued high rates of urbanization are expected to drive increases in demand; if per capita incomes begin once again to rise, total demand growth in the domestic market could exceed 5% per year. Satisfying such increases in demand year after year would be a major challenge for any commodity supply chain.

Expanding domestic and regional markets for Kenyan horticultural produce, integrating the bulk of the country's smallholder farmers into profitable supply chains that satisfy these markets, and ensuring consumers of a growing supply of horticultural produce with falling real prices and improving quality, will require investment in three key areas: technical production constraints, "hard" and "soft" public market infrastructure, and the legal and regulatory environment.

The impact of the growth of supermarkets on the fruits and vegetables production and marketing system is difficult to assess at this time. On the one hand, both major supermarket chains indicate that they are moving towards "preferred grower" procurement systems which eliminate or greatly reduce procurement from brokers in favour of direct procurement with a limited number of commercial and some organized smallholder farmers. On the other hand, supermarket chains' fruits and vegetables market share is currently less than 5% even in Nairobi (lower elsewhere), and essentially 0% among the bottom 80% of households in the income distribution. It is anticipated that supermarket chains' FFV market share will lie between 10% and 20% in 10 years time (Tschirley, 2004).

Apart from investing in the development of supply chains through supermarkets, improving quality and reducing costs in assembly, wholesale, and "traditional" retail market outlets will be central to meeting the challenge of the domestic and regional vegetable market. The level of investment needed to enhance the competitiveness of the traditional supply system is well beyond what the government alone could finance. Active partnering with donors and private sector will thus be crucial. In some cases, effective partnering will require a fundamental change of orientation on the part of government.

10 Selection of pilot chain

In both Kenya and Tanzania tomato and onion are main vegetable crops. Tomato is a slightly more important vegetable commodity in terms of acreage, production and economic value. Both tomatoes as onions are traded from Tanzania to Kenya, onion at an already much larger scale. A pilot chain focused on tomato will enable links to ongoing donor-funded activities in both Kenya as Tanzania. Two different pilots have been selected, one focussed on the cross border trade and the other focussed on supplying the high segment market. The pilots are further described in separate documents.

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