Scripta Horticulturae
Number 2

Sustainable International Networks in the Flower Industry

Bridging Empirical Findings and Theoretical Approaches

J. Wijnands

A publication of the
International Society for Horticultural Science

ISHS

Sustainable International Networks in the Flower Industry
Bridging Empirical Findings and Theoretical Approaches

Jo Wijnands

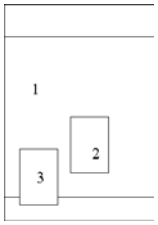
The Hague
October 2005

ISSN 1813 - 9205
ISBN 90 6605 0 098, *Scripta Horticulturae n° 2*

Published by ISHS, October 2005
Executive Director of ISHS: Ir. J. Van Assche
ISHS Secretariat, PO Box 500, 3001 Leuven 1, Belgium

Printed by Drukkerij Geers, Eeckhoutdriesstraat 67, 9041 Gent-Oostakker, Belgium

Photographs on the front cover:



By courtesy of:
1. Tom Vandenbosch
2. Frank Ammerlaan
3. Frank Ammerlaan

CONTENTS

PREFACE

Market access to Western European markets for developing countries is a key issue in the 2004-2007 policy programme 'Vital and Together' of the Dutch Ministry of Agriculture, Nature and Food Quality. The Netherlands helps developing countries to improve their market performance by means of public-private partnerships, capacity building and the provision of access to Western markets. The aim is to stimulate sustainable agricultural development and to decrease poverty in developing countries. This report describes theoretical approaches to ensure the sustainable development of floriculture in developing countries. Market growth and competitive advantage are used as indicators for sustainability. The report also provides an overview of floriculture worldwide. Large importing countries as well as the main exporting countries are reviewed. Next the report tests the empirical findings against the theoretical approaches. The conclusion is directed to the usefulness of the theoretical approaches for analysing the sustainable development of the floriculture industry in developing countries. The impact on poverty reduction and the issue of capacity building are not within the scope of this study.

The LEI thanks Mr G. Westenbrink of the Dutch Ministry of Agriculture, Nature and Food Quality for his valuable comments and his involvement in this research. The Ministry funded the work under the umbrella of research programme 433 'Market development'.

Jo Wijnands,
The Hague, 2005

SUMMARY

Conclusions
A partnership between the floriculture industry of Kenya and the Netherlands is beneficial for both countries. This is one of the main conclusions of this report. Kenya is an important supplier of cut flowers to the Dutch marketing organizations, and the Netherlands is the main destination for Kenyan flowers. Switching to other suppliers by the Dutch as well switching to other market organizations by the Kenyan is still possible. The transaction costs of switching are expected to be higher for the Kenyan floriculture industry. Second, basic data on the worldwide floriculture industry are limited available and are far from exhaustive. This hampers a well-elaborated analysis of the sustainability of the partnership between Kenya and the Netherlands and of the competitive advantage of the floriculture industry in both countries. The Netherlands has 2 % and Kenya less than 0.5 % of the worldwide recorded areas of ornamentals. The leading position of the Netherlands as an exporter of cut flowers (45 % share in world export) is well known. Kenya takes the fourth position as world exporter (4 % share). Despite the renowned Dutch export position, in all European countries the domestic production has a larger share in the consumption than the imports.

Research aims
The Dutch Ministry of Agriculture, Nature and Food Quality helps developing countries to access European markets and supports them in capacity building. However, it is not clear which factors promote the sustainable development of industries in developing countries. The primary aim of the research on which this report is based was to assess a theoretical framework to evaluate the sustainability of industries in countries. In this, only the economic development was taken into account: little attention was paid to the 'people' and 'planet' aspects of sustainability. Second, the research aimed at obtaining a concise overview of the flower business worldwide. Special emphasis was given to Kenya and the Netherlands. In the fourth part, the theoretical findings are tested against the empirical findings. The aim of this fourth part is to provide recommendations concerning the most suitable theoretical approach to understand and support the sustainable development of industries in developing countries.

Conceptual framework
Product and production characteristics distinguish flower and fresh food chains from industrial products chains as well as from non-perishable agricultural chains. Managing these chains is complex because of the characteristics of the product. Perishability, variability in price, quantity and quality, seasonality, bulkiness and geographic specialization all complicate the efficient organization of perishable supply chains. The often large number of small and medium-sized producers further complicates matters, since this entails high transaction costs and increases the variability of production, and the geographic spread increases distribution costs. The fact that production, trade and consumption are spread over the world makes it one of the few truly global supply chains. These characteristics require advanced organization and management to result in efficient and sustainable global chains. An imbalance in strategic scope and firm size of the key actors at different levels in the chain can be observed. Currently, the power of retailers is increasing due to concentration and internationalization. Chain cooperation used to be the key success factor of the Dutch horticulture sector; nowadays, however, competition has control. The ease, with which SMEs can be substituted by other SMEs, results in exploitative behaviour by retailers, while exploring or 'learning' behaviour could provide more beneficial and sustainable relationships.

Section 2 summarizes the key elements of the different approaches of the literature review. The approaches show several ways to measure the performance of an industry. Sustainability is not a keyword in any of these theories. Some are focused on the understanding of the conduct and performance, others on how to attain a better performance in the future. The value of a theory depends on the problem definition. The approaches in the overview seem to be sufficient to deal with question related to the economic position of an industry in a global supply chain. The competitive-

ness of industry can be analysed, as can the strategic management of an individual firm or the benefits of cooperation between firms in the chain. The theories are able to give the conditions for economic sustainability in the long run.

Facts about the world's floriculture industry

The main findings of the scan of the floriculture worldwide are summarized in Table 1. The main importers are Germany, the UK, the USA, the Netherlands, France, Japan and Italy. The three main import regions are dealt with; the Netherlands is used as a proxy for the European countries. The research was not focussed on the demand side of the floriculture industry; therefore the European demand countries are not dealt with. More emphasis is given to the exporters. The top five exporters are the Netherlands, Colombia, Ecuador, Kenya and Israel. These were included in the research, as were other East African flower-exporting countries. Only the most important African countries are summarized in Table 1.

The lack of a harmonized database of basic information is in fact the first conclusion. Moreover, one should keep in mind that the two countries with the largest areas of ornamentals are not included. China has one third of the world's area of ornamentals and India one sixth. Both countries are excluded from the overview because of the lack of data and their insignificance on the export or import market. Several countries from the Asian region are also omitted, whereas the import portfolio of Japan suggests the growing importance of several countries in this region. The huge areas of ornamentals in the importing countries USA (8 % of world total) and Japan (around 6 %) are remarkable. Even in the major importing countries, the domestic production outweighs the imports as share in consumption. In the UK – the country with the lowest level of self-support – more than two thirds of the consumed flowers are domestically produced. The domestic production of Japan (a large importer) is growing annually by 8 %.

As regards area, the Netherlands is not one of the biggest producers: China, India, the USA and Japan each have a larger area, and Colombia is reaching the level of the Dutch. In export value (EUR 3000 million) the Dutch have a significant lead. The main variety of cut flowers grown is roses. Roses strongly dominate the floriculture sector in most countries. Only in the USA, Japan (both importing countries), the Netherlands, Israel and Columbia is the share of roses far below 50 %. The competition on the market is therefore high and suggests that countries can easily be substituted. However, within the variety of roses, several cultivars and colours can be distinguished. Each combination of cultivars and colour has a specific market niche. In broad outlines: the South American countries produce large-bud roses, whereas the East African countries produce small-bud roses.

Table 1. Main characteristics of selected cut-flower producing countries

Determinant	Nether-lands	USA	Japan	Kenya	Israel	Uganda	Zambia	Tanzania	Colombia	Ecuador
Area of ornamentals (ha)	8 300	23 300	20 000	n/a [a].	n/a	n/a	n/a	n/a	5 900	3 155
Protected area of flowers (ha)	5 800	15 560	9 000	n/a	2 750	n/a	n/a		5900	n/a
Number of farms	7 750	10 000	80 000	140	1 900	18	40	12	450	375
Cost price at farm level	High	High	High	Low	High	Low	Low	Low	Low	Low
Production value (EUR million)	3 540	5 248	3 150	45	230	8	>17	n/a	540	190
Growth rate of production %	1	0	8	15	5	14	+/-	0	5	15
Main varieties of cut flowers [b]	ro, ch, li,	gl, ro, ch,	ch, ca, ro,	ro, hy, ly,	wf, ro, gy,	ro	Ro	ro	ro, ca	ro
Share of main variety (%)	23	n/a.	33	68	9	> 80	95	80	29	80
Export value (EUR million)	3 000	33	n/a	200	145	28	16	7	710	260
Main export destinations [c] (in order of importance)	DE, UK, FR	n/a		NL, UK, DE	NL,US, DE	NL	NL	NL, DE	US, UK, CA	US, NL, RU
Import value (EUR million)	440	610	170	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Main countries of import origin [c] (in order of importance)	KE, IS, ZI	CO, EC, ME	NL, TH, SK							
Code of conduct [d]	MPS	n/a	n/a	MPS, L	MPS	MPS	L	n/a	L	L
UPOV member	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
Capital availability	***** [e]	*****	n/a	***	****	*	n/a	*	n/a	n/a
Standard skilled labourers	*****	****	****	***	***	*	n/a	*	n/a	n/a
Logistics	*****	*****	*****	***	*****	***	*	*	n/a	n/a
Access to retailers	*****	*****	*****	***	*	*	*	*	n/a	n/a
Physical infrastructure	****	*****	*****	*	****	*	n/a	**	n/a	n/a
Knowledge infrastructure	*****	***	***	**	*****	**	n/a	**	n/a	n/a
Home market	*****	*****	*****	*	n/a	*	*	*	n/a	n/a
Presence of supporting industries	*****	***	***	**	*****	*	n/a	*	n/a	n/a
Breeders of unique varieties	*****	n/a	n/a	*	*****	*	*	*	n/a	n/a
Economic/political stability	*****	*****	*****	**	****	**	n/a	**	***.	***

[a] n/a =not available

[b] ca=carnations, ch=chrysanthemums, ge=gerberas, gl=gladioli, gy= gypsophilia, hy=hyphericum, fr=freesias, fy=fynbos li=lilies, ly=lysianthus, or=orchids, pr=protea, ro= roses, sa=salidago, wf=wax flowers. Summarized in order of importance.

[c] CA= Canada, CO= Colombia, EC=Ecuador, DE=Germany, FR=France, IS= Israel, KE= Kenya, ME= Mexico, NL= The Netherlands, RU= Russia, SK=South Korea, TH= Thailand, UK= United Kingdom, US=United States of America, ZI= Zimbabwe. Summarized in order of importance

[d] L= local label from producers association

[e] Relative classification: ***** very positive/favourable, **** positive/ favourable, *** medium, **negative/poor and * very negative/poor

On the international markets, codes of conduct are of major importance. For the European market, MPS is the dominant code. These codes of conduct respond to consumers' concerns about environmental and ethical aspects. Membership of the Union International pour la Protection des Obtentions Végétales (UPOV) enables access to new cultivars and colours. The importing countries and Israel have a favourable position with respect to knowledge and distribution infrastructure and access to consumer outlets. Of the African countries, Kenya has a comparatively good position. Information has not found for the South American countries.

Despite the huge quantity of information presented here, many vital facts are missing, such as information on cost prices, including the costs of marketing and logistics till consumers, based on the standardized accounting rules and information about attributes (cultivars, colours) with respect to consumers' preferences. Almost no information was found on the enabling condition of modern ICT applications. The transparency of price formation and the standards of the Dutch auction are two of the few exceptions.

Facts and theories

The worldwide floriculture sector is competitive. Barriers to both entering and exiting the sector are low. The costs of switching between suppliers or buyers and between flower varieties are also low. The flower production in most developing countries is destined for developed countries: the domestic market in developing countries is negligible. The sustainability of the industry is therefore determined by the competitive advantages and the strategic behaviour. Porter's approach is well suited to analyse the competitive advantages. The facts gathered are insufficient for drawing conclusions for the Kenyan or the Dutch horticulture sector. However, it is very clear that an industry will be excluded from international chains if the capabilities in the supply bases are insufficient to meet the international demand standards – which include a competitive price. Theories on how to derive a strategic scope and how to derive a strategic advantage are also available. Cooperation and customer-oriented support seems to be more beneficial, as is a chain governed by foreign buyers or investment. However, the question is: will any competitive advantage endure and thus be sustainable? Answering the question can be conducted within the framework of theories but it demands more empirical facts than are publicly available.

Dutch-Kenyan Partnership

The floriculture industry contributes to the economy of Kenya. The benefits are for the marketing organizations. Whether this partnership or direct marketing to buyers in other countries benefits the Kenyans most is not clear. Further research to quantify the difference in transaction costs and the competitive position of Kenya is recommended. Capacity and institution building based on a collective approach seem to be most successful in supporting sustainable development in Kenya.

1. INTRODUCTION AND GOALS

Market access to Western European markets for developing countries is a key issue in the policy programme 2004-2007 'Vital and together' of the Dutch Ministry of Agriculture, Nature and Food Quality. The Netherlands supports developing countries to improve the market performance by means of public-private partnerships, capacity building and the provision of access to Western markets. The aim of the partnerships is to stimulate sustainable agricultural development and to decrease poverty in developing countries. This report presents:

1. An assessment of a theoretical framework for analysing the internationalization of the flower industry (Section 2). This Section focuses on the question what criteria should be used to evaluate the economically sustainable development of an industry that depends on foreign markets and institutions. Here, the focus is on theoretical concepts that incorporate small and medium-sized enterprises (SMEs) and perishable products. A literature survey was used as input for this Section.
2. A concise overview of the world's flower business (Section 3). The Dutch and the Kenyan flower industry operate in a highly competitive environment on the world level. Gaining insight into the competitive factors is necessary. In this part, preliminary answers are given to two questions, namely whether Kenya has a sustainable flower industry and what the impact is on the Dutch flower sector. Public statistics and published articles were used in drafting this Section. It is shown that the international cut-flower chain is based on SMEs. It is also shown that flowers have a set of production characteristics that differ widely from non-perishable industrial products.
3. Conclusions concerning the state of the art of theories related to the performance of the world flower business, with an emphasis on the position of Kenya and of the Netherlands (Section 4). Here, the theoretical considerations from Section 2 are tested against the empirical findings. The information and research gaps are identified. However, the main line of the theories deals with non-perishable products and a hierarchical governance structure.

Sustainable development in this research has a rather limited and in fact an economic scope. The variables share on the world market, its development, market growth and a competitive advantage are used as indicators for sustainability. The flower production in developing countries is aimed at the markets in developed countries. The main contributions to the economy of developing countries are foreign currency income and employment: the 'profit' factor of the triple P approach. The 'people' and 'planet' factors are not dealt with explicitly, although it will be shown that these elements are largely covered by codes of conduct.

The issues addressed are:

- Market access is here understood as access to international markets and is largely based on comparative advantages. Access to the domestic markets is not included in this paper. The product attributes, also for developing countries, should meet the relatively high standards of markets in developed countries. High quality, food safety guarantees and codes of social conduct together with a competitive price setting are examples of mandatory attributes. In general, the product requirements for the international market differ considerable from those for the domestic markets in developing countries. The operational question is: what are the product conditions to enter the developed markets? Formulated more generally: how can the product requirements be fulfilled in order to enter markets/new markets?
- Gaining a sustainable position on these developed markets requires a well-performing supply chain. This position has to be established in a highly competitive and international environment. Understanding the key success factors of those chains is the first step; the next step is to organize the competitive supply chain. Organizing an international chain does not mean doing it all oneself. Cooperating by joining already existing chains can be a good strategy. The question of the unique selling point remains: what is your added value in the chain? Competitiveness issues have to be dealt with.

- After knowing what to produce and how to market it, the last issue is how to produce it. The production knowledge should be available and the network of supplying firms should be adequate. Many of the networks of firms supplying growers producing for the domestic market are not well equipped for growers aiming at exports. In this respect, the question is: what will be necessary for a sustainable development of the industry in the developing country?
- Market access for developing countries also raises questions linked to, for example, poverty reduction, the dissemination of knowledge or capacity building especially for smallholders in developing countries. The research of Westerman et al. (2005) addresses these issues, which were not within the scope of this research.

Granting market access or even supporting market access will influence the industry in a developed country. The competition will increase and due to the import the production in the developed country (if present) can decrease or the firms should repositioning themselves. Excluding foreign producers from Dutch networks and institutions was a defensive approach 10 years ago in the Dutch flower industry. It became clear, however, that it was a failing strategy. The Dutch involvement in marketing flowers was reduced, which could have resulted in a reduction of the market share on their European markets. At the moment, the Dutch industry is more interested in keeping its lead position in marketing flowers. The market opportunities are paramount, not the country of production. However, this approach raises the question: what is the minimum amount of domestic production required to maintain the leading position of Dutch flower-wholesalers? This strategic positioning of the Dutch industry connected with these issues was not a subject of this research.

The theoretical part of the research was focussed on several approaches of international chains. Descriptions of several cases of chain cooperation in fresh products can be found in the literature. Mostly a clear theoretical concept is missing from these descriptions. If the industrial organization theory is used the complex reality has been simplified to two links in the chain. Second, studies on competitiveness (Porter's concept is frequently used) are focussed on industries or nations and not on individual firms. Moreover, Porter's theory has a descriptive nature, without quantified benchmarks. International trade studies are commodity (product) oriented. Third, studies on internationalization are mostly focussed on multinational companies based on a hierarchical governance structure. As a large number of independent SMEs characterizes the fresh-product chain, a different approach is necessary. Studies on global commodity chains (GCC) in which SMEs are taken into account are largely focussed on non-perishable goods. So it is not yet clear which approach is most suitable to analyse international chains dealing with the complex set of attributes of fresh products and an atomistic structure of the chain. The aforementioned theories are briefly summarized in relation to the potential these concepts can have for fresh-products chains (Section 2).

The empirical part of the research (Section 3) was focussed on the flower business worldwide, but the conclusions are focussed on Kenya in relation to the Dutch flower business. The flower business in Kenya has been subject to investigation several times; see for instance van Roozendaal (1994), Thoen et al. (1999), Eaton et al., (1999), Petitjean (2002) or Wijnands (2003). These reports have mainly a descriptive nature. Thoen et al. (1999) highlight the Kenyan flower industry's position in the international chain. However, the question 'Are the conditions for a sustainable industry in the long run fulfilled?' is still relevant. Doubts arise because:

- The Kenyan Flower industry relies entirely on exports; the domestic market is of no importance.
- Production and marketing knowledge largely comes from abroad. Most farms have foreign management.
- The market channel is dominated by the Dutch auctions. Around two thirds of the flowers produced are marketed by these auctions. Direct marketing to the British supermarkets (the next channel of importance) was thought to be promising at the end of the 1990s. Diversification in the flower varieties made it possible to serve the supermarkets with a full range of flowers including bouquets. The relative share of these markets channels, however, did not change much.

- Non-local suppliers provide the advanced production equipment as well as services and consultancy. This can hamper the chain effectiveness.

Granting market access to the Netherlands will influence the Dutch industry. Due to the competitiveness, it is difficult to grow some varieties of roses (small buds) profitably in the Netherlands. Growers are asking themselves whether growing flowers in the Netherlands will remain profitable. On the other hand, the Dutch wholesalers have increased their competitive power by providing their clients with less expensive flowers and a larger range of varieties. But will a dominant position in serving the European consumer be possible without a group of economically vital producers at home? The Dutch Ministry of Agricultural, Nature and Food quality is looking for a conceptual framework that will enhance a well-balanced opinion about the long-term sustainability of an industry in developing countries as well as the impacts on the domestic industry.

Section 4 deals with the testing of the theoretical approaches against empirical findings. The report ends with some conclusions (Section 6) and a discussion (Section 5).

2. CONCEPTUAL FRAMEWORK

Product and production characteristics

The aim of this Section is to assess a theoretical framework for analysing and strengthening partnership. The major theories dealing with international agricultural chains will be reviewed. A testing of these theories against the empirical findings in fourth Section will show the sustainability of the partnership between Kenya and the Netherlands and the knowledge gaps. The similarity of the flower chain to the fresh food product chain means that a wider range of literature is applicable to the flower chain. Only where the characteristics of cut flowers are incompatible with the other products will cut flowers be dealt with separately. In this Section, cut flowers as well as fresh vegetables, fruit or meat products are indicated as 'fresh products' (as opposed to frozen, canned, dried or otherwise preserved products). Product and production characteristics distinguish fresh-product chains from industrial-products chains and even from non-perishable agricultural chains. Managing these chains is complicated by the fact that the production and wholesale parts of the chain consist of a large number of SMEs. Furthermore, international trade makes it possible to serve demand-driven retailers with a large assortment of products that may be out of season in the importing country or that are not domestically produced.

The characteristics of fresh products and their production characteristics are presented in Figure 2.1. These characteristics play a major role in marketing, price formation and the economic behaviour of the chain actors, and thus complicate the organization of an efficient demand-driven supply chain.

Attribute	Explanation
Perishability	The quality begins to deteriorate at the moment of harvest and continues throughout the marketing chain; the product 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 instable prices. Price negotiation occurs frequently on spot markets while the products are en route. Trust and informal agreements are involved.
Seasonality	Most fresh products have seasonal production patterns and a decreasing seasonal demand pattern. Supermarkets provide a large assortment of fresh products year-round. Long-distance shipments are complementary to local production, but often also competitive supply resources
Substitutes	Most products have varieties, which are slightly different, or other products can fulfil the same consumers' wishes (different types of vegetables or meat). For most products, alternative forms exist: fresh, canned, frozen, dried, prepacked.
Bulkiness	Water is the major component: fresh products 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 shifted to lower-cost areas and this speeded up the mechanization.

Figure 2.1. Product and production characteristics of fresh product

Looking at the international cut-flower chain, an imbalance in strategic scope and size can be found for the key actors at different levels in the chain. The power of retailers is still increasing due to concentration and internationalization. This enables them to set standards, such as BRC, MPS or EurepGAP. Their tangible investments are rather small compared to their annual turnover. The retailers' intangible assets (e.g. service image, brands or private labels) are of more importance. The market share of supermarkets is increasing, but in most countries specialized flower shops still have the largest market share. This is quite different for other fresh-food product (e.g. fresh vegetables, meat, dairy products): for these products the supermarkets in developed countries have the largest market share, around 60 % or higher. At the other end of the chain (upstream), a comparable mixed situation can be found. In general, plant and seed breeders are strongly internationalized, but again a large number of small enterprises are active on the market for ornamentals. The very large

variety of flowers, and within each variety a large number of differences (e.g. colour, shape and vase life), are assumed to be the reason why there are a large number of firms in the ornamental breeding industry compared to the food crops breeding industry. The investments made by these breeding firms are rather large compared to their annual turnover. They can push new varieties into the consumer-driven chain. Between them are large numbers of 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 own regions. The wholesalers are the link between the growers and retailers. This link is facilitated by the Dutch auctions, which today are particularly characteristic of the flower industry.

For most fresh products, the challenge is to gather the large quantities demanded by retailers. For cut flowers, the opposite is true. Most farms are specialized in growing one flower variety, perhaps in different colours. Retailers and especially florists need a large variety of flowers in small volumes. Thus, the quantity produced by one grower is too large for one wholesaler, lets alone for one florist. The auctions enable, in a very efficient way, the production of growers to be split up and packages of small quantities of different varieties of flowers to be composed.

Setting aside the auctions, the conduct of growers and wholesalers in the flower business does not differ from that of growers and wholesalers of other fresh-product chains. The wholesalers' main driving force is the economic performance in a very short term (days or weeks), partly stimulated by the product attributes. Switching between suppliers is very common at the retail level. This forms a sharp contrast with the requirements set by retailers, such as preferred suppliers, category management, or labelling.

In conclusion, the fresh-product chain comprises a large number of specialized SMEs in several parts of the world. Therefore what is characteristic is not the economic activity spread across borders of countries (most common governance structure of multinationals), but the fact that international production and trade are increasingly organized by specialized firms involved in strategic decision-making and economic networks at a global level.

International trade theory

Van Berkum and van Meijl (2000) provide a review of theoretical concepts to explain international trade in food products. Figure 2.2. summarizes the most important assumptions, determinants and implications of trade theories. It shows that comparative advantage is the most important determinant of trade patterns. The comparative advantage has two dimensions:

- Cost of uniqueness advantages, which means a comparison of the domestic with foreign sectors or products. Not only factor advantages are relevant; also economies of scale will lead to international trade.
- The highest efficiency gap. Even if a sector performs well other sectors can perform even better. In the long run, the sector that is thought to be successful performs less well than partial competitiveness studies predict. The better performing sectors can pay an additional rent for the production factors.

Van Berkum and van Meijl (2000) characterize the agricultural trade as follows:

- A large part of agricultural and food trade is between similar countries.
- The importance of trade in processed agricultural products increases at the expense of trade in basic products.
- Trade in processed food is concentrated among a few countries.
- Market concentration in food processing industries and retailing is increasing.

In their overview, little attention is explicitly paid to fresh products, but the modern trade theories give some leads. Some aspects will be highlighted based on their overview and their references. Trade in processed products between developed countries is increasingly intra-industry trade (IIT). 'Observations indicate that agricultural trade is concentrated mainly among countries having

more or less similar factor endowments and that the products traded are increasingly of a processed (highly differentiated) and intra-industry nature' (Van Berkum & van Meijl, 2000, p. 523).

In the literature, the distinction between horizontal and vertical product differentiation is important (Greenaway & Torstensson, 1997). The former is associated with preferred varieties (Dixit & Stiglitz, 1977), the latter with quality between similar products (Lancaster, 1979). Empirical results from Christodolou (1992) and Pieri et al. (1996) show a positive relation between product differentiation, taste overlap and market proximity and IIT. Gehlhar and Pick (2002) investigated trade based on unit values. The Standard International Trade Classification Revision 3 (SITC rev 3) at the 4- and 5-digit level was used for their research. If unit values (prices) cannot explain trade flows, non-price competition dominates. This means products are differentiated. They conclude that 'Nearly 40 % of the US food exports could be characterized as dominated by non-price competition'. 'Differentiated products' are the category for which non-price competition is relevant; among these products are several fresh products. The United States is, for instance, a low-cost supplier of cheese and fish, whereas it imports a larger volume at a higher price of these products. Fresh product like beef, poultry, stone fruit and cabbage are classified as successful non-price competition. The US competes successfully without having a price advantage. Fresh tomatoes, cucumber and other fresh vegetables are classified as non-successful non-price competition: the US has a product differentiation advantage but is not competitive on the international market. This approach can be used for classifying the world market in cut flowers.

Then there is innovation. Dosi et al. (1990) 'found that changes in trade performance were strongly associated with changes in innovative activities than changes in relative labor costs' (van Berkum & van Meijl 2000, p. 532). Importing countries can gain from embodied knowledge in traded products, for example capital goods and chemicals for plant growing. These two remarks are important because the Dutch agricultural and food industry is relatively innovative and exports processing equipment as well as goods from breeding station, such as seeds, plants or animals. Embodied technology is thus a part of these exports. However, to measure the relation between knowledge creation or innovation and trade will require further efforts (van Berkum & van Meijl, 2000, p. 536).

In conclusion, new developments in trade theory can contribute to the explanation of partnership between the Dutch and the Kenyan flower business, but there is still a considerable scope for future work. In addition to international trade based on price competition, non-price competition based on product differentiation should be recognized as an explanatory factor in international trade flows.

Trade theories	Important assumptions	Determinant(s) of trade	Implications
Traditional trade theories			
Ricardo	- natural resources (climate, soil, geographical position) differ between countries - technology differs between countries - homogeneous goods, perfect competition, constant returns to scale	- countries differ in labour productivity (as a result of different levels of natural resources and technology)	- trade patterns determined by comparative advantage - inter-industry trade - the more countries differ, the more they trade - severe income distribution effects
Heckscher-Ohlin-Samuelson	- initial labour and capital endowments differ - technology identical across countries - homogeneous goods, perfect competition, constant returns to scale	- countries differ in factor endowments	
Modern trade theories and trade implications of new growth theories			
New trade theories	- internal or external economies of scale - imperfect competition - differentiated goods - technology identical across countries	- economies of scale and product differentiation - market segmentation and price discrimination	- history and chance factors determine trade patterns - precise patterns of trade indeterminate - inter- and/or intra-industry trade - income distribution effects small
Trade implications of 'new' growth theories	- growth by knowledge creation - A) factor endowments (human capital, unskilled) differ between countries *or* -B) initial technological level differs between countries - homogeneous, unskilled labour-intensive, low-tech goods and differentiated, human capital-intensive, high-tech goods. Technological opportunities are higher for differentiated high-tech goods. - national or international knowledge spill-overs	- initial specialization pattern determined by initial factor endowments (A) or technological level (B). This specialization pattern determines growth rate and the specialization pattern in future because technological opportunities differ between sectors.	- inter-industry specialization for homogeneous goods - intra-industry specialization for differentiated goods (precise pattern of trade indeterminate) - countries may lose from trade especially when knowledge spill-overs are national in scale. However, most models assume international knowledge spill-overs.
Neo-technology trade theories and trade implications of evolutionary growth theories	- technological level differs between countries (i.e. there are technology gaps) - newly developed knowledge does not flow immediately between countries as it is country- and firm-specific - newly developed knowledge is cumulative and path dependent - product differentiation by product innovation	- technology gaps, which grow with process and/or product innovation and close with imitation, give countries at least a temporary comparative advantage	- trade patterns determined by technology gaps - inter- and/or intra-industry trade - leading countries have to innovate to maintain income levels - countries may lose from trade (if trade-off exists between static and dynamic efficiency). Chances of this occurring are higher because knowledge is cumulative and firm-/country- specific.

Figure 2.2. Overview of the most important assumptions, determinants and implications of trade theories
Source: van Berkum and Van Meijl (2000)

Industrial economics and competitiveness theory

Industrial economics is a major theoretical approach to explain the economic behaviour of firms in an industry. At the fundamental level, there are no differences between industrial economics and price theory as part of the theory of the firm in microeconomics. Explaining these basic economic theories will not be dealt with separately in this report. In this Section, three parts of industrial economics will be dealt with: the structure-conduct-performance (SCP) approach, Porter's theory, and transaction costs economics (TCE).

The **SCP model** is a widely used tool for describing industrial sectors and can also be used to explore a food chain (Carlton & Perloff, 1999). Within the model, which is presented in Figure 2.3., several exogenous factors (mentioned in the boxes 'Basic Conditions' and 'Government Policy') deal with trade theories. Incorporating analyses based on these theories in the SCP model provides a better understanding of the dynamics of flowers chains and the driving forces behind them. However, the emphasis on the international dimension of the SCP model is not evident.

