A Cross Country Analysis of Cut Flower and Foliage Exports: The Case of Kenya

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Abstract

In terms of volume and value, cut flowers are the single most important horticultural exports, followed by vegetables and fruits in Kenya. Floricultural trade in the country is export oriented with an end-user focus. There are three main consumption centres where the market value for cut flowers is high, these are: the Europe Union (EU), United States of America (USA) and Japan. Competition for the developed countries' markets is high, suggesting that countries may be easily substituted.

This study seeks to measure the comparative advantage of the Kenya's cut flower and foliage exports in relation to its main competitors in these markets. The aim is to explore ways to improve its market share and strategy in the fast growing and dynamic cut flower industry. Cut flower and foliage export data for 1995 to 2006 from Kenya, Uganda, Tanzania, Ethiopia, Colombia, Ecuador, Israel and The Netherlands was used to measure Kenya's revealed comparative advantage. Results show that in the EU market cluster, Kenya should focus on market penetration and product development. The Japanese market is a prime candidate for diversification and development of new, special and different products through co-operation with importers. In the USA market, the country should pursue new products and develop a market for the current products because the South American countries already have a comparative advantage. Finally, promotion and lobbying should be used to increase market share.

It is important to strengthen the market infrastructure so as to develop new strategies for market intelligence and network formation for the EU, USA and Japan markets. Secondly, adapt geographical indications for Kenyan products which are viable marketing tools. Thirdly, encourage development of a domestic market for cut flowers. Fourthly, increase participation of smallholders in the production chain and finally, increase domestic support and safeguard cut flower exports by enhancing financing of the sector as envisioned in the Cotonou partnership agreement. Further, research is suggested on determining the market potential and competitiveness for Kenyan cut flowers in specific external markets.

Abbreviations and Acronyms

AGOA	African Growth and Opportunity Act
CBI	Centre for the Promotion of Imports
EAC	East African Community
EHPEA	Ethiopian Horticultural Producers Exporters Association
EPAs	Economic Partnership Agreements
EPC	Export Promotion Council
EU	European Union
EUReGAP	Euro-Retailer Good Agricultural Practice
FPEAK	Fresh Produce Exporters Association of Kenya
GI	Geographical Indications
HCDA	Horticultural Crop Development Authority
ISHS	International Society for Horticultural Science
KFC	Kenya Flower Council
KHC	Kenya Horticultural Council
MoA	Ministry of Agriculture
NAFTA	North America Free Trade Area
RUV	Relative Unit Value
SME	Small and Medium Enterprises
USA	United States of America
WTO	World Trade Organization

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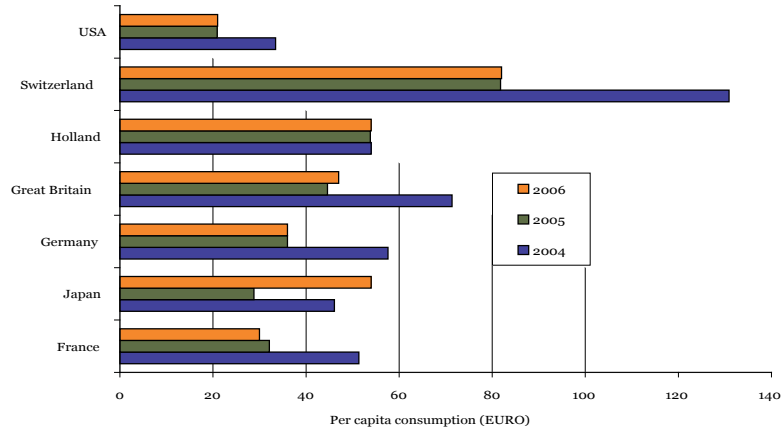
1. Introduction

1.1 Overview of Global and Domestic Cut Flower Industry

There are three significant producers and consumers of cut flowers internationally. With the exception of India and China, these are Europe Union (EU), Japan and the United States of America (International Society for Horticultural Science-ISHS, 2005). The market for cut flowers in a country depends on the average consumption per capita. According to the Floriculture Council of Holland (FCH), Figure 1.1, the annual consumption per head ranges from 20 Euros in the USA to more than 80 Euros in Switzerland. The market value is high in Japan, Europe and the USA, making these countries viable markets for developing countries.

Taking into account international trade flows, the largest exporter of cut flowers and foliage is the Netherlands, followed by Colombia, Ecuador and Kenya, respectively (ISHS, 2005). The European Union (EU) is the world's leading importer of flowers and foliage, with imports amounting to €3.4 billion in 2006. The EU is believed to consume over 50 per cent of the world's flowers. It includes many countries that have a relatively high per capita consumption of cut flowers. Besides the Netherlands, other important suppliers that contribute major shares are Kenya (9%), Colombia (3%), Ecuador (3%) and Israel (2%). Kenya increased its supply by 12 per cent annually between 2002 and 2006. Israel decreased in importance in the same period, with supplies decreasing by 8 per cent annually (Centre for the Promotion of Imports-CBI, 2007). In the USA,

Figure 1.1: Per capita consumption of flowers in selected countries



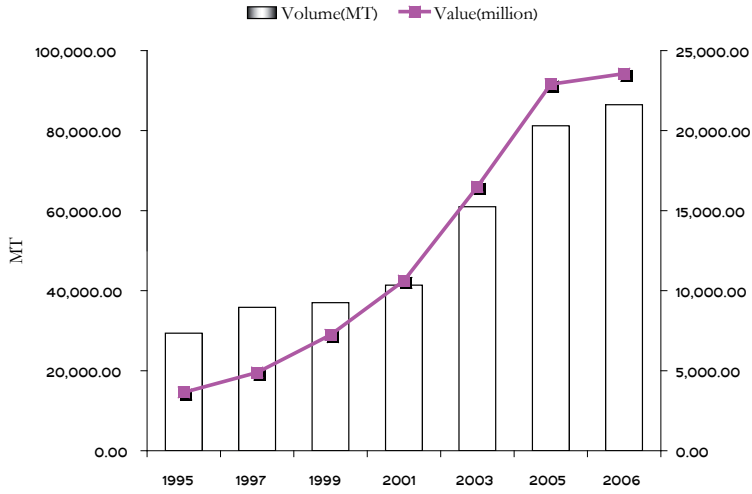
Source: Flower Council of Holland (2007)

the Netherlands, Columbia, and Ecuador combined supply over 80 per cent of the imported cut flowers and foliage. Similarly, South Korea, Malaysia, Thailand, The Netherlands, New Zealand and Colombia are the main suppliers of the imported flowers (67%) into Japan (ISHS, 2005; World Bank, 2004; and Wijnands and Hack, 2000).

Altogether, African countries represent 8 per cent of world cut flower exports, with a value of almost US$ 300 million. Kenya is Africa's largest exporter, accounting for 55 per cent of African exports, followed by Zimbabwe (22%), Zambia (6%) and South Africa (4%). Other emerging countries are Uganda, Tanzania and Ethiopia. Roses are the most important export cut flower for sub-saharan Africa producers, representing 65 per cent of Kenya's production and a great share of the production in Zimbabwe and Zambia. Other significant exports are carnations (8%), chrysanthemums (1%) and various summer flowers (World Bank, 2004; and Horticultural Crop Development Authority-HCDA, 2007). The production in Kenya is geared for the export market, with only an estimated 3 to 5 per cent sold in the domestic markets (Fintrac, 2005). Between 1995 and 2006, flowers comprised the largest share of horticultural exports in both volume (43%) and value (55%), and this has been steadily increasing as shown in Figure 1.2 (Horticultural Crop Development Authority, 2007).

Worldwide, the floriculture industry is competitive, barriers for entry and exit to the industry are minimal, cost of switching between

Figure 1.2: Kenya's export volume (MT) and value (current prices) (Ksh) for cut flowers from Kenya from 1995 to 2006 (selected years)



Source: Horticultural Crop Development Authority (2007)

the suppliers, buyers and even flower varieties are low (World Bank, 2004). Most flower production in developing countries is inadequately supported by the domestic markets and therefore highly dependant on the developed countries' markets. This connotes that comparative advantage and strategy are vital for a country's floricultural industry to be sustainable. Kenya's floricultural trade is no exception; it is export oriented in a competitive international market.

