A COMPETITIVENESS ANALYSIS OF THE SOUTH AFRICAN FLORICULTURAL INDUSTRY

by

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UITTREKSEL

'N MEDEDINGENDHEIDSANALISE VAN DIE SUID AFRIKAANSE BLOMBEDRYF

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Vanuit 'n internasionale mededingendheidsperspektief is die Suid Afrikaanse blombedryf marginaal. Wanneer die vraag-kant van die Suid Afrikaanse blombedryf met die van 24 ander lande vergelyk word vertoon Suid Afrika die heel swakste. Suid Afrika se jaarlikse blomverbruik is sowat R3,04 per kapita wat in skerp kontras staan met Switserland wat R385,00 per kapita verbruik, die hoogste ter wêreld. Die Suid Afrikaanse blombedryf presteer ook nie na wense met betrekking tot die benutting van geleenthede om internasionaal te bemark nie. In vergelyking met 20 van die wêreld se grootste blom uitvoerlande is Suid Afrika die 17de (voorheen 15de) grootste uitvoerder in die wêreld. Suid Afrika kan kers op steek by lande soos Israel, Chilli en Zimbabwe wat onderskeidelik die 1ste, 5de en 6de grootste uitvoerlande is.

Aangesien daar 'n groot vraag na Suid Afrikaanse blomme in internasionale markte ondervind word, kan die bogenoemde statistieke nie in isolasie beskou word nie. Redes vir die vraag na Suid Afrikaanse blomme sluit onder andere die unieke biologiese diversiteit van Suid Afrika se inheemse blommeryk en ook die seisoensverskil tussen Suid Afrika en die uitvoermarkte wat hoofsaaklik in die Noordelike-halfrond gesetel is in. As die Suid Afrikaanse blombedryf dus meer mededingend kan wees kan waardevolle buitelandse valuta ingeoes word.

Die mededingendheid van Kenya en Zimbabwe op internationale vlak bewys dat Afrika lande wel die potensiaal en vermoë het om te kompeteer in die Europese mark. Suid Afrika se mededingendheid in terme van ander uitvoerlande in Afrika kan as volg opgesom word: Suid Afrika het die voordeel van die mees gevorderde ekonomiese en fisiese infrastruktuur, die grootste en mees gesofistikeerde plaaslike blomindustrie en 'n goed ontwikkelde plaaslike mark met 'n groeikoers van ongeveer 19% per jaar. Die Suid Afrikaanse produsente

staar egter talle nadele in die gesig, soos hoë invoer tariewe in die Europese Unie, minder gunstige klimaat, hoër arbeidskoste, arbeidsonrus en die feit dat produsente oor 'n groot geografiese area versprei is wat organisasie en kollektiewe bedinging bemoeilik, 'n relatiewe groot plaaslike mark strem ook die druk op produsente om internasionale markte te ontgin.

Om sy volle potensiaal te bereik moet die Suid Afrikaanse blombedryf rekenskap hou met globaliseering en internasionale markte wat al hoe meer toeganklik raak. Suid Afrikaanse blomprodusente kan gevolglik sterker mededingendheid van internasionale produsente in die gesig staar. Die Australiese blombedryf is 'n voorbeeld van 'n nuwe en dinamiese mededinger waarmee Suid-Afrika moet rekenskap hou. Mededinging, veral ten opsigte van die bemarking van unieke inheemse blomme na teikenmarkte in Europa en Japan is besig om te verhoog. Die belangrikheid van die verhouding tussen hierdie twee lande word weerspieël in die feit dat Australië een van Suid-Afrika se vinnigste groeiende uitvoermarkte is en dat Suid-Afrika, Australië se tweede grootste invoerder van blomme is.

Die mededingendheid van die Suid Afrikaanse blombedryf verlang aandag met betrekking tot beleidsaspekte en fokus om sy lewensvatbaarheid te bevorder. Beleidmakers sal moet fokus op die gelykmaking van die speelveld, veral met betrekking tot subsidies en voordelige handelsooreenkomste wat dikwels Suid Afrika se mededingers bevoordeel, veral Sub-Sahara Afrikalande. Op industrievlak behoort op die skepping van "tyd-, plek- en vormnut" gefokus te word sodat produsente die verlangde kwaliteit en kwantiteit op die regte tyd en plek produseer en bemark.