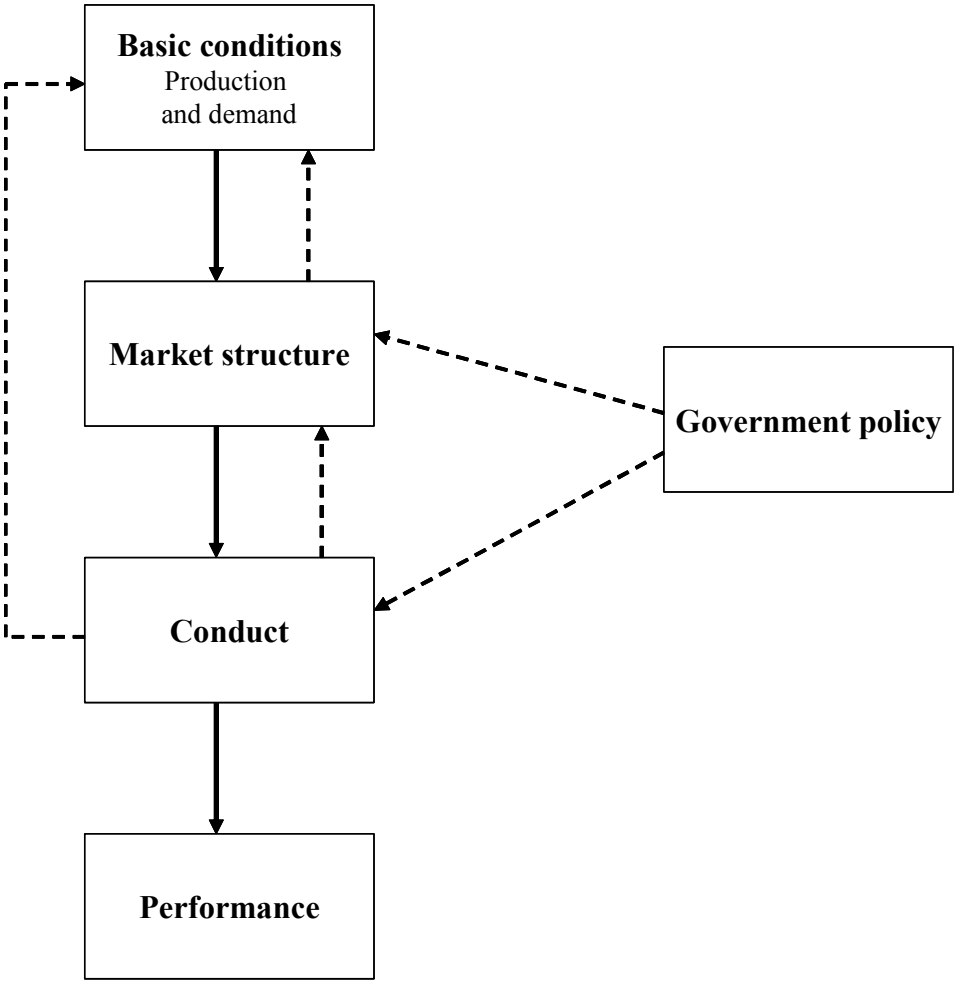


Figure 2.3. The SCP model
Source: Carlton & Perloff, 1999

The approaches on competition between industries and nations are well known from the famous works of **Porter** (1980, 1985, 1990). In his works he also stresses new developments in international trade theories, beyond the comparative factor advantages. 'Competitive advantages that rest on factor costs are vulnerable'. The lowest cost source for a resource can shift quickly as new technology allows the exploitation of resources in places deemed impossible or uneconomical. Compared with van Berkum and van Meijl (2000), Porter (1990, p. 17) suggests that the product

cycle theory is the beginning of a truly dynamic theory. The state of art is still at an academic level and therefore not yet suitable for empirical work. Porter pays particular attention to contributions of global strategies to competitive advantages (Porter, 1990, p. 33). He integrated various concepts in a framework – 'Porter's diamond'. The diamond's determinants are (1) factor conditions, (2) demand conditions, (3) related and supporting industries, and (4) firm strategy, structure and rivalry. In addition to these four determinants, he distinguishes two additional factors: chance and the role of the government.

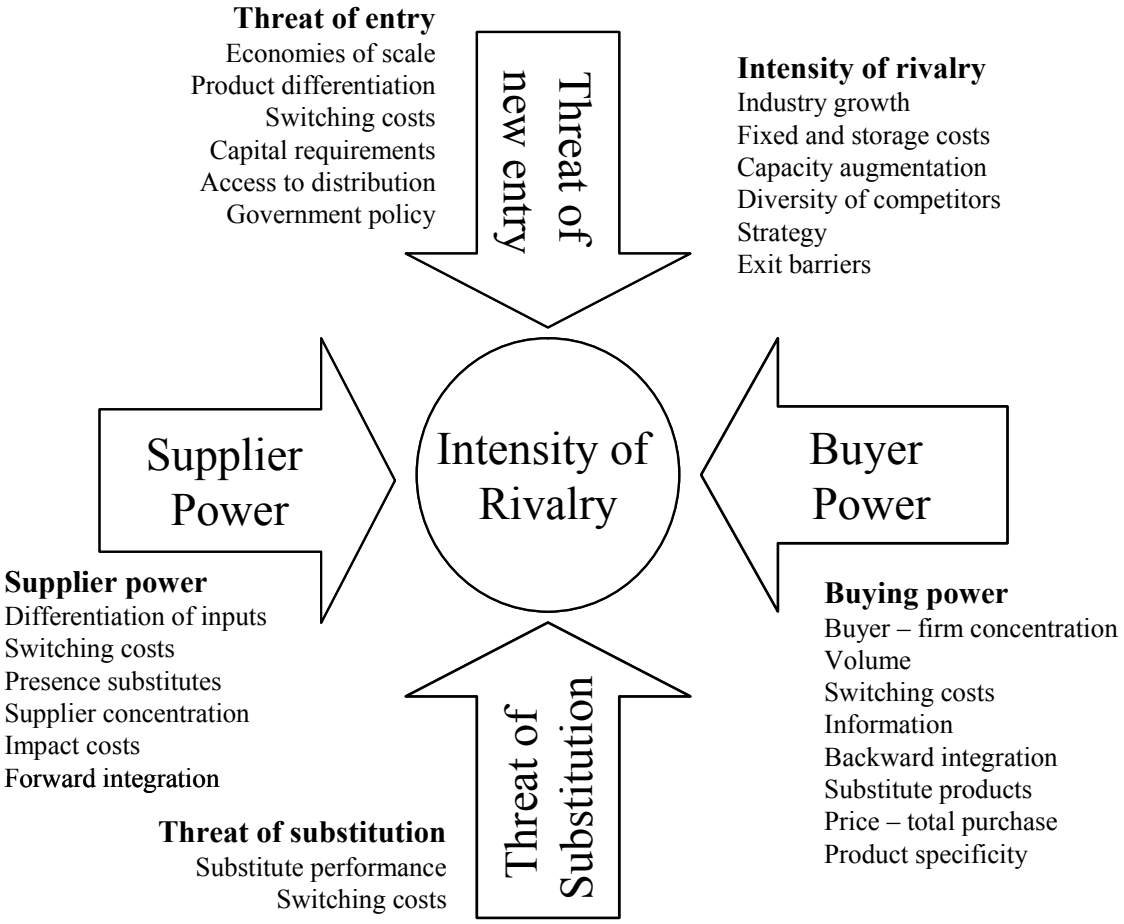


Figure 2.4. Porter's Diamond

A slightly different configuration of Porter's diamond is presented in Figure 2.4. (Porter, 1985). This framework is well elaborated and useful for analysing the competitiveness of an industry. Porter has been extensively used in the horticulture sector (see for instance Hack & Heijbroek, 1992). However, in the theory the quantification of the differences between industries or nations is lacking. Second, it is unclear how to weigh the importance of the competitiveness determinants against each other. Porter in fact benchmarks items of the SCP model against other nations or industries. Moreover, deriving a strategy is based on a SWOT (strengths, weaknesses, opportunities, threats) analysis (see Porter, 1980, p. 64). Section 4 deals more in depth with the possibilities of measuring Porter's determinants and an evaluation based on the empirical findings.

The third approach of industrial economics is the **transaction cost economics** (TCE). 'TCE describes the firm as efficiency-inducing administrative instrument that facilitates exchange between economic actors' (Lieblein, 2003, p. 939). According to Hobbs (1996a), transaction costs are the costs of carrying out any exchange between firms in a market. Four key concepts are important:

1. *Bounded rationality*: People intend to make rational decision, but in situations of complexity or uncertainty the ability of people to make a fully rational decision is limited (Hobbs, 1996).

2. *Opportunism*: Williamson (1979) defines this as self-interest seeking with guile. Sometimes businesses or individuals will exploit situations to their own benefits. According to Hobbs (1996a), the fewer the number of alternative suppliers or buyers, the more likely it is that one will act opportunistically to alter the business terms to one's own advantage.
3. *Asset specificity*: This refers to the degree to which transaction needs to be supported by transaction specific assets. *'An asset is transaction specific if it cannot be redeployed to alternative use without a significant reduction in the value of the asset'* (Douma & Schreuder, 1992).
4. *Informational asymmetry:* In neo-classical economics, perfect competition is possible because information is perfect and costless. TCE recognizes that many transactions are characterized by incomplete, imperfect or asymmetric information.

These key concepts will increase the transactions costs. Hobbs (1996b) divides transaction costs into three main categories:

- *Information costs* arise for firms that are searching for information about products, prices, inputs, or buyers and sellers.
- *Negotiation costs* arise from the physical act of the transaction, such as negotiating and drawing up contracts. Auction costs, transportation costs, speed of payment and time for these activities are also negotiation costs.
- *Monitoring or enforcement* costs arise after an exchange has been negotiated. Quality control, enforcement of codes of conduct, grade uncertainty (and hence lower than expected prices) or product damage can be seen as part of the monitoring costs.

Unfortunately, monetary values cannot be assigned to all transaction costs. Monitoring costs involved in, for example, grade information asymmetry is difficult to value in monetary terms without information on the probability of an incorrect grade being applied by the grower and the loss incurred by this incorrect grade. Sometimes values can be found for transaction costs: for instance, the time needed to retrieve price information or time spent on marketing through auctions or on direct marketing (Hobbs, 1996b).

In conclusion, industrial economics highlight several aspects of an economically sustainable development of industry. Most parts of the theory are of a benchmark nature. This demands information about more supply chains or from chains from different countries. The sizeable number of determinants indicates the effort for information collection.

Strategic management and internationalization theory

Strategic management

The development of an industry primarily originates from the development of individual firms. An opinion about the theories on firm level will be necessary. Relevant theories are based on micro and business economics, as mentioned in before. It is assumed that these theories are well known: applications already have a long tradition. Next to economics, concepts of strategic management are important. Such management deals with decision-making and orientation on future developments of the firm given the international markets. A sustainable development of farms in Kenya even with excellent market opportunities will only be successful with a proficient level of farm and strategic management.

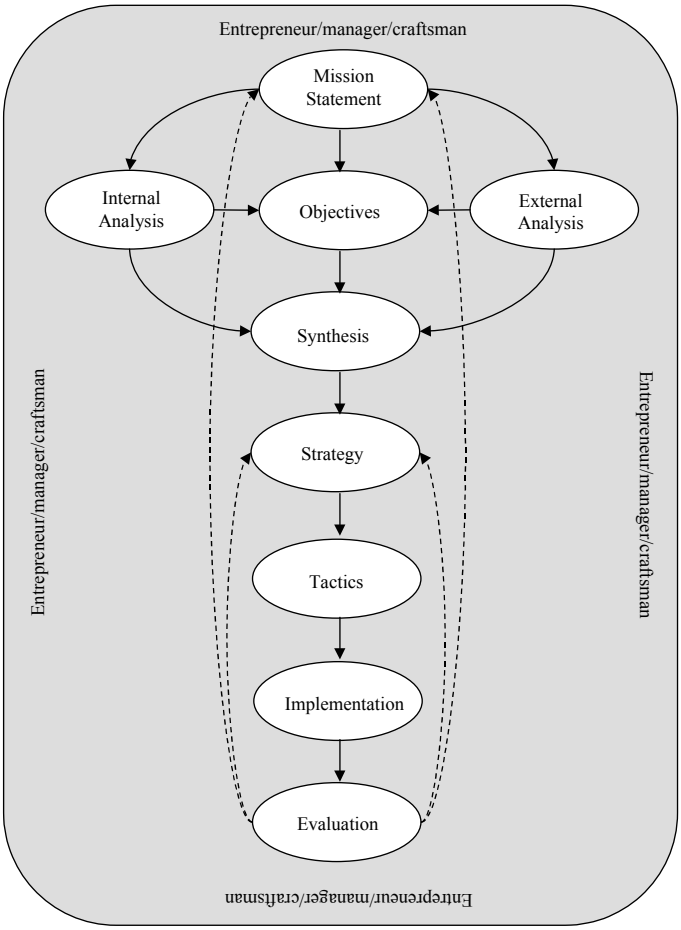


Figure 2.5. Strategic management model

According to several authors, farm management concerns planning, implementation and control (e.g. Boehlje & Eidman, 1984, p. 15; Kay & Edwards, 1994, p. 9). Turner and Taylor (1998, pp. 1-3) also distinguish the function 'evaluate plan'. Second, these and others authors (e.g. Casavant et al., 1999, p. 13; Herbst & Erickson 1996, p. 2) explain the decision-making process that applies to all the areas mentioned. The concepts of planning and control are theoretically elaborated and illustrated by several agricultural applications. The external environment is mostly a neglected subject in these books or gets only poor attention if it is included at all (e.g. Barry et al. 2000). Wright et al. (1998) – a non agricultural management book – define strategic management more broadly: 'Strategic management encompasses managing not only the stages identified but also the earlier stages of determining the mission and goals of an organization within the context of its external and internal environments'. To clarify the role of the analysis of the internal and external environment a generic strategic management model (Figure 2.5) is presented. The elements of this model and the sequence of elements in model are quite comparable in several textbooks (see e.g. Higgins & Vince, 1993; Hill & Jones, 1995; Wright et al., 1998; David, 1999). The elements of the strategic management are extensively elaborated in the aforementioned textbooks. The application of this approach will be dealt with in a review of the literature (Section 4).

Transnational management

The development of the Kenyan flower industry depends partly on the Dutch flower industry. It can be seen from the Dutch point of view as internationalization of the Dutch industry. The determinants for internationalization are more or less identical to those for the formulation of a strategy

(Bartlett & Ghoshal, 1992). However, transnational management is generally not a specific issue in strategic management books, which is why I shall give it some attention in this Section. Multinational companies (Unilever, Philips, etc.) formulate, in addition to generic and functional strategies, strategies in which transnational management is incorporated. Transnational management means adapting the production process to or servicing the right (international consumer) markets for your product. It means using not only the differences of the international consumers' markets but also the differences in production possibilities. This is why the geographic location of the farm is important. The competitive advantages of transnational management are summarized in Figure 2.6. It becomes clear from this table that the transnational strategic goals are a further elaboration of the general strategic goals of strategic and functional management.

Strategic goals	*Source of competitive advantage*		
	National differences	Economies of scale	Scope advantages
Efficiency	Price of production factors	Production level	Sharing costs by different countries
Risk management	Risks of market and government policy	Production level in balance with strategy and operational flexibility	Portfolio-differentiation (risk and opportunities)
Innovation	Learning of organizational and process management.	Cost advantage of experiences.	Learning of different markets, products or activities.

Figure 2.6. Strategic goals and means for competition advantage
Source: Bartlett & Ghoshal, 1992

Transnational management is becoming an important issue in the strategic management of the agribusiness sector. First, an increasing number of firms in the Dutch horticulture sector have a production location in more than one country. Good examples are breeders of vegetables seeds or the producers of cutting chrysanthemums. Seed breeders are active worldwide. The horticulture cluster of the Netherlands is renowned throughout the world and a majority of the multinational seed companies are located in the Netherlands (Rabobank, 2002). But also in the flower industry, several Dutch propagation companies have production locations in several countries. Some Dutch companies are active In East Africa; for instance, Dekker produces chrysanthemum cuttings in Tanzania (www.dekkerchrysanten.nl) and Fides does so in Uganda (www.fides.nl). These internationalization strategies are mainly motivated by production costs, production level and portfolio differentiation.

A second illustration of the necessity of an international dimension in the external orientation of horticultural farmers is the fact that horticultural products are in general commodities that are traded worldwide. The production location of these commodities will quite often differ from the consumption location. The international trade flow of fresh tomatoes and cut flowers are well-known examples of this statement. The threat of new competitors or substitute products, the position in the chain and the bargaining power are mostly dealt with at marketing level.

Governance of global commodity chains

The aforementioned approaches are generic theories in which the position of developing countries is not specifically mentioned. Furthermore, the position of large numbers of SMEs involved in global fresh-product chains also lacks specific attention. Briefly, the actual situation is:

- Exports of fresh products from developing countries are increasing.
- The buyers are mostly supermarkets in developed countries. The case for flowers is slightly different, because in most countries specialized florists have a market share of above 50 %.
- Supermarkets play a key role in governing the chain due to their size and international market power.

- This enables the supermarkets to specify standards on, for example, cost, quality, food safety or certification.
- On the other hand, this helps producers to identify which products could be successful in the global chains.

The impact of the buyer-driven chains in developed countries on the industry in developing countries became a research topic in development economics. Gereffi et al. developed a framework to explain the governance patterns in global commodity chains (GCC). They constructed a theory of value chain governance based on three factors:

1. The *complexity* of information and knowledge transfer required to sustain a particular transaction, particularly with respect to product and process specifications;
2. The extent to which this information and knowledge can be *codified* and, therefore, transmitted efficiently and without transaction-specific investment between the parties to the transaction; and
3. The *capabilities* of actual and potential suppliers in relation to the requirements of the transaction. (Gereffi et al., 2003, p. 6)

Gereffi et al. distinguish five different chain governance types, if they value the three factors by either low or high. Figure 2.7. gives an overview of these governance types. Gereffi et al. (2003, p. 5) describe the five governance types:

1. *Markets*. The basic governance form is the spot market; however, persistency and repeated transactions are not excluded. Costs of switching between new partners are low for both parties.
2. *Modular value chains*. Supplier produces to a lead firm's specification. Turnkey suppliers take full responsibility for the competencies of surrounding process technology. The use of generic machinery limits transaction-specific investments.
3. *Relational value chains.* The interactions between buyers and sellers are complex; they create mutual dependency and a high level of assets specificity. Relations upstream of the suppliers might be of a market nature.
4. *Captive value chains.* The lead firm monitors and controls the suppliers. They are small, have low capabilities and get codified information how to produce. They face significant switching costs and are therefore captive.
5. *Hierarchy.* In fact this governance form is vertical integration with full managerial control from headquarters.

Governance type of value chain	Complexity of transactions	Ability to codify transactions	Capabilities in the supply base	Coordination and power asymmetry	Characteristics
1. Market	Low	High	High	Low ↕ High	Easy to switch between partners
2. Modular	High	High	High		Internalize hard to codify (tacit) information. Low switching costs
3. Relational	High	Low	High		Tacit knowledge must be exchanged between buyers and sellers
4. Captive	High	High	Low		Monitoring and investments in suppliers' capabilities
5. Hierarchy	High	Low	Low		Competent suppliers cannot be found

Figure 2.7. Governance types[1] for global commodities chains
Based on Gereffi et al. (2003)

[1] Gereffi et al. (2003) exclude three combinations. The two combinations of low complexity of transactions and low ability to codify are unlikely to occur. The combination of low complexity of transactions, high ability to codify and low supplier capability leads to exclusion and is not be considered as a governance type.

Gereffi's theory has similarities with the transaction costs economics from the industrial economics theory (see e.g. Douma & Schreuder, 1992, p. 142; Hendrikse, 1998, p. 218). In that theory, the governance structure depends on uncertainty and complexity of transactions (factor 1) and assets specificity or transaction-specific investments (factor 2). Gereffi et al. add the capabilities as an additional factor, which results in a modification of the theory. Whether this modification is specific to suppliers from developing countries is not clear. It recognizes the discrepancy of the requirements of the final products on the home and export market.

The fresh vegetable chain between Kenya and the UK is one of the cases Gereffi et al. (2003, pp. 12-13) describe with this conceptual framework. This market-based global value chain shifted to more explicit coordination, due to the competitive strategies of UK supermarkets. Until the 1980s, the traditional governance form was spot markets: traders bought at farm gate or wholesale markets in Kenya and exported the product to the wholesale markets in the United Kingdom. In the 1980s, UK supermarkets began to use the quality and variety of fresh product as the main source of competitive differentiation. The product attributes distinguished include a consistent year-round supply, ready to eat and guarantees about food safety, environmental standards (e.g. pesticides use) and labour standards. The supermarkets developed closer relationship with UK importers and Kenyan exporters. The suppliers' capabilities and systems became subject to regular monitoring and auditing at all levels in the supply chain. In the meantime, the supermarkets reduced the number of suppliers and increased the suppliers' responsibility for supply chain management, product development and consumer research. The fragmentation upstream has decreased and the governance type has become more relational. Moreover, major exporters increased their production at the expense of purchasing from smallholders. Jaffee (2003, p. 42) made similar observations: a significant motivation for backward integration and cut-backs in the numbers of smallholders.

Gereffi et al. (2003) try to understand the dynamics of the supply chain: 'How and why do the complexity of information, the ability to codify and suppliers' competence changes?' They make three observations:

1. Information complexity increases as lead firms seek to obtain more complex outputs and services from their supply base. Existing suppliers may not effectively meet the new requirements. However, increasing capabilities in the supply base have helped to push the architecture of global value chains away from hierarchy and captive networks toward the relational, modular and market types.
2. Tension between codification and innovation. Innovations can lead to a restart of the process of codification.
3. Suppliers' competences increase by learning, as new suppliers enter the chain, as new technologies come on stream or as lead firms increase the requirements for existing suppliers. New technologies can dramatically influence the supply chain: old suppliers will be traded in for others. In a global chain these new suppliers can come form other parts of the world.

In conclusion, GCC recognizes the industry structure of SMEs, but is in essence a modification of parts of the industrial economic theory.

Conclusion

The literature review uncovered several ways to measure the performance of an industry. Sustainability is not mentioned as a keyword in the approaches. Figure 2.8. summarizes the key elements. Some are focused on understanding the conduct and performance, others on attaining a better performance in the future. Section 4 deals with bridging the theory and empirical findings.

Theory	Focus	Mainstream theory	Key determinants
International trade	Products	Neo-classical economics	Difference in productivity, endowments and differentiated products.
Structure-conduct-performance	Firms	Industrial economics	Market structure of an industry, conduct and performance of firms within the limitations of 'Basic conditions (important in trade theories) and government policy.
Competitive advantage	Firms	Business administration	Intensity of rivalry, entry barriers, buyers' power, suppliers' power and substitution threats.
Transaction costs economics	Transactions	Industrial economics	Imperfect, incomplete and asymmetric information. Information, negotiation and monitoring costs are made for transactions.
Strategic management	Firms	Business administration	Governance aspects and strategic decision-making at firm level.
Transnational management	Firms	Business administration	Identical to strategic management, with a strong emphasis on production or distribution diversification in several countries.
Global commodity chains	Chains	Industrial economics.	Complexity of transaction, ability to codify transactions, capabilities in the supply base.

Figure 2.8. Overview of theories, focus and key determinants

3. FLORICULTURE WORLDWIDE

Introduction

This Section describes the international cut-flower industry. This description is based on publicly available statistics and is focussed on the main production regions and trade flows. The following Section deals with some characteristics of the cut-flower industry, then provides a short overview of codes of conduct. Next, an overview of the worldwide flower production, trade and consumption is given. The subsequent Sections deal with the largest consumer markets, namely Europe, the USA and Japan. Then some major world supply countries in Africa and South America are dealt with. The main focus, of course, is on the position of flower producers in East African countries and the Netherlands. The last Section summarizes the main findings.

Industry characteristics

The growing and the marketing of cut flowers depend on several key success factors. This Section deals with the production factors as well as with the characteristics of the markets.

According to Liemt (2000), successfully growing flowers requires:

1. Good physical conditions: high light intensity, abundant water, clean soil (or the use of hydroponics), good climate.
2. Appropriate seeds and planting material.
3. Capital for investments and working capital.
4. Productive and skilled labour.
5. Expertise in growing techniques.
6. Good management and organizations.
7. Pesticides and other chemicals.
8. Energy for heating.
9. Infrastructure.
10. Quality consciousness all along the production and post-harvest chain. Cut flowers have a highly perishable nature and the deterioration starts at the moment of harvesting.

The above factors mainly concern the production environment. Within the context of Porter's theory, the international competitive environment is as important as production knowledge. The brief overview of the international trade flows underlines that the flower business is a global business. Moreover, most developing countries in the flower business produce for export markets and the domestic market is irrelevant. Second, due to the trade flows the international trade regulations and standards need to be met. Therefore, Liemt's list needs to be supplemented with some items, for example:

11. Adequate logistic structure for exporting.
12. Adequate supply chain infrastructure, including post-harvest treatments and a network of supplying industry.
13. Knowledge of the destination markets, especially the consumers' preferences and their dynamics. Emotion is one of the main attributes of flowers. Fashion trends or crazes are of importance for, for instance, the type and colour of flowers.
14. Knowledge of strengths and weaknesses compared to the competitors.
15. Knowledge infrastructure has to be innovative and responsive to the requirements of the destination markets.
16. Meeting the international trade standards. For propagation inputs (nursery stocks or seeds) acceptance of the Union International pour la Protection des obtentions Végétales (UPOV) regulations is highly desirable. An adequate phytosanitary control system in the production country is necessary for exporting.

17. Meeting the quality standards including triple P (planet, people, profit) codes of conducts in order to fulfil the consumers' preferences. The supermarkets chains increasingly set the parameters for these standards.

It can thus be concluded that not only the production circumstances are of importance but also the marketing and logistics.

Codes of conduct and plant property rights

Several codes of conduct are available in the flower business. Some of these codes are summarized in this Section. Also the protection of plant property rights by the Union International pour la Protection de Obtentions Végétales (UPOV) will be discussed. UPOV membership and having a code of conduct are requirement to entry the international cut-flower market. Both can be seen as a kind of codification as mentioned in Section 2.

Phytosanitary obligations

The plant protection service is responsible for excluding, combating and controlling pests and diseases in the plant sector. For instance, the Dutch Inspection Service, which is supervised by the Plantenziektenkundig Dienst (PD), carries out the inspections and can issue plant passports (sometimes required in the EU) and phytosanitary certificates valid for the EU. Comparable plant inspection services are rather common in most countries. A proficiency level in conducting the phytosanitary obligations is a condition for international market entry. Without a well-functioned plant protection service, products can deteriorate due to the time-consuming logistic handling at airports, or products will not be allowed into the importing countries by the quarantine authorities. In both cases the economic losses will be high.

The Dutch MPS code

The Dutch *milieu programma sierteelt* (MPS; Floriculture Environmental Project) has been running since 1995. It was initially aimed at reducing dependency on chemical crop protection. In the scheme, the use of pesticides, fertilizers and energy, and waste management are recorded. In recent years the focus has shifted towards certification activities. For the environmental issues, four levels of qualification schemes are provided. Due to the increasing number of supermarkets that demand EurepGAP and a social code, MPS developed additional standards like ISO-9001, social codes or trade certifications. For instance, the social code covers health, safety and terms of employment. At the moment, 4000 growers in around 30 countries are members, and MPS is becoming an internationally recognized world standard. Having a MPS certificate is important for trading through the Dutch auctions. Due to the advanced recording system, the information can be used for different goals and reduces the need to register the same data several times. However, taking part in the MPS certification system is not without its obligations and is not free. For more information, see www.my-mps.com.

The Kenya Flower Council code

The Kenya Flower Council code has two levels regarding labour and environmental standards. The Silver Standard is consistent with ILO (International Labour Organization) conventions. This first level certifies compliance with labour rights, health and safety standards and environmental legislation. The Gold Standard requires stricter standards and farms can achieve this standard after having gained the silver standard. The audits are external and repeated every six months. The Kenya Flower Council signed a partnership with MPS in 2002. MPS is involved with the international certification and auditing.

The Ecuadorian Flower Label Programme

The Flower Label Programme (FLP) started as a business-to-business code between a German importer and the Association of Flower producers and Exporters of Ecuador. The standards are

focussed on environmental conditions, social and labour conditions. The FLP has a low level of participation among Latin American producers. In Zimbabwe, some producers (nine in 1999) are accredited. In Tanzania, two farms were permitted to enter the programme; however, they were unable to show sufficient compliance with the standards (ILRF, 2003).

Max Havelaar
The Max Havelaar foundation certifies agricultural products that are produced and sold in accordance with the international criteria of fair trade. Exporters selling with the Max Havelaar label receive a higher price from Swiss consumers. Max Havelaar flowers account for approximately 5 % of the total Swiss cut-flower market (ILRF, 2003). It is not clear whether this standard is used for cut flowers in other countries.

Protection of new varieties: UPOV
Consumer preferences are continuously changing, which requires new plant varieties. Innovation in plant varieties is essential in a demand-driven cut-flower chain. But also in respect with cost effectiveness, quality and quantity improvements in new varieties are necessary in the highly competitive cut-flower supply chain. Breeding new varieties of plants requires substantial investments. Breeders must obtain profits to recover these costs to fund new research. UPOV ensures that members of the Union will grant the breeder the property rights on the basis of a set of clearly defined principles. To be eligible for protection, varieties have to be 1) distinct from existing commonly known varieties, 2) sufficiently uniform, 3) stable and 4) new in the sense that they must not have been commercialized prior to certain dates established by reference to the date of application for protection (UPOV, 2004). Being a member of UPOV enables access to new varieties and thus the innovation and market orientation of the supply chain. Not being a UPOV member can be a competitive disadvantage. Most developed countries are a UPOV member.

The flower industry worldwide: production and trade

To give an impression of the world flower industry, some figures concerning consumption, acreage and production value will be shown. The market for cut flowers in a country depends on the average consumption per capita and the number of inhabitants. The annual consumption per head ranges from a few euros in Russia to 90 euros per year in Switzerland. The market value is high in the USA, Japan, Germany and the UK (see Figure 3.1.). Aiming at these markets is the challenge for the exporting countries.

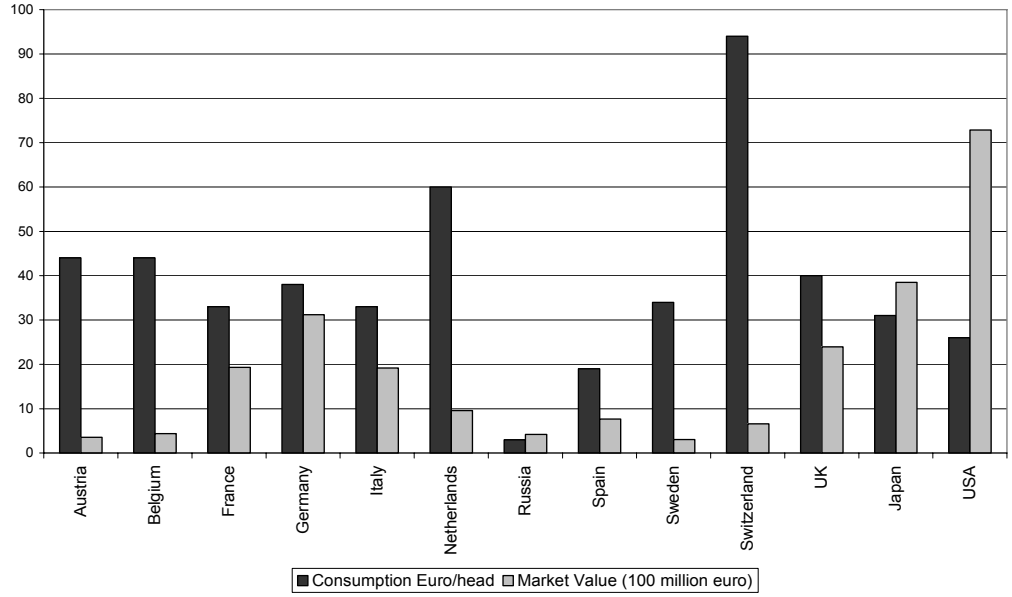


Figure 3.1. Cut-flower consumption per head (EUR) and market value (EUR 100 million)
Source: AIPH, 2004

Figure 3.2. shows the domestic production and imports of cut flowers of the largest consumption countries. The domestic production is estimated on the market value of cut flowers minus the imports plus the export, all based on the statistics of the AIPH (2004). However, it is not possible to match different figures in a consistent manner. Figure 3.2 therefore provides just a tentative view. The main conclusions are that domestic production is the main source for consumption, and in Europe the Netherlands is a dominant foreign supplier. The Netherlands is in this context a net exporting country. Worldwide there are three main consumption centres: the USA, Japan and Europe.