This study seeks to measure the comparative advantage of Kenya's industry in relation to its main competitors in the world market, with a view to improving its market share and strategy in the fast growing and dynamic cut flower industry.

1.2 Problem Statement

Floricultural trade in the country is oriented to an end user focus that heavily relies on research advancements and market information from the Netherlands to set the agenda. The trade is export-oriented with an almost none existent domestic market. The country faces competition from countries in Africa, Middle-East and South-America, which have similar production environments. In some cases, near better comparative positions are increasingly becoming successful in supplying the highly developed European market. Competition for the developed countries' markets is high, suggesting that countries can be easily substituted. For instance, up to 1998, Israel was the largest non-European supplier to the European market followed by Kenya. However, from 1999, Kenya took over the leading position, with Colombia and Ecuador maintaining their positions. How long the country will maintain this position is not known because product specialization has not changed much over the decades and, broadly speaking, the basic structure of the industry has not significantly evolved over time.

Countries such as Uganda, Tanzania and Ethiopia are quickly emerging as major competitors. Kenya is providing a basis for growth of this industry in the neighbouring countries in form of technical support (skilled and experienced labour force). Some farms in Kenya are even relocating to the neighbouring countries, and reducing their operations in the country. This is because Kenya's neighbours are offering better investment environments (World Bank, 2004). In Ethiopia, for instance, according to the Ethiopian Horticultural Producers Exporters Association (EHPEA), the government is offering 5 year tax holidays, relatively better infrastructure (cost of electricity, transport, duty free access for inputs

and capital items), attractive leasehold agreements just to mention but a few.

Kenya's comparative position in floricultural trade is not yet determined. The producers' share of the consumer price is decreasing gradually, with the bulk of the money being used on transportation, technological innovations, advertising, and packaging, among others. Consumers have continued to attach importance to aspects such as health, environment, ethical and social issues, value added processes and traceability, making these issues to account for a larger portion of the production costs (Dolan and Humphrey, 2000; Dolan, *et al.,* 1999). Producers are therefore put in a position where they have to adjust their production processes so as to embrace the changes in the market place and remain competitive. Currently, horticultural exports to the EU enjoy preferential market access under the Cotonou Partnership Agreement and, lately, the Interim Economic Partnership Agreement between the EU and the EAC.

Under the framework of the WTO's Doha development agenda, trade preferences have been at the core of ongoing negotiations for further multilateral trade liberalization. Most Least Developed and Developing Countries, including Kenya, consider that a move to further liberalization will not be in their interest, as the erosion of preferences would reduce the benefits they reap from their preferential access to developed countries' markets. In this light, it is becoming important for Kenya to determine its comparative position so as to evaluate whether or not change is necessary to improve its competitive position.

1.3 Research Objectives

1. Give an overview of Kenya's trends in cut flower and foliage exports, with reference to selected competitors in EU, Japan and USA markets.
2. Measure the revealed comparative advantage of the Kenyan cut flower and foliage exports.
3. Provide suggestions on improving the market strategy of the Kenyan cut flower and foliage exports.

1.4 Research Questions

1. What are the export trends of the cut flower and foliage exports over the last two decades?
2. Who are the main competitors for Kenyan flower exports, and which are their preferred markets?
3. What is the revealed comparative advantage of Kenyan flower exports?
4. What changes would be useful for maintaining or boosting the current market share?

1.5 Justification

Horticultural trade is essentially buyer-driven. Kenya's major horticultural export commodities are confined to a very narrow range of commodities comprising roses, french-beans, peas, passion fruits and avocados, with the EU being the key market. This is supported by trade agreements that are not exclusive, and thus the countries products can be substituted by other ACP countries with similar advantages.

In terms of volume and value, cut flowers are the single most important horticultural exports, followed by vegetables and fruits according to data from the Ministry of Agriculture (MoA) and Horticultural Crop Development Authority (HCDA). Kenya exported approximately 163,200MT of fresh horticultural produce in 2006, with flowers accounting for 53 per cent of volume and 55 per cent of value; vegetables 38 per cent of volume and 41 per cent of value; and fruits 9 per cent of volume and 4 per cent of value. Roses stand out as Kenya's single most important export product, accounting for 35 per cent of total horticultural export value earned in 2006. Within the cut flowers sub-sector alone, roses accounted for 65 per cent of total export value. Other important cut flowers that rank well behind roses include carnations and chrysanthemums cuttings. The other four most important export commodities in value accounting for just 29 per cent in 2006 were french beans in assorted specifications (21%), peas with edible pods comprising sugar snaps and snow peas (5%), passion fruits (2%) and avocados (1%) (Ministry of Agriculture, 2007; and Horticultural Crop Development Authority, 2007).

The EU is an important market for export horticulture to a number of ACP countries including Kenya. Based on EU Trade Statistics

(EUROSTAT), overall ACP countries' horticultural exports to the EU amounted to approximately €900 billion in 2006, cut flowers and foliages accounted for about €49.6 billion or 5.5 per cent of ACP horticultural exports to the EU, of which Kenya, Zimbabwe, Uganda, Zambia, Tanzania, Rwanda and Ivory Coast are major suppliers.

Since the advent of export horticultural production in the country in the 1960s, the industry has been mainly private sector-driven. The government has facilitated the sectoral growth through infrastructure development, incentives and support services. Structural and macroeconomic reforms plus the introduction of more liberalized trading environment, have provided a major boost to the countries horticultural prospects (Export Promotion Council, 2005). This study hopes to use cut flowers as a case study to explain the country's current position and precedent trends. This information will contribute to setting priorities, and formulating policies and programmes that will assist the industry and the general horticultural sector to develop decisive strategic re-orientation to maintain and expand the industry to ensure survival.

1.6 Organization of the Paper

This paper is organized into five sections. The study context has been introduced in Section one to highlight the importance of the Kenya cut flower industry, and state the research problem, questions, objectives and justification. Section two reviews literature on the markets and product characteristics, whereas the methodology is outlined in Section three. Key results from the study are discussed in Section four, while Section five provides the conclusion and recommendations.

2. Literature Review

2.1 Markets for Cut Flowers and Foliage

2.1.1 European market

According to the European Union's (EU) market survey (2007), EU consumes over 50 per cent of the world's flowers. Broadly, the market can be classified into three: (1) Mature markets such as Germany, The Netherlands, France, Belgium, and the Scandinavian countries. These markets have relatively high levels of per capita expenditure on flowers. They are familiar with flowers and are interested in new and interesting products; (2) Growth markets such as Spain and the UK. These markets are generally of considerable size, for instance the UK is one of the largest consumer markets. The per capita spending, however, is still low compared to the mature markets; (3) Markets in development, such as the East-European countries and Greece. The economies of these countries are growing. Nevertheless, flowers are still considered a luxury and are bought mainly as gifts. Table 2.1 shows the five most important cut flowers in the Netherlands auction, which are Roses, Chrysanthemums Tulips, Lilium and Gerbera.