ABSTRACT

A COMPETITIVENESS ANALYSIS OF THE SOUTH AFRICAN FLORICULTURE INDUSTRY by Ignatius Marthinus van Rooyen

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From an international perspective the South African flower industry is marginal. When comparing South Africa's domestic demand to that of 24 countries, South Africa is ranked last with an annual per capita consumption of approximately R3,04 per capita. In contrast Switzerland is ranked number 1 with a per capita consumption of R385,00. In terms of cut flower exports, South Africa is also performing marginally. Out of 20 countries, South Africa performed at number 17. Countries such as Israel - number 1; Chilli - number 5; Zimbabwe - number 6; Equador - number 8 and New Zealand - number 9 outperformed South Africa by far.

The high demand for South African flowers experienced in many international markets provide a sound basis for expanding international trade. Important reasons for this high demand are among others, the production season differential between South Africa and markets in the Northern Hemisphere and South Africa's unique floricultural bio-diversity. The competitiveness of Kenya and Zimbabwe in the international arena is also an indication that African countries have the ability and potential to compete in Europe. Compared to it's African competitors South Africa have a more advanced economic and physical infrastructure, the largest and most developed domestic flower industry and a highly developed domestic market with a growth rate of approximately 19% per annum over the past 5 years. However, the South African grower face numerous disadvantages such as high import tariffs in to the European Union, less favourable climatic conditions for flower production, higher labour costs, labour unrest, difficulty organising growers scattered over such a large geographic area, a lack of motivation to export and a good local market, but one with low standards that does not prepare growers to compete overseas.

Two major forces will have to be dealt with to fulfil the South African flower industry's full potential. These are related to the increasing globalisation and opening up of markets in the international trade. South African flower producers therefore expect to face increasing competition from producers elsewhere in the world. An example of a force that the South African flower industry have to contend with is the Australian flower industry. The Australian flower industry has made substantial progress in recent years. Competition especially with respect to the marketing of unique indigenous flowers to similar target markets in Europe and Japan are intensifying between these two countries. Australia is also one of South Africa's fastest growing export markets and South Africa has grown to the second largest importer of flowers to Australia which is a further implication of the significance of the relationship between South Africa and Australia.

The competitiveness of the South African flower industry should thus receive attention from policy and industry level to promote the viability in the industry. Policies should focus on leveling playing fields, especially in view of the subsidisation and preference trade agreements which often favour competitors, especially countries in Sub-Sahara Africa. Policies should also facilitate the promotion of technology to enable South African producers to compete cost effectively in international markets. At industry level the challenge should focus on the creation of "time, place and form" utility to provide markets with the required product at the required time and place.

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INTRODUCTION

1.1 Background and problem statement

A wide variety of cut flowers is grown and marketed by South African producers. These flowers include roses, chrysanthemums, carnations, gypsophila, asiatics, irises and indigenous cut flowers such as proteas, freesias, Guernsey lilies and gladioli. The South African cut flower industry is currently valued at R400 million and consists of approximately 420 ha of cultivated production areas and 20 000 ha of natural environment where varieties such as proteas, pincushions and ferns are harvested (Taschner, 1997b). South Africa has a large domestic demand for cut flowers and about 80% of the domestic production is sold through locally developed distribution channels such as the Multiflora auctions, wholesalers, florists, supermarkets and street vendors. The remaining 20% of cut flowers are exported, mainly to Germany and the Netherlands.

The Agricultural Research Council's Development Impact Analysis Group (ARC - DIA) is currently conducting a research programme to determine the impact of technical research and development on various agricultural industries. The flower industry was selected and researched in collaboration with the ARC – Roodeplaat's Vegetable and Ornamental Plant Institute. This institute is involved in technology development and transfer to serve the South African cut flower industry. The main question investigated in the research programme is: "What are the impact and contribution of the ARC – Roodeplaat's Vegetable and Ornamental Plant Institute?" Specific questions include the following:

- To what extent are the needs of the growers for information and technology satisfied by international and local sources (consultants, organisations, government, etc.)?
- What is the gap between the current and required information and technology?
- What is South Africa's position in the international flower industry?
- What is the impact of ARC - Roodeplaat on the South African flower industry?
- How willing are growers to form a group to fund technological development?
- What impact has new technology had during the past 5 years?