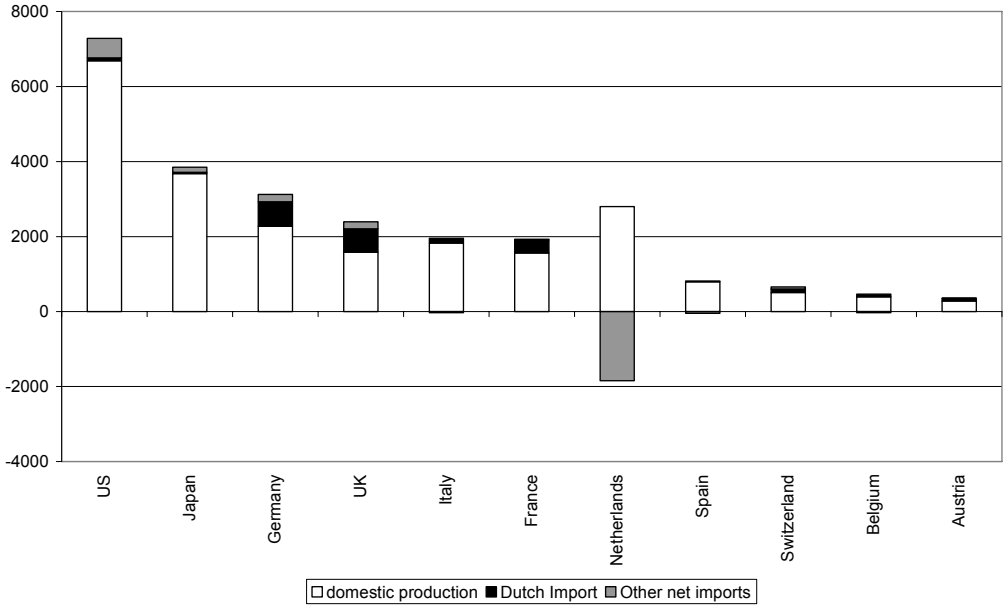


Figure 3.2. Domestic production and net imports of cut flowers (EUR million)
Source: AIPH (2004)

Figure 3.3. shows the worldwide production in countries with more than 1500 ha devoted to flowers. China (122,600 ha) and India (65,000) have a majority in the world acreage of flowers and pot plants. Figure 3.3 shows that the USA comes third (after China and India) in acreage. The Netherlands is more or less in the line with other EU countries. Europe has a 15 % share in the world area of flowers. The Asia-Pacific region has a share of two thirds in the world acreage, due to China and India. Taiwan, Korea and Australia are the other major flower producing countries in this region. The area of flowers in Africa is very small (2 % share). Kenyan is the largest African grower, with approximately 2200 ha; South Africa and Zimbabwe both grow around 1100 ha of flowers.

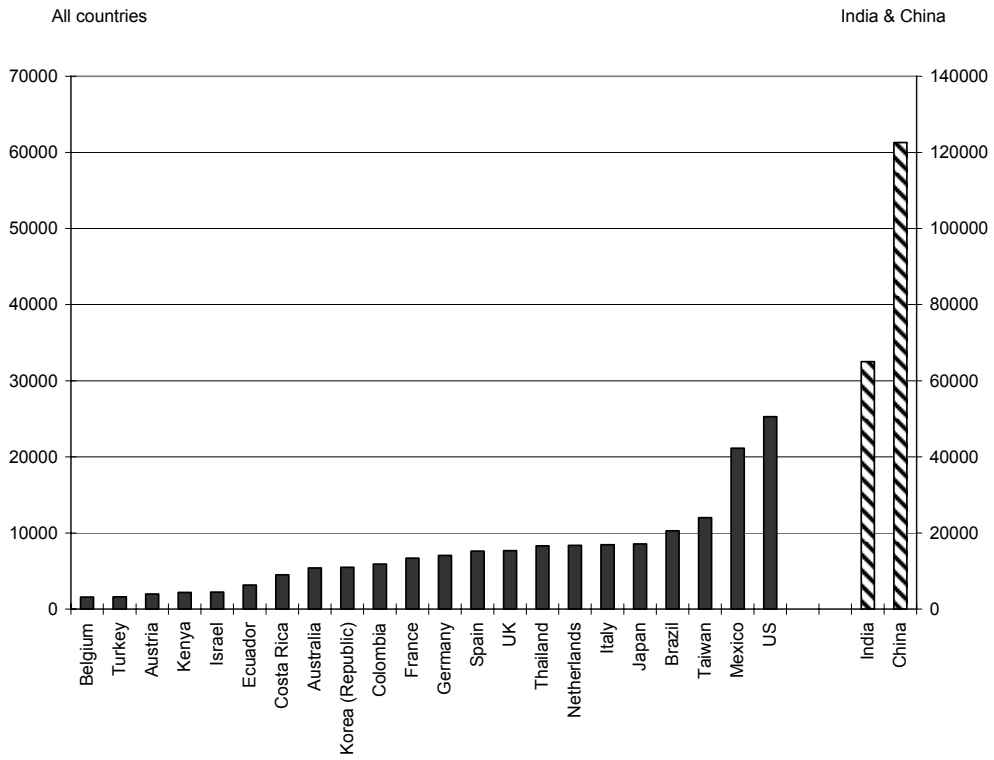


Figure 3.3. Area (ha) of flowers and pot plants for selected countries
Source: AIPH, 2004

Another angle from which to look at the world flower business is the production value. Unfortunately, the available statistics have a disadvantage. Production value information is not available for Mexico, Costa Rica or Ecuador. The production value for these three countries has been estimated by multiplying the area by the production value per ha of Colombia. These estimates have been used in Figure 3.4. The production value for China (EUR 34,336 million) is far larger than that of the USA; data for India are not available. Both countries are excluded from the analysis due to insufficient data and their negligible role in the world trade. The differences in total production values between the other countries are remarkable. The areas of Japan and Germany (see Figure 3.3.) are more or less in the same range, although the production values differ considerably. The production value in Kenya is also modest compared to other countries with the same area. The differences depend on the cultivation intensity per ha, which is shown in Figure 3.5. by the indicator production value per ha.

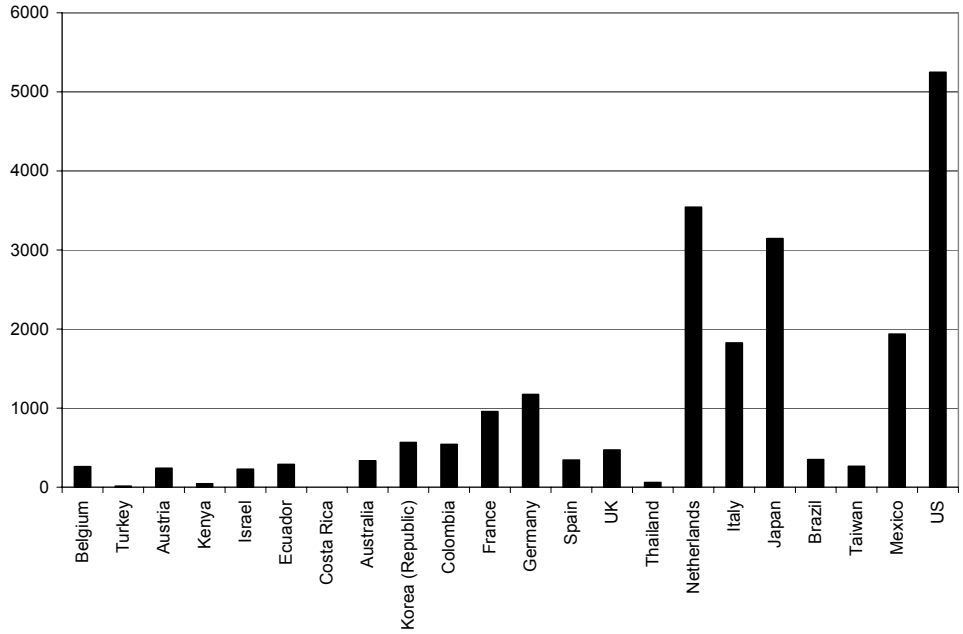


Figure 3.4. Total production values of flowers and pot plants (EUR million)
Source: AIPH, 2004 (values for Mexico, Costa Rica and Ecuador estimated by the present author)

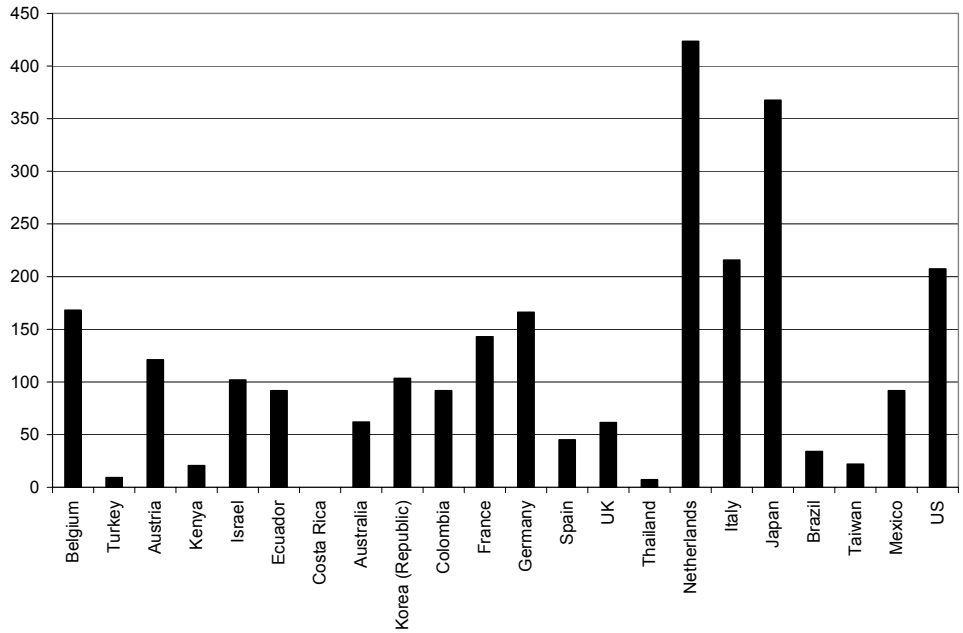


Figure 3.5. Production values of flowers and pot plants (EUR 1000 per ha)
Source: AIPH, 2004. Due to missing information, the values for Mexico, Costa Rica and Ecuador have been put at the same level as Colombia.

Figure 3.5. shows a high level of intensity in the Netherlands and also in Japan. Several other European countries and the USA are the second group. But also the production value per ha in Colombia (a major exporter of roses) is rather high. China is a member of this group: the production value is EUR 280 per ha, the third highest after the Netherlands and Japan, which is remarkable. The production value per ha in Kenya is rather low. The explanation for this is partly the low production costs rather than the value of the flowers at the consumer markets. This also applies also to the producers in South America.

However, production alone is not enough to be part of a global commodity chains. In this respect, international trade flows are of more importance. Figure 3.6. shows the exports of cut flowers

of the major exporting countries. The dominant export position of the Netherlands stands out. The share in the world export was around 45 % in 2002, while Colombia (the second largest exporting country) has a share of only 12% and Ecuador a mere 5 %. For such other horticulture commodities as tomatoes the difference between the three major exporters is less pronounced: the net export value of the three main exporters – Spain, Mexico and the Netherlands – is more or less on a par for tomatoes. As is shown in figure 3.6, several countries with a small production area or value are major exporters. Kenya is the fourth world exporter. But also several other African countries are exporters to the EU: Uganda and Zambia (each with EUR 17 million export value), Tanzania (6 million), Ethiopia and Morocco (around 3 million each) and Egypt (1 million). China's exports to the EU (around EUR 0.1 million) and those of India (EUR 2.6 million) are negligible, certainly compared to the area of flowers. South American producers not mentioned in Figures 3.6. and 3.7. are of no importance as exporters to Europe.

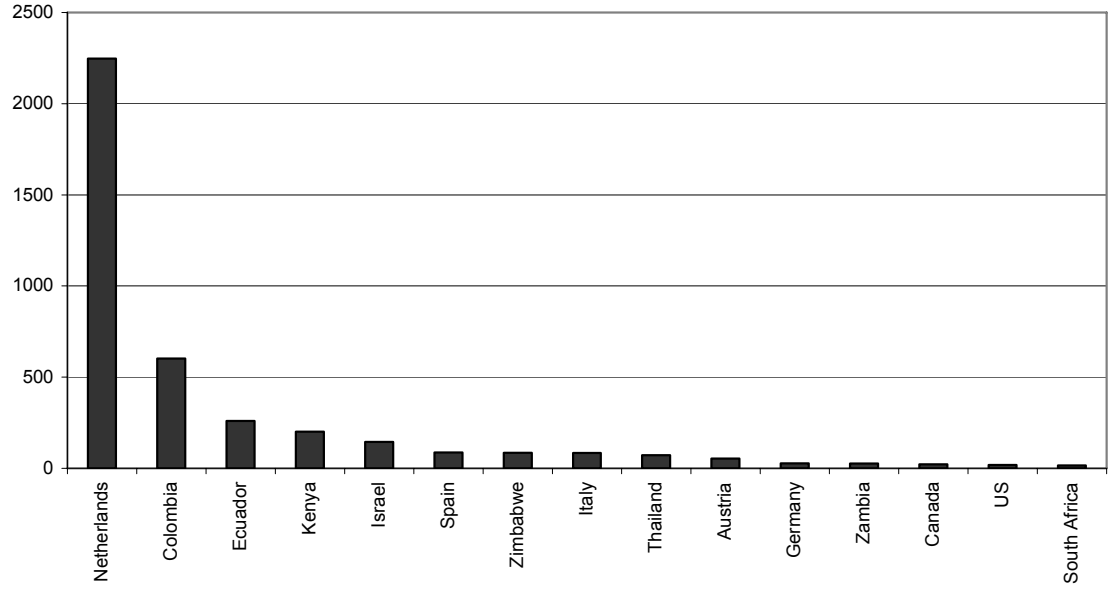


Figure 3.6. Export of cut flowers (EUR million)
Source: AIPH, 2004

The main importers are the developed countries, which in general have also a large area of flowers, particularly the USA (Figure 3.7.). The USA imports mainly from Colombia (EUR 338 million), Ecuador (EUR 111 million) and the Netherlands (EUR 74 million). The USA and the South American countries can be regarded as the second flower trade cluster. Europe is the first cluster, and is twice as large as the USA cluster. Canada is also a part of the USA cluster, with major imports from the USA (EUR 124 million), the Netherlands (EUR 44 million) and Colombia (EUR 35 million). It is remarkable that Netherlands is not only a large exporter but also a large importer. The import value is about 25 % of the export value. The Netherlands is the major supplier of the European countries (the dominant marketing position of the Netherlands will be dealt with more extensively hereafter). Japan is part of the Asia-Pacific flower trade cluster, with a size of 25 % of the USA cluster. Main suppliers for Japan are the Netherlands (EUR 27 million), Thailand (EUR 27 million), South Korea (EUR 22 million) and New Zealand (EUR 20 million). South Africa and Kenya both export around EUR 2 million to Japan.

Regarding the objective of this study, all East African countries are included because partnership with these countries is the issue of this study. South American countries are included because they are East Africa's competitors. The Netherlands (as intermediary for other European countries), Japan and the USA are the potential markets for the African countries. The opportunities on these markets should be of primary importance for the exporting countries.

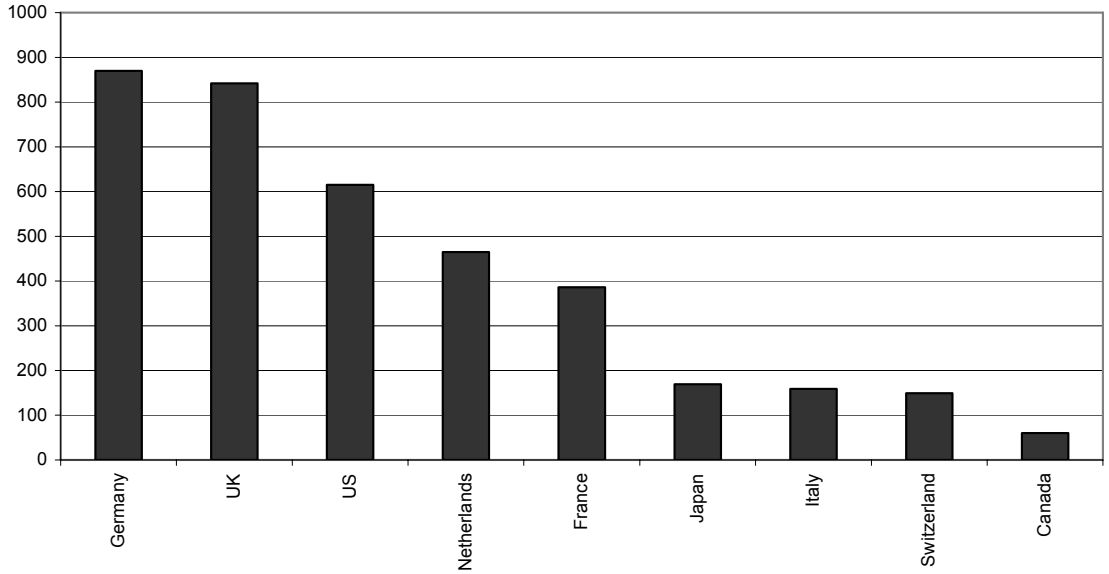


Figure 3.7. Import of cut flowers (EUR million)
Source: AIPH, 2004

The European markets

The European markets in brief

The previous Section highlighted the fact that Germany, the UK, France and Italy have the highest market values for cut flowers. These countries are also in the top 10 list of cut-flower importers (Figure 3.7.). Within the limited context of this study, no research was found on which to base an extensive discussion of these markets. It should be kept in mind that the UK is the second European importer of Kenyan flowers, and Germany is the third. Exports to these promising markets are potential opportunities for the emerging countries. The cut-flower trade flows for selected EU countries are summarized in Table 3.1.

The Netherlands is the origin country for 80 % of the imports in Italy and the UK, and for 90 % of the imports in Germany and France. This dominance is highly advantageous for the Dutch: the large volume enables efficient logistics at low costs. Italy has a remarkable level of imports from Thailand. Germany has small supplies from Kenya, Colombia and Ecuador. Despite the remarkable market position of the Netherlands, there is competition in these countries, sometimes from unexpected producing countries. The major competitors on these European markets are the domestic growers. As shown in Figure 3.4., the production value is considerable: Italy has the second largest production value in the EU. Germany and France rank fourth and fifth, respectively.

Table 3.1. Imports of cut flowers in 2003 (EUR million)

	Importing countries					
Exporting countries	EU	Nether-lands	Germany	France	Italy	UK
The Netherlands	2 061	-	652	358	123	621
Kenya	208	135	15	3	1	51
Colombia	94	21	10	1	0	44
Ecuador	71	35	13	3	7	2
Thailand	16	2	1	0	12	0
Others	450	246	40	32	10	67
Total	2 901	439	731	396	152	785

Source: AIPH, 2004

In some countries the market channels are dominated by flowershops, and in others by supermarket chains. In the UK, the supermarkets have the largest share, whereas in Germany the specialized florist is the major outlet (Table 3.2). Supermarkets and garden centres are expected to increase their market share. The concentration on the demand side will have major impacts on the marketing system. Similar developments occurred in the greenhouse vegetable sector in the 1980s and 1990s, which resulted in the auction in the Netherlands disappearing as a marketplace. The wholesalers are the most important intermediaries between the vegetable growers and supermarkets. Higher volumes in the supermarkets and a higher responsiveness were the driving forces behind the elimination of the Dutch vegetable auctions. In this respect, the flower auctions still have a function, not in composing large quantities of flowers of a same variety, but in regrouping the quantities in several mixed quantities in a wide range of varieties. Flowers are sold in bouquets and consumers need a wide range of choice as regards varieties and colours. The consumer outlets in the Netherlands are: about 5000 florist shops and retail outlets, 1500 shops on the street corner and about 1000 garden centres. Even in Holland the number of outlets is large, whereas the German and British markets are of even more importance than the Dutch market.

Table 3.2. Market share (%) of supermarkets in consumer expenditures

Country	Cut flowers	Greenhouse vegetables
Netherlands	25	85
England	64	90
Germany	14	90
Denmark	46	90
France	15	70

Source: Hillenraad, 2004

The Dutch flower industry: the European hub

The Dutch flower industry is renowned throughout the world. Being an international marketing hub for cut flowers, having advanced production methods and the innovative nature of the industry largely contributes to this position. In this Section the key issues are briefly specified. Figure 3.8. presents the Dutch cut-flower chain, with some indication of its international position.

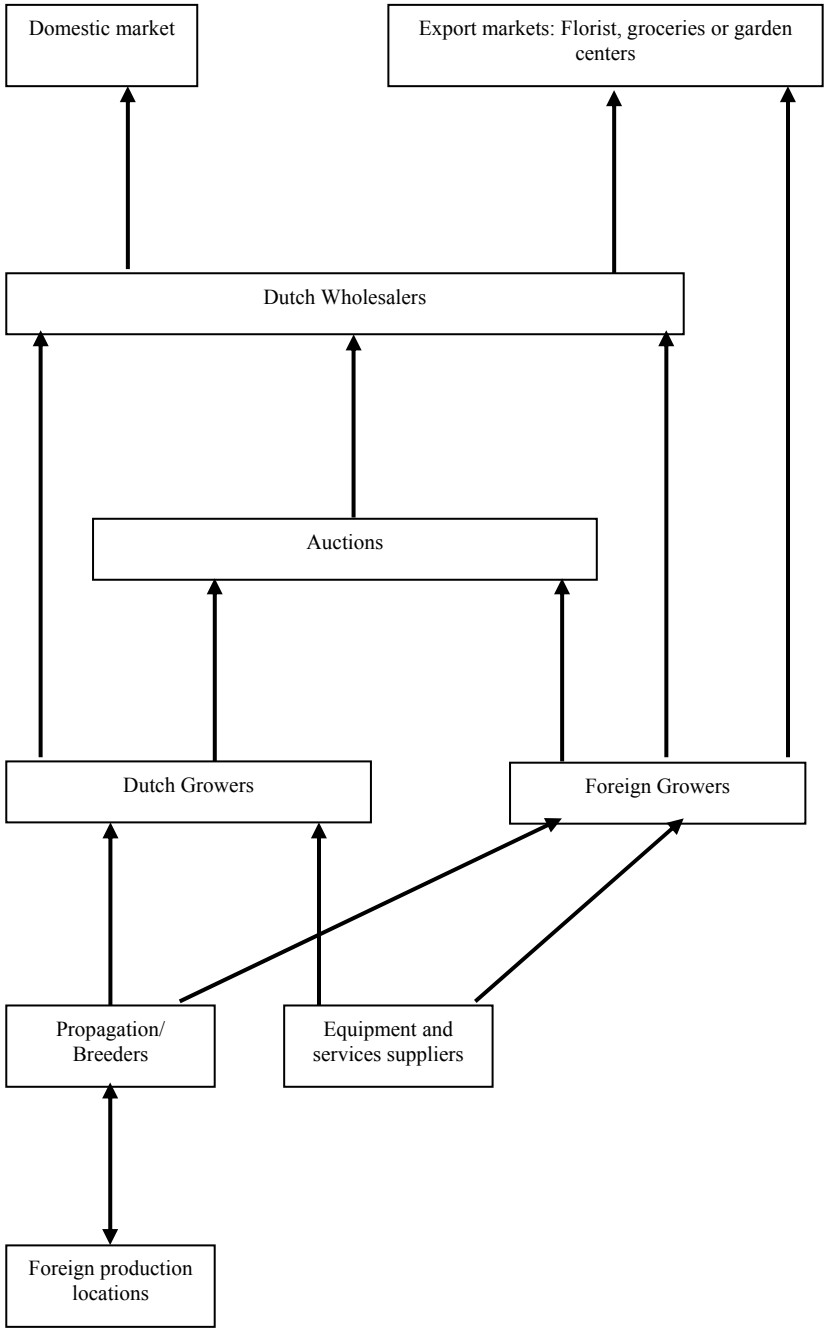


Figure 3.8. The Dutch cut-flower chain

International trade

The main Dutch export destinations are other European countries, the USA and Russia (Figure 3.9.), with Germany, the UK and France as the main destinations. During the last decade, the export value increased by 7 % each year (Figure 3.10.). The Dutch imports amount to around 25 % of the

export value. Kenya is largest foreign supplier, followed by Israel. Furthermore, most East African producers use the Netherlands as a marketplace; two thirds of their exports are destined for the Netherlands. For Colombia, this figure is just 4 %, and for Ecuador 14 % (Figure 3.11.). The market for these two countries is the USA.

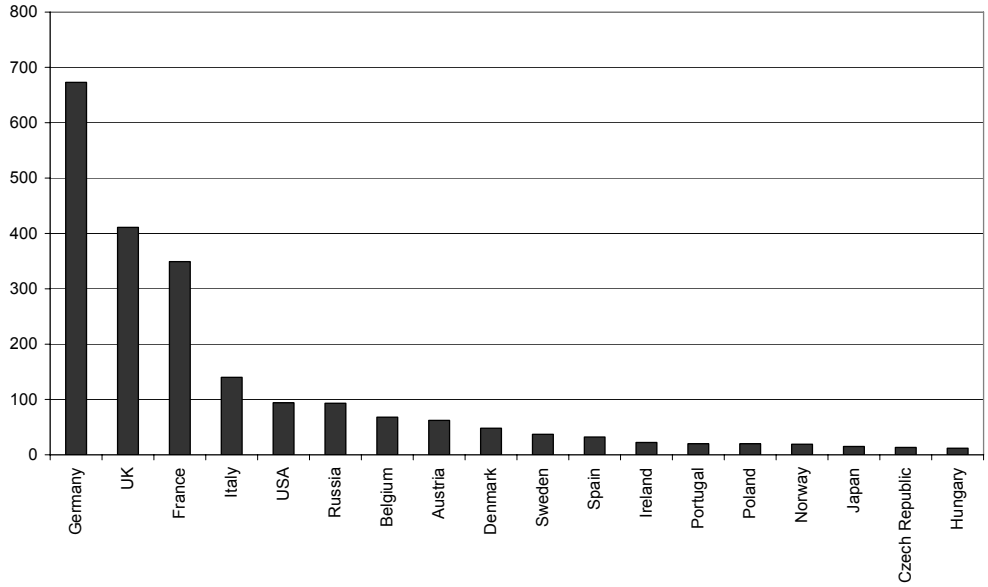


Figure 3.9. Imports from the Netherlands by country (EUR million)
Source: AIPH, 2004

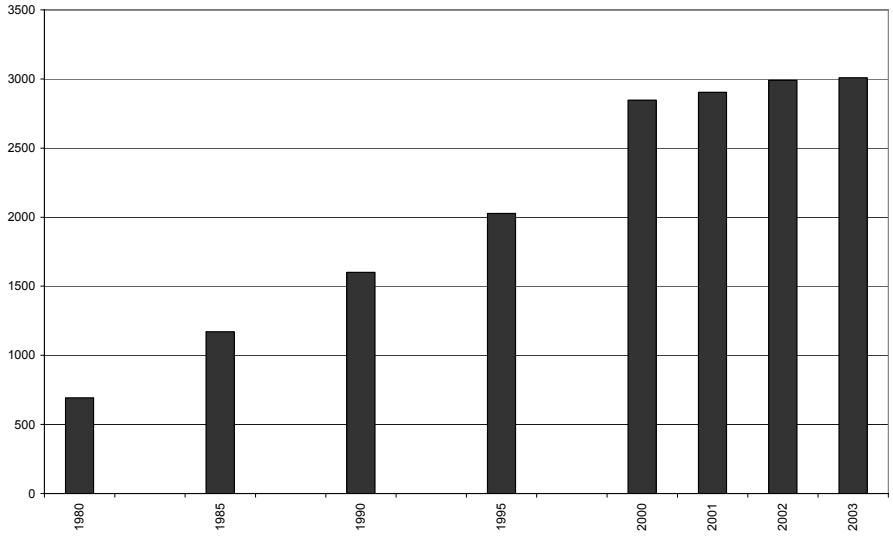


Figure 3.10. Export of cut flowers from the Netherlands (EUR million)
Source: AIPH, 2004

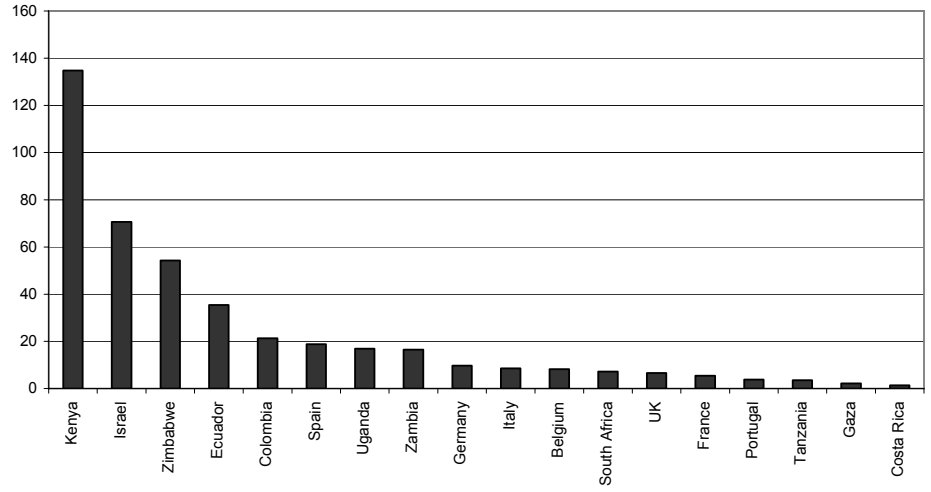


Figure 3.11. Imports of cut flower by the Netherlands (EUR million)
Source: AIPH, 2004

Auctions

The Dutch auctions are the world's largest marketplace for flowers (Table 3.3.). The size of the major wholesale markets in Germany, Italy and Switzerland are just a mere 5 % of the size of the two main Dutch auctions. Only one foreign auction (in the western part of Germany) comes anywhere near the size of the second Dutch auction: it is only 50 % of the size. It will be clear that the price formation in Western European countries is dominated by the Dutch auctions. The turnover of all auctions is still growing, while it is decreasing at most wholesales markets.

Figure 3.12. shows that the auctions decrease the transaction costs between buyers and sellers. The auctions are cooperatives with growers as members. Members must sell to the auctions and in turn the auctions are obliged to sell all the members' flowers. The Dutch flower auctions use a clock that starts at a high price determined by the auctioneer based on market knowledge and the actual supply. The price drops until a buyer stops the clock to buy a lot of flowers from a specific grower at the actual clock price. The process restarts for the remaining part of the lot of that specific grower or for a lot from another grower. The system of the auction enables growers to specialize: they can grow monocultures. The quantity of one cultivar produced by one grower is in general too large for one buyer. Economies of scale are another advantage for the grower.

Table 3.3. Turnover of auctions and wholesale markets in Europe, 2003

Company	Country	Type	Turnover (EUR million)	2003/2002 (%)
FloraHolland	NL	Auction	1920	+0.1
Aalsmeer	NL	Auction	1598	+0.9
Oost Nederland	NL	Auction	62	+8.6
Vleuten	NL	Auction	23	+2.7
NBV/UGA	D	Auction	715	+12.4
Hamburg	D	Wholesale market	102	
Dortmund (2001)	D	Wholesale market	46	-7.8
Frankfurt	D	Wholesale market	18	-30.0
Düsseldorf	D	Wholesale market	37	-1.7
Berlin	D	Wholesale market	31	-12.0
Mannheim	D	Wholesale market	32	+4.9
Pescia	I	Wholesale market	94	-10.8
Blumenbörse Zürich	CH	Wholesale market	26	-9.0

Source: AIPH, 2004

Exchange process	*Implementation*	*Strengths*	*Weaknesses*
Search	All trading options are present at the auctions	All major trading opportunities in one location reduce search costs	Buyers have to come to the auction and sellers have to deliver their products there.
Valuation	'Dutch auction' bid method	Efficient for trading small lots within a fixed time, up to 1000 transactions per hour	Prices decrease during the day. Fairness is accomplished by a sequence based on a lottery
Logistics	Auction is central hub providing logistics for transferring products between buyers and sellers. Costs are shared among all buyers	Very efficient transfer and enables specialization in marketing functions	Packaging costs are incurred multiple times: for transport to and from the auction. Multiple handling of flowers can damage them.
Payment and settlement	Auction provides systems or order tracking, payments and settlements within one day	Shared costs among auction participants and economies of scale in these systems	
Authentication	Auction authenticates participants and grades the quality of products. It is responsible for tracking and ensuring delivery of orders to buyers	Very efficient for large number trading. The auction reduces counterpart risk, product and related authentication costs for buyers and sellers	Buyers and growers perceive quality grades as too broad, artificially inflating the value of products at the lower end of the quality rating
Communication and computing	Simple visual and computerized communications of competitors, products, price and other trading information on the clock	Efficient and low cost for shared communications infrastructure	Requires synchronous communications for trading and allocation of parties to the limiting trading floor.
Product representation	The product is present and a simple code identifying grower and a gross level quality grade	Buyers can directly inspect the product in the auction hall	Buyers and growers perceive quality grades as too broad. The cost of visual inspection
Legitimating	Auction is responsible for recording bids and legitimating transactions		
Influence	The auction can exclude growers and buyers who do not meet various criteria	The auction, by centralizing and requiring the product to be delivered prior to sale, minimizes opportunism.	Auctions rules tend to favour growers
Dispute resolution	The auction provides for various arbitration mechanisms and rules for resolving problems	Low dispute resolving costs	

Figure 3.12. The features of the Dutch flower auctions
Source: Kambil & van Heck, 1998

The disadvantage of the auction system is the decoupling of the contacts between buyers and producers. The advantages of the Dutch auction became also available to non-members from foreign countries. Until the mid 1990s, the Dutch growers strongly opposed marketing flowers from competing countries. However, it became clear that the developments in these competing countries would continue and that they would develop their own market channels. The Dutch Teleflower auction was established in the 1990s specifically for these foreign growers. However, the Dutch wholesalers also became customers at this auction. So even with the exclusion of foreign growers by the Dutch growers' owned auction, the foreign growers used the Dutch marketing infrastructure. It became clear to the Dutch industry that cooperating with these countries would strengthen their competitiveness.