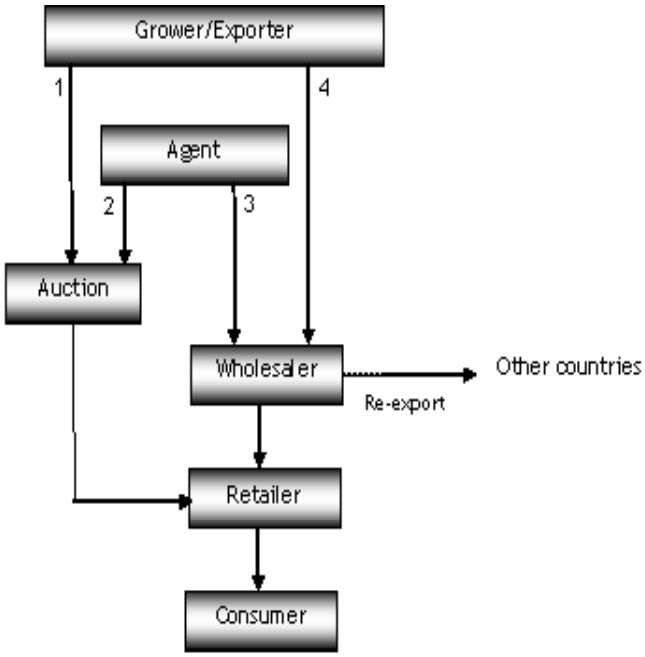
African growers provide the market with mainly Roses, to keep up with increasing competition and search for lower costs. Some European growers (particularly in The Netherlands), have relocated their production to lower cost countries that offer good cultivation circumstances such as Kenya and more recently Ethiopia. As shown in Figure 2.1, cut flowers sold in the EU basically access this market through four main channels,

Table 2.1: Top 5 cut flowers species sold at the Netherlands auctions in € million (selected years)

	2002	2004	2006
Roses	700	706	758
Dendranthema (Chrysanthemum) (Spray)	307	285	300
Tulips	171	185	223
Lilium	168	158	167
Gerbera	108	116	122

Source: Floriculture Council of Holland (2007)

Figure 2.1: Distribution channels for the cut flowers in the European Union



Source: Adapted from CBI market survey (2007)

though this depends on the product in question. Nevertheless, most developing countries send their flowers through channel two into the auction system.

2.1.2 United States of America (USA) market

The United States is a large producer of cut flowers, with production valued at $5.36 billion in 2005,[1] and at the same time an importer of cut flowers in 2006 with an estimated value of 1.1 trillion Euros (COMTRADE, 2008).

This market is diverse, with all types of fresh flowers arriving from all over the world, with roses being the most important cut flower in terms of value (U.S.ITC, 2003). This market is supplied mainly by foreign growers in South America, with Colombia supplying more than one-half of such

[1] Total crop value for the 36 state programmes for all growers with $10,000 or more in sales (United States, Department of Agriculture–National Agricultural Statistics Service).

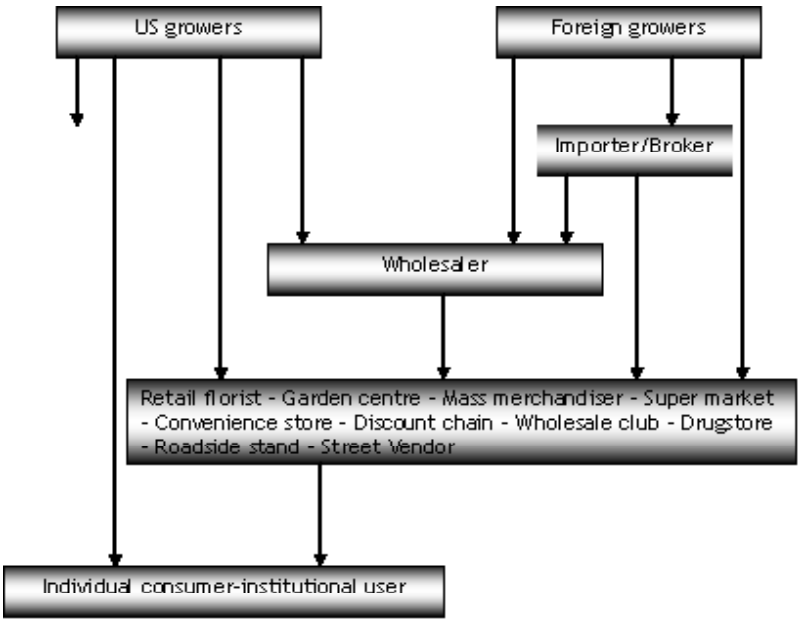
imports, and the Netherlands and Ecuador accounting for a quarter of total imports (COMTRADE, 2008; ISHS, 2005; and U.S.ITC, 2003).

According to the U.S.ITC (2003), the US industry is generally characterized as fragmented because each of these industry segments has unique issues and perspectives–note the auction does not play a significant role in this market. Cut flowers into this market basically follow three channels: local, fresh cut flower growers may sell their products to a flower wholesaler, a florist, or directly to the consumer. Foreign fresh cut flower growers sell to wholesalers, importers or brokers, or directly to a florist (Figure 2.2).

2.1.3 Japanese market

Similarly, Japan has a significant domestic production of cut flowers, and it is not an important importer in the global market. For instance, in 2006, total cut flower and foliage imports were an estimated 50 billion (COMTRADE, 2006; and ISHS, 2006). However, it is an important market niche for exclusive products or out of season products. Cut flower imports are essentially free in the Japanese market, nonetheless,

Figure 2.2: Major distribution channels for fresh cut flowers in the USA



Source: US International Trade Commission (2003)

understanding the consumer preferences, the traditional habits and meeting the Japanese import regulations is problematic (ISHS, 2005). Cut flower marketing in Japan involves importers, auction houses wholesalers and florists and is dominated by auction markets. However, in the recent past, importers have been shifting towards direct marketing (Figure 2.3). These distribution channels coordinate both the local and foreign demand and supply of cut flowers (Centre for Native Floriculture, 2006).

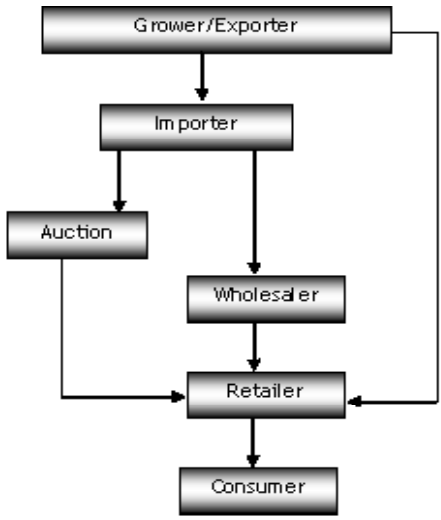
2.2 Product and Product Characteristics

The product type and product characteristic play a major role in marketing, price formation and the economic behaviour of the actors, in both the supply and demand chain. Table 2.2 highlights the key characteristics.

2.3 Cut Flower Chain

The cut flower chain has several players. Downstream are the powerful retailers who are instrumental in advocating and enforcing standards, such as 'Milieu Project Sierteelt' or 'Floriculture Environmental Project' or EurepGAP just to mention a few. At the other end of the chain (upstream),

Figure 2.3: Distribution channels for cut flowers in Japan



Source: Adapted from Centre for Native Floriculture (2006)

Table 2.2: Product and product characteristics of fresh cut flowers

Attribute	Explanation
Perishability	The quality of a cut flower begins to deteriorate at the moment of harvest and continues throughout the marketing chain. This demands proper storage, climate conditioning and handling.
Price, quantity and quality variations	The biological nature of the production process makes it difficult to schedule the supply and quality to market demands. This hampers an effective supply control and can result in unstable prices. Price negotiation occurs frequently on spot markets or when cut flowers are on transit. Trust and informal agreements are involved.
Seasonality	Most cut flowers have seasonal production patterns and a decreasing seasonal demand pattern. Long distance shipments are complementary to local production, but often have competitive supply resources.
Substitutes	Most cut flowers have varieties, which are slightly different, or other products that can satisfy consumers' wishes (different types of cut flowers, and potted plants among others). For most flowers, alternative forms exist: fresh and dried among others.
Bulkiness	Water is the major component: flowers are bulky and have a low value per unit.
Geographic specialization of production	Regional specialization has altered marketing patterns, lengthened and complicated the market channel and increased transport costs. The production is shifting gradually to lower-cost areas and there is an increased use of mechanized systems.

Source: Adapted from ISHS (2005)

there are the plant and seed breeders who are strongly internationalized, and a large number of small enterprises are active on the market for ornamentals. These are able to push new varieties into the consumer-driven chain. Between them are large numbers of small and medium enterprises (SMEs) of growers and wholesalers in both developed and developing countries. The substitution possibilities of these enterprises are high, and their strategic scope is mostly limited to their respective regions (Dolan and Humphrey, 2000; Wijnands and Hack, 2000; Dolan, Humphrey and Harris-Pascal, 1999; and Theon*, et al.*, 1999).