Two major studies have been conducted on the impact of technology development of the Proteaceae and Lachenalia (Wessels, Anandajayasekeram, Littlejohn, Martella, Marasas and Coetzee, 1997) as part of the ARC's impact assessment of the flower industry. This study is completed as a result of the request by the ARC-DIA as a third study on the economic aspects of the South African cut flower industry.

1.2 Objectives of this study

It was agreed that this study would focus on the following objectives:

- To contextualise South Africa's position in the international environment
- To assess growers' perceptions and marketing activities
- To identify producers' problems and discuss means of overcoming these problems
- To establish the extent to which South Africa and Australia are able to compete in the international flower industry
- To indicate the extent to which South Africa and Australia are able to compete with each other.

This study was extended to the Australian situation because of the substantial progress that the Australian flower industry has made, the increasing competition South African flowers could expect from Australia and also because the opportunity arose to study the Australian situation owing to a study exchange programme between the University of Pretoria in South Africa and the University of Queensland in Australia.

1.3 Methodology

The first methodology used in the analysis is the "Determinants of Competitive Advantage" as proposed by Porter (1990). In the application of this descriptive methodology, a general overview is given of the industry and the forces that influence a competitive advantage. The main aim of this approach is to lay a broad foundation for a further more detailed study.

Since this is only a descriptive analysis, the competitive position of the industries can be compared for the individual determinants. However, comparing the competitiveness of the industries by taking into account all the determinants would require a highly complex multi-criteria analysis which assigns weights to each industry's individual determinants. For the purpose of this study, it will be assumed that all the determinants have equal weight. This can be considered as a weakness and will decrease the validity of the results of this analysis, but this methodology can still provide some important insights into the competitiveness of these industries.

Owing to the weaknesses of the first-mentioned method, a methodology dependent on trade data was chosen to give further insights into the competitiveness of the industries. The Revealed Comparative Advantage model developed by Balassa (1989) determines the comparative advantage of industries when taking into consideration the relative importance of the industries in world trade and the relative importance of the industries as an export product of the respective countries. However, as this methodology only takes trade data into account and does not include domestic demand and supply, it cannot provide a balanced view of the competitiveness of the industries.

This led to the choice of a final methodology to give greater insight into the competitiveness of the industry from the perspective of commodity systems. The Policy Analysis Matrix (PAM) developed by Monke and Pearson (1989) analyses representative industry budgets for some of the main commodities in order to calculate the competitive and comparative advantage of the specific commodity systems.

To conclude, by employing these methodologies the study will attempt to establish and compare South Africa and Australia's capabilities for competing in the international flower industry. A general descriptive analysis will first be given as the basis for establishing these

capabilities. This will be followed by an analysis of the trade data available to establish the industries' ability to export and compete internationally. Finally an analysis at micro-level of flower systems will provide insight into the competitiveness of typical flower-producing and exporting businesses located in South Africa and Australia. Each analysis will provide a different viewpoint on the issue of competitiveness, and contribute to a greater understanding of the competitiveness of the South African and Australian flower industries – both industries in the southern hemisphere.

1.4 Scope of the study

The world floricultural industry consists of three subindustries, namely the flower industry, the foliage industry and the plant industry (IFTS, 1997). This study is restricted to the ambit of the flower industry.

The scope of this study includes two subindustries of the flower industry. The first is the cultivation of the traditional temperate flowers (flowers exotic to South Africa and Australia) that dominate commercial production and consumption throughout the world. Examples of the most popular traditional flowers produced in South Africa and Australia are roses, chrysanthemums, carnations, orchids, lilies, statice, alstroemeria, lisianthus, calla lilies, tulips, freesias and gypsophila (James, 1996). In the remainder of the study, these flowers will be referred to as traditional flowers.

The second subindustry consists of flowers derived from Australian and South African native plants (harvested in the wild and also artificially propagated). These flowers will be referred to as wildflowers in the remainder of the study. The study excludes Australian native orchids, sea grass and seaweed.

1.5 Framework of analysis and outline of the study

An analytical framework was developed within which the above objectives could be addressed. This framework is illustrated in Figure 1.1 Each of the elements in this framework will be described in detail in the subsequent chapters.