The marketing costs of the auction range from 10-12 % of the auction selling price for large volumes or high-value products, and up to 20 % for small volumes or low-value crops. These costs include commission, promotion levies, bucket rent and handling fees. The marketing costs and the airfreight costs inhibit marketing of small volumes or low-value flowers from foreign growers (Thoen et al., 1999). Most of the costs at the auction are equal for members and non-members: lot charges, trolleys tariffs and the costs of phytosanitary inspection are the same for all suppliers. Members pay a contribution fee of between EUR 450 and EUR 1350 as well as a 3.9 % provision, whereas non-members pay a 5.9 % provision. The difference amounts to less than 3 % (FloraHolland, 2004).

Dutch exporters

The large volume of flowers requires a high level of logistic performance. As mentioned, the retail structure is quite atomistic, as is the structure of the exporters. The scope of scale is important in marketing flowers (table 3.4). Small exporters fit rather well with the florists; large ones will have supermarkets as their customers. The 5 % of export wholesalers with an annual turnover above EUR 20 million have a market share of 49 %. At the other end of the scale, 69 % of the wholesalers have a share in the total turnover of only 10 %.

Table 3.4. Numbers of export wholesalers and turnover

Turnover (EUR million)	Number	Number distribution in %	% turnover
0 - 2	792	69	10
> 2 - 5	167	14	11
> 5 – 10	88	8	13
> 10 – 20	55	5	17
> 20 – 40	35	3	20
> 40	19	2	29
Total	*1156*	*100*	*100*

Source: HABG, 2004

The division of their turnover in 2003 and 2002 is summarized in Table 3.5. The profit margin of the wholesalers was rather small: 1.3 % in 2003 and 1.7 in 2002. This low profit figure is comparable with the margins in the vegetable industry. So it will be clear that the gross margin consist largely out of costs to market the flowers. It is, however, not clear whether the margins differ between small and large wholesaler.

Table 3.5. Margins of the Dutch wholesalers

Indicator	*2003*	*2002*
Turnover	100.0	100.0
Purchases	73.3	74.4
Logistics	8.0	7.4
Exploitation costs	17.4	17.7
Profit before taxes	1.3	1.7

Source: HABG, 2004

Dutch growers

The total area of cut flowers, including propagation, amounted to 3700 ha of greenhouses in 2003. This acreage reached its peak in 2000 with 3900 ha of greenhouses. At the same time, the acreage of ornamentals (pot plants) increased slightly. The total acreage of cut flowers and ornamentals under glass remained more or less at the same level. The number of growers decreased from 6600 in 2000 to 5800 in 2002 (an annual decrease of 6 %). Despite the decrease in holdings and to a lesser extent areas, the production value of cut flowers increased annually by 1 % to reach EUR 2150 million in 2003. The figures for the total of ornamentals (cut flowers and pot plants) are 3 % and EUR 3540 million. However, since 2000 employment has decreased annually by almost 5 %; in

2003, the number of jobs amounted to 43,000. This means that the labour productivity increased. According to van Liemt (2000), the Netherlands has the most efficient and productive producers. Table 3.6. shows the main developments of the floriculture industry at growers' level. The product lifecycle of freesia and carnation is approaching the end; there has been a strong decrease in this area. The Netherlands imports carnations from Colombia and Spain. The area of lilies increased, whereas the area of roses stayed, surprisingly, at the same level, despite the huge imports from Kenya. Small-bud cultivars are grown in Kenya and these have disappeared in the Netherlands. The profitability of the Dutch floriculture sector is higher than that of any other Dutch agriculture sector.

Table 3.6. Characteristics of the Dutch flower industry

Indicator	1980	1990	2000	2001	2002	2003
Growers of ornamentals (number)	7 923	8 004	6 575	6 156	5 796	5 597
Acreage of ornamentals (ha of greenhouse)	3 976	5 140	5 927	5 845	5 823	5 769
Turnover of ornamentals (EUR million)			4 836	4 859	5 120	5 220
Employment (1000 labourers)			49 801		45 308	43 263
Area of pot plants	701	1 201	1 758	1 775	1 762	1 819
Area of cut flowers (ha greenhouse)	2 983	3 773	3 923	3 815	3 770	3 666
Rose	766	889	932	921	907	853
Chrysanthemum	428	738	774	753	755	702
Lily	137	210	276	271	272	266
Gerbera	230	208	253	256	253	246
Orchid		185	212	194	222	216
Freesia	366	322	221	215	200	198
Carnation	466	250	86	67	57	47

Source: CBS, 2004

Table 3.7. gives a breakdown of the income. Labour, energy and planting materials are the largest costs items. The results of the Dutch cut-flower growers are the average of a group of farms. The firms are highly specialized on one flower variety. For roses, big-bud type, the average yield per ha is 2.5 million stems, which results in an average cost price of EUR 0.21-0.25 per stem. The average auction price is around EUR 0.26. Capital for investment is widely available at competitive interest rates. The mostly family owned farms have a solvency of around 50 %. Due to the collateral of the farmers, the risk for the bank is very moderate.

Table 3.7. Economic performance of the average Dutch cut-flower firm (EUR 1000)

Indicator	1996	2001	2002
Area cut-flower greenhouse (ha)	1.0	1.4	1.4
Number of fulltime employment	5.6	5.2	5.5
Family income	34	53	66
Returns total	*423*	*553*	*596*
Costs total (excluded own labour and capital)	*389*	*501*	*531*
Seeds and propagation materials	65	73	71
Pesticides	64	10	9
Energy	65	102	97
Depreciation	48	67	70
Non-family labour	72	85	101
Interest	17	24	25

Source: FADN (EU-Farm Accountancy Data Network)

Breeders and equipment
The production of propagation material is an important part of the flower industry. It is carried out in special nurseries. The techniques vary from traditional methods like grafting and producing cuttings, to more modern methods like tissue culture or genetic engineering, including marker technology. The Netherlands is one of the world's most advanced producers and home to many international companies in this field. In 2000, the total production value was around EUR 700 million. Some of the cuttings are produced in developing countries. For example, Dutch chrysanthemum cuttings are produced in Kenya, Tanzania and Uganda. The export value of cuttings and young plants was around EUR 170 million in 2000 (Rabobank, 2002).

To defray the high costs of plant breeding, the breeders are compensated for their investments through royalties and licences. The UPOV (Union International pour la Protection de Obtentions Végétales) issues guidelines for legislation on plant breeders' rights. Most countries offering these rights are affiliated to the UPOV. For emerging countries it is important to have access to new varieties in order to meet the rapidly changing consumer demands. In addition, very high own investments are required to meet the international standards of modern varieties (LNV, 2000).

Greenhouses, robots and computer systems, transport systems, cold stores, sorting and bunching machines as well all other production materials such as hydroponics, biological plant protection, pesticides, trays are manufactured in the Netherlands. The suppliers are often based in the production areas.

Knowledge infrastructure
The knowledge structure is embedded in the Wageningen University and Research Centre, which has about 7000 employees. A broad scope of pure, strategic and applied research is concentrated at the Centre. Research on plant breeding, greenhouse techniques, post-harvest handling, growing techniques, and economics and marketing is carried out at the Centre. The research is both publicly and privately financed. Private consultants and the plant production information service (LTO-groeiservice) disseminate the knowledge gained. Education at all levels – ranging from skills for labourers working in greenhouses, to academic researchers – is widely available in the Netherlands and on a competitive level for non-agricultural education. The high performance of the Dutch floriculture is acknowledged by Porter (1990, p. 85), Jacobs et al. (1990, pp. 109-118) and Batt (2000).

Key findings
The Dutch floriculture sector:
- Is a complete industry: supplying and related firms are abundant and locally available. Proficient knowledge is available for all links in the supply chain, from breeding till consumption.
- Is the largest exporting country with a full range of flowers from all over the world.
- Has the European countries as its home market.
- Acts as marketing institution for several other producing countries.
- Has a high compliance with codes of conduct and is leading with MPS.
- Is export oriented for propagation materials and equipment, as well as for the final product such as flowers.
- Sometimes suffers from competitors who have cost-price advantages (e.g. small-bud roses have almost disappeared in the Netherlands).

The USA: the largest flower market

As is shown in Figure 3.1., the US market is one of the world's largest consumer markets for flowers. Despite the large production value, it is the third world importer of cut flowers. Since 1989, imports have slightly increased while the domestic production has remained the same (Figure 3.13.). Before 1994, the domestic production exceeded the imports. This Section deals with the opportunities of the US market.

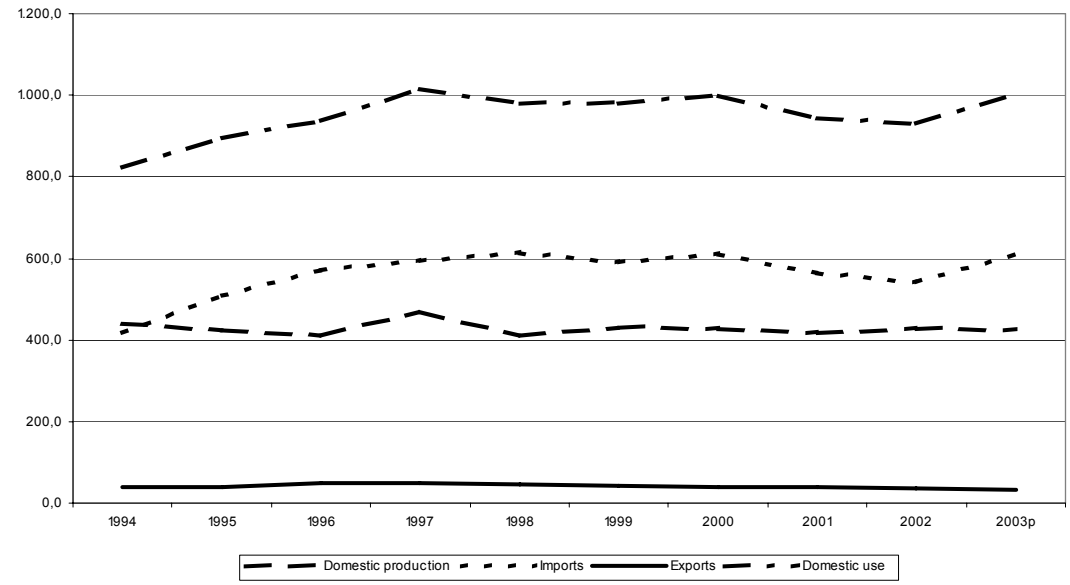


Figure 3.13. Production, import and export of cut flowers in the USA (USD million)
Sources: Floriculture Crops, NASS; FATUS, ERS; U.S. Bureau of Census

Trade

Although African countries export cut flowers to the USA, the amounts are very small: South Africa EUR 1 million, Zimbabwe and Zambia both around EUR 200,000 and the other countries some EUR 10,000. The distance is not the issue, because the USA imports also from Israel, Thailand and New Zealand. The main exporters to the USA are Colombia (supplying more than 50 %), Ecuador and the Netherlands: between them, these three countries have a market share of over 80 % (see Figure 3.14.).

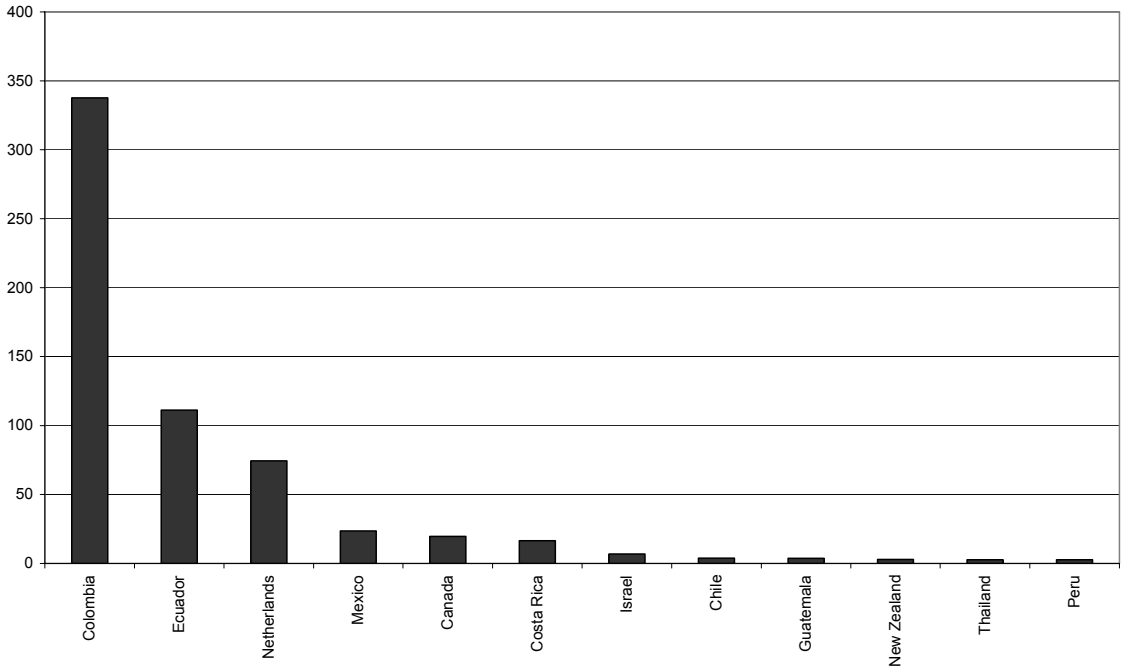


Figure 3.14. Cut-flowers imports in the USA in 2001 (EUR million)
Source: AIPH, 2004

Table 3.8. USA imports of cut flowers in 2001

Variety	EUR million	Main origin countries
Standard roses	223	Colombia, Ecuador
Pompon chrysanthemums	57	Colombia, Costa Rica
Standard carnations	50	Colombia, Ecuador
Miniature (spray) carnations	30	Colombia, Equator
Alstroemeria	26	Colombia, Canada
Gypsophilia	24	Ecuador, Colombia
Others	205	
Total	615	

Source, AIPH, 2004

Miami International Airport receives 80-90 % of all imported cut flowers (van den Broek et al., 2004). Standard roses account for 36 % of the total value of imported cut flowers (Table 3.8), followed by chrysanthemums (9%) and carnation (8%). The rose variety is of the big-bud type, which is not the commonly grown variety in East African countries. Imports have a share of 60 % in the domestic US consumption. The tariff and trade agreement terms show a duty rate ranging from 3.2 % for miniature carnations up to 6.8 % for roses. However, several regions have a free trade tariff, which results in an average rate of duty of 1.1 % ad valorem. The special tariff is applicable to, for example, the NAFTA (North America Free Trade Agreement) countries, sub-Saharan countries that come under the African Growth and Opportunity Act, and countries that come under the Andean Trade Preference Act (ATPA). The Netherlands and Columbia – two major exporters to the USA – are excluded from the special tariff (USITC, 2003).

Marketing and consumption

The consumption per head is relatively low in the USA (see Figure 3.1 and Table 3.9): potentially the consumer expenditures for cut flowers can be higher. Bedding plants have a major share in the consumption of ornamentals (Table 3.9.). With a share of around 10 %, the cut-flower market is a rather small market in the US. The consumption of roses per US household is low compared to the large share in the import (Table 3.9.) and in other floricultural crops such as beddings and garden plants. In 1996, a mandatory grower-funded promotion programme was formally organized. Assessments of 0.5 % of the gross sales were to generate USD 10 - 12 million for promotional activities. The US Department of Agriculture (USDA) handled the administration and collection of the programme until it was dismantled in 1997 after it lost the support of growers (USITC, 2003). Cut flowers are promoted generically through industry associations and other voluntary organizations. US and Colombian growers promote flowers in the USA through the Flower Promotion Organization, a voluntary arrangement they formed to boost the short- and long-term demand for flowers. The consumption of fresh cut-flowers tends to be seasonal and peaks around certain holidays. More than 50 % of the floral product purchases are for gifts.

The retail marketing of fresh cut-flowers has shifted from a large number of small, independent retail florists to florist chains and mass market retailers with garden centres. In 2000, the specialty outlets (mainly florist shops) had a market share of 60 %, and mass merchandising had a share of 36 % (van den Broek et al., 2004). The entrance of mass merchandisers changed the marketing practice in the industry. It has moved from a product and sales orientation to a customer-driven, market-oriented approach. The mass merchandising concept of strict inventory management and the tracking of consumer sales has begun to be adopted by independent retailers and suppliers. A key aspect in mass merchandising is the notion that low prices move large quantities of merchandises and gives them the ability to exert control over their suppliers. This, in addition to low-priced imports, has kept fresh cut-flower prices low. The cost-cutting strategies of the mass merchandisers may induce the development of more productive flower varieties by breeders, particularly in the 40-50 centimetre lengths destined for the mass markets, increasing volume to reduce costs per stem and introducing more efficient management practices (USTIC, 2003).

Table 3.9. Consumption of ornamentals in the USA per household (in USD)

	2000	2002	2004 (forecast)
All cut-flowers	4.08	3.96	3.83
(Roses)	*(0.66)*	*(0.55)*	*(0.47)*
Flowering plants	7.58	7.82	7.46
Foliage plants	4.48	4.99	4.87
Beddings plants	19.87	22.25	22.28
Total ornamentals	36.01	39.02	38.44

Source: Jerardo, 2004

Prices and sourcing

Markets for locally produced cut-flowers are in San Francisco, Los Angeles and San Diego in California. In other cities, like Boston or New York, the centres for wholesale florists are not tied to producer locations but are central locations convenient to retailers (van den Broek et al., 2004). The wholesale market prices (Table 3.15) in the USA seem to be rising, despite the fact that the prices are largely dominated by the imports (table 3.10). Starman (2004) shows that flowers come from all over the world. Here, the Dutch marketing system and the Miami importers play an important role.

Table 3.15. Wholesale prices of cut flowers (USD per unit) in the USA

Variety	2000	2001	2002	2003	2004[a]
Roses, all	0.37	0.37	0.37	0.38	0.40
Pompon chrysanthemums	1.31	1.30	1.31	1.32	1.36
Standard carnations	0.16	0.16	0.16	0.17	0.17
Alstroemeria	0.24	0.24	0.27	0.29	0.30

[a] forecast

Source: Jerardo, 2004

Production

Due to the increasing low-priced import competition, many US growers have shifted production to cut-flowers specialties, which are not imported in significant volumes (see Table 3.8). The top seven main production states are California (accounting for 66 % of annual of US production), Florida, Washington, Hawaii, Oregon, New Jersey and Michigan. The flowers are grown in open fields or within a protective structure, like glass or fibreglass greenhouses, or constructions that provide shade or protection against wind, for example, an overhead latticework covered with a layer of polyethylene film (Table 3.11.).

Table 3.11. US ornamentals production, area and growers

	1999	2001	2003
Large growers (sales > USD 100,000) (number)	4 793	4 738	4 741
Area in ha			
Glass greenhouses	583	652	645
Fibreglass cover	758	769	715
Plastic film cover	2 861	2 871	3 109
Total greenhouses covered	*4 202*	*4 292*	*4 469*
Shade/temporary cover	3 333	3 335	3 235
Total covered area	7 535	7 627	7 704
Open field	11 251	11 736	15 581
Total area	18 786	19 364	23 284
Average sales per ha (USD 1000)	192	178	231
Average sale per grower (USD 1000)	1 945	2 345	2 481

Source: Jerardo, 2004

The covered area accounts for about 20 % of the total area. The majority of ornamentals are grown in the open field. The number of cut-flower growers declined from 3120 in 1980 to 2067 in 1998. The large growers (sales > USD 100,000) declined from 760 in 1997 to 615 in 2001. The industry has been going through a period of consolidation and contraction in the number of growers. Most fresh cut-flower growing operations are family owned and operated. During the production process, approximately 50 % of all direct labour is used in harvest activities. Post-harvest handling methods developed for domestically produced flowers over 20 years ago are still current practice. During grading, human decision-making is still important despite the availability of length or stem weight sorting machines.

In conclusion, the production of cut flowers for the US market has moved overseas. Imports exceed the domestic production. Opportunities for importers are the mass markets: large volume at competitive prices and logistic services. It is one of the largest consumer markets.

Japan: the world's second largest market

Trade

Japan's economy is the second largest in the world. However, stagnant economic growth led to stagnant growth in consumption expenditures. The market value of cut flowers in Japan is second after the USA, but larger than Germany, the UK and Italy. Japan is also the fourth country in production value after China, India and the Netherlands. The annual growth rate of the production value between 1994 and 1998 was 8 % (Jetro, 2001). Only 7 % of the cut-flower consumption is imported. Nevertheless, it is also an important importer (EUR 170 million) as is shown in before. The main exporters are the Netherlands, Thailand, South Korea, New Zealand and Colombia (Figure 3.15). The market share of these five countries amounts to 67 %. In Europe, the Netherlands alone has a market share of over 80 %; in the USA, Colombia has a share of 55 % and in Japan the largest supplier has an export market share of around 15 %. The imports from the Netherlands decreased from 3280 tons in 1996 to 2675 tons in 1999. Figure 3.15 shows the internationalization of the cut-flower industry. The Republic of South Korea has improved its import position. The presence of Asian and Pacific countries on the Japanese market is obvious. The competition is, however, on a world scale because African and South American countries, as well as the Netherlands, are exporters to Japan. Kenya and Ecuador are small suppliers, but grew steadily in the period 1999 – 2001. Moving flowers from harvest to retailer for domestic production takes two days and for foreign production two to four days.

Cut-flower imports in Japan are essentially free, although inspection under the Plant Quarantine Law is compulsory. This law prohibits, for example, the import of plants infested by pests (as defined by the Japanese Ministry of Agriculture) and plants in soil or flowers containing soil. A plant quarantine certificate must be attached to related documents, such as invoices. Japanese plant quarantine officers check the documents and visually inspect the flowers. Japanese plant quarantine officers can be stationed in the exporting country, as they are, for example, in Holland. Pre-inspection contributes to negligible levels of rejection and enables Customs to be cleared quickly. The costs are for the exporting country.

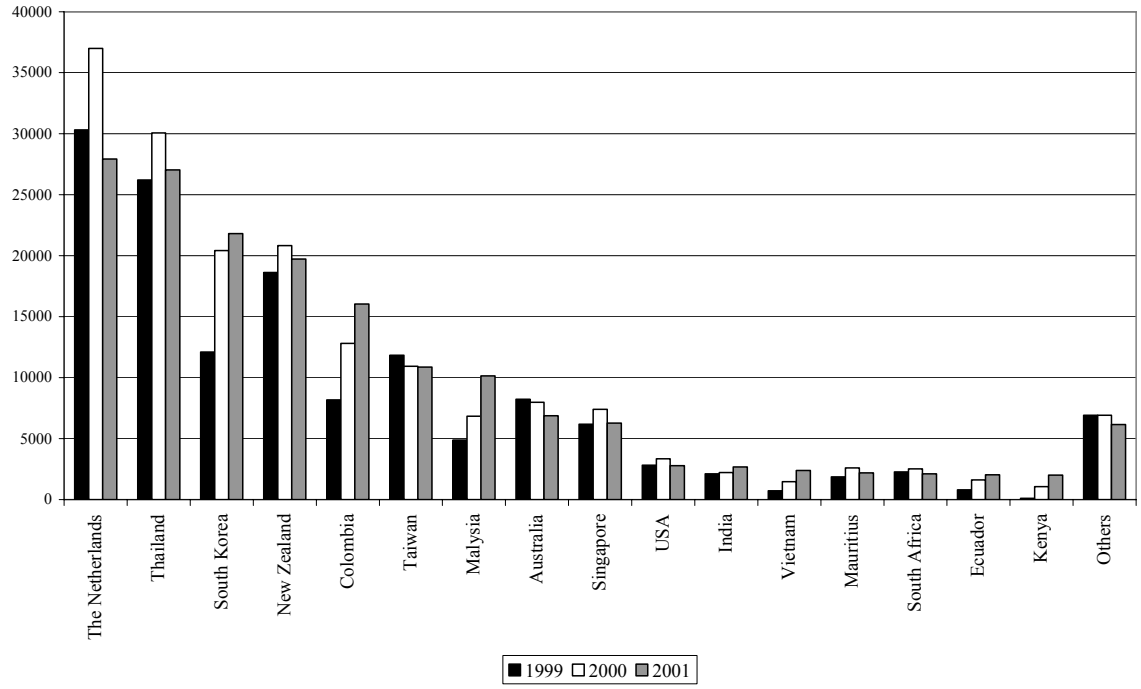


Figure 3.15. Cut flower imports in Japan (EUR 1000)
Source: AIPH, 2004

Consumption and retail

Japanese flower demands were traditionally concentrated on ceremonial occasions like weddings, funerals or coming of age. In the mid 1980s, home delivery and mail order systems were introduced, and the demand for flowers as gifts and for regular use took off and rapidly increased in the early 1990s. The order & delivery and shop sales are for household consumption, the share of which in 1998 was 67.3 % (Table 3.12.). The sales from wholesalers declined from 73 % in 1991 to 71 % in 1997, while the sales of supermarkets rose from 8 to 12 %. The flower specialty shops remain at the mainstream of retailing; the number as well as the total turnover increased slightly in the mentioned period. However, the same trend as in European countries and in the USA can be seen: a higher market share for supermarkets. The development of the total Japanese consumption over the period 1980 –1998 is shown in Figure 3.16. The annual growth rate in consumption was almost 6 % in this period (Jetro, 2001).

Table 3.12. Cut flower demand by business (%)

	1989	1992	1995	1998
Business use	39.7	35.9	32.9	32.7
Order and delivery	9.8	10.5	10.3	11.6
Shop sales	50.5	53.6	56.8	55.7
Total	100.0	100.0	100.0	100.0

Source: Jetro 2001

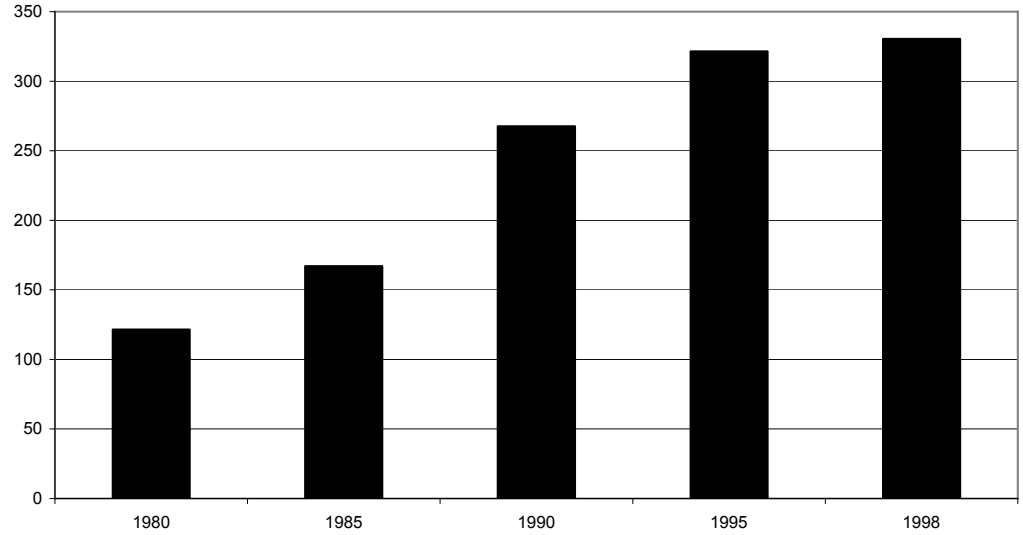


Figure 3.16. Consumption of cut flowers in Japan (USD million)
Source: Jetro, 2001

The Japanese distribution channel looks like the Dutch channel but without an export dimension. The structure, however, is quite different. The wholesalers, including the wholesale markets and auction, smoothly coordinate in both countries the interaction between supply and demand and ensure competitive price formation. However the concentration in the channel is much lower than in the Netherlands: in 1999, there were 277 wholesale markets, reflecting the widespread consumption and production throughout Japan. According to Jetro, many differences can be cited between the Japanese and Dutch wholesale markets. It can be concluded that the Japanese markets are less advanced than the Dutch (Figure 3.17.). Moreover, the Japanese wholesale markets are focussed only on the domestic market.

		Japan	The Netherlands
Distribution	Shipping parties	Individuals, groups, unions	Individuals, companies
	Shipping packages	Cardboard	Mainly reusable transit buckets
	Transport to the market	Transport agents	Individual transport
	Reloading during transport	Yes	No
Markets	Number	277	7
	Scale of largest market	Ohta Market: 4.5 ha	Aalsmeer: 70 ha
	Turnover of largest market	USD 285 million (1997)	USD 1075 million (1997)
Management	Management body	Independent companies	Cooperative of growers
	Handling fee	Double that of Dutch auctions	
	Middle trade system	Undeveloped	Well established
	Quality inspection	Standards according to place of origin (markets not involved)	Ranking by markets' official inspectors
	Cold rooms	No yet	Yes

Figure 3.17. Comparison of wholesale markets in Japan and Holland
Source: Jetro, 2001

Growers

Japan stretches from the cold north to the semi tropical south, which enables the cultivation of various flowers in all seasons. Much of the domestic production has shifted from outdoor farming to greenhouses. Over 90 % of carnations, roses, orchids and gerberas are produced in greenhouses. Most chrysanthemums, especially the smaller ones, are conventionally grown outdoors. The number

of flower growers is dropping; in 1997, there were around 83,000. The area is slightly increasing and reached a level of almost 20,000 ha in 1997: 9000 ha of greenhouses and 11,000 ha outdoor. So the average farm size is low, with approximately 0.25 ha in total and only 0.10 ha of greenhouses. In the Netherlands, the average size is 1 ha of greenhouse, as it is in the USA. In the USA, 3 ha additional outdoor has to be added to the farm size. Chrysanthemums account for one third of the production value of cut flowers; carnations, roses and lilies each account for 10 % (Jetro, 2001).

Conclusions
Japan is a small importer of cut flowers compared to European countries and the USA. The high domestic production forces exporting countries to look for market windows: low prices, exclusive products or out-of-season products. In addition, understanding the consumer preferences, the trading habits and meeting the Japanese import regulations are self-evident, however not always easy to fulfil. The countries in the Asia Pacific region have taken advantage of the opportunities, just as the Netherlands did. A strategic focus and plentiful means to implement the strategy in the long run are the minimal conditions for long-term success.

African and Middle East exporting countries

Introduction

Several countries in Africa and the Middle East export, mainly to Europe. Table 3.13. shows the importance of these countries on the world market.