'A red rose bought at a supermarket somewhere in western Europe today might come from Colombia or alternatively from The Netherlands, Italy, Israel, Morocco, Kenya, Ecuador, or several other places. Countries

with different factor endowments compete to produce what in the end looks like the same product' (Meiver, 1999). Entry into a cut flower market is not restricted as such. However, there are certain attributes that are important for a country to be engaged in this trade. They include: production skills at farm level, organized post-harvest logistic and marketing systems, and finally handling phytosanitary, customs and other international trade issues (World Bank, 2004; and Wijnands and Hack, 2000). Switching costs are low, buyers are able to switch from one grower to another, or one country to another using a certification code as a proxy for lower transaction costs (World Bank, 2004). While competition is certainly fierce, the trade statistics show otherwise, 'new' countries are able to enter the market all the time (Dolan *et al.*, 1999). The market demands are gradually changing; supermarkets want products that are 100 per cent ready for their shelves, complete with consumer packaging and bar-coding. This is driven by the fact that flowers are no longer purchased just for special occasions, but have become a more regular decorative feature in the home, and thus part of the regular weekly shopping routine. This transformation will make substantial demand on the cut flowers industry. The development of fully-integrated supply-chain capabilities will demand new skills and new know-how. It will make particularly challenging demands on smallholder producers (Subramanian *et al.*, 2007).

2.4 International Trade Theory

The determinants of international trade have been of scholarly and political interest since the eighteenth century when Smith ([1776] 1910) laid the axiomatic foundation captured by the paraphrased statement, "Trade makes possible the gains from specialization." This observation became the foundation of classical and modern trade theories. Ricardo (1817) made the next significant contribution by stating the law of comparative advantage; that is, "countries tend to export those goods that have the lowest relative costs—and therefore prices—in autarky." However, while Ricardo and later Mill (1848) presented a powerful and rational argument for free trade, and effectively showed that trade was the result of differences in a country's production functions, neither of them attempted to explain why these differences existed in the first place (Deardorff, 1999).

Comparative advantage may be thought of as comprising both the law of comparative advantage (as developed by Ricardo) and a collection of

assorted sub-theories or models that attempt to explain those differences between nations that lead to trade. Economists generally regard the factor proportions model as the Heckscher and Ohlin (1991) or H-O theorem. It explains the basis for specialization, hence trade as the result of differences in the factor endowments of nations: "a country has a production bias towards, and hence tends to export the commodity that uses intensively the factor with which it is relatively well endowed" (Gandolfo, 1998).

Thus, the emphasis is on different factors, and inequalities of factor endowments may lead to gains from trade. Their results reveal that trade in goods is indirect trade in factors, and that trade and income structures are interrelated (Krugman and Obstfeld, 2000).

3. Methodology

3.1 Conceptual Framework

Trade literature with respect to the generality of the principle of comparative advantage has a position that can be identified, limited to Ricardian and Heckscher-Ohlin-type trade and does not apply to other forms of trade such as intra-industry trade. The more general interpretation suggests that a producer has comparative advantage if his/her production costs in terms of equilibrium factor prices are lower than those of international competitors, irrespective of the source of cost advantages. This could be cheapness of either primary or intermediate inputs (extended Heckscher-Ohlin), or the use of different technology (Ricardo) or the production at larger scale (Krugman), or any combination of the former sources, such as in the product cycle model (Vernon). Once there are more *n*-goods, the measurement of comparative advantage requires the use of monetary costs at equilibrium prices. These approaches rely on perfect markets, implying a comparative advantage. This could mean that trade is enhanced by the different cost advantages. Costs measured in market price terms infer to competitive advantage, or cost competitiveness. However, when equilibrium prices are used, comparative advantage is implied (Cockburn *et al.*, 1998).

Under free trade, countries specialize and are net exporters of goods that they have a comparative advantage. To identify which good or industry a country has comparative advantage, the sign of the difference between autarkic and free trade relative prices gives a clear indication. If the sign is positive, then the country is competitive in production and export of the particular good. If the sign is negative, then the country has comparative disadvantages in production and export of that particular good. Relative autarkic prices are unobservable variables, thus hindering identification of true or shadow comparative advantages. To overcome this, empirical literature uses revealed comparative advantage (Balassa, 1965) to analyze specialization patterns of countries (De Benedictis and Tamberi, 2001), reflecting the success in exporting countries relative to a worldwide norm (Siggel, 2006). The approach is used to compare national sectoral shares with their international analogs and to infer the existence of comparative advantage through the examination of actual output and/or trade flows as done by Balassa (1965). The Balassa index follows an asymmetric distribution with a fixed lower bound of 0 and a

variable upper bound across time, across countries with a threshold value of 1. This study looks at one product across several countries, thus the international product specialization index that is based on the Balassa will be used (it is explained in the analytical framework).

To formulate growth strategies for the Kenyan flower exports, the theory of Ansoff about product/market matrix (Kotler, 1988) will be used. The product strategies, such as product development and diversification may not offer increased market share in already existing markets, but strategies such as market penetration in mature markets (Table 3.1).

3.2 Analytical Framework

The Kenyan flower industry was expounded by analyzing the position of Kenya in comparison with the main competitors and their preferred markets.

3.2.1 Descriptive analysis

(a) Trend of exports

(i) The general trends of Kenyan exports were determined, this was done by exponential smoothing to account for seasonality and trend. The winter model (SPPS vs.13) was used assuming linear trend component and a multiplicative seasonal component for Kenya.

(ii) The market share for Uganda, Tanzania, Ethiopia, Israel, Colombia, Ecuador and Netherlands in EU-25, Japan and USA market was computed.

(iii) The average annual percentage growth of exports from 1995 to 2006 for Uganda, Tanzania, Ethiopia, Israel, Colombia, Ecuador and Netherlands was also calculated.

Table 3.1: Ansoff's product/market matrix

	Existing flower products	New flower products
Existing market	Market penetration	Product development
New markets	Market development	Diversification

Adapted from Kotler (1988)

(b) Relative Unit Value (RUV)

The RUV of the sector was calculated as the ratio of the average unit value of exports for a country to the world average unit value. The reference point or average relative unit value is 1 (the unit value in the targeted country, equals the unit value in the world market). If the RUV is below (above) 1, then the country exports its product at a lower (higher) price than the world average unit price. According to new theories of international trade, a product is differentiated by quality, which is often reflected by difference in prices. Assuming that a consumer has access to product information, two products of different qualities cannot be sold at the same price. Thus, the unit value is used as a proxy for price, because prices are not available for individual commodities. Higher unit values are considered as reflecting higher quality, assuming that all other factors are equal.

(c) Comparative advantage

The country's comparative advantage was measured against the selected countries using the Revealed Comparative Advantage (RCA) index. RCA index was first proposed by Balassa (1965).

Assume that the world[2] economy comprises *N* countries and *m* sectors. Country *i* export of the sector *j* are x_{ij} and total exports of country *i* are given by $X_i = \sum_{j=1}^{m} x_{ij}$. World exports of sector *j* amount to $X_{wj} = \sum_{i=1}^{N} x_{ij}$, while total world exports can be seen either as the sum of all sectors or as the sum of all countries, that is $X_w = \sum_{j=1}^{m} x_{wj} = \sum_{i=1}^{N} X_i^1$. Using relative export structure, the Balassa index can be written as:

$$B_{ij} = \frac{x_{ij}}{X_i} / \frac{x_{Wj}}{X_W} \quad \text{for all country } i=1,2 \ldots, N; \text{ and product } j=1,2, \ldots,m \quad (1)$$

If the share of sector *j* in total exports of country *i* is higher than the equivalent share of sector *j* in the world exports, i.e. $\left(\frac{x_{ij}}{X_i}\right) > \left(\frac{x_{Wj}}{X_W}\right)$, then $B_{ij}>1$ and country *i* is classified as having a revealed comparative advantage in sector *j*. Here the index uses $\left(\frac{x_{Wj}}{X_w}\right)$ to normalise $\left(\frac{x_{ij}}{X_i}\right)$ with a threshold level of 1.