Table 3.13. Cut-flower exporting countries in Africa and Middle East (EUR million)

	Exporting countries in EUR million											
Importing:	Israel	Turkey	Kenya	Zimbabwe	Uganda	Zambia	South Africa	Tanzania	Ethiopia	Ivory coast	Morocco	Total
The Netherlands	71	1	135	54	17	17	7	4	0	1		307
Germany	3		15	1			2	2	3			26
UK	3	6	51	1			1				1	63
France			3				1			2	1	7
Other EU	14	4	4	1	1	0	2	0	0	1	1	28
Total EU	91	11	208	57	18	17	13	6	3	4	3	431
Swiss	1		6	3			1	1			1	13
US	7						1					8
Canada	2											2
Japan	1	1	2	1			2					7
Total	102	12	216	61	18	17	17	7	3	4	4	461

Source: AIPH, 2004. 2003 figures for EU countries and 2001 for non-EU countries.

Kenyan flower industry: a major African producer

Kenya is the world's fourth largest exporter of flowers. Nevertheless, the production is, in world shares, low and a home market is almost completely absent. Flower exports have a share of about 40 % in the export of horticulture products, and the share is increasing. The export of horticulture products is the second source of foreign currency. Some key figures of the flower industry are summarized in Table 3.14. The president of the Kenya Flower Council mentioned that the market share of exports to the Netherlands increased to 69 % and decreased at the same time to the other countries (Dubai in Bloom, 2004). He has the opinion that the European market defines the Kenyan flower industry. The diversification in cultivars enables direct marketing to the UK and other coun-

tries. It is possible to export bouquets or to provide supermarkets with large volumes of flowers. Eaton et al. (1999) expected this trend since the mid 1990s, but it did not become reality. The advantages of marketing by the Dutch auctions and wholesalers outweighed those of direct marketing. The key issues for the Kenyan flower industry are therefore the logistics to the Netherlands, producing an adequate quality of flowers and having a sufficient performance on the farms. These aspects are dealt with in the following.

Table 3.14. Key figures on the Kenyan flower industry.

Indicator		
Acreage of flowers (ha)		2 180
Number of growers		140
Export (ton)		41 400
Market shares (%)	Netherlands	65
	UK	25
	Germany	7
	France	2

Source: Wijnands, 2003

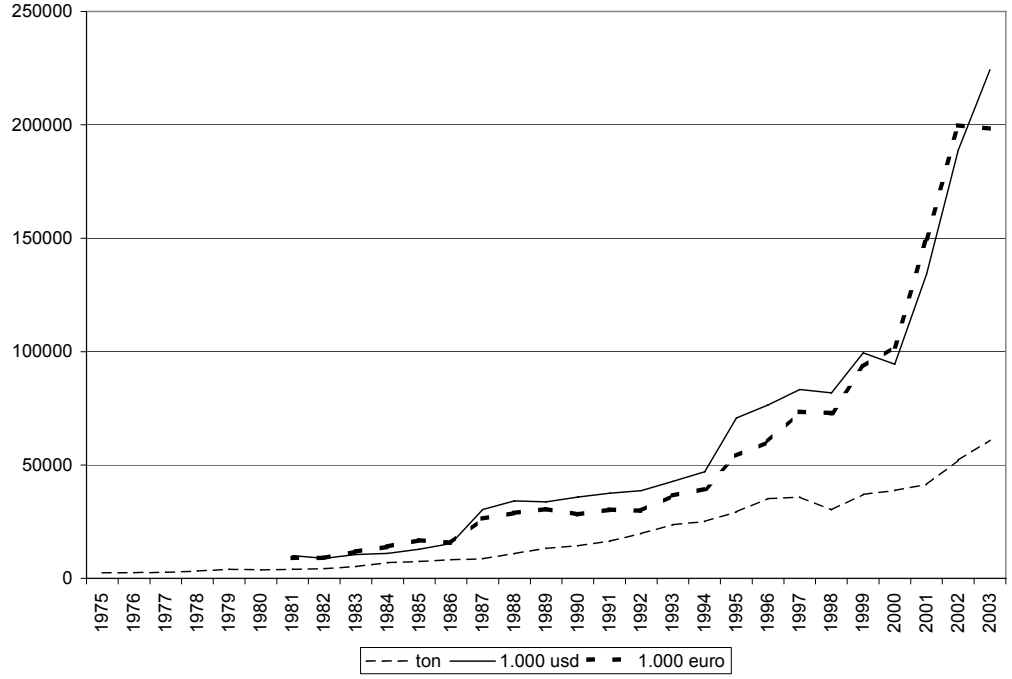


Figure 3.18. Cut-flower production in Kenya
Source: HCDA, 2005.

The overall economic development of Kenya is weak. The annual GDP (gross domestic production) growth has been around 1 - 2 % for the last 5 years. Nevertheless, it is the largest economy in East Africa. The priorities of the government are to support the growth in employment and to tackle corruption. International aid is necessary to improve the infrastructure and the financial sector. The flower production has been growing since the mid 1980s; it reached a temporary peak in mid 1990s and has accelerated ever since (see Figure 3.18). The export of flowers shows the same growth: the domestic market is negligible. Next to the higher production, the higher prices also contributed to the higher value. During a period of over 20 years, Kenya has had an annually growth rate of 13 % in flower production and 15 % in production value. The price of flowers is more volatile, as is shown in Figure 3.19. It reached a peak in 1987 and 1998, and has been comparably high since 2000. The influence of the exchange rate between the euro and US dollar contributes slightly to the high 2003 level in USD.

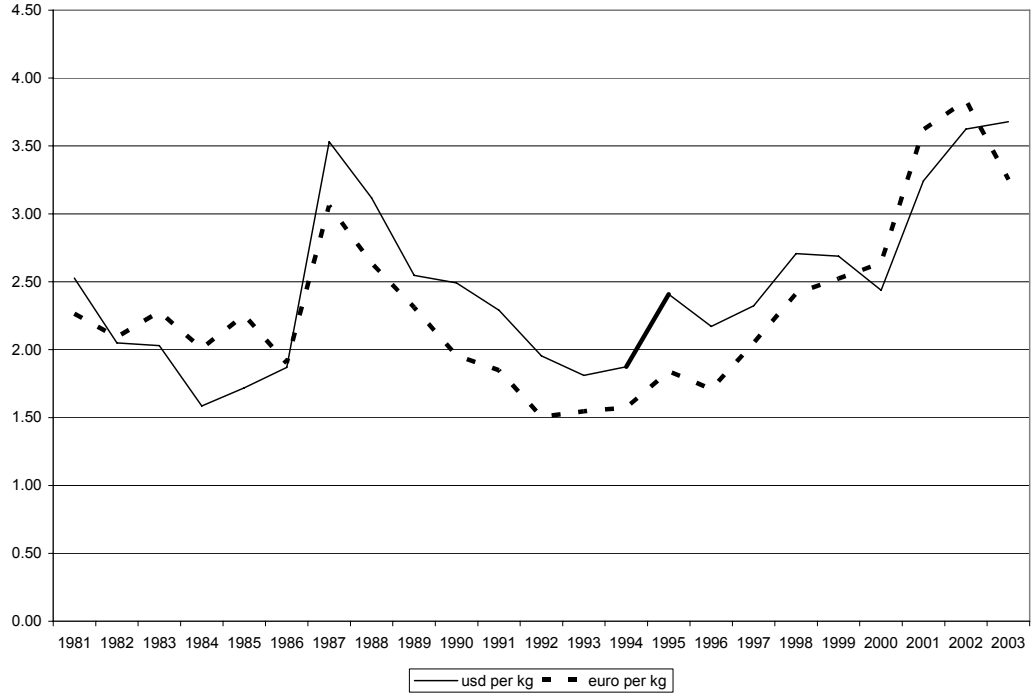


Figure 3.19. Price of cut flowers per kg
Source: HCDA, 2005.

Cut flowers are highly perishable: they have a vase life of a few days to a couple of weeks. This demands an effective and uninterrupted cold chain from the moment the flowers are harvested until they reach the vase of the final consumer. Optimal post-harvest treatment in Kenya is the same as in other countries. Due to the distance to the consumers, airfreight handling is of major importance for Kenya. At the moment the specialized cargo forwarders have invested in such facilities. Four airfreight forwarders are responsible for approximately 90 % of the Kenyan flower exports. However, smallholders cannot afford these service and they have to use the Kenya Air freight handling, without cold storage. The disadvantage for the small grower is huge because of lower price due to the quality losses in this stage. Even for the specialized forwarders it should be clear that loading the airplane should be done without delay. Leaving the flowers on the platform for a while in the heat of the sun will negate most of the efforts to keep the quality as high as possible. The temperature control in the airplane can be assumed to be at a suitable level. At the airport, most air freighters facilitate customs and inspection by the Kenya Plant Health Inspectorate Service (KEPHIS) for phytosanitary certificates.

Auctions or direct marketing
Thoen et al. (1999) estimated the costs of marketing by auction and of direct marketing to Germany and the UK (Table 3.15). They distinguish three different channels: through the Dutch auctions to the German retailer, direct to the German market and direct to the UK market. The main assumptions are based on a margin as a percentage of the purchase price for each chain participant after the auction. Thoen et al. calculated different margins depending on the chain. The central focus is the purchasing price of the retailer. Or as Thoen et al. states: 'Supermarkets [in the UK] insist on competitive prices. They monitor prices carefully and see increasing both scale and innovation as the means to achieve cost efficiencies'.

Table 3.15. Share of costs in % of retail purchasing price of Kenyan flowers

	Dutch auction to German market (stems)	Direct to German market (stems)	UK direct chain (bouquets)
Producer's share	38	45	57
Air freight	18	19	24
Marketing costs	44	36	20
Purchase price retail	100	100	100
Consumer price	214	214	235

Source: Based on Thoen et al., 1999

Table 3.15. suggests better prices for the growers if they sell by direct marketing. However, Thoen et al. (1999) concluded that 'the realized auction price could be up to 20 % higher for loyal overseas suppliers than for irregular suppliers of average quality flowers. This stems from the fact that the auction system is a vehicle for premium prices not for channelling poor quality'. Thoen et al. (1999) also mention several other transaction costs, which are not included:

- Cost of marketing (telephone and fax).
- Finance on weekly base by the auctions in contrast to monthly payment and a higher certainty about paying out by the auctions.
- Transparent quality inspection and product rejection in auction sales.
- Free market information provided by the auctions, which is probably censored by importers.

The differences in air freight costs seem illogical; this is perhaps a result of exporting bouquets to the UK. Bouquets mean additional labour input at the farm level. The margin at the retail level is relatively high in the UK. So the conclusion is that it is rather difficult to compare the marketing costs by auction to those of direct marketing. Figure 3.12. lists even more advantages of the auction system. Comparing marketing costs for Kenyan flowers needs more attention.

Developments at the second and third markets: UK and Germany

The margins as suggested in Table 3.15. should lead to an increase in direct marketing. In this Section, some development on the British and German market is highlighted. The UK has a 25 % share in the EU imports from Kenya. During the 1980s, Kenya exported on a small scale to the UK (about 500 tons in 1986, representing 5 % of total production). In 2003, however, this figure was almost 12,000 tons, representing almost 20 % of Kenya's production volume. According to Thoen et al. (1999), the improved market position is influenced by:

- The growing market power of the UK supermarkets, which need large volumes at competitive prices.
- A favourable economy, which increased flower consumption.
- The strength of the British pound.

The contributions of the Kenyan flower industry are:

- A development of long-term relationships between Kenyan exporters and UK importers. Access to technical and marketing information is an additional advantage.
- The transition to quality-oriented, differentiated products.
- The diversification and expansion to more exclusive flower varieties like roses and summer flowers instead of carnations and chrysanthemums.

In the UK 60 –70 % of the Kenyan flowers are direct sales for supermarkets, controlled by a few British importers. However Thoen et al. (1999) mention the risk of product rejection in periods of market saturation in the UK. Opportunistic behaviour is not completely excluded.

The development on the German market is quite the opposite. Until the 1990s, Germany was the largest export market for Kenya's flowers. A joint venture between the Kenyan producer Sulmac and a major German importer, Florimex, contributed heavily to that market position. The termination of the exclusive contract ended the favourable market position. Alternative suppliers and diminishing consumer interests in carnations are other factors that contributed to the decline. At the

moment, a few small importers control the distribution of Kenyan flowers to the supermarkets. These chains are fully controlled by the German importers (Thoen et al., 1999). The expected growth of the market share of supermarkets is an opportunity for the Kenyan growers; however, the supply chain should be organized. The transaction costs can be higher than marketing by the Dutch auction with the transparency in price formation, quality control, market information and regular payments (without any uncertainty). This development and the suggested higher prices for the growers are not in line. Perhaps the transaction costs of direct marketing at farm level are higher than the higher marketing costs by auctioning.

Growers

The different climate zones in Kenya favour flower growing. The main cut-flower areas are located to the north and northwest of Nairobi. In Kenya, 70 % of the production value is from roses, followed by hypercum, lisianthus and standard carnations, each with a share of around 2 %. There are as many as 50 other varieties. Thus, roses are the major export product.

Nairobi airport is important for the logistics. Recently, a new airport has been built in the Eldoret region, and might stimulate the production areas in the western part of Kenya. Access to water and the availability of infrastructure are the other main conditions. The farm size ranges from peasant farmers of up to 5 ha to large farms of more than 250 ha. The labour force on the farms of 20 to over 100 ha ranges from 250 to 6000 people. The 25 largest producers account for nearly 75 % of the total exports. Overseas investors as well as Kenyan, white, Indian and African farmers own the large farms. The smallholders mostly grow for others. Information on the structure of the growers was not found.

Table 3.16. Tentative investments for a Kenyan cut-flower greenhouse (USD per ha)

Cost item	Costs
Greenhouse construction	50 000
Irrigation layout	5 000
Water pumps	2 500
Spray Unit	1 300
Fertigation equipment	25 000
Cold storage (20 % of total)	18 000
Insulated truck (20 % of total)	21 000
Total	*122 800*
Annual capital costs (25 %)	30 700

Source: Thoen et al., 1999

Table 3.16. shows the fixed costs for roses, based on a farm of at least 5 ha. Roses were chosen because this crop accounts for more than half of the exports (in 1998 about 18,000 tons), followed by statice (3300 tons), alstroemeria (1900 tons) and spray carnation (1800 tons).

One cold storage facility and of one insulated truck have sufficient capacity for a farm of 5 ha. A lifetime of 10 years has been assumed, which means an annual depreciation of 10 %. The interest rate is around 14 %. The average invested capital will be 50 % of the investments, which mean 7 % capital costs. Maintenance costs are estimated at 8 %, due to high level of machinery. This means that the annual costs can be estimated at approximately 25 % of the fixed costs. Information about the availability of capital is missing. Some sources mention an interest rate of 25 – 30 %. This means that the annual cost could be as high as 30 or 35 %. Table 3.17. summarizes the variable costs. The production costs are approximately USD 0.064 per stem. As shown in table 3.15, the additional marketing costs are about 50 – 60 % of the production costs at farm level. The costs to deliver one stem to the auction are therefore around USD 0.09 – 0.10. One should take into account that the dollar is rather weak compared to the euro (end 2004). All the costs and especially the airfreight costs are fixed in USD, while the auction prices are in euros.

Table 3.17. Tentative annual fixed and variable cost of roses production in a Kenyan greenhouse (USD per ha)

Cost item	Costs	%
Annual costs fixed capital (25 % of investment)	30 700	23
Land preparation	14 000	11
Plant material (including royalties)	53 250	40
Irrigation	500	0
Fertilizers	5 300	4
Pesticides	6 000	5
Labour	14 275	11
Packaging	3 500	3
Transportation	4 000	3
Total	131 525	100
Stems per ha	2 055 000	
Cost per stem (USD)	0.064	

Source: Thoen et al., 1999 partly modified by author

The high conversion rate between the euro and the dollar means higher profits for the Kenyan growers. However, the high oil costs at the moment (end 2004) will have the opposite effect on the costs. The plant materials and the marketing costs account for the major part of the total costs. The costs per m^2 are around EUR 20 compared to EUR 60 in the Netherlands. As is shown in Table 3.17., plant materials are major costs at the farm level. Kenya's adoption of UPOV means paying the royalties, unless they want to risk seizure by the auctions' authorities. Smallholders will face an uncertain future because of the high costs of planting material and logistics combined with a mediocre flower quality (Thoen et al. 1999).

Labour and environmental codes

European buyers, the Kenyan conservation movement and the flower industry itself encourage codes of conduct. The Kenya Flower Council (KFC) codes are directed to environmental and labour issues. KFC offers two levels of codes. The silver standard covers worker terms and conditions, health, safety and environmental responsibilities. A higher standard of environmental performance has to be achieved in the gold standard. There are several others codes in practice for the flower industry in Kenya in order to meet the international trade and consumer standard. Multiple code compliance is common among the larger flower producers. KFC states that 'serious and responsible growers should be able to meet [the silver standard] without much effort'. Collinson (2001) estimated the compliance costs of the KFC code above the already adapted international codes. He selected 5 growers ranging in size from 4 ha to above 100 ha.

The largest costs concern the use and handling of agrochemicals (pesticides and fertilizer); the second largest costs are management costs. The costs are the highest in the year of implementation. On the smallest farm, the cross-compliance costs are 1 % of the annual turnover in the first year and only 0.6 % in the following years. Young and small farms had to make several changes that their larger and older competitors had already adopted. For the other farms, the costs are less than 0.1 % of the annual turnover (Collinson, 2001). Collinson's conclusion is that 'compliance with new codes of practice holds little fear for the more progressive flower growers'. Standards have become internalized and represent industry entry requirements for serious new growers.

Related and supplying industries

The aim of the KFC is '*To be the lead organization in the provision of advisory, self-regulatory and promotional services for the floriculture industry in Ke*nya'. However the main items on their public websites concern the conduct of code standards, some general information and fact sheets about the industry and the country. The information is outdated: figures are from 1999. Marketing information is not on the website (http://www.kenyaflowers.co.ke, visited on 24-11-2004). Little infor-

mation about related industry and supplying industries was found. Thoen et al. (1999) conclude that 'The country is now largely self-sufficient in in-house knowledge and also provide consultancy service to other SSA countries'. Manufacturing firms facilitate the construction of greenhouses and improve access to agrochemicals, irrigation and fertigation equipment. In-country propagation allows the testing of varieties under local conditions. In addition to one private firm, the Kenya Agricultural Research Institute is involved in tissue culture. Moreover, the large producers hire professional managers. These firms should have a fair knowledge of consumer trends on the European markets and should be able to cope with the product lifecycles of cultivars. The conclusion seems to be that the related and supplying industries seem adequate. However, no information is mentioned about loans, education and so on. Wijnands (2003) concludes that the knowledge infrastructure is weak. The website of MOI university mentions research and advisory services in the field of horticulture. The involvement in running projects became not clear (www.mu.ac.ke/docs/organisation/faculties/foa/horticulture/horticulture.html). Also recent publications are not mentioned.

Key findings
Kenya's flower industry:
- Is mature and has achieved a critical mass for technical learning, market information and supply of equipment, advisory services and logistics. However, much knowledge is hired from foreign consultants. Innovative cultivars have to be imported. Moreover, it is not yet clear whether Kenya has a self-bearing industry, which is innovative and competitive for a market at a long distance.
- Meets the international environmental standards of Good Agricultural Practice and applies social codes. It is one of the most codified flowers industries in the world.
- Operates in a weak domestic economy. The business confidence among the large growers is high. The robustness of the industry in the case of economic decline or political instability is still a black box.
- Is export oriented in an increasingly competitive international market. The competitive power worldwide is not yet determined. Mostly it is compared with the emerging flower industries in other sub-Saharan countries. These are mostly small and competitively weak.
- Largely depends on the Dutch marketing institutions. The transactions costs seem to be higher than in the Netherlands; this, however, has not been empirically investigated. In a global commodity chain, other countries can easily substitute Kenyan suppliers.

The cut-flower industry in Israel: innovative

The flower industry in Israel had a hard time in the 1990s, but started to recover at the beginning of the new millennium. The depreciation of the dollar against the euro improved the economic performance of the growers. Labourers from Thailand replaced the Palestinian labourers as a result of the conflict between Israel and Palestine (Reinders, 2002). Israel's cut-flower industry can still be regarded as rather advanced. Around 80 % of the flower production is destined for export, accounting for 31 % of the country's total fresh agricultural exports. The major part is marketed by the Dutch auctions. Flowers and ornamental plants account for 8% of the total agricultural production. The production value in 1994 was CHF 317 (ECU 192 million) and EUR 229 in 1998 (annual growth rate of around 5 %). Wax flowers, roses and Gypsophilia are the main varieties (Table 3.18) of the in total 2750 ha of flower production. Traditional varieties such as roses, gerbera and carnation accounted for 80 % of the flower production in the past: nowadays they account for less than 40 %. New varieties include summer flowers from Europe for winter production as well as flowers indigenous to the southern hemisphere. These varieties have been developed to suit the changing demands on the world market.

To meet the international quality standards, Israel showed initiative on the following aspects:
- Israeli flower growers have joined the MPS code of conduct.

- The post-harvest chain is strictly maintained to guarantee high quality and reliability.
- Investigated whether airfreight can be substituted by sea transport for some varieties.
- Real-time information on markets, flower production, guidelines on disease prevention, fertilizing, growing conditions as well as on economics.
- Research on the adoption of non-chemical pest control, such as soil solarization, insect traps, pheromone traps and UV-absorbing plastic that spatially disorientates insects.
- 3 % of the agricultural GNP (USD 90 million) is annually invested in R&D. Israeli agriculture has become a model for efficient use of water, land and human labour, accompanied by record yields of high-quality products. Research is conducted at the academic and the applied level. Batt (2000) valued the Israeli competitive advantage of this item higher than that of the Dutch.
- Using emerging biotechnologies aimed at a state-of-art propagation, an efficient use of biopesticides and using plants as bioreactors to produce pharmaceuticals or vaccines.
- A governmental funded (80 %) agricultural extension service.

Table 3.18. Flower production in Israel

Product	Area (ha)	Yield per ha (stems)
Wax flower	256	400 000
Roses	214	2 500 000
Gypsophilia	207	1 000 000
Solidago	198	1 600 000
Safari sunset	188	400 000
Helantius	137	250 000
Ruscus	89	2 500 000
Limonium	70	1 000 000
Gerbera	58	400 000
Total	2 748	

Source: Israel, 2004

The Israelis are aware of their renowned position in the world. Export of plant and propagation material has increased significantly, due to the increased demand and an intensive effort to meet the high quality required by the European and American standards (Israel, 2004). Israel has also been successful in greenhouse vegetables. Israel's fresh pepper exports increased by several hundred percent during the last decade and the export price is the highest in the world. This shows their quality as well as their innovative power in greenhouse crops. Israeli plant producers have farms outside Israel (in e.g. Kenya, Ethiopia, Tanzania, China and Turkey). The Galilee College offers, for instance, an international programme on Floriculture. 'The seminar aims to equip the participants with skills and advanced technologies both in project management and floriculture – advanced knowledge' (www.galilcol.ac.il/floriculture.htm)

The average flower farm has 1.2 ha of greenhouses; the vegetable farms have an average of 4 ha. The total area covered with plastic greenhouses, net houses or walk-in tunnels increased from 900 ha in 1980 to 6800 ha in 2002 (4000 ha for vegetables and 2800 ha for flowers). The total area of crops grown in substrate has increased to 800 ha. Computers automatically control the water, fertilizer and climate systems. An innovative technology based on shower systems allows the greenhouses to cool down during the day (water droplets absorb heat) and to be heated at night with minimal energy use. This method is especially used for ornamental plants. Furthermore, Israel exports fertilizers.

It can be concluded that Israel has a good knowledge infrastructure, is innovative and export oriented. In several aspects it can compete with the Dutch, but it lacks the extensive marketing institutions (auction, wholesalers). This conclusion is supported by research by Batt (2000). The Israeli economy is recovering from the worldwide economic decline. The dispute with Palestine had also a negative impact on the economy.

The flower industry in Zimbabwe: an industry in disarray

The information found about the flower industry in Zimbabwe dates from 2000. It is well known that the political instability since 2000 has deteriorated the economic situation. Furthermore, the information in the report of Davies (2000) that is used in this Section is rather old; it should therefore be carefully interpreted. Floriculture in Zimbabwe ranks as the second largest in Africa, behind Kenya. Floriculture now accounts for 64 % of the total value of horticultural exports and 27 % by volume. In the year ending June 2000, this amounted to 19,488 tones worth USD 89.65 million – the latter marking a 24% increase over the previous season. The export grew considerably: from USD 5.15 in 1990 and from USD 32.38 million in 1995. Between 1990 and 1997, the USD value of cut flowers increased annually by 87 %. The figures in Table 3.13 suggest a strong setback in the export value, in 2003 EUR 61 million. 'Roses' is the main crop with a share of 70 % in the export. In 1997, there were about 900 ha under cut flowers on 250 farms and jobs for around 30,000 people. The main production regions are Central Mashonaland (112 growers), Eastern Districts (38 growers), Marondera (35 growers) and Makonde (31 growers). The Export and Flower Grower's Association of Zimbabwe (EFGAZ) supports the flower industry by promoting quality standards, establishing economic and reliable airfreight, and by providing training.

The costs of flower growing are summarized in Table 3.19. It is shown that the costs of airfreight account for around 60 % of the total costs. Compared to Kenya, it is [relatively twice as high. In the calculations it is not clear whether the costs of capital (greenhouses) are included. A wooden greenhouse (low tech) cost less than a quarter of an imported one (high tech), which enables climate regulations and facilitates a higher quality. On an experimental station it is shown that the production in a wooden greenhouse is 122 stems per square metre compared to 224 stems per square metre from imported steel greenhouses. The costs of an imported greenhouse amounted to USD 120,000, whereas the wooden one costs only USD 16,000. Second, it is not clear whether the costs of planting materials are incorporated. These costs, including royalties, are around USD 30,000.

Table 3.19. Cost of cut-flower in growing Zimbabwe (Season 1992/1993)

Indicator	Percentage contribution
Running costs	5.2
Wages	14.2
Repairs and maintenance	9.3
Packaging	4.4
Air freight	59.7
Fertilizer	2.2
Chemicals	1.9
Administration and other costs	3.1
Total	100.0

Source: Davies, 2000.

The total costs for setting up 1 ha of cut flowers are USD 210,000 for a local and USD 320,000 for an imported greenhouse. The high inflation (50 % in 1999) inhibits expansion: capital is difficult to obtain under this condition. The devaluation of the Zimbabwean currency favours the local greenhouses, which however restricts the quality level of the flowers. In 2004, the exchange rate was USD 1 for ZWD (Zimbabwe dollar) 5400 and in 1999 only ZWD 38. This also affected the imports of chemicals. More than 80 % of the chemicals used in the cut-flower industry are imported. This means that the prices increased considerably; there is now shortage, because it is too expensive to hold stock (Davies, 2000).

In conclusion, the Zimbabwean floriculture sector suffers from the political instability and the bad economic situation. Despite the potentials in the early 1990s, its competitive power on the world flower market is very weak.

The emerging Ugandan flower business

The Ugandan export of cut flowers grew steadily from USD 1.6 million in 1994 to USD 26.5 million in 2003 (Figure 3.20). A further growth to an export value of EUR 28 million in 2004 is expected. The political stability has supported this growth. The main destination is the Dutch auction FloraHolland.

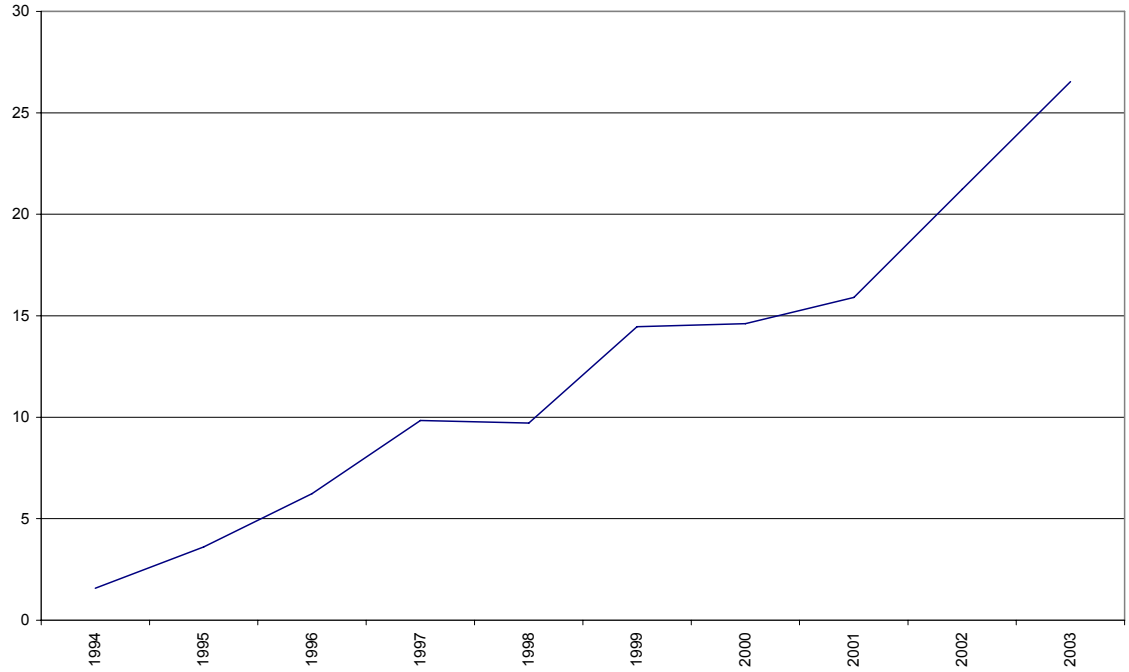


Figure 3.20. Ugandan export value of cut flowers (USD million)
Source: Uganda Flower Exporters Association (www.ufea.com)

The flower industry has two segments: cuttings and cut flowers. In volume, the cuttings account for about 17 % of total export. The 30.5 ha of chrysanthemums and the 1.5 ha of pot-plant cuttings are produced on farms, most of which belong to international propagation firms (mainly Dutch, like Fides, van Zanten and Delflores). They profit from the low labour cost and therefore have a production location in Uganda and in several other countries. As shown in table 3.13, the Netherlands is the main destination for cut flowers: 90 % are auctioned. Roses are the main component of cut flowers (at the end of 2003, 140 ha). There are 35 rose varieties grown, of which 90 % are a sweetheart variety (a small-bud variety adapted to the Ugandan climate). The total area of cut flowers is at least 173 ha (www.ufea.com), whereas the AIPH (2004) statistics mention just 126 ha. The sector is now an important contributor to the economy and is the seventh largest export earner. The annual growth rate of 14 % is more than double that of the overall economy (6 %). The direct employment is around 5800 people on 18 farms. Most farms are located near Lake Victoria in Mpigi district between Kampala and Entebbe (www.ufea.com). The average farm size is around 10 ha.

According to Asea and Kaija (2000), the Ugandan flower industry is strongly dependent on foreign suppliers. All inputs required for production are available but have to be obtained from foreign countries. These inputs are fertilizers, planting materials, pesticides, packaging materials, greenhouse plastics and netting. The industry still lacks qualified labour. Unskilled labour is abundantly available. At the beginning of 2004, 12 farms registered for the MPS label, which indicates a good orientation towards the market demands. Other inputs, such as land and water, seem to be on a good level. This also applied to the road network and post-harvest cold chain (including a cold store

at the airport and the international airport). The cold store as well as the air freight capacity is shared between flowers and fresh fish: this contributes to the economics of the logistics.

The website (www.ufea.com) of the Uganda Flower Exporters Association (UFEA) provides current price information for a range of cut flowers. UFEA is also involved in:

- Selecting varieties that are high yielding and suited for the Ugandan growing conditions.
- Implementing the Code of Practice (MPS).
- Improving post-harvest logistics (it created Fresh Handling Limited to handle the export for UFEA members).
- Chartering planes to ensure freight space.

Table 3.20. Production cost on a 9-ha Ugandan rose farm until sales at the auction

Costs	Including marketing	Excluding marketing
	%	%
Freight	36	
Handling and commission marketing	17	
Pesticides and fertilizers	11	23
Packaging materials	6	13
Fuel	1	2
Labour	15	32
Repairs and maintenance	1	2
Depreciation (including plant materials)	11	23
Other	2	4
Total costs	100	100
Costs per stem (USD)	0.06	
Income per stem (USD)	0.076	
Profit per stem (USD)	0.016	
Net profit per ha (USD)	5 773	

Source: Unido, 2004.

UFEA's support contributes to a prospering floriculture and decreases the costs of information gathering and logistics. The government has put more emphasis on higher value crops (such as roses) to help alleviate rural poverty. The horticulture sector is the fastest growing sector. The political environment is in favour of developing horticulture.

In Uganda, roses continue to be the major product. Growing conditions do not favour many varieties. However, sweetheart roses can achieve yields of up to 500 stems per m2 and a consistent good quality. Large flowered roses cannot compete with Dutch roses. The production cost of roses on a 9-ha farm is summarized in Table 3.20. In 2001, the investment for a metal greenhouse was around USD 41,200 per ha (Unido, 2004). Due to the different assumptions, comparing the costs with the Kenya situation is difficult. However, some remarkable differences can be mentioned. The costs of plant material are about one third of depreciation costs (23 %) and thus around 8 % of the costs, marketing costs excluded. In Kenya, the share is 40 %. On the other hand, the share of labour costs is rather high compared to Kenya.

Zambia: Floriculture has a set back

The Zambian floriculture sector has been a fast growing export industry since the 1980s. In the season 2000/2001, over 12,000 people had a job in the industry. Almost 10,000 tonnes were exported to the Dutch auctions. According to the AIPH (2004) statistics, the value of exports to the EU were EUR 17 million. The area of flowers amounts to 195 ha, of which 145 ha are for roses. Over 60 varieties of roses are grown, accounting for 95 % of the output of the sector. The other 5 % comprises summer flowers. As in many other African countries, Zambia lacks a supportive home

market. Table 3.21. summarize the exports to the Netherlands. After spectacular growth in the 1990s, there has been a setback in recent years.

Table 3.21. Exports from Zambia to the Netherlands

Year	EUR 1000
1992	2 000
1996	6 000
2001	17 600
2003	16 500

Source: AIPH, 1993, 1997, 2002 and 2004

Some disadvantages are: the high airfreight tariffs because of the small quantities exported at one time and the lack of well-trained manpower (Sikazwe, 2004). The Zambia Export Growers Association (ZEGA) has set up a code of conduct (ZEGA, 2004). This code provides guidance to members and set standards for the following:

- Storage, use and disposal of pesticides.
- Worker welfare.
- Good Agricultural Practice and protection of the environment.
- Due diligence in the production, harvesting, grading and packaging of produce.

This code complies with the COLEACP codes and is broadly similar to European standards like EurepGap or MPS (ZEGA, 2004). However, it is not an internationally accepted standard code. Little information about cost price, marketing information, phytosanitary issues, structure of the industry or the supporting industries has been found. It is therefore difficult to assess the competitive power of the Zambian floriculture sector. The set-back in recent years suggests that the industry is having a hard time.

South Africa: high ambitions

South Africa is the most prosperous sub-Saharan country, but the income distribution is distorted: 81 % of the black population still lives beneath the poverty line. Despite the positive effect of economic restructuring, reshaping the economy is not yet finished. The economy is in a bad shape after the abolition of apartheid, and corruption is endemic. South Africa has two faces: a developed and a developing country.

As shown in Table 3.13., the Netherlands is the main destination for the flower exports. With a share of 40 %, trade flows differs from other African countries. The embargo due to the country's apartheid policy some decades ago is the main reason for this large share of other countries. Some characteristics of the South African flower industry are summarized in Table 3.22. Exports have stagnated and the development differs considerably from the boost in Kenya: South Africa lost some ground. The acreage of cut flowers and pot plant is about half of the Kenyan acreage, while there are six or seven times as many growers. The farm size is on average 1 ha: rather small.

Table 3.22. Characteristics of the floriculture sector in South Africa

Indicator	Year	
Flowers and pot plants protected area	2000	350 ha
Flowers and pot plants open air	2000	700 ha
Holdings	2000	900
Value of production (flowers and pot plants)	2000	EUR 69 million
Export cut flowers	1995	EUR 22 million
	2000	EUR 15 million
	2003	EUR 17 million

Source: AIPH, 2004

Kaiser (2000) performed a cluster analysis of the South African floriculture industry. His research method is largely along the lines of the strategic management concept as mentioned in Section 2. The main difference is the application to the whole industry instead of a firm. The ambition is sky high:

> '*Whilst the industry currently employs 17,500 people with export revenues of 30 million USD, over the next 10 years, with the appropriate focus and investment, the industry can expect to attract over USD 250 million in foreign exchange and create over 80,000 further jobs*.' (Kaiser, 2000)

The actual developments are not in the line with the ambition reported by Kaiser. South Africa has some natural advantages:

- Worldwide demand for indigenous products.
- Diversity of the product range.
- Favourable climate conditions and a season opposite to the northern hemisphere

However, Kaiser (2000) discovered that success has not been achieved because competitors began to cultivate large quantities of the South African indigenous cultivars and because competition is also based on non-price factors such as quality perception and delivery capacity, which rely on an efficient supply chain, an enabling environment and low costs. Several strategic focus areas in Kaiser's study (2000) underline the competitive disadvantages of South Africa. The sector needs to 'increase production and comply with eco-label standards', as Kenya and Uganda have done. Moreover, insufficient R&D resources, an unfocused, non-industry-wide R&D strategy, and the lack of an industry-wide organization hamper the competitiveness. Little information is given about related and supporting industries. So despite the promising natural resources and the presence of a domestic market, the performance of the South African flower industry is very weak.

Cut flowers in Tanzania: staying behind

Despite the good climate conditions for growing cut flowers around Arusha and Kilimanjaro regions there has not been much development. In contrast with the Ugandan exporters association (UFEA) the Tanzanian grower association (TAFA) does not show much activity (Gray, 2004). However, in 1990s the flower production grew from around 28 ha (1994) to 80 ha (1998) on 12 farms (Semboja et al., 2000). Two firms opened after 2000 production locations of several ha for cuttings (chrysanthemums and pot plants). At the moment, the acreage is estimated at 75 ha of roses and 15 ha of chrysanthemum cuttings. After the phenomenal growth, it has been almost stagnant during the last 5 years. However, Gray (2004) mentioned that the government has come forward with a finance package for 40 ha expansion of roses, grown in artificial substrate under a steel construction. However, the production infrastructures in the cut-flower industry is poor (Gray, 2004; Wijnands, 2003; Semboja et al., 2000) due to:

- Lack of an active growers' or exporters' association.
- Poor road infrastructure. Kilimanjaro airport does not have sufficient facilities and the industry has not reached the critical mass required to justify investment in sufficient cargo service. Nearly all the production has to be trucked to Nairobi.
- Unavailability of chemicals.
- Insufficient knowledge infrastructure. Even for small problems, solutions are sought abroad.
- Inadequacy of investment and insufficient working capital.

The cold storage on the farms and at Nairobi airport, and in the cool trucks, seems to be adequate. The majority of flowers are marketed by the Dutch auctions (Semboja et al., 2000). The cuttings are marketed by the mother companies. Table 3.23. shows the high level of marketing and freight costs in the cost price of cut flowers. These costs are higher than in Uganda or Kenya. The share of labour is small. It will be clear that the auction price for Tanzanian flowers will not differ from Kenyan of Ugandan flowers given a comparative quality level. The main conclusion is that the flower industry in Tanzania is very weak, due to the insufficient scale of the industry. This inhibits

an adequate infrastructure of knowledge, suppliers and marketing outlets. The importance of the agriculture for the economy is high: it provides two thirds of the jobs and 45 % of the GDP.

Table 3.23. Operational costs of flower growing in Tanzania

Item	%
Chemicals and fertilizers	4.2
Technical advice	0.8
Energy	3.5
Wages	3.4
Freight	16.0
Marketing commissions	52.0
Depreciation	1.3
Interest	18.9
Total	100.0

Source: Semboja et al., 2000

South American floriculture

The Colombian floriculture industry

The figures from AIPH (2004) in different tables are not consistent with each other. The main export destination of the Colombian flower industry is the USA, according to these statistics (Table 3.24.). The UK is the second destination. The export to the Netherlands increased by a total of 65 % in the period 2000 – 2002, while it remained on the same level for the UK. The export to the Netherlands is above the total export growth of 13 %. At 40 %, the export growth to Canada is also above average. The share of the EU in the total exports decreased slightly. The South American producers primarily export their flowers to the US market, because of logistics costs. However, surpluses from South America are sent to the Netherlands for European consumers. In this respect they are also competitors for the East African growers on the European markets. Furthermore, the USA can also be a market for the African growers.

Table 3.24. Export of Colombian flowers in 2002 (EUR 1000)

	Carnations	Roses	Total	
			EUR	%
USA	114.0	171.7	576.1	81
Canada	7.7	6.0	18.9	3
UK	26.7	0.9	29.5	4
Netherlands	10.0	1.6	11.9	2
Spain	6.8	3.3	10.8	2
Germany	6.1	0.7	7.4	1
Puerto Rico	0.9	1.7	6.0	1
Other countries	27.5	18.4	50.8	7
Total	199.7	204.3	711.4	100

Source: AIPH, 2004. (AIPH figures for Canada are mistaken for those of the USA)

As in several other countries (e.g. Kenya), the Colombian exports with an annual growth of 13 % have grown steadily since the mid 1970s (Figure 3.21). But in last decade it slowed down beneath 5 % since 1996. The exports are important for the Colombian economy: flowers contribute almost 6 % to the total exports (Asocolflores, 2004). In 2004 the area of greenhouses for flowers amounted to 5900 ha; employment comprised 94,300 direct jobs and 80,100 indirect jobs – a labour intensity of 16 persons per ha. The growth in the area was on the same speed as the export growth rate. The number of jobs grew more slowly, due to increasing mechanization and the replacement of carnation by roses. At the end of the 1970s, 25 persons worked on one ha, which decreased to the

aforementioned 16 in 2003. Carnation growing has a labour demand of 50 % above that of roses (Farné, 1998).

Asocolflores (Colombian non-profit association of flower growers and exporters) represents growers who handle more than 80 % of the total flower exports from Colombia. It has more than 200 affiliates. Asocolflores promotes the flower industry in the world markets, and its integral development in such areas as environment, research, transport and general welfare for the workers. According to Asocolflores, Colombia has a complete business nucleus of growers, suppliers, logistic facilities, and a geographically strategic location (Asocolflores, 2004). Asocolflores (2004) is involved in:

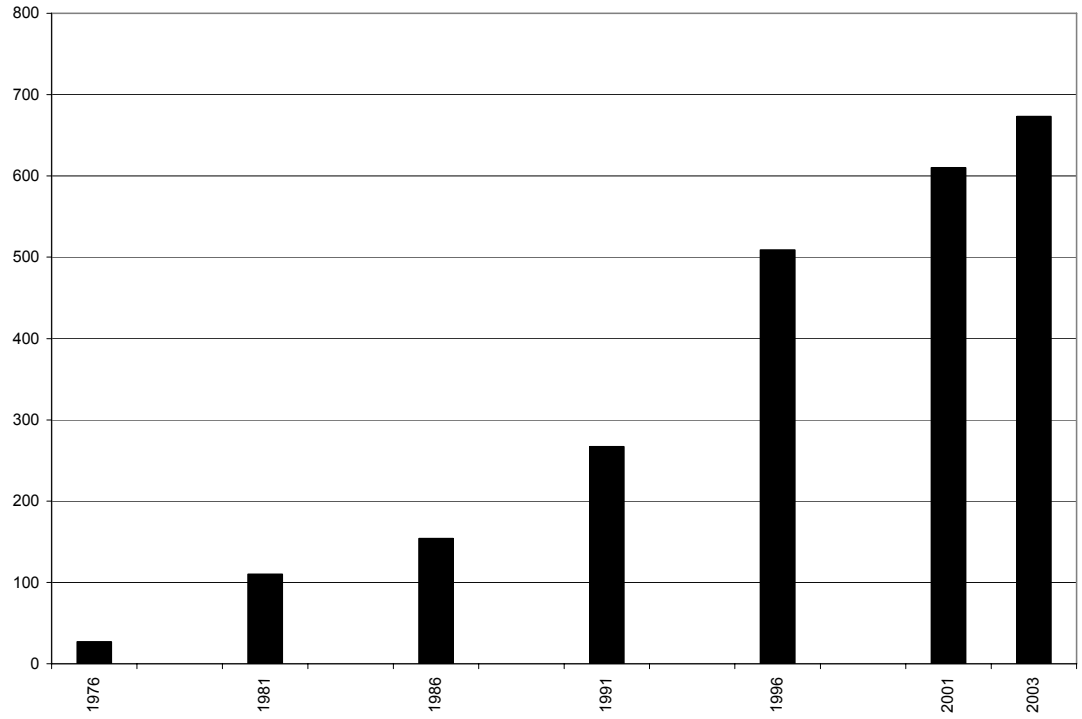


Figure 3.21. Colombian flower exports (USD million)
Source: Farné, 1998; AIPH, 2004

- Florverde social and environmental code. It promotes continuous improvement of the standards on human resource management, professional training, occupational health and welfare and on environmental issues like integrated pest management (IPM), waste management, friendly landscaping and control of emissions.
- Social and community activities, like housing, literacy campaign, school reinforcement or childcare.
- Logistics support. It prepares checklists on how to handle with the guidelines of US customs and provides the latest information on the preparation of export documents and transport services.

The Flower promotion Organization (FPO, 2004) is a cooperative between Colombian and US flower growers. It was created to develop a US marketing campaign aimed at increasing consumer demand for fresh cut flowers. The FPO board of directors comprises four US growers, four Colombian growers, one importer and one wholesaler. Information on the performance at farm level, the chain cost price and on market opportunities has not been found.

In conclusion, the Colombian flower industry largely depends on the US market. In contrast to Kenya, last decade the export growth rate slowed down. An opinion about the economic performance is missing. Batt (2000) valued the competitive power of Colombia just below Israel and the Netherlands.

The Ecuadorian floriculture industry

The flower exports of Ecuador grew annually by 35 % from a mere USD 1.7 million in 1986 to USD 293 million in 2003 (Figure 3.22.). Since 2000, the annual growth rate has been 15 – 20 %. The export performance is better than the Colombian.

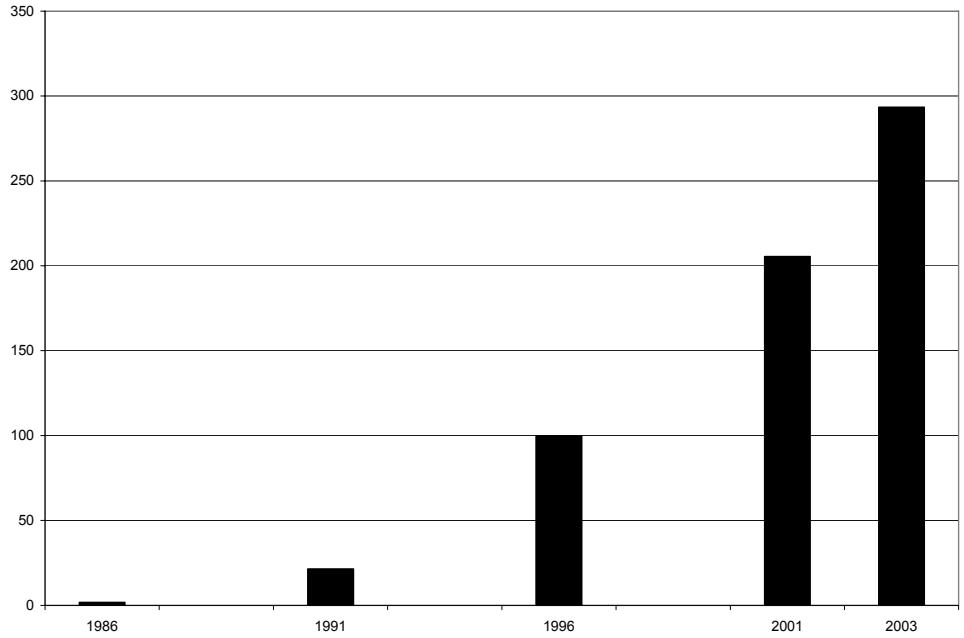


Figure 3.22. Ecuadorian flower exports (USD million)
Source: Palán & Palán, 1999; AIPH, 2004

The main export destination is the USA (65 %). The importance of Europe (26 %), especially the Netherlands and Russia (table 3.25), is remarkable. As is shown in Table 3.25., roses are dominant. Ecuador is very vulnerable to the market development of this product. The product export portfolio of Colombia is in this respect less vulnerable, but the country portfolio of Ecuador is better. Palán and Palán (1999) conclude: 'Currently, there is a good profit margin for the producer'. The producer's share of the consumer dollar is however just 16 % (USD 0.25), whereas freight and marketing costs to the US importer amount to 55 % (USD 0.85). The retail price is USD 1.55 per stem.

The number of flower growers is estimated at 375, and the grown area is approximately 2,900 ha (Expoflores, 2004). Little information has been found on the performance of the floriculture sector in Ecuador or on the network of suppliers and the knowledge infrastructure. Palán and Palán (1999) suggest that refrigerated trucks are available as cold storage at Quito airport. The Association of Flower Producers and Exporters of Ecuador (Expoflores, 2004) started in 1984. Its mission is:

> *To promote and consolidate the prestige of Ecuador's flower growing sector both at home and worldwide, by promoting human, ecological, trade, logistic and technological development in keeping with sound environment principles, as well as fostering the optimal interrelation of participants in quality production chain*.

Expoflores has an own code of conduct with regulations on child labour, working hours, payments and on propriety rights. However, the detailed regulations and certification procedure could not be retrieved. Palán and Palán (1999) recommend implementing, on a common basis, such services as nurseries, medical insurance and training (e.g. occupational safety and health, and handling chemicals).

Table 3.25. Export of flowers from Ecuador in 2003

	Roses	Total	
	EUR million	EUR million	%
USA	139.4	174.9	67
Canada	6.1	8.0	3
UK	0.5	1.5	1
Netherlands	16.1	22.3	9
Spain	3.8	4.1	2
Germany	5.3	6.6	3
Russia	20.5	21.2	8
Italy	2.6	4.7	2
France	1.6	1.8	1
Colombia	1.4	2.5	1
Chile	1.1	1.3	1
Japan	1.0	1.6	1
Others	7.9	8.8	3
Total	207.3	259.3	100

Source: AIPH, 2004

Summary: the world flower business in a nutshell

This Section presents a brief overview of the main findings. Section 4 tests the theoretical against the empirical findings. The main characteristics of the countries are summarized in Table 3.26. The information is derived from different sources. The figures for an identical item (e.g. area of cut flowers from different sources) are several times not in a line with each other. The findings are therefore sometimes not accurate. The lack of a harmonized database of basic information is in fact the first conclusion. Moreover, one should keep in mind that the two countries with the largest areas of ornamentals (China and India) are not included. Second, several countries from the Asian region have been omitted, even though the import portfolio of Japan suggests a growing importance of several countries in this region. The importance of several American countries is also missing from this survey. On the other hand, the most important importing countries – with the Netherlands as exponent of the European countries – are included. Third, even in the major importing countries the domestic production outweighs the imports as share in consumption. In the UK (the country with the lowest self-support), more than two third of the consumed flowers are domestically produced. The domestic production of Japan – a large importer – is growing at 8 % a year. Figures for the domestic production of the European importing countries are not taken into account.

As regards area, the Netherlands is not one of the biggest producers: China, India, the USA and Japan have larger areas, and Colombia is reaching the level of the Dutch. In export value (EUR 3000 million), the Dutch are significantly ahead: Colombia – the second largest exporter – exports only EUR 710 million worth of flowers, followed by Ecuador (EUR 260 million) and Kenya (EUR 200 million). The main variety of cut flowers grown is roses. It strongly dominates the floriculture in most countries. Only in the importing countries and in Israel and Columbia is the share of roses far below 50 %. The competition on the market is therefore high and it suggests that countries can be easily substituted. However, within one variety of roses, several cultivars and colours can be distinguished. Each combination of cultivars and colour has its own market niche. In broad outlines: the South American countries produce large-bud roses, while the East African countries produce small-bud roses. Within Kenya, a shift can be seen from small-bud to larger bud roses. Small-bud roses are seen as relatively cheap commodities for the mass markets, such as supermarkets. Big-bud roses are more exclusive, with a higher value added. Even the aforementioned rather detailed information is not sufficient enough to draw sharp conclusions. However, in both roses segments the competition is worldwide. The Dutch lost their competitive advantage on the small-bud segment and Israel largely substituted roses for other flower varieties.

On the international markets, code of conducts are of major importance. As shown in Table 3.26, most countries have a code of conduct, and most of the codes cover for example EurepGap standards. For the European market, MPS is dominant. A code of conduct partially responds to the consumers' concerns about environmental and ethical aspects. Membership of the UPOV enables access to new cultivars and colours; the breeders have some guarantees in respect to their property rights. The product lifecycle of cultivars is becoming shorter and shorter: lacking access means no innovation in this field.

The importing countries and Israel have a favourable position with respect to infrastructure and to access to consumer outlets. Of the African countries, Kenya has a comparatively good position. Information has not found for the South American countries.

Despite the huge bulk of information, a lot is still missing, such as information on cost prices, including costs of marketing and logistics till consumers, based on standardized accounting rules and information about attributes (cultivars, colours) with respect to consumers' preferences.

Almost no information has been found on the enabling condition of the modern ICT applications. The transparency of price formation and standards of the Dutch auction can be seen as one of few exceptions. The auction prices of roses from exporting countries are summarized in Table 3.27. The differences in prices reveal not only differences in intrinsic quality but also in varieties. The production of small-bud roses is very low in the Netherlands, while the majority of the sold big-bud roses are grown in the Netherlands. Prices in Kenya are at the upper end, but still far below Dutch prices. Ecuador receives high prices. The competitive power of Israel is not shown in the prices of roses.

Table 3.27. Auction prices of roses per stem in 2004 (EUR)

Country	Big buds		Small buds	
	Stems sold (1000)	Price	Stems sold (million)	Price
The Netherlands	1,488	0.30	184	0.15
Imported total	595	0.17	1,092	0.11
Kenya	392	0.16	699	0.12
Israel	8	0.13	85	0.12
Zimbabwe	46	0.11	81	0.09
Uganda	17	0.12	174	0.09
Zambia	41	0.12	20	0.10
South Africa	10	0.15	-	-
Tanzania	15	0.15	5	0.10
Colombia	0.5	0.24	-	-
Ecuador	31	0.38	7	0.31

Source: *Vakblad voor de bloemsterij 21a*, 2005

Table 3.26. Main characteristics of selected cut-flower producing countries

Determinant	Nether-lands	USA	Japan	Kenya	Israel	Zim-babwe	Uganda	Zambia	South Africa	Tanzania	Colombia	Ecuador
Area of ornamentals (ha)	8 300	23 300	20 000	n/a [a)].	n/a	900	n/a	n/a	1 050	n/a	5 900	3 155
Area of cut flowers (ha)	3 500	5 770	20 000	2180	2 750	900	173	195	n/a	90	n/a	n/a
Protected area of flowers (ha)	5 800	15 560	9 000	n/a	2 750	n/a	n/a	n/a	350		5900	n/a
Number of farms	7 750	10 000	80 000	140	1 900	250	18	40	900	12	450	375
Cost price at farm level	High	High	High	Low	High	Low	Low	Low	Medium	Low	Low	Low
Production value (EUR million)	3 540	5 248	3 150	45	230	27	8	>17	69	n/a	540	190
Growth rate of production %	1	0	8	15	5	< 0	14	+/-	< 0	0	5	15
Main varieties of cut flowers [b)]	ro, ch, li, ge, fr, or	gl, ro, ch, ca	ch, ca, ro, li	ro, hy, ly, ca	wf, ro, gy, sa	ro	ro	Ro	pr, fy	ro	ro, ca	ro
Share of main variety (%)	23	n/a.	33	68	9	> 70	> 80	95	n/a	80	29	80
Export value (EUR million)	3 000	33	n/a	200	145	61	28	16	17	7	710	260
Main export destinations [c)] (in order of importance)	DE, UK, FR	n/a		NL, UK, DE	NL, US, DE	NL, SW	NL	NL	NL, DE, JP	NL, DE	US, UK, CA	US, NL, RU
Import value (EUR million)	440	610	170	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Main countries of import origin [c)] (in order of importance)	KE, IS, ZI	CO, EC, ME	NL, TH, SK									
Code of conduct [d)]	MPS	n/a	n/a	MPS, L	MPS	n/a	MPS	L	None	n/a	L	L
UPOV member	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	Yes	Yes
Capital availability	***** [e)]	*****	n/a	***	****	*	*	n/a	n/a	*	n/a	n/a
Standard skilled labourers	*****	****	****	***	***	*	*	n/a	n/a	*	n/a	n/a
Logistics	*****	*****	*****	***	*****	*	***	*	n/a	*	n/a	n/a
Access to retailers	*****	*****	*****	***	*	*	*	*	n/a	*	n/a	n/a
Physical infrastructure	****	*****	*****	*	****	*	*	n/a	n/a	**	n/a	n/a
Knowledge infrastructure	*****	***	***	**	*****	*	**	n/a	n/a	**	n/a	n/a
Home market	*****	*****	*****	*	n/a	*	*	*	***	*	n/a	n/a
Presence of supporting industries	*****	***	***	**	*****	*	*	n/a	n/a	*	n/a	n/a
Breeders of unique varieties	*****	n/a	n/a	*	*****	*	*	*	***	*	n/a	n/a
Economic/political stability	*****	*****	*****	**	****	*	**	n/a	***	**	***.	***

[a)] n/a =not available

[b)] ca=carnations, ch=chrysanthemums, ge=gerberas, gl=gladioli, gy= gypsophilia, hy=hyphericum, fr=freesias, fy=fynbos li=lilies, ly=lysianthus, or=orchids, pr=protea, ro= roses, sa=salidago, wf=wax flowers. Summarized in order of importance.

[c)] CA= Canada, CO= Colombia, EC=Ecuador, DE=Germany, FR=France, IS= Israel, IT=Italy, JP= Japan, KE= Kenya, ME= Mexico, NL= The Netherlands, NZ=New Zealand, RU= Russia, SK=South Korea, SW= Swiss, TH= Thailand, UK= United Kingdom, US=United States of America, ZI= Zimbabwe. Summarized in order of importance

[d)] L= local label from producers association

[e)] Relative classification: ***** very positive/favourable, **** positive/ favourable, *** medium, **negative/poor and * very negative/poor.

4. EMPIRICAL FINDINGS TESTED AGAINST THE THEORIES

International trade theories

This Section aims to integrate the theories with the empirical findings. The first Section deals with the international trade theory. The following observations characterize trade patterns:

- *Growth of trade*
  Because of the lack of a consistent time series for the worldwide trade, a well-founded conclusion is hard to draw. However, the Dutch annual export growth of 7 % and the fact that it is the largest exporter, support the assumption that the international trade is growing. The high export figures from emerging countries (Kenya, Colombia, Ecuador) also support this assumption.
- *Trade as part of consumption*
  The international trade in flowers has just a minor share in local consumption. Even in the countries with large imports, over two thirds of the consumption of ornamentals is domestically produced.
- *Trade between similar countries*
  Trade between similar countries applies to the Netherlands: the Netherlands exports to countries that produce even larger quantities of cut flowers. Major flows are one-way, namely from less developed producing countries to the main consumption countries. The Netherlands and Israel seem to be leading in exports of propagation materials, technical equipment and consultancy services to the less developed flower producing countries. Thus, the flower trade contradicts the findings of van Berkum and van Meijl (2000): trade between more or less identical countries.
- *Intra-industry trade*
  No indication has been found of trade between developing countries. The African and the South American countries export to Europe (mainly the Netherlands) and to the USA, respectively. The Netherlands acts as the European distribution centre for the imported flowers and as a world market for worldwide excess supply or shortages. There are trade flows from South American countries to Europe, and from Europe to the USA – the major market for the South American countries.
- *Market concentration in wholesaling and retailing*
  At the retail level, the market is shifting from specialized flower shops towards supermarkets. An estimate of the impact on the marketing of flowers from less developed countries depends on a number of assumptions. The importance of mass markets will increase in the coming decades, as will the consumption of flowers. Mass markets are keen on very competitive prices, which will lead to a pressure on prices. But this has been the case for a long time in other horticultural products.
- *Exchange rates*
  The auction prices are in euros, while most of the costs are in dollars. The high exchange rate between the euro and the dollar is in favour for the foreign growers: in fact the depreciation of the USD by 50 % (from USD 0.85 to USD 1.30 per euro) means a price increase for foreign growers. This positive difference is partly mitigated by the market. The slowing down of the production value of cut flowers in Kenya from the mid 1990s until 2000 and the acceleration in 2002 and 2003 can partly be explained by the changes in the exchange rates between the dollar and the euro. This exchange rate influences the performance of Dutch firms less, because the major destinations of their flowers are other euro countries. Some indirect effects may be expected. The USA, for instance, will import fewer European flowers due to the higher prices, which will affect prices in Europe.

Trade determinant	Empirical observations
Countries differ in labour productivity	Some indications are found in the number of labourers per ha: labour productivity. These differences are significant even if the different flower varieties contribute partly to it. The technology level is however of more importance. Lots of experts indicate that labour-intensive flowers are grown in low-wage countries.
Countries differ in factor endowments	A major driver is the difference in labour costs. This outweighs the higher costs of logistics to the consumer market and the purchase of means of production from developed countries. The abundance of labour in these countries is obvious, whereas capital is scarce.
Economies of scale and product differentiation	Economies of scale at growers' level are not obvious. Although the total area and the number of farms suggest some differences between countries, the economic performance is not available. The differences in market concentration at wholesale level between countries are also not clear. Data from the Netherlands do not give an impression of a huge concentration at wholesale level. The Dutch competitive advantage is the concentrated and a diversified supply at auction level. Product differentiation exists: small-bud roses in the African countries and big-buds roses and carnations in South America. A rather diversified supply of varieties in the Netherlands, Japan and Israel. The economies of scale in auctioning are obvious
Market segmentation and price discrimination	The atomistic structure of the floriculture industry does not give any reason to assume market segmentation and price discrimination exist. History and chance factors, however, do determine trade patterns. The Dutch agriculture knowledge infrastructure, its long trade position and the Dutch auction system can been seen as factors that determine the flower trade pattern.
Specialization by factor endowments	The specialization by initial endowments (human capital, unskilled) is evident. Labour-intensive cut flowers are grown in countries with an abundance of labour. Examples are the production of chrysanthemums cuttings and small-bud roses (both labour demanding products) in Kenya, Tanzania and Uganda. This endowment is also plentifully available in other countries with suited growing conditions. Proteas in South Africa are an example of a 'biodiversity' endowment. However, other countries are imitating these cultivars.
Specialization by technological level	The Netherlands and Israel have a high level of technology. The position of Japan cannot be determined due to insufficient information. The Dutch technology is more suited for regions with a maritime or land climate whereas the technology of Israel is more directed to arid and semi-arid regions. The cultivars grown in both countries are more diverse than in other countries and are more demanding with respect to knowledge and technology. The literature scan indicates that both countries have a leading position in breeding and propagation materials. The origin of technology at least in the African countries largely comes from the aforementioned countries. The main challenge for the African countries is to match the technology and flower cultivars with growing condition and human skills.
Technology gaps, process and product innovation.	The growing conditions are highly controlled in the Netherlands and Israel and the breeding programmes are high level: they are in the forefront of developments. For some market segments, they have the advantage of first movers. It is however not clear whether they have a competitive advantage overall. The growth level of the production is rather low.

Figure 4.1. Determinants from trades theories and empirical observations

What can be learned from these theories?

Figure 4.1. discusses the determinants from the trade theories as previous Sections. The abundance of labour underlines the growth of trade from several countries. However, it does not explain why, for example, the trade flows from Tanzania, Zimbabwe or South Africa are not in the same line as the developments in Kenya or Uganda. Other determinants give evidence for these differences, for instance political instability in Zimbabwe and poor chain governance in Tanzania. A prediction of the sustainability of the developments in Kenya or other African countries cannot be derived from these theories.