To over come this, the international product specialization index suggests the use of a different normalization, thus denominator.

[2] The definition of 'world' is the reference countries Kenya, Uganda, Tanzania, Ethiopia, Zambia, Zimbabwe, Morroco, Egypt, Israel, Colombia, Ecuador and The Netherlands. The number of products is limited to different types of cut flowers in the horticulture sector. Balassa (1965) did not use the world as a whole, but aggregate comprising 6 areas (EU, USA, Canada, UK, Sweden and Japan).

International product specialization index

$B_{ij}^{*} = \frac{x_{ij}}{X_i} / \left(\overline{\mu_i} \right)$ for all country *i*=1,2,...,N; and product *j*=1,2,...,m (2)

Where $\left(\overline{\mu_i} \right)_j = \left(\frac{\overline{x_{ij}}}{X_i} \right) = \frac{1}{N} \sum_{i=1}^{N} \left(\frac{x_{ij}}{X_i} \right)$ is the average export share of sector *j* across the different *i* countries. Each country *i* =1,2,...N has a particular share on sector *j* exports $\left(\frac{x_{ij}}{X_i} \right)$, and is the un-weighted average of this export share in all countries. The threshold for this index is also 1.

If the share of sector *j* in total exports of country *i* is higher than the average share of sector *j* in the N economies of the worlds, i.e $\left(\frac{x_{ij}}{X_i} \right) > \left(\overline{\mu_i} \right)$, then $B_{ij}^{'} > 1$ and this country is classified as being relatively more specialized in sector *j*. Thus, the value of each can be interpreted as the contribution of each country *i* in sector *j* to N. Therefore, it is dependent on the number of countries or regions under consideration. The international sector specialization index mean within each sector (cross-country analysis) is always equal to 1, that is $\frac{1}{N} \sum_{i=1}^{N} B_{ij}^{*} = 1$ (De Benedictis and Tamberi, 2001; Amador, Cabral and Maria, 2006).

Thus, the revealed comparative advantage was arrived at by calculating the international product specialization index for Kenya, Uganda, Tanzania, Ethiopia, Israel, Colombia, Ecuador, and The Netherlands.

3.3 Data Types and Sources

Export data for Kenya, Uganda, Tanzania, Ethiopia, Israel, Colombia, Ecuador, and Netherlands was collected from COMTRADE and EUROSTAT. Import data from EU-25, Japan and USA was collected from COMTRADE and EUROSTAT. The Standard International Trade Classification Revision 3 (SITC rev 3) at the 4- and 5-digit level was used for this study. Code SITC. REV. 3 codes S3-2927- cut flowers and foliage and S3-05 for fruits and vegetables.

4. Results and Discussion

4.1 Cut Flower and Foliage Exports Trends

(i) Cut flower and foliage exports trends in Kenya

The value of cut flower and foliage exports from Kenyan exporters over the decade has risen steadily. This can be attributed to demand for flowers by consumers, and is a sign that the country is receptive to the consumers' dynamic needs. Production is seasonal, with the peak during the European winter months and low production in the European summer months. It is also geared towards complimenting the importer countries own production.

Flower exports have continued to increase over the last two decades despite a consistent overall decline in Kenya's export performance (Wagacha, 2000). This upward trend is attributed to economic liberalization, coupled with export incentives to improve competitiveness. The government has also played a facilitative role through its regulatory bodies such as HCDA. The private sector has been instrumental in this growth through institutions such as Fresh Exporter Association of Kenya (FPEAK), and the Kenya Flower Council (KFC). Farmers have been able to establish self-regulatory industry standards and champion marketing of Kenyan flowers.

Cut flower production is largely based on large-scale and medium large commercial farms with very little contribution from the smallholders. The country has an estimated 5,000 producers, ranging from smallholder farmers to large commercial operations. About, 50 medium to large-scale operations produce 75 per cent of total exports on farm sizes ranging from 20 to >100 hectares. Another 10 to 15 per cent of exports are produced by several dozen small to medium-scale operations of 4 to 10 hectares. The remaining 5 to 13 per cent of exports are produced by 3 to 4,000 smallholder farmers on less than 4 acres, but mostly on an acre or less of land (Fintrac, 2005; Kolavalli and Whitaker, 2004). More than 90 per cent of Kenya's flowers are handled by four specialized air freight forwarders (three of which are owned or linked to top flower producers) that aggregate all horticultural produce and in turn are able to secure better air freight purchasing power. After export, the large scale exporters have a logistic infrastructure for direct distribution to the mass market retailers (Hornberger *et al.*, 2007).

ii) Market share and average annual growth rate

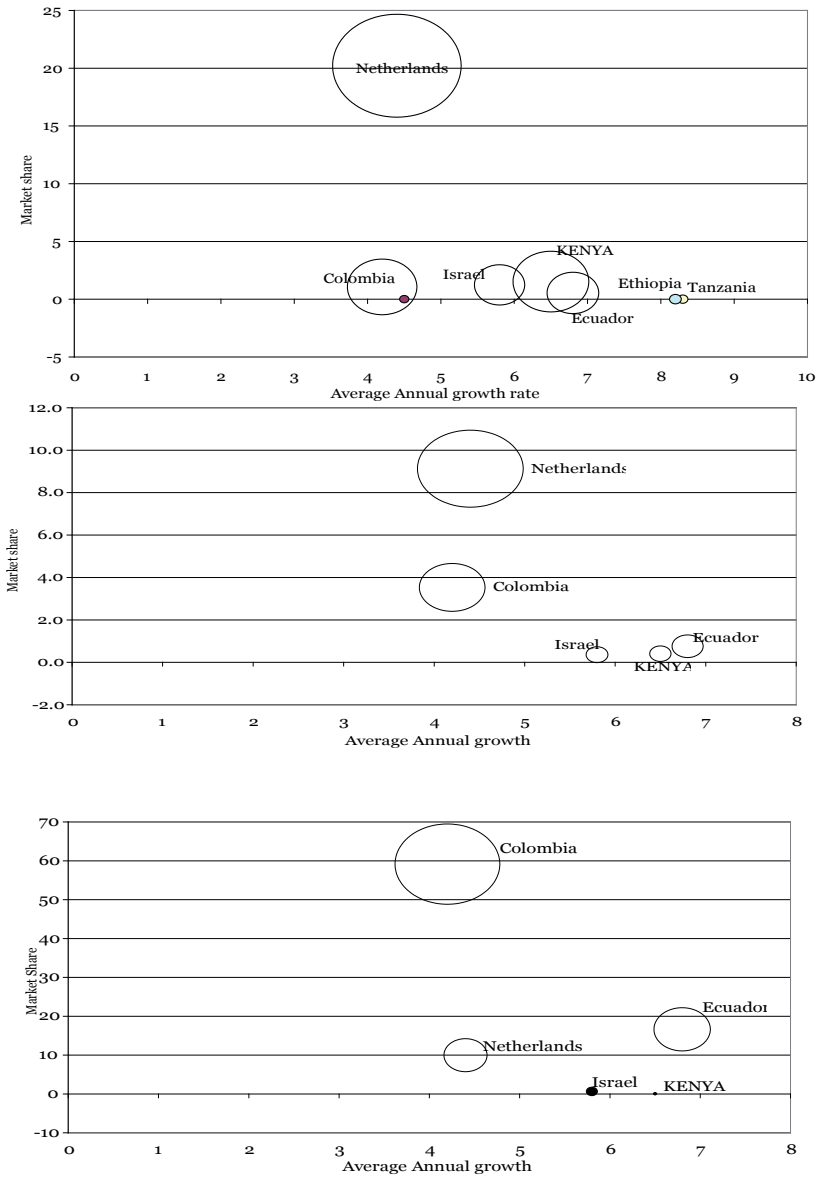
a) The European-(25) market

As indicated earlier, the EU is believed to consume over 50 per cent of the world's flowers. The union includes many countries that have a relatively high per capita consumption of cut flowers. The EU is the world's leading importer of flowers and foliage, with imports amounting to €3.4 billion in 2006. In contrast, the volume of cut flower imports decreased by 11 per cent in 2006. This indicates higher average prices of the imported flowers. In 2006, cut flowers and foliage from other EU member countries accounted for 76 per cent of total imports. Imports from outside the EU consisted 24 per cent, this share has increased from 21 per cent in 2002. The Netherlands is the leading importer, accounting for approximately 55 per cent of extra-EU imports. As a result, The Netherlands is the main supplier of cut flowers and foliage to other EU member states, accounting for almost €2.4 billion or 69 per cent of total imports in terms of value in 2006 (CBI, 2007).