Second, the high technology and innovative level of the Netherlands and Israel have not resulted in high growth levels of the production of cut flowers. Due to the lack of information about the growth level of the breeding and supporting industry, no statement can be made regarding their development.

Third, the trade flows from East African countries to the Netherlands as an intermediate stage in exporting to European countries is explained by the history and chance factors that determine trade patterns: economies of scale and (logistics and marketing) product differentiation. So trade theories contribute to understanding trade flows, but more information is needed to explain the sustainability of an industry in a developing country. Disaggregating the products into more categories is desirable. As mentioned, roses have for instance different bud sizes, stem length or colour, and each is aimed at a specific market niche. Insufficient data, substitution between products and several other aspects demand huge efforts to use trade theories to explain the development in countries. Empirical research on the aforementioned observation is lacking for the floriculture industry.

Industrial economics: SCP model

The structure-conduct-performance (SCP) model is partly used to classify the empirical findings. As shown, information that fits in the boxes about 'basic conditions', 'market structure' and 'government policy' is partly available. Information about the chain organization from breeders to consumers is hard to find for most countries. Information classified in the boxes 'conduct' and 'performance' is even harder to find. Drafting a full overview of all elements needs a lot of labour consuming field surveys. The theory does not give any indication how to compare and to benchmark countries, let alone to assess the sustainability of an industry in a country or the dynamism of an industry. As a conclusion, it can be stated that the SCP model is a useful tool for data collection and analysing an industry: it provides the analyst with a comprehensive set of focus points.

Porter's competition model

The empirical findings of the world flower industry are summarized in the framework of Porter's diamond (Porter, 1985). In this Section, his issues are translated to the flower industry and matched with the findings from Section 3. The following deals with the five elements of Porter's diamond.

Entry barriers

Figure 4.2. assesses Porter's determinants concerning entry barriers for the cut-flower industry and gives a tentative evaluation of the countries on the determinants. Entry barriers to increase the market share by growers are not restricted. The facts prove that a significant part of the flowers are entering Europe, the USA and Japan. It could be that the performance is lower due to higher transactions costs. An empirical foundation has not been found.
Despite the fact that the Netherlands has a prominent position as exporter, the market share in consumption of Dutch flowers is in most countries low. Even an assumed policy of the auctions to exclude foreign growers will probably have a limited impact in the long run. The volume of several producing countries is large enough to allow direct marketing; however, it will influence the level of transaction costs. How ever small or large an industry in a country may be, it should organize the supply chain and supply services to the buyers.

An evaluation of Figure 4.2 shows that skills are an important entry barrier for the industry in a country. The skills are in three major areas: 1) production skills at farm level, 2) organizing the post-harvest logistics and marketing system, and 3) handling phytosanitary, customs and other international trade issues. In fact the capabilities in the base of supply chain should be on a fair professional level; otherwise the industry will be excluded from the chain.

Determinant	Explanation	Evaluation
Economies of scale	Areas of cut flowers as indicator for the buying power of input and services; the average farm size for economies of scale.	The flower industry in Tanzania with only 90 ha is not flourishing. Uganda, which had the same area some years ago but now has about 170 ha, is however booming. So the acreage is not one of the most important determinants. The same applies to the average farm size: a fair production growth rate in Japan (average farm size 0.25 ha) and no growth in Zambia or Zimbabwe (average farm size 5 ha) or in the USA (2.3 ha).
Product differentiation	Branding is very unusual in the flower industry; therefore different varieties of cut flowers are chosen as product differentiation. Membership of UPOV as a proxy for access to new or innovative varieties and cultivars.	The main varieties of the exporting countries are roses. It can partly be seen as a commodity, where competitive prices and services dominate the international trade. Unclear is whether other flowers for bouquets are locally grown in the consumption regions. Non-UPOV members, except Uganda, show low growth rates.
Switching costs	In general, buyers can easily switch to other flower producers. Having a certified code of conduct will be used as proxy for lower transaction cost or buying flower from a country. MPS will be used as the dominant standard.	The major European and African exporters comply with MPS certification standards. In South America, local standards are more common. Exporting countries with no code of conduct have a rather low level of export growth.
Capital requirements	Availability of capital at the market.	Lacking information about capital availability, foreign direct investment and the lending condition makes an evaluation difficult. The development in Uganda suggests that capital is not a restriction.
Access to distribution	The ease to reach the final consumer. The logistics is one issue; the other is access to retailers. The third element is the trade barrier.	The Netherlands, USA and Japan have the best access to logistics and the final consumer. The Netherlands is the only exporting country. However Kenya, Israel and Uganda organize the logistics to the final consumer on an adequate level and use the Dutch marketing system. Colombia has access to the USA market via the Flower Promotion Organization. The high production (and export) growth rate of Ecuador indicates a good performance in reaching the end users. The additional transactions costs are not clear. Phytosanitary aspects can be a restriction for exporting. An adequate inspection level in the country of origin is important. Several countries do not meet the international standards.
Cost disadvantages 1. Proprietary product technology 2. Access to inputs 3. Experience curve 4. Government subsidies	1. Product know-how. For flowers this means having breeders in the country or having unique varieties. 2. Cost of production factors, especially labour. Second, the presence and maturity of the supplying and related industries are of importance. 3. The skills and education of labourers in the field of cut-flower growing. 4. Gives the government preferential subsidies.	1. Most less developed countries have a cost disadvantage in particular compared to the Netherlands, because they lack breeders. The difference is not clear, though, because breeders work internationally. Thus the cost disadvantage can be small. 2. The cost of labour in most developing countries is low. The supplying and related industry is immature throughout African. Just like marketing, it can be postulated that the transaction costs are higher. However, no empirical research showing this has been found. 3. Cost disadvantages can be assumed due to poor relevant education in the developing countries. Despite the limited possibilities for formal education, Kenya has a fair level based on experience. 4. Not known.
Government policy	Government support to the development of the industry	Unknown.

Figure 4.2. Entry barriers in Porter's approach

Intensity of rivalry

The elements of the intensity of rivalry are summarized in Figure 4.3. In general the differences between countries are small. The asset specificity is probably higher in developing countries: switching to greenhouse vegetables is not common, whereas the Dutch and Israelis have this opportunity. The joint level of the analysis of the exit and entry barriers leads to an important conclusion in Porter's theory. A low level of entry barriers results in low returns, in stable returns if the exit barriers are also low and in risky returns as the exit barriers are high (Porter, 1980, p. 22). The annual fluctuations in returns at farm level indicate that the exit barriers are on the high side (de Bont & van der Knijff, 2004). In conclusion, rivalry does not have much influence on the sustainability of an industry in developing countries.

Determinant	Explanation	Evaluation
Industry growth	Growth of the industry	The market share of some developing countries has increased significantly: Kenya has surpassed Israel as an exporting country. The higher market share has been reached with a low number of varieties. However non-members of UPOV, except Uganda, perform poorly in production growth. At growers' level, the industry growth in the Netherlands and the USA has stabilized, which means more competition to acquire a larger market share.
Fixed and storage costs	High fixed costs drive firms to full capacity. The perishable nature of flowers precludes storing the end product. Both lead to pressure on the price.	From the Dutch case one can see that at the growers' level the fixed costs are high compared to the value added. At the wholesale level the fixed cost are relatively low: the cost of purchasing the product dominates. So the price pressure on grower level will be higher than at wholesale level. A lack of data hinders a comparison between countries.
Capacity augmentation	Level of capacity increments to reach economies of scale	Enlargement of farms can be in fact at any level. So enlargement of one farm will not lead to an imbalance of supply and demand. No differences between countries exist.
Diversity of competitors	Owner operators may be satisfied with subnormal rate of returns on capital and labour.	Insufficient information was found on the ownership of farms. In developing countries, more operators do not own their farm. So their profitability is under pressure due to the subnormal rate for production factors on family farms. The sustainability of the industry will be lower.
Strategy	If a number of firms have high strategic stakes, rivalry in an industry becomes more volatile.	Differences between firms exist as mentioned in Section 2. In light of the research aim, the differences between countries are of importance. Israel is aiming at being innovative. The Dutch are less pronounced, but being a major European supplier and quality producer fits probably the best. Kenya tries to have a share in direct marketing in Europe. Most developing countries are aiming at employment and foreign currency, so in fact growth. Little information was found about differentiation in several countries and codes of conduct are more or less compulsory in serving the consumer markets.
Exit barriers	Specialized assets, fixed costs, strategic barriers, emotional barriers and government restrictions result in high exit barriers.	The differences on these aspects between countries are low. In the Netherlands the fixed costs are higher due to a higher technology level. But, as in Israel, flower greenhouses can also be used for vegetable growing. In most African countries there is no tradition in vegetable growing in greenhouses. In the case that investors own the greenhouses, which is partly the case in the African countries, emotional barriers are lower. One should keep in mind that in the short run the exit barriers are very high: changing the crop within a few years is expensive due to the high investment in plant materials. So the exit barriers are medium high.

Figure 4.3. Rivalry Determinants

Power of buyers

Porter's third element in analysing the competition power concerns the power of buyers (Porter, 1985). Each producing country has a specific group of buyers. The South American countries depend largely on the USA market. From the literature scan, little information on wholesale level in the USA was found. The same is the case for Japan, and little additional information was found for their foreign suppliers. Figure 4.4. analyses mainly the buying power of Europe (represented by the Netherlands). The prominent role of the auctions should be seen as a facilitating marketing institution. At that place, sellers and buyers meet each other. It is the number of sellers and buyers that is most important, not their concentration at one place. The growth potential of buyers is determined by the growth rate of consumption. In most European countries the consumption of cut flowers is still growing. However, there will be a shift to the supermarket, as mass market, which is very price sensitive. The flower shops are quality sensitive and demand differentiated products; however, the volume per shop is low. The market volume of supermarkets will increase, partly at the cost of the flower shops. These general market developments at the retail level are sufficiently specified for this general analysis. If a country wants to make a business plan to increase its market share in a specific niche on a specific market, the analysis needs more market information.

Determinant	Evaluation
Bargaining leverage	
Buyer concentration versus firm concentration	The large number of Dutch wholesaler as specified in Section 3 supports the conclusion that the concentration is low. 19 exporters, 2 % of the total, have a market share of around 30 %. Producers are even less concentrated; see the number of cut-flower growers in several countries who are aiming at the same consumer markets.
Buyer volume	Buyer volumes in total can be large, but from one variety the volumes are small. In most cases the supply of one grower has to be split up for more buyers.
Costs buyer switching relative to firm switching	Buyers can easily switch between growers: the auction facilitates this process. Many growers offer substitutes. Growers can also switch between wholesalers; however transaction costs will increase unless the growers also use the auction as facilitator.
Buyer information	The information from the auction is public; even non-members can obtain price and quantity information. The auction prices are a benchmark for the international price formation. However growers do not have information about the sales from the wholesalers to the retailers.
Ability of backward integration	Backwards integration of wholesalers is not to be expected: wholesalers will set production parameters (such as codes of conduct and quality levels), partially forced by retailers or consumer groups.
Substitute products	Substitute products are plentifully available; the consumer cannot discriminate between almost similar varieties or colours. On the other hand, a grower cannot easily switch between varieties: the cropping plan is at least one year, and for roses (which are perennials) several years.
Price sensitivity	
Price/total purchase	The price has a major impact on the performance of wholesalers. As stated in 3. the profit margin of wholesalers is below 2 %, so a lower price compared to the competitors will be leverage on the profit margin.
Product differences	At the Dutch auction, the differences in product quality between growers is common knowledge. It even results in small price differences. The vast numbers of varieties within one flower species provides a continuum of products with slight differences.
Impact on quality / performance	In the short run none, due to the production characteristics.
Buyer profits	Price sensitivity has the largest impact on the profitability of growers: their cropping plan is determined for a longer period. The wholesalers are dealing daily, in most cases without any price agreements.
Decision makers' incentives.	Innovative flowers (colour, shape, variety) get a price premium. The Dutch and Israeli growers have an advantage due to the proximity of breeders.

Figure 4.4. Determinants of the European buyer power

From the specifications in Figure 4.4., one can see that small differences between Kenya and other sub-Saharan Africa countries and the Netherlands can be distinguished. The proximity of consumer markets and wholesalers feeds the hypothesis that transaction costs for switching (information collection) should be easier in the Netherlands than in the developing countries. So the bargaining power of buyers will not discriminate the sustainability between the two mentioned groups of growers.

Substitutes

The fourth group of Porter's determinants are several aspects of substitutes. Substitutes are plentifully available at low switching costs, as mentioned in the main groups of determinants. Meier (1998, p. 275) expresses this as follows:

> *'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 dozen other places. Countries with different factor endowments compete to produce what, in the end, looks like the same product.'*

Providing services to the retailers can decrease substitution. This needs partnership with the retailers. Unknown is which kind of services the Kenyan flower industry provides to the UK supermarkets. Research on the competitiveness of Dutch wholesalers identified several possibilities to improve in this respect the performance of wholesalers (see e.g. Hack & Borgstein, 1998). The strength of the Dutch suppliers on the French and the German market is as good as that of their competitors. On the British market the performance in this respect needs improvement. The Dutch are reluctant to sign the long-term contracts desired by the British retailers. The market share of the retailers is rather high compared to other European countries and is even growing. Meeting the demands of these retailers will be obligatory for staying on the British market. The Dutch exporters judge that their own performance is better than that of their competitors, but foreign buyers do not agree on this superior performance. On a competitive market it is necessary to have a good perception of your own performance (Hack & Borgstein, 1998).

Supplier power

The bargaining power of suppliers is a mirror of the power of buyers. Figure 4.5. summarizes the main empirical findings. Figure 4.5. does not give arguments to suppose that a large difference in supplier power exists. However, the limited availability of airfreight capacity is mentioned as a restriction on the developments of the Tanzanian flower business. On the other hand, Uganda succeeded in organizing that capacity even with a smaller industry. Co-operation between firms can therefore be important.

Role of government

Porter (1990) also described the role of the government (and of chance) in addition to the aforementioned factors. The government is sometimes added as an additional variable in his approach of analysing the competitiveness. The government can and will influence the other determinants by, for instance, subsidies on production factors, institution building or supporting research. Porter mentions several variables that are commonly used in developed countries. In the literature review in Section 3, little information was mentioned on the role of government. Israel and the Dutch support the knowledge infrastructure. The roles of other local governments are not clear. The supporting role of international organizations (e.g. UN, World Bank or USAID) is also not dealt with.

Determinant	Evaluation
Differentiation of inputs	In countries with abundant labour, most inputs are standard and imported. Perhaps an economic fine-tuning is necessary between the level of technology and labour input. Plant varieties have a higher level of differentiation. First, the varieties should be suited for the climate and/or growing technique; second, new varieties contribute to innovations. Membership of UPOV increases the availability of plant varieties.
Switching cost of suppliers	Many firms are active in the supplying industry in several producing countries. The literature scan indicates that Israel and the Netherlands are leading, and are also supplying developing countries. It is very likely that several suppliers are in business in these countries. As mentioned, little information was found about the representation of these firms. So it is not clear whether switching of supplier is easy in some countries. The limited availability of airfreight is mentioned as a restriction to the development in some countries (e.g. Tanzania).
Presence of substitute inputs	Substitutes are in most cases abundantly available. The functionality of inputs is on the same level; however, little difference can occur in design, technology level or services.
Supplier concentration	The concentration of suppliers is higher in countries with a large area of flowers. It can be a disadvantage in countries with a small area or regional, scattered areas.
Importance of volume to supplier	Due the industry nature of small and medium sized enterprises, the importance of each grower to a supplier is low.
Cost relative to total purchase of the industry	Some cost make up a large share of the total. Some of these are in all countries, e.g. labour and depreciation of and interest on the investments and costs of plant and propagation materials. In the Netherlands as well as in Kenya, seeds or plants take a share of more than 15 % of the total costs. A main difference is the high share of energy in the Netherlands and of airfreight in African and South American countries.
Impact of inputs on cost of differentiation	Some inputs may affect the quality level of the end product, but using the appropriate equipment is a matter of production knowledge and availability of capital.
Threat of forward integration.	The size of most firms is too small for backward of forward integration. However, examples of large firms with backward and forward integration are mentioned.

Figure 4.5. Determinants of supplier power

The decline of the Zimbabwean floriculture industry shows the importance of political stability. This variable also includes such issues as corruption, safety and attempts to fight poverty or distribute income more fairly. In several developing countries, this can be a threat to the development of an industry.

Not only the domestic government but also international trade policy is important. Ikiara et al. (2003) conclude that the EU-CAP reform has eroded the trade preferences Kenya has enjoyed since Lomé I, with declining incomes for the Kenyan farmers. Second, the substitution of non-reciprocal trade preferences by the proposed economic partnership agreements will also affect Kenya. Third, costs for exporters are rising because of the sanitary and phytosanitary standards and the food safety standards. Since 1 April 2003, the inspection of flower exports at the point of entry is compulsory (Ikiara et al., 2003). These developments can influence the competitiveness as well as the income of farmers, but will not be self-evident. The EU policy will affect more countries and a well-prepared country can even benefit from these developments if other countries are lagging behind.

Conclusions

The obvious conclusion is that Porter's approach is well suited for analysing the competitiveness of industry. It can handle quantitative as well as qualitative data. These data are put in a well-elaborated framework. However, conclusions based on Porter's approach have a static and comparative nature. First, the situation at a specific moment is analysed. Second, data measured at one time and situation are of limited importance. The differences with its competitors determine whether an industry has an advantage. Porter's approach includes a SWOT

analysis, which has to be completed with strategies. The hardest parts of evaluating the sustainability of a sector will therefore not be the approach, but collecting sufficient data. Data are necessary from the sector in question, of several competitors as well as from the destination markets. The destinations markets set the quality parameters of the product and performance. The literature overview of Section 3 shows the limited availability of public data sources. Mostly it means additional fieldwork.

Transaction costs economics

Examples of using the transactions costs economics (TCE) can be found in the literature. Hobbs (1996a, 1996b, 1996c) did some work on cattle marketing by auctions or direct sale, and on traceability, quality and animal welfare issues; Hobbs and Young (2000) worked on contracting in the USA grain industry; Boger (2001) focussed on Polish hog marketing; and Weleschuk and Kerr (1995) concentrated on prairie special crops. There is no TCE literature concerning the marketing of cut flowers or other ornamentals. However some hypotheses can be formulated.

Information costs. Information will be easier to obtain in regions with a high concentration of cut-flower growers. This also applies to prices and suppliers of inputs and services for marketing costs, logistics, costumes clearance, phytosanitary inspections and documents, and final product prices. Producers in consumption areas are in addition favoured in retrieving information on market prices and consumer preferences. So in this respect the Netherlands has both advantages, whereas several countries that mainly export to distant markets will have higher transactions costs. Second, one can assume that marketing by auction will have lower transaction costs than firms that are in the direct marketing of cut flowers. The transparency of the prices at the auction and the guarantee that your entire product, if it meets the minimum quality standards, will be sold, means less time for information seeking. This does not mean that marketing by auction is also most profitable.

Negotiation costs. Producers at a long distant from the consumer markets have at least the additional costs of the logistics, and costs for Customs and phytosanitary handlings. Differences between direct marketing and marketing at auctions will also exist. The auction costs are easily obtainable (see Section 3), whereas the costs of direct marketing will more difficult to obtain, and will vary between partners or the time spent on marketing will be higher. Security and speed of payments are guaranteed in the case of marketing by auction.

Monitoring or enforcement costs. Monitoring at a long distant will be more difficult. So in this respect a same distinction between producers in different region can be made. Second, in the case of codified quality standards, monitoring needs fewer efforts. In this respect, auctions have well-trained inspectors. Whether non-local suppliers perceive their independence at the same level as local suppliers is a question.

What do transaction cost economics contribute to an understanding of the sustainability of the cut-flower industry in developing countries?

A main contribution could be measuring the difference in transactions costs between different supplying countries and different marketing channels. That information can be used to strengthen the competitiveness and sustainability of the cut-flower industry in developing countries.

Strategic management model: literature review

Here, the strategic management model in Figure 2.5 is used to organize literature. Research that describes integrated concepts of strategic management is discussed first.

Integrated concepts of strategic management
Bremmer et al. (2000) identify the relationship between innovations, technical and economic performance and strategic management. Even though the conceptual framework of strategic management has been given, no empirical study was done to test it. Orth (2000) links the consumer requirements based on the Quality Function Deployment (QFD) concept to cultivation measures. He aims at 'an integrated framework that links market research with operation management: providing information for planning production, allocating resources and changing market strategies'. In fact Orth aims at strategic management in which market orientation is highly important. Both authors emphasize the need for thoroughly market orientation and external analysis. The aforementioned authors deal only with theoretical considerations.

Ogier and Dillon (2000), on the contrary, deal with an application without explicit consideration of the theoretical framework. They describe a case in which strategic management in a consultative manner is applied to a clematis chain. The chain is in fact one firm that performs all activities in the chain: selection, breeding, propagation, production, sales and customer services. Attention is explicitly paid to functional strategies and control. The functional strategy concerns labour division within the management team, developing specific skills, training and team building. The financial performance and quality control are the aspects of control of the strategy. Two aspects of this study are of special interest: just one hierarchical organized firm is responsible for the chain from selection to marketing, and it is one of the world's largest breeders and producer of clematis.

Research done by Hack et al. (1998) is based on a SWOT analysis derived from Porter. They made a business plan for Dutch rose growers. They analysed the international competitiveness of rose growers and derived from this analysis four different strategies. First, the Dutch cost prices of different varieties of roses are compared with those of producers in African and South American countries. Second, they gathered information about opportunities and threats on the most important consumer markets, thus forming the external analysis. Poot et al. (2001) performed a study of greenhouse vegetables based on the same research method. In both studies the strategies are aimed at increasing the competitiveness and market power. The authors recognize the necessity of translating these strategies to individual firms, but that part was only touched upon in their studies. From the viewpoint of strategic management, the possibilities of implementing the suggested strategies on firm level and the internal analyses of individual firms are important missing links in both studies

Mission and goal statements
Several empirical studies mention missions and goal formulation (e.g. Alleblas, 1998; Trip, 2000; Kroon, 2002). Nonetheless a recent study on these issues in horticulture has not been found.

External analysis
Several authors did research on the external environment. Vadnal (2000) analysed the difference between the results of SWOT analyses carried out by different levels of management of Slovene fruit growers. The conclusion indicates the necessity of improving the managerial profiles. Marketing and international competition is the scope of study of several other authors. Research done by Hack et al. (1998) and that by Poot et al. (2001), which are already mentioned as part of integrated concepts, are also examples of analyses of the external envi-

ronment. Wijnands and Silvis (2000) described the competitiveness of the Dutch horticulture and agricultural sectors. Their proposals for improving the competitiveness are quite general and addressed to all actors in the chain. A study by Hack and Zimmermann (1996) is quite innovative in formulating strategies for increasing the size of future markets for the bulb sector. The link with the strategic management of individual actors is weak. However it is recognized as an import item and partly elaborated for the wholesalers. In all these studies, the aim is to increase the market orientation of all actors in the chain.

Internal analysis
Several authors focussed on aspects of the internal environment. Alleblas (1988) and Trip (2000) deal with the decision-making process and the role of information. The focus of Alleblas is mainly on economic performance and human resource management. The product lifecycle (PLC) of an innovative way of producing azalea cuttings in Belgium is described by van Lierde (2000). The effects on productivity, profitability and farm size are analysed, as well as on the prices on the market. Mulder (1994) developed a simulation model for horticulture under glass. The opportunities and future structure of the business have been analysed with financial data and economic performance. In Mulder's study the external environment is taken into account with trend forecasts of prices. Niejenhuis et al. (1996) deal with the family lifecycle based on the classical farm management approach. The results are a distribution of holdings over the different phases. Verhaegh (1998) made a comparison of the cost price of tomatoes, peppers and cucumbers between growers in the Netherlands and Spain. He concludes that the cost prices of Dutch growers are higher than those of the competitors. He suggests that the Netherlands can have a competitive advantage by decreasing the cost price or increasing the market price by offering a higher quality product. This study is a good example of internal analysis from the scope of transnational management.

Strategy formulation
Ekelund Axelson and Axelson (2000) elaborate the differentiation strategy for the Swedish tomato market. The industry is dealt with as one actor. Their conclusion emphasizes the need for strategic planning in order to attain market power and a competitive advantage compared with 'better equipped competitors'. Montigaud (1996) formulates a strategy for an alliance in the French fruit and vegetable chain. The performances of two alliances are illustrated. The aspects of implementing and control within the chain are dealt with. The positions of individual actors in the network are recognized in their case, however the strategy is not based on the characteristics of the individual farms. Van Meijl et al. (1999) deal explicitly with internationalization strategies from the suppliers to greenhouse growers. Their research deals with the opportunities on the international market linked with strengths and weakness of their own product or performance of the firm. Again, the conclusions are dedicated to the industry as a whole and not to separate agents. Nevertheless it is a good example of transnational management and the study gives a good description how to implement it.

Implement the strategies, including the organizational structure
Alleblas (1995) investigates the selection and hiring of labour for horticulture greenhouses. However, no linkages are made to the firms' strategy and the study focuses on the operational level. Trip (2000) deals with the decision-making process on Dutch flower firms. His approach is derived from farm management theories. Attention is paid to the management level, measurement of efficiency, price forecasts based on laboratory experiments with an information display matrix. Only some elements of strategic management are dealt with. Verhaar (2000) stresses the need for life-long learning and employability on mega farms. However, the embedding of this conclusion in a theoretical concept of strategic management is lacking.

Bokelman and Lenz (2000) discuss the necessity for chain cooperation in order to meet the market requirements. The analysis for chain cooperation is based on the assumption on the efficiency of labour division and on transaction costs. Sufficient production volume, as one of the requirements indicates an advantage of large farms. The case of a large-scale vegetable grower deals with the strategy implementing in the chain (Grimsdell, 1996). The relation with processors and wholesalers and the strategic advantages and risks are analysed. Philippe and Sauvée (1999) and Sauvée (2000) analyse the governance structure between autonomous agents of the tomato chain in Brittany (France). Each autonomous agent contributes to a part of the strategic management of the total chain. Attention is mainly focussed on a governance structure with incomplete contracts in order to achieve a brand name.

Wijnands (2001) and Silvis et al. (2002) describe in their reports several cases in which Dutch vegetable growers have a second production location in Spain. In terms of transnational management, they use the advantages of lower production costs (especially labour) and they can use the opportunities to differentiate their products (year-around supply of good quality products instead of seasonal supply). Government policy, especially environmental regulations, is the main motive for Dutch growers to start a farm in a foreign country. In foreign countries, the growers have the opportunity to create large-scale farms. Examples are given of 50 or more ha of greenhouses, compared with an average of less than 3 ha in the Netherlands. In Kenya, one flower grower has as many as 250 ha, with 4000 labourers. These Dutch growers in foreign countries intensively use the Dutch horticulture infrastructure: suppliers and the knowledge infrastructure, and wholesalers for marketing the products. This large-scale grower shows some backward integration: the company builds its own greenhouses and organizes its own logistics including airfreight. The growers in the USA produce for the local market and are innovative in learning from different markets in terms of strategic management. Like the growers in Spain, they are using the Dutch technological knowledge. The flower growers in East Africa are using not only the technological knowledge of the Dutch but also the marketing infrastructure of the auctions and wholesalers (Silvis et al., 2002; Wijnands, 2003). These 'Dutch' growers in foreign countries are examples of transnational management and of the implementation of concepts of strategic management. However, none of these authors relates his analyses to the concept of strategic or transnational management.

Control and evaluation activities

Several authors deal with quality assurance and control, such as ISO or HACPP (Ogier, 2000, pp. 103-199; Grimsdell, 1996). Taragola et al. (2000) measure environmental and quality management on the performance of Belgian glasshouse holdings. The explanatory variables are based on the personal characteristics of the manager and on farm characteristics. However, strategic management is very narrowly defined and the performance indicators are not operationally defined. Also Alleblas (1988) and Trip (2000) pay attention to performance on different farms as a result of decision-making.

Kroon et al. (2002) conclude that producer groups have organizational, marketing, logistical and financial advantages. The components of strategic management are implicitly taken into account. The advantages of aspects of functional strategies are evaluated and recommended. The organizational aspect concerns not only the internal side but also the cooperation with other comparable firms or with suppliers and buyers (e.g. wholesalers). The evaluation of the external environment is mostly limited to the next links in the chain. Strategies based on thorough market analyses are not mentioned. However, the hypotheses of their evaluation are derived from a strategic management approach.

Summary of the findings

- It is hard to find research dedicated to strategic management for farms, let alone empirical work dedicated to cut-flower growing firms in developing countries.
- Empirical work on integrated concepts of strategic management and measurement on the performance of firms is limited.
- The focus of the analysis of external environment is mainly market oriented.
- Analyses of the internal environment are mostly nationally oriented: the strengths and weaknesses are compared with firms in the same country.
- Several authors have dealt with cooperation within the chain or as a group of producers as a strategic management issue.

Research on competitiveness and the formulation of market strategies show that horticulture is a market-oriented industry. As shown by Grimsdell (1996) for a large-scale farm or by Kroon et al. (2002) for producers' groups, large-scale farms have several options for implementing these strategies in order to attain better business or market performances. Confidentiality, in order to act as first mover, might be a restriction on research in this field.
Chain cooperation and chain governance are at the same time important issues that influence the marketing of products. However, the result of these two research fields are poorly translated into strategic management options. The economic advantages and the economic performance and risk of chain cooperation need a more structured and integrated approach.

What are the possibilities of strategic management?
The strategic management model is an important tool to analyse individual firms and to derive the market opportunities as well the weaknesses in a consistent framework.

Transnational management model

Transnational management is an even more neglected research field at the level of growers and receives poor attention at the level of suppliers and wholesalers. Some examples are mentioned before in this section. Remarkably, wholesalers in vegetables are sourcing internationally and are serving the internationally organized retailers. Moreover, the literature review shows cases of Dutch growers in which transnational management is already common practice. Transnational management should be a part of strategic management. The producers of greenhouse equipment need a larger market than the Dutch domestic market to remain profitable, which means it is necessary to be innovative. Van Meijl et al. (1998) show this scope advantage. Growers can take several competition advantages offered by transnational management to attain several strategic goals. The size of farms should then be rather large to have sufficient managerial capacity to execute all functional tasks. The question in this matter is: in which way will internationalization influence the size of farms, and when will multinational farms be as common as multinational companies in other industries? The literature gives the impression that certainly for horticulture firms, transnational management is within reach in the coming decade. Suppliers and growers already have multinational sales or production facilities. Strategic management can contribute to an implementation of approach that supports the *sustainable development of an industry*.

Governance of global commodity chains (GCC)

The three factors that determine the governance of global commodity chains, as mentioned in Section 2, and the empirical findings are:

1. *Complexity of transactions*
   Arguments for either a low or a high classification can be given. The complexity of transaction is low when product specification fits within the standards of the industry. The auctions have rather clear specifications, which are at a certain level the reference standard for the industry. The majority of transactions can be classified within this category. However, the complexity of transaction is high when the production is based on a specification of a buyer, for example a 'code of conduct' variety of flowers of bouquets. The increasing share of supermarkets in consumer expenditures leads to an increasing complexity. Supermarkets strive to a unique position by providing differentiated products and services. A code of conduct specified by a customer, with additional requirements on delivery time and varieties, means a high level of complexity. The transaction costs in monitoring and negotiations on the specification are then high.
2. *Ability to codify*
   Codifying the product and the product process is highly possible. Several codes of conduct and quality grades of the auctions are examples of the high ability of codifying.
3. *Capabilities in the supply base*
   This has to be ranked high. Low capabilities in the supply base will definitely occur. But as Gereffi et al. (2003) state, these growers will be excluded. Switching between the suppliers of cut flowers is easy.

According to this theory, the basic governance form will be therefore spot markets and is moving to a modular value chain. But in both cases the switching costs are low, as is the coordination and power asymmetry.

What does it mean for capacity building and market access?
Not meeting the basic quality standards of the buyers (i.e. supermarkets) leads to exclusion. As most developing countries have no home market for cut flowers, the growers produce for the markets in Europe, Japan or the USA. The growers have to meet the industry standards in these countries. So if growers in a country do not meet them fully, it can be relevant to support the needed capabilities. But even then it will be necessary to analyse the market prospects and to organize the supply chain.

5. DISCUSSION

Conditions for market access

The assumption is that market access contributes to poverty reduction. However, certain conditions have to be fulfilled and the possibilities differ with different approaches. Page and Slater (2003) summarize the conditions for market access and how different initiatives will affect these. The conditions can be seen as a specification of Porter's entry barriers. Of more interest is her classification of the possibilities of different initiatives. Figure 5.1. is an overview of how different initiatives affect these conditions.

Condition	Direct foreign investment	Large direct buyers	Developing country producers	Export promotion agency	Aid programmes or targeted technical research
Awareness of possibility of exporting	Yes	Yes	Yes	Possibly	Possibly
Familiarity with buyers: understanding the different preferences of buyers	Yes	Yes	Difficult	No	No
Familiarity with standards	Yes	Yes	Difficult	Possibly	Possibly
Access to equipment and inputs	Has information	Has information	Must find	No	No
Access to investment and working capital	Yes	Not normally	Must find	No	No
Access to appropriate labour	Possibly training	Possibly training	Must find	No	No
Adapted and new technology	Yes	Yes	Must find	Possibly information	Extension work
Organization and orientation of firms	Yes	No	Must do	No	No
Legal regimes: land tenure	No	No	No	Government Yes	No
Quality and reliability	Yes	Yes	No	Perhaps	Perhaps
Local transport and communications	Can offer substitutes	No	No	Can offer	No
International transport and communications	Yes	Yes	No	Yes	Perhaps
Tariffs and non-tariff barriers	Advice and lobbying	Advice and lobbying	No	Political intervention	Perhaps
Other trading conditions (exchange rate, customs service)	Advice/ bypassing	Advice	No	Yes	Advice/ perhaps

Figure 5.1. Entry barriers affected by different initiatives
Source: Page & Slater, 2003

Figure 5.1. shows that entry barriers are the lowest for foreign direct investment or for direct buyers. Producers in developing countries should cooperate with an export promotion agency to minimize entry barriers. Aid programmes or technical research can temporarily substitute some activities of an export promotion agency. The short term of aid programmes or targeted technical research can be a threat for a long-term sustainable development. Local producers must make major efforts to access all inputs and production factors and to become familiar with buyers. This can be an impregnable barrier, unless an organization can organize these aspects. An example of such an organization is the Egyptian Union of Producers and Exporters of Horticultural Crops (UPEHC, 2003). UPEHC is focused on enabling production by providing:

- Agricultural inputs
- Climatic information
- Spraying equipment, pesticides and packing materials
- Packing, processing and cold-storage services
- The coordination of all types of transport and export contracts
- An extension service, through a state-of-the-art network
- Educational and promotional programmes.

The members are mostly small and medium-scale farmers and cooperatives, processors and exporters.

Impact of customer orientation on smallholders

Dolan and Humphrey (2004) and Humphrey et al. (2004) observed 'a tendency towards the concentration of production and processing in Africa in the hands of a few large firms, which is likely to continue'. Their research deals with the fresh fruit and vegetable chain between Kenya and the UK-based retailers and importers. The introduction and enforcement of product and process requirements meant tighter linkages:

- Supermarkets in discussion with importers and exporters developed product parameters. The exporters invest in cold storage, pack houses and high-care facilities so that the produce can be harvested, processed and transported in hygienic and controlled conditions. For instance, large exporters secured their post-harvest process and the efficient flow of the produce through the chain by joint ventures with freight forwarders.
- The coordination of production schedules, aimed at continuity in supply, involved regular contact.
- Process parameters were enforced by regular inspection based on quality systems, including pesticide management and retail company-specific codes. This led to a shift of production from smallholders to large farms. The supermarket perception was that smallholders could not meet the process control and exporters were concerned about the costs of monitoring the large number of small farmers.

Nevertheless, relationships were rarely formalized in contracts and supermarkets sourced from a range of importers. A typical supermarket has approximately six different suppliers of imported fruit and vegetables. The large-scale (250 ha) Kenyan flower grower mentioned in Section 4 shows some backward integration: the company builds its own greenhouses and organizes its own logistics, including airfreight (Wijnands, 2003). The lessons are: meeting the requirements of the buyers and efficiently organizing the supply chain are mandatory.

Humphrey and Schmitz (2002) provide an example of the importance of customer orientation. A US footwear chain set standards for the Brazilian Sinos Valley footwear cluster and facilitated the upgrading of the industry. Firms in the Sinos Valley concentrated on the production and local firms benefit considerably from this. They were ahead in production abilities. However, Chinese producers undercut the Brazilian producers and the prices dropped sharply. The Brazilian neglected the design aspect of shoes.

Clusters and alliances

The aforementioned lessons of customer orientation are in line with the findings of Humphrey and Schmitz (1996). They are focussed on clusters instead of global commodity chains. Humphrey and Schmitz summarize their lessons 'as the Triple C, which stands for customer oriented, collective and cumulative':

- Customer-oriented assistance programmes, which work through participation in SME delivery contracts with large enterprises, seem more successful.
- A collective approach has lower transaction costs and facilitates mutual learning.

- Cumulative improvements in competitiveness are more likely to be achieved if an SME support approach is guided by a customer orientation and targeted at the collective.

Kannan and Tan (2004) underline the importance of alliances. Strategic alliances are not dealt with explicitly in the review of theories. Participants realize that joining an alliance and forming a cooperative relationship may facilitate the achievement of mutual competitive advantage. Buyer interest in alliances is driven by efforts to reduce prices, increase the dependency of supply, and influence quality and delivery schedules. On the other hand, suppliers find alliances attractive, since they offer the advantages of a stable, reliable market and allow them to influence customer quality. Adopters of supplier alliances attach greater importance than non-adopters to ensuring high levels of product quality, and this has a positive impact on performance. Alliances enhance long-term product performance. The Ugandan flower case compared to the Tanzanian gives some evidence for cooperation in the flower industry. The Ugandan Flower Exporters Association recognizes the mutual advantage and provides services on some aspects for a competitiveness industry, whereas the cooperation in Tanzania is poor.

6. CONCLUSIONS AND RECOMMENDATIONS

General conclusions

The primary aim of the research was to answer the question: what criteria should be used to evaluate the economically sustainable development of an industry that depends on foreign markets and institutions? Several theories were dealt with. Each theory concerns a part of the economic complexity. The international trade theory is useful to identify international trade developments and whether the competition is based on prices or on product differentiation. It is rather weak in explaining expected developments. Furthermore, a disadvantage of the research question is the focus on products rather than on firms or industries. Theories based on industrial organization are better suited for evaluating sustainable development. Micro-economics approaches, which were not summarized, enable the quantification of certain aspects. In this framework, transaction cost economics focus on measuring the cost of exchanges between actors. Porter's competitiveness model is well suited to analyse an industry and its environment. Despite its weakness in explaining future developments, it has the power of deriving the key success factors that determine future developments. Porter's approach has a descriptive and bench marking nature. Interpreting the outcomes is not an explicit part of the theory. Expert judgement is sometimes involved. The structure-conduct-performance model and the global commodity chain model are differentiations of industrial economics approaches. Strategic and transnational management models are well suited for goal setting and deriving strategies and tactics for individual firms. In Section 5, the importance of clusters and strategic alliances is emphasized. These aspects are also determinants in Porter's model. The conclusion has to be that Porter's model contains sufficient criteria to analyse a sustainable development. However, the model needs a lot of information.

The second aim was to provide a concise overview of the world's flower business. The majority of this report is dedicated to this subject. However, on several aspects this overview is disappointing. Reliable statistics of the basic indicators like acreage, number of holders, yields, prices, flower varieties or trade flows are incomplete, not consistent or not available at all. Several flower-producing countries are left aside. Little information is available on emerging countries and countries in the Asia-Pacific region. This information is the starting point for an analysis of an industry. To make a well-founded opinion on sustainable developments of the flower industry in a country, one needs a vast quantity of business information from that country and from its main competitors. In fact, all the information for Porter's model is necessary. The review is in several aspects incomplete. Assessing sustainability in one country makes it necessary to collect this information for all major competitors. The Sinon footwear example shows that innovative power and customer orientation should not be neglected as a key success factor for long-term sustainability. As shown in Section 3 several countries have the same product portfolio and these countries are in fact each other's competitors. In conclusion, many efforts will be necessary to make an overview of even the basic facts concerning the world's flower business.

The third aim was to present conclusions concerning the state of art of the theory related to the performance of the world flower business with emphasis on the position of Kenya and the Netherlands. Sufficient theories are available to tackle the problem of sustainability, but a thorough understanding will require a lot of information. Only some of that information is publicly available, if it is available at all. It is therefore not possible to evaluate the sustainability or competitive power of the floriculture industry of Kenya or any other country. Basic facts like cost prices, transaction costs, costs of inputs, market prices and the availability of inputs and services are missing. A limited number of conclusions on the performance can be drawn:

- The production or export growth indicates a good performance of the Kenyan floriculture. But other countries have a comparable performance and more or less the same product portfolio.
- The Netherlands has a good performance in marketing flowers; several countries, from all over the world, export to the Netherlands. The Netherlands exports to different countries all over the world.
- The Ugandan case shows that the size of the industry is of less importance than a high performing chain organization. Governance of the chain by importers from developed countries reduces the entry barriers. However, the chain leader can easily switch suppliers.

Partnership between Kenya and the Netherlands

Two questions can be raised in the context of partnership between Kenya and the Netherlands.

What are the actual benefits?
The floriculture sector in Kenya contributes to employment. On average, 15 –20 people are required to work a hectare of flowers. Thus the direct employment on the farms can be estimated at 30,000 – 40,000 full-time employment equivalents. The employment in the supplying and related industry will be around twice as high. Moreover, the number of people who are economically dependent on the sector (i.e. the workers' families), will be five or ten times as high. Despite the full orientation towards exports, the floriculture sector contributes to alleviating poverty. As stated in Section 3 horticulture is the second source of foreign currency. By exporting to the Netherlands, the Kenyan growers can easily obtain the parameters for entering the European markets. As expressed by an emerging Egyptian flower grower: 'Who doesn't work with the Dutch, doesn't learn to export'.

The benefits for the Dutch are twofold. First, Kenyan exports improve the country's strategic position: the wholesalers can provide flowers in a broader price range. The quantities and price level are suitable for mass marketing – a market channel of growing importance. According to AIPH statistics (Section 3) the imports are about 25% of the Dutch exports. Kenya also contributes to the Dutch employment in marketing their flowers. During the last decade, the share of the Dutch auction has remained stable; the share of direct marketing has not increased. It could be questioned whether the imports substitute Dutch production. The Netherlands would be out of business for these flower varieties due to the international competitive disadvantage. The focus of the Dutch flower growers should be on other varieties. Second, the Netherlands benefits from the export of inputs and services to Kenya. It can be concluded that the partnership benefits both countries. However the long-term sustainability of this mutually beneficial relationship is not clear. The rising market share of supermarkets and the Kenyan experience in direct marketing to, for example, UK supermarkets give the Kenyan the opportunity to switch to direct marketing.

How can sustainable development in Kenya be strengthened? Will the Dutch floriculture sector benefit from the partnership?
The growing exports from Kenya indicate a good performance. The question as regards sustainable development is: will this result and this competitive advantage endure? From the global commodity chain theory we learn that capabilities in the supply base are a prerequisite for taking part in a global chain. Little information about the capabilities in the supply base, or about education in that field, has been found. Strengthening the technical (production and post-harvest level) and managerial capabilities will support a sustainable development.

Achieving a higher standard of technical skills enables the innovative power: adoption of new production techniques and diversification by growing more demanding flower varieties. As shown, access to the flower market is based on international competitive advantages. Switching between suppliers is easy. Entrepreneurship based on strategic management will contribute to a sustainable position on the world market. Improving the capabilities in this respect will contribute to higher levels of independence from international consultants and to more involvement from local entrepreneurs.

Second, institution building is important. Within the region Kenya has a fair standard on phytosanitary inspection and Customs handling. However, the website of Ugandan UFEA provides more market information. In the past Uganda showed more interest in working together in selecting rose varieties suited to the local climate conditions. In the coming years, the Kenyan horticultural sector will have to reorient itself towards the choice of flower varieties. As shown in Section 3 most emerging countries grow roses which means that Kenya will have to choose between other flowers or more differentiated roses. This and their marketing strategy should be guided by a customer orientation. Humphrey and Schmitz (1996) show that a collective approach is recommended.

The Kenyan growers will remain at least a competitor for the Dutch growers. But as mentioned, if the Kenyans are not the growers in another country will be. The auctions and wholesalers will be benefited from a large quantity of flowers. Furthermore, the Kenyan growers can switch to inputs and services from, for example, Israel. The Dutch still have a comparative advantage in marketing.

REFERENCES

Asea, P.K. and D. Kaija, 2000 *Impact on the flower industry in Uganda. Geneva*. ILO. Working Paper WP 148, 2000.

Asocolflores. http://www.asocolflores.org/info/info_datosin_ingles.php 2004 Retrieved 30-11-2004.

AIPH. International statistics flowers and plants. Institut für Gartenbauökonomie der Universität Hannover, 2004. Volume 52.

Alleblas, J.T.W. (1988): Management in de glastuinbouw. Een zaak van passen meten, PhD thesis. LEI, Den Haag, 217 pp.

Alleblas, J.T.W. (1995): De betekenis van informatie bij het personeelsbeheer in de glastuinbouw. LEI, Den Haag, 100 pp.

Alleblas, J.T.W. , Mulder, M., (1997): Kansen voor Kassen. LEI, Den Haag, 60 pp.

Barry, P.J., C.B. Baker, P.N. Ellinger and J.A. Hopkin (2000). Financial management in Agriculture. Interstate Publishers, Inc, Danville Illinois, 678 pp.

Bartlett, C.A. and S. Ghoshal (1992). Transnational management; grensoverschrijdend management. Academic service, Schoonhoven, 202 pp.

Batt, P.J. (2000) Strategic lessons to emerge from an analysis of selected flower export nations. In: Journal of International Food & Agribusiness Marketing. Vol. 11(2000) 3 pp. 41-73

Berkum, S. van and H. van Meijl. The application of trade and growth theories to agriculture: a survey. The Australian Journal of Agricultural and Resource Economics. Vol. 44 (2000) no. 4., pp. 505-542

Boehlje, M.D. and V.R. Eidman (1984). Farm management. John Wiley and Sons, New York, 806 pp.

Boger, S., (2001). Quality and contractual choice: a transaction cost approach to the Polish hog market. European Review of Agricultural Economics. 28(3), 241-261.

Bokelman, W., Lentz W. (2000) Prerequisites for value adding partnerships between trade and producers in the vegetable growing sector. Acta Hort. (ISHS) 536, 589-597.

Bont, C.J.A.M. de (red.) en A. van der Knijff (2004). Actuele ontwikkeling van bedrijfsresultaten en inkomens in 2004. LEI, Den Haag.

Bremmer, J., Baltussen, W.H.M., Huirne R.B.M. (2000): Incentives to innovation and strategic change: an analysis of Dutch horticulture and arable farming. Acta Hort. (ISHS) 536, 231-237.

Broek, L. van den, J.J. Hayu, A.W. Hodges and E.M. Neves. Production, marketing and distribution of cut flowers in the United States and Brazil. University of Florida. 2004 Retrieved on 4-12-2004 from: http://hortbusiness.ifas.ufl.edu/Cut%20Flowers%20Brazil-US.pdf

Brumfield, R.G. (1996); Acta Hort. (ISHS) 429.

Carlton, D.W. and J.M. Perloff (1999). Modern Industrial Organization. Addison-Wesley, Reading Massachusetts.

Casavant, K.L., C.L. Infanger and D.E. Bridges (1999). Agricultural economics and management. Prentice Hall, London, 434 pp.

CBS. Land en tuinbouwcijfers. CBS/LEI, Voorburg/Den Haag, 2004.

Christodolou, M. (1992). Intra-industry trade in agrofood sectors: the case of the EEC meat market. In: Applied Economics, volume 24 , pp. 875-884

Collinson, C. The business cost of ethical supply chain management: Kenya flower industry case. National resources institute (NRI), Kent, 2001. Report no 2607.

David, F.R. (1999): Strategic management concepts. Prentice Hall New Jersey, 351 pp.

Davies, R. (2000) The impact of globalization on local communities. A case study of the cut flower industry in Zimbabwe. International Labour Organization (ILO), Geneva.
Dixit, A.K. and Stiglitz J.E., (1997) Monopolistic competition and optimum product diversity. American Economic Review. Volume 67, pp. 297-308.
Dolan, C. and J. Humphrey, (2004). Changing governance patterns in the trade in fresh vegetables between Africa and the United Kingdom. In: Environment and Planning A. volume 36 (2004), pp. 491-509.
Douma, S and H. Schreuder. Economic approaches to organizations. New York Prentice Hall, 1992.
Dosi, G., K. Pavitt and L. Soete, (1990). The economics of technical change and international trade. Harvester Wheatsheaf, London.
Dubai in bloom. Kenyan Leader sees Africa's growth through new centre. In: *Dubai in bloom, 2004, p. 23.*
Eaton, D., M.D. Hack and J. Wijnands. Flower business in sub-Saharan Africa. Den Haag, LEI, 1999 (restricted).
Ekelund Axelson, L. Axelson, J., (2000): Hyper-competition on horticultural markets. Acta Hort. (ISHS) 536: 485-492.
Expoflores, 2004. http://www.expoflores.com. Information retrieved on 23-12-2004
Farné, S. Employment and working conditions in the Colombian flower industry. ILO, Geneva, 1998. Working paper 129.
FloraHolland (2004). Floraholland import tariffs 2004. Commercial leaflet.
FPO. http://www.flowerpossibilities.com/facts.html Retrieved 1-12-2004
Gray, D. Growing around the world: Floriculture in East Africa. In: Floriculture International, 2004. http://www.floraculture intl.com/archive/articles/705.asp retrieved 15-09-2004.
Greenaway, D. and J. Torstensson, (1997). Back to the future: taking stock of intra-industry trade. *In: Weltwirtschafliches Archiv, Volume 133 (1997), pp. 249-269*.
Gehlhar, M.J. and D.H. Pick,(2002). Food trade balances and unit values: What can they reveal about price competition? In: *Agribusiness, 18 (1), pp. 61-79.*
Gereffi, G., J. Humphrey and T. Sturgeon. The governance of Global value chains. Forthcoming in: *Review of international Political Economy, Nov. 2003.*
http://www.soc.duke.edu/sloan_2004/Papers/governance_of_gvcs_final.pdf Retrieved on 14-10-2004
Grimsdell, K. (1996) The supply chain for fresh vegetables: what it takes to make it work. Supply Chain Management Vol. 1 no 1 1996, pp. 11-14.
HABG. Kentgetallen 2003. Hoofdbedrijfschap Agrarische Groothandel Bloemen en planten. Aalsmeer 2004.
Hack, M. and A.M.A. Heijbroek (1992). Visie op de internationale concurrentiekracht in de bloemisterij. Rabobank Nederland, Utrecht, pp. 48.
Hack, M.D., Zimmermann, K.L (1996): Product differentiation strategies based on trends in the market. Acta Hort. (ISHS) 429:423-429.
Hack, M.D. en M.H. Borgstein (1998). Concurrentiemonitor snijbloemen. Agricultural Economics Research Institute (LEI), The Hague.
Hack, M.D., Greeff, R.J.M. de, Ham, E. van der, (1998). Rozenkwekers kiezen klanten. LEI, Den Haag, 34 pp.
HCDA, (2005). Horticultural Crops Development Authority, Annual statistics. http://www.hcda.or.ke/stats.asp. Retrieved: 7-1-2005
Hendrikse, G.W.J. Moderne organisatietheorieën. Schoonhoven, Academic Service, 1998.
Herbst, J.H., Erickson, D.E., (1996): Farm management principles, budgets and plans. Stipes Publishing, Champaign Illinois, 320 pp.

Higgins, J.M. and J.V. Vincze (1993). Strategic management: text and cases. The Dryden Press, Fort Worth, 1175 pp.
Hill, C.W.L., Jones G.R. (1995) Strategic management. An integrated approach. Houghton Mifflin Company, Boston, 436 pp.
Hobbs, J.E. (1996a). A transaction cost approach to supply chain management. In: Supply Chain Management. Vol. 1(1996) no 2, pp. 15-27
Hobbs, J.E. (1996b). Transaction costs and slaughter cattle procurement: processors' selection of supply channels. In: Agribusiness, 12 (6), pp. 509-603
Hobbs, J. E. (1996c). A transaction cost analysis of quality, traceability and animal welfare issues in UK beef retailing. In: British Food Journal, 98 (6), pp. 16-26.
Hobbs, J.E. and Y.M. Young (2000). Closer vertical co-ordination in agrifood supply chains: a conceptual framework and some preliminary evidence. In: Supply Chain Management, 5 (3), pp. 131-142.
Humphrey, J., N. McCulloch and M. Ota, (2004). The impact of European market changes on employment in the Kenyan horticulture sector. In: Journal of International Development, volume 16 (2004), pp. 63-80.
Humphrey, J. and H. Schmitz, (1996). The triple C Approach to Local Industrial Policy. In: World Development, volume 24 (1996), no 12, pp. 1859-1877.
Humphrey, J. and H. Schmitz, (2002). How does insertion in global value chains affect upgrading in industrial clusters? Regional Studies vol. 36 (2002), number 9, pp. 1017-1027.
Ikiara, G.K., M.M. Ikiara and W. Odhiambo (2003). The impact of the European (EU) on poor and marginalized people: The case of Kenya's Horticulture and fisheries sectors. http://www.acp-eu-trade.org/documents/Kenya%20research%2025%20June%20final.pdf. Retrieved: 7-1-2005
ILRF. Codes of conduct in the Cut-Flower Industry. 2003. Retrieved form: www.laborrights.org on 24-11-2004.
Israel (2004). Israel's Agriculture: Innovations make the land bloom. Ministry of Agricultural and Rural Development. http://www.moag.gov.il/news/Pages7_33_agri2003.pdf Retrieved 22-11-2004
Jacobs, D., P. Boekholt and W. Zegveld, 1990. De economische kracht van Nederland. Een toepassing van Porters benadering van de concurrentiekracht van landen . Stichting Maatschappij en Onderneming, Den Haag.
Jaffee, S. From challenge to opportunity. Transforming Kenya's fresh vegetable trade in the context of emerging food safety and other standards in Europe. Washington, The International Bank for Reconstruction and Development, 2003.
Jerardo, A, Floriculture and nursery crops outlook. USDA-ERS Washington, 2004. flo-003.
Jetro. Japanese market report cut flowers: regulations and practice. 2000 report 58. http://www.jetro.go.jp/en/market/reports/jmr/058.pdf Retrieved 17-11-2004.
Kaiser. South African Floriculture Cluster Study. Kaiser associates. 2000. http://www.nedlac.org.za/research/fridge/flowers/intro.pdf Retrieved 02-12-2004.
Kambil, A. and E. van Heck. Reengineering the Dutch flower Auctions: A framework for analysing exchange organizations. In: Information System Research. Vol. 9, No 1, March 1998.
Kannan, V.R. and K.C. Tan, (2004). Supplier alliances: differences in attitudes to supplier ad quality management of adopters and non-adopters. In: Supply Chain Management: an International Journal., volume 9 (2004), number 4, pp. 279-286.
Kay, R.D. and W.M. Edwards (1984). Farm management. McGraw-Hill, New York., 458 pp.
Kroon, S.M.A. van der, Tacken, G.M.L., Uffelen, R.L.M. van, Paassen, R.A.F. van, Poot, E.H., Buck, A.J. de, (2002): Productenvereniging in beeld. LEI, Den Haag. 59 pp.

Lancaster, K., (1979) Variety, Equity and efficiency. Columbia University press, New York. Lieblein, M.J. The choice of organizational governance form and performance: prediction from transaction cost, resource-based and real option theories. In: Journal of Management. 2003 29 (6) pp. 937-961.
Liemt. G. van. The world cut flower industry: Trends and prospects. ILO, Geneva, 2000. www.ilo.org/public/english/dialogue/sector/papers Visited 5-10-2004
Lierde D. van, (2000): Technical and economic dynamics of innovations in Belgian azalea production. Acta Hort. (ISHS) 536: 277-284
LNV, The Dutch floriculture sector. Ministry of Agriculture, Nature Management and Fisheries. The Hague, 2000.
Meijer, V. (1999). Cut-flower production in Colombia – a major development success story for women? In Environment and Planning A. Volume 31 (1999), pp. 273-289.
Meijl, H. van, Horen L. van, Wolters, A. (1998): Een wereld te winnen: Strategische keuzes in de glastuinbouwtoelevering. Den Haag, LEI, 50 pp.
Montigaud, J.C. (1996). An alliance strategy in the fruit and vegetable sector: the example of Agro-Marché Strategies. Acta Hort (ISHS) 429: 197-204
Mulder, M. (1994) Sector exploration and financial analysis: a simulation model for horticulture under glass. PhD thesis. Den Haag, LEI, 247 pp.
Niejenhuis, J.H. van Verstappen, C.D.G., Leutscher, K.J. (1996) The family-firm life cycle as a tool in assessing regional development of horticulture. Acta Hort (ISHS) 429: 393-400.
Ogier, J.P. (2000): Acta Hort. (ISHS) 536
Ogier, J.P., Dillon, M. (2000): Strategic management development through quality and business management excellence: a case study for the 21st century development. Acta Hort. (ISHS) 536: 141-153.
Orth, U.R., (2000): Quality function deployment: A means of integrating consumer expectations throughout cultivation systems. Acta Hort. (ISHS) 536: 607-612.
Page, S. and R. Slater, (2003). Small producer participation in global food systems.: Policy opportunities and constraints. In: Development Policy Review, 21 (2003) 5-6, pp. 641-654.
Palán, Z. and C. Palán. Employment and working conditions in the Ecuadorian flower industry. ILO, Geneva, 1999. Working Paper 138.
Petitjean, M.F. Booming Floriculture in Africa. In: *Floriculture International* 12 (2002) 06
Philippe, F., Sauvée (1999): Coordination efficiency: proposals for a framework. An illustration with the fresh tomato sector in France. Pp. 579-596. In: Galizzi, G., Venturini, l. (1999): Vertical relationships and coordination in the food system. Physica-Verlag, Heidelberg, 641 pp.
Pieri, R., D. Rama and L. Ventturine, (1996). Intra-industry trade in the European dairy industry. Paper presented at the VIII EAAE conference on Redefining the roles of European agriculture', Edinburgh, 3-7 September.
Poot. E.H., Mulder, N.D., Paassen, R.A.F., Hack, M.D., Nienhuis, J.T., (2001). Concurrentiekracht glasgroente: positiebepaling en strategische opties voor de Nederlandse groentesector. Naaldwijk, Praktijkonderzoek Plant & Omgeving, 75pp.
Porter, M.E. http://library.wur.nl/cgi-bin/WebQuery/clcwwwf?AU=Porter,+M.E.+(1990) The competitive advantage of nations. MacMillan, Basingstoke, 855 pp.
Porter, M.E. (1980) Competitive strategy: techniques for analysing industries and competitors. New York, The Free Press, 396 pp.
Porter, M.E. (1985) Competitive advantage. Creating and sustaining superior performance. New York, The Free Press, 557 pp.
Rabobank. Kiemkracht. De evolutie van de sector uitgangsmateriaal: van autonomie naar partner in de business. Rabobank, Utrecht, 2002.

Reinders , U. Sierteelt Israël krabbelt uit diep dal. In: *Vakblad voor de bloemisterij 46* 2002.
Roozendaal, G. van. Kenyan cut Flower Blooming. Biotechnology and Development monitor. 1994. No 20 pp. 6-7.
Santema, S.C., M. Dingena en N. van Dishoeck (1997). Succesvolle marketingplannen. Denken Kiezen en Doen. Utrecht, F&G Publishing, 169 pp.
Sauvée, L. (2000), Managing a brand in the tomato sector: authority and enforcement mechanisms in a collective organization. Acta Hort. (ISHS) 536: 537-544.
Semboja, H.H.H., R. Mbelwa and C. Bonaventura, (2000). The cut-flower industry in Tanzania. Geneva. ILO. Working Paper WP 152,.
Sikazwe, D. Zambian flower exports set to soar? In: New Agriculturist. http://www.new-agri.co.uk/01-5/focuson/focuson7.html Retrieved on 06-12-2004
Silvis, H.J., Jonker, T.H., Bont, C.J.A.M. de, Wijk, M.S. van, Wolswinkel, C.J.W. (2002): Boeren op vreemde bodem. Over emigratie en semigratie. Den Haag, LEI, 119 pp.
Starman, T.W. The floriculture industry. http://aggie-horticulture.tamu.edu/floriculture/hort428/Lecture/industry.ppt Retrieved on 17-11-2004
Taragola, N., Lierde, D. van, Huylenbroeck, G. van (2000): Environmental and Quality Management on Belgian Glasshouse Holdings. Acta Hort. (ISHS) 536: 71-79.
Thoen, R., S. Jaffee, C. Dolan and L. Waithaka. Equatorial Rose: The Kenyan - European Cut Flower Supply Chain. (1999) www1.worldbank.org/wbiep/trade/c_papers/Roses2KenyaSupplychain.pdf. Retrieved on 22-sept-2004
Trip G. (2000): Decision making and economic performance of flower productions. PhD thesis, Wageningen, Wageningen University, 129 pp.
Turner, J. and M. Taylor (1998). Applied farm management. Oxford, Blackwell Sciences Ltd, 394 pp.
Unido (2004). Investing in Uganda's floriculture industry. http://www.unido-aaitpc.org/unido-aaitpc/new1/uganda/floriculture.pdf Retrieved 24-11-2004
UPEHC (2003). http://www/upehc/org/eg. 08-10-2003
UPOV. What it is, what it does. http://www.upov.org/en/about/pdf/pub437.pdf. Retrieved 24-11-2004
USITC (2003). Industry & trade summary: Cut flowers. US International Trade Commission, Washington. USITC publication 3580.
Vadnal, K. (2000); The fruit growers' perception of competitive performance of the Slovene fruit growing industry. Acta Hort. (ISHS) 536: 321-330.
Verhaar, K. (2000): Employees as a strategic asset for agricultural production. Acta Hort. (ISHS) 536: 455-459.
Verhaegh, A.P. Kostprijs tomaat, komkommer en paprika in Nederland en Spanje. Den Haag, LEI, 76 pp.
Weleschuk, I.T. and W.A. Kerr (1995). The sharing of risks and returns in prairie special crops: a transaction cost approach. Canadian Journal of Agricultural Economics. 43(2), pp. 237-258.
Westerman, E., G. Splinter and C. Mukindia. Partnership for marker access: Towards a sustainable market oriented horticultural sector in Kenya. The floriculture sector in Kenya. LEI, Den Haag, 2005. Unpublished position paper.
Wijnands, J., Silvis, H.J., (2000): Onderweg. Concurrentiepositie Nederlandse agrosector. Den Haag, LEI, 112 pp.
Wijnands, J. (2001): Nederlandse tuinbouw kijkt in Spaanse spiegel : verslag studiereis tuinbouw Valencía, Alicante, Murcia en Almería (Spanje). Den Haag, LEI, 32 pp.
Wijnands, J. (2003): Internationalisering van de Nederlandse sierteeltcluster in Oost-Afrika : bevindingen van studiereis naar Kenia, Tanzania en Oeganda aangevuld met deskresearch. LEI, Den Haag, 38 pp.

Williamson, O.E. (1979). Transaction cost economies: the governance of contractual relations. In: Journal of Law and Economics, 22 (1979), pp. 233-262.
Wright, P., Kroll M.J., Parnell, J. (1998): Strategic management concepts. Prentice Hall, London, 336 pp.
ZEGA. The ZEGA code of conduct. http://www.zambiaexportgrowers.com/code-of-conduct1.htm. Retrieved 08-12-2004.