Imports from developing countries have increased from 17.5 per cent in 2002 to 21.6 per cent in 2006 (EUROSTAT, 2008). These imports, when aggregated, account for an estimated 4 to 5 per cent of the market share of the EU. As indicated earlier, the EU is Kenya's largest export market. Kenya accounts for approximately 1 to 2 per cent of that market (Figure 4.1), while Colombia, Ecuador and Ethiopia account for less than 2 per cent of the market. Despite the growth in exports over the decades, since the turn of the century, Kenya's share of the market seems to decline and is being overtaken by Israel and Colombia. This can be attributed, in part, to the lack of diversification of flower varieties and product. Currently, the country's product diversification is biased to fresh flowers and limited to specific flower varieties namely roses, carnations, assorted summer flowers and chrysanthemum (Theon *et al.,* 1999). This is unlike Israel for instance, which has evolved over time and moved from traditional flower varieties, such as roses, gerbera and carnations to wax flowers, roses, gypsophilia and a variety of summer and indigenous flowers (World Bank, 2004).

Secondly, Kenyan growers have over the years relied on the auctions in The Netherlands as the main marketing channel (Figure 2.1). Theon *et al.* (1999) suggest that growers would receive better prices if they sold through direct markets; however, he also notes that reliable consistent suppliers are able to get premium prices at the auctions. He goes further to suggest that the marketing cost for Kenyan flowers through the

Figure 4.1: Value (current prices) of cut flower and foliage exports 1995-2006 for Kenya



Note: Bubble size proportional to absolute export value
Source: Computed from EUROSTAT (2008); and COMTRADE (2008)

auctions or through direct marketing channels should be compared. It is important to note that most developing countries that sell flowers in the EU do so through auctions. The global flower chain is classified as a spot market, according to Gereffi *et al.* (2003), meaning the complexity

of the transactions are low, the supply side has the capacity to meet the market demands, and the marketing channels are relatively transparent.

(b) The Japan market

Japan imports only 7 per cent of the cut flower consumption needs. The imports mainly come from Thailand, Malaysia, Taiwan and South Korea, among other countries (Centre for Native Floriculture, 2006 and ISHS, 2005). The Netherlands, Colombia, Coast Rica, and Ecuador account for an average of 14 per cent of the market share. Kenya has less than one per cent of the market share. Exports to Japan from Kenya have increased over the recent past. However, as indicated earlier, understanding the consumer preferences, the traditional habits and meeting the Japanese import regulations is problematic (ISHS, 2005). This is a market that the country could consider for developing new products.

(c) The USA market

The USA is a large importer of cut flowers despite the fact that the country produces substantial volumes for her domestic market (ISHS, 2005). More than 50 per cent of the market share is accounted for by Colombia. When Colombian imports are combined with Ecuador, he Netherlands and Coast Rica, their market share is over 90 per cent. Kenya's contribution is less that 0.5 per cent of the market (Figure 4.2). Here, the country should consider intensifying the supply of flowers, developing new products and diversifying because the main players in this market have a comparative advantage.

(d) Average annual growth rate

The average annual growth rate of cut flower and foliage exports has been increasing annually in all the selected countries, corroborating that the growth of this sub-sector has been steady. In East Africa, with the entry of countries such as Ethiopia and Tanzania, substantial growth has been recorded in the last five or so years. South American countries such as Colombia, for instance, have slowed in their growth from 13 per cent in the mid 1970s to less than 5 per cent from the 1990s to date. Ecuador, on the other hand, has recorded a rising growth rate since the 1980s. Israel has recorded a steady growth rate of approximately 5 per cent annually since the 1990s, inspite of its dynamic political arena (ISHS, 2005).

4.2 Relative Unit Value of Exports

(a) Relative Unit Value (RUV) of exports to the Europe Union-25

The comparison of unit values gives an indication of an exporter's relative prices. The unit value is used as a proxy for price, because prices are not available for individual commodities. Higher unit values are considered to reflect higher quality, assuming that all other factors are equal. RUV for USA was not computed due to lack of data for total volume of imports into the USA. Table 4.1 shows that Kenya export prices are higher than the relative price of cut flowers in the European Union. When Kenya is compared with the other selected countries, the indication is that Kenya's cut flower are different in quality (1.8) from its competitors Colombia (1.3), and Netherlands (1.4).

(b) Relative Unit Value of exports to Japan

When the Japanese market is taken into account (Table 4.2), Egypt (6.8) again shows that her exports are of better quality than the rest of the selected countries. Kenya (2.8) on the hand, sells relative better quality cut flowers than her major competitors, Colombia (1.8), Ecuador (2.2) and Netherlands (2.0).

(c) Relative Unit Value of exports to Japan and European Union- 25 combined

When the EU-25 market and the Japanese market are combined, Table 4.3 shows that on average, Kenya (1.0) sells at the market unit value, while its competitors, Colombia (0.7), Ecuador (0.8) and The Netherlands (0.8) sell at prices lower than the relative unit value in these markets, reflecting that Kenya sells better quality cut flowers and foliage than its competitors. The East African countries, on average, sell their cut flowers at the unit value in these markets.

4.3 International Product Specialization Index

The international product specialization index based on the Balassa Index was used to measure the comparative advantage of the selected countries (Appendix I).

(a) European Union-25 market

Kenyan and Tanzanian cut flowers and foliage exports have a comparative advantage in the EU-25 , compared to all the other countries that do not

Table 4.1: Relative unit value of exports in the EU-25 market

	1999	2001	2003	2005	2006
Kenya	1.76	1.96	1.96	1.77	1.94
Uganda	0.81	1.23	1.32	1.39	1.94
Tanzania	1.69	2.90	2.48	1.59	1.56
Ethiopia	2.03	2.20	5.68	1.82	0.00
Israel	3.42	0.00	0.00	1.50	1.57
Colombia	1.10	1.48	1.48	1.30	1.28
Ecuador	1.38	1.57	1.32	1.80	1.32
Netherlands	1.29	1.33	1.41	1.67	1.72

Source: Computed from COMTRADE (2008)

Table 4.2: Relative unit value of exports in the Japan market

	1995	1997	1999	2001	2003	2005	2006
Kenya	4.77	3.45	2.91	2.26	2.18	2.01	2.04
Israel	0.00	63.18	56.50	0.00	0.00	1.70	1.65
Colombia	3.06	2.06	1.82	1.70	1.65	1.47	1.34
Ecuador	4.03	2.82	2.29	1.81	1.47	2.05	1.39
Netherlands	3.02	2.32	2.13	1.53	1.57	1.90	1.81

Source: Computed from COMTRADE, 2008

Table 4.3: Relative unit value of exports in the Japan/ EU-25 market

	1999	2001	2003	2005	2006
Kenya	1.10	1.05	1.03	0.94	0.99
Israel	2.13	0.00	0.00	0.79	0.80
Colombia	0.69	0.79	0.78	0.69	0.65
Ecuador	0.86	0.84	0.70	0.96	0.68
Netherlands	0.80	0.71	0.74	0.89	0.88

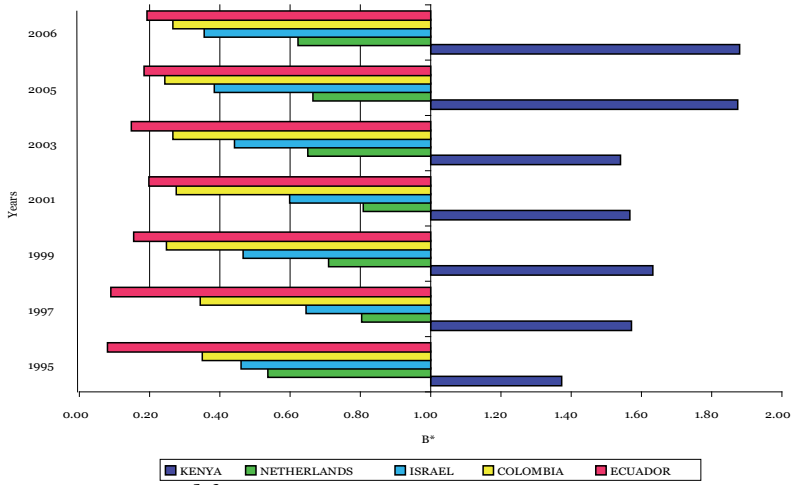
Source: Computed from COMTRADE, 2008

have a comparative advantage (Figure 4.2). As earlier indicated, this is Kenya's main export market and has been able to ensure fast, flexible and reliable delivery system for cut flowers and foliages through the participation of a variety of private institutions, despite the fact that the country has relatively higher freight cost to Europe from Kenya ($1.6/kg) when compared with countries such as Israel ($0.75/kg) (Subramanian *et al.*, 2007 and World Bank, 2005).

b) The USA market

Colombia and Ecuador show comparative advantage, while the other countries have comparative disadvantages in this market (Figure 4.3). The South American countries benefit from tariff free access to these markets. They are excluded from special tariff that other countries attract despite the African Growth and Opportunity Act (AGOA) and

Figure 4.2: International specialization index for selected countries in the European Union-25 market



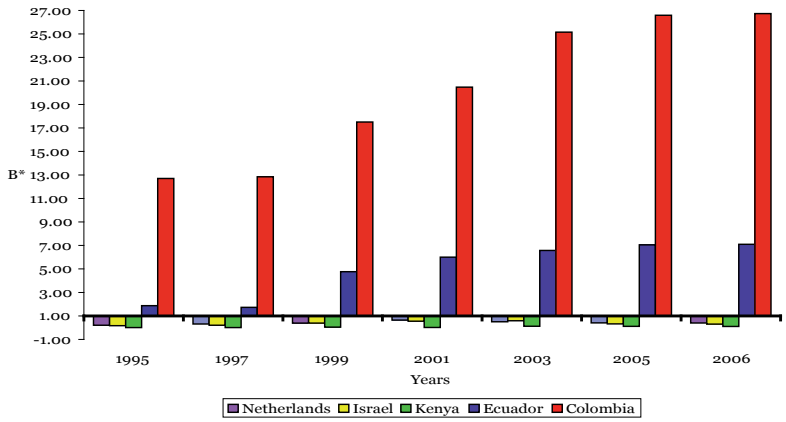
Source: Computed from COMTRADE, 2008

the North America Free Trade Agreement-NAFTA (ISHS, 2005 and Flower Promotion Organization, 2004). In addition, the flower farmers in Colombia have a jointly owned co-operative with US flower growers called Flower Promotion Organization. It also acts as a marketing front for Colombian farmers to sell their flowers in the USA (FPO, 2004). Nevertheless, the Ecuadorian export portfolio is highly skewed to roses, making the industry very vulnerable to the market developments of this product (Palan and Palan, 1999). Kenya's lack of comparative advantage may be attributed to distance, few and far between market initiatives towards this market. It must be noted, however, that the USA market prefer the big bud type roses, which are not commonly grown in Kenya (World Bank, 2004).

(c) Japanese market

In the Japanese market, Colombia, Netherlands, Ecuador, Israel, Costa Rica and Kenya show a comparative advantage from the year 2004 when cut flowers have had a comparative advantage (Figure 4.4). As indicated earlier, this market has unique consumer tastes and is suitable for niche products.

Figure 4.3: International specialization index for selected countries in the USA markets

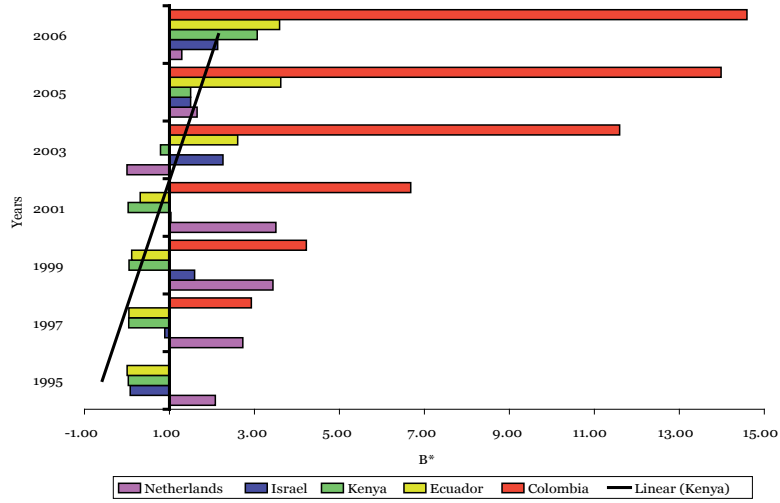


Source: Computed from COMTRADE, 2008

4.4 Synthesis of the Results

Kenya's most important horticultural export is cut flowers and foliages, which are of good quality, thus attracting higher prices than the average market price. The EU is an important market for Kenyan exports because of the traditional links and Kenya enjoys preferential access granted by trade agreements. Kenya's important competitors (Colombia and Ecuador) have comparative advantage in their primary market (USA) and are gaining market share in the other markets.

Figure 4.4: International specialization index for selected countries in the Japanese market



Source: Computed from COMTRADE (2008)

The Netherlands is the largest exporter and importer of cut flowers. It is interesting to note that the country has no comparative advantage in the cut flower and foliage market in the EU-25 and the USA when compared with developing countries. This maybe due to the fact that there are several other flower products' markets that the country participates in such as bedding and potted plants, including the production of plant and propagation material. The Netherlands is extremely advanced in breeding innovation and technology. It has a good knowledge infrastructure, extensive marketing institutions, and is aided by the policy of using the auctions to exclude the foreign growers in the supply chain, thus reducing the number of direct market sales by these growers in the European Union (ISHS, 2005; World Bank, 2004; and Batt, 2000).

Israel also shows comparative disadvantage in EU-25 and the USA. This can be attributed to the diversification that the cut flower industry has taken such that the country has moved from basic cut flower production to include production of plant, propagation material and knowledge infrastructure. Apart from that, its exports have evolved from traditional varieties such as roses, gerbera and carnations to wax flowers, roses gypsophilia and a variety of summer and indigenous flowers. It is important to note that cut flower production in Israel is technologically superior and innovative, thus can only be compared to the Dutch production systems, but lacks extensive marketing institutions (ISHS, 2005; World Bank, 2004; and Batt, 2000).

5. Conclusion and Recommendations

5.1 Conclusion

Kenya has a revealed comparative advantage in the cut flower and foliage markets in the EU and Japan. The products sold in these markets are of relatively higher quality compared to her major competitors, thus assuring a better price. Kenya commands a 1.5 per cent share of the EU and a negligible share of the Japan and the USA markets. Kenya's main competitors, for instance Colombia, have a comparative advantage in the USA and Japan and control more than 50 per cent of the market in the USA, about 3.5 per cent in Japan and an estimated 1 per cent in the EU. Colombia's quality of the cut flowers and foliage to the EU and Japan is lower than that of Kenya, as shown by its relative unit value, which is less than a unit.

The market for cut flowers consists of a wide range of product groups. Kenya has managed to be the leading foreign supplier to the EU, with a very limited product range that is not unique to other developing countries involved in trade. The domestic market in the country is almost non-existent, when taking into account that the EU, Japan and the USA have a very vibrant domestic market and the imports are used to compliment their own production.

In the European Union market cluster, Kenya should focus on market penetration and product development. The EU market is run on an auction system. With increasing competition, support may be needed to identify and form linkages/networks to facilitate direct sales. South American producers (Colombia, Ecuador) have already developed market distribution channels that reach both wholesalers and retailers (Subramanian *et al.*, 2007). Products such as mixed bouquets, dried flowers, indigenous flowers, perfumes, just to mention but a few, should be explored.

The Japanese market is a prime candidate for diversification and development of new, special and different products through co-operation with importers. However, aggressive and strategic market research will be required. This would, in the long run, provide an avenue for the industry to penetrate the other Asian countries.

In the USA market, the country may be interested in pursuing new products and developing a market for the current products. This is

Box: 1 Flowers farms move out of Kenya

'Sher Agencies, a leading producer of roses, produces 600 million stems annually, making it the biggest producer in the world. Reported that flower prices had dropped by more than 20% in the past two years. "Flower prices have been dropping every year, thus raising our production costs and reducing the profit margin sharply," a spokesman said. He added that the cost of production of flowers was very high, and that players in the sector are now shifting to Ethiopia as it is offering a more conducive environment for investors'

Source: Allafrica.com /the East African Standard (Nairobi) 06/03/06'.

because South American countries already have a comparative advantage in this market. Finally, the country should focus on promotion and lobbying to increase market share. Promotion should be directed towards relevant motives such as environment, health and fair trade.

Kenya has for a long time been a force to recon with as concerns the cut flower and foliage exports in the world and in Sub-Saharan Africa. However, countries in Eastern Africa have recently started providing competition. New producers such as Ethiopia and Uganda have successfully broken into the European flower market, although they still have a significantly lower market share (Box 1).

5.2 Recommendations

Horticultural trade policy in Kenya has been driven largely by the private sector. Nevertheless, it is imperative for the government to be actively involved in implementing policy in this sector, thus ensuring benefits for the country's population as a whole. In the cut flower sub-sector, some of the desired interventions include:

(a) Strengthening the market infrastructure

The value chain for cut flower needs to be streamlined and information symmetry facilitated along the chain. Together with the producer associations, the country should endeavor to develop new strategies for market intelligence, network formation and at the same time gain and maintain their current market share.

(b) Adapting to geographical indications for Kenyan products

Geographical indications (GI) are valuable as market tools in the global

economy. It acts as a certification that the product is of certain quality due to its geographical origin. This should be carried out hand in hand with product development in public private partnerships, with relevant research institutions in the country. This will fast track the development of the sector towards the direction of the Netherlands and Israeli's floriculture sectors.

(c) Encouraging development of a domestic market for cut flowers

With improving livelihoods of the Kenya population, people should be encouraged to consume their own produce, hence provide a buffer for the cut flower industry. Value should be added to consumption products such as drying, preparation of perfumes and other products.

(d) Increasing participation of smallholders in the production chain

Farmers should be encouraged with incentives to produce cut flowers and foliages for both the domestic and export market by providing incentives such as tax holidays, preferential extension services, market information, and trade support services among others.

(e) Increasing domestic support and safeguard cut flower exports

In order to safeguard the erosion of preferences of horticulture exports envisaged in both the EPAs and the Doha Round of negotiations, there is need for Kenya to emphasize the need for the EU to observe the principles of cooperation in development financing of the sector, as envisioned in the Cotonou partnership agreement. Furthermore, Kenya has flexibility to enhance domestic support to the sector under the Green Box measures, if need be, to consolidate her market share of the products.

5.3 Suggestions for Further Research

1. Further research should be carried out to determine the market potential for Kenyan flowers in the Europe, Asia, Middle East, and the USA markets.
2. In addition, the competitiveness of Kenyan flowers in Europe, Asia, Middle East, and the USA markets should be assessed.

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Appendix

Table 1: International product specialization index for the European Union-25 market

EU	1995	1997	1999	2001	2003	2005	2006
Colombia	0.35	0.34	0.25	0.28	0.27	0.24	0.27
Ecuador	0.08	0.09	0.15	0.20	0.15	0.18	0.19
Ethiopia	0.08	0.04	0.07	0.07	0.24	0.40	0.00
Israel	0.46	0.65	0.47	0.60	0.44	0.38	0.36
Japan	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kenya	1.37	1.57	1.63	1.57	1.54	1.87	1.88
Netherlands	0.54	0.80	0.71	0.81	0.65	0.66	0.62
Tanzania	0.00	0.23	0.18	0.35	0.24	0.20	0.26
Uganda	0.36	1.07	1.51	2.45	2.90	5.66	5.76
United States	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South Africa	0.00	0.00	0.00	0.04	0.04	0.04	0.04

General statistics international product specialization index EU-25 market

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
Colombia	0.29	0.35	0.24	0.04	0.51	1.52	1.63	0.44
Ecuador	0.15	0.21	0.08	0.05	-0.48	1.95	1.02	0.60
Ethiopia	0.12	0.40	0.00	0.13	1.10	2.90	2.41	0.30
Israel	0.51	0.67	0.36	0.12	-0.04	1.52	1.10	0.58
Japan	0.00	0.00	0.00	0.00	0.69	2.33	1.18	0.55
Kenya	1.67	2.33	1.36	0.26	1.30	4.47	4.43	0.11
Netherlands	0.71	0.85	0.54	0.10	-0.13	1.91	0.63	0.73
Tanzania	0.20	0.35	0.00	0.11	-0.67	2.75	0.92	0.63
Uganda	2.62	5.76	0.36	1.91	0.61	2.05	1.20	0.55

Table 2: International product specialization index for Japan market

	1995	1997	1999	2001	2003	2005	2006
Colombia	0.98	2.93	4.22	6.68	11.60	13.98	14.59
Ecuador	0.00	0.05	0.11	0.31	2.61	3.62	3.59
Israel	0.08	0.89	1.59	1.04	2.26	1.50	2.14
Kenya	0.03	0.04	0.05	0.03	0.79	1.50	3.06
Morocco	0.32	0.00	0.00	0.00	30.04	0.00	0.00
Netherlands	2.08	2.73	3.44	3.50	0.00	1.65	1.29

General statistics international product specialization index Japan market

	Mean	Medium	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
Colombia	7.34	6.62	14.59	0.98	4.92	0.36	1.64	1.18	0.55
Ecuador	1.31	0.25	3.92	0.00	1.63	0.69	1.69	1.83	0.40
Israel	1.39	1.54	2.26	0.08	0.69	-0.45	2.27	0.67	0.71
Kenya	0.60	0.13	3.06	0.03	0.91	1.88	5.66	10.60	0.00
Netherlands	2.15	2.23	3.72	0.00	1.26	-0.54	2.23	0.88	0.65

Table 3: International product specialization index for the USA market

	1995	1997	1999	2001	2003	2005	2006
Colombia	12.70	12.84	17.50	20.48	25.15	26.59	26.73
Ecuador	1.88	1.73	4.76	6.01	6.57	7.05	7.10
Ethiopia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Israel	0.17	0.21	0.38	0.55	0.59	0.32	0.31
Kenya	0.01	0.01	0.04	0.02	0.12	0.11	0.10
Netherlands	0.21	0.31	0.39	0.65	0.50	0.41	0.40
Uganda	0.00	0.00	0.00	0.00	0.00	0.00	0.00

General statistics international product specialization index USA market

	Mean	Medium	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
Colombia	19.65	19.17	26.73	12.70	5.68	-0.03	1.37	1.33	0.51
Ecuador	4.91	5.38	7.30	1.73	2.28	-0.32	1.45	1.40	0.50
Ethiopia	0.02	0.00	0.23	0.00	0.07	3.01	10.09	43.31	0.00
Israel	0.38	0.35	0.68	0.17	0.17	0.32	1.83	0.89	0.64
Kenya	0.60	0.04	0.15	0.00	0.05	0.55	1.82	1.31	0.52
Netherlands	0.42	0.41	0.69	0.16	0.18	0.09	1.89	0.63	0.73
Uganda	0.02	0.00	0.20	0.00	0.06	2.99	10.01	42.50	0.00