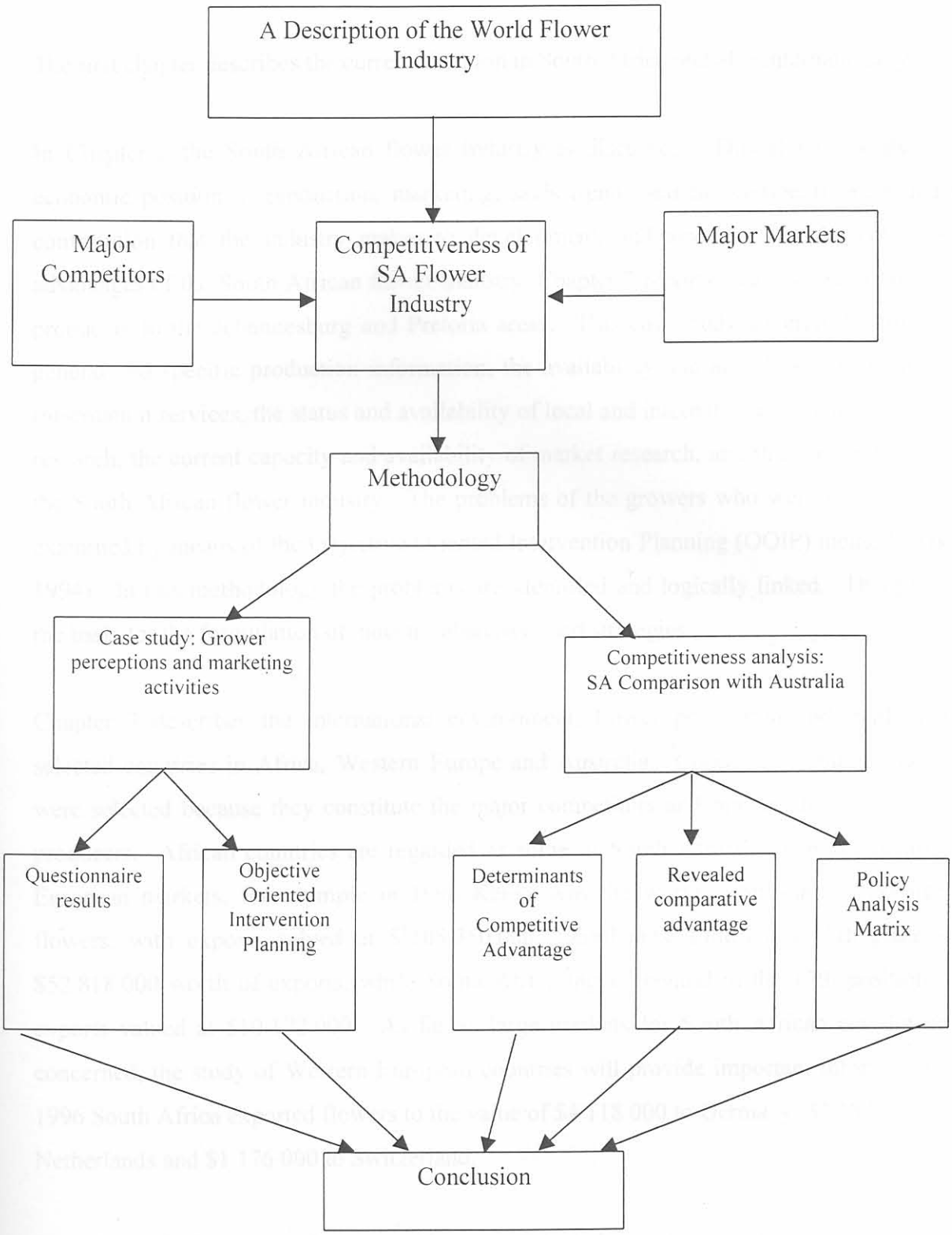


Figure 1.1: Analytical framework

The first chapter describes the current situation in South Africa and also internationally.

In Chapter 2 the South African flower industry is discussed. This chapter analyses the economic position of production, marketing, sales trends and the competitiveness and the contribution that the industry makes to development, and also assesses the comparative advantages of the South African flower industry. Chapter 2 reports a case study of cut flower producers in the Johannesburg and Pretoria areas. This case study covered the following: general and specific production information, the availability and actual use of research and information services, the status and availability of local and international technical production research, the current capacity and availability of market research, and the competitiveness of the South African flower industry. The problems of the growers who were interviewed are examined by means of the Objective Oriented Intervention Planning (OOIP) method (ABOS, 1994). In this methodology the problems are identified and logically linked. This provides the basis for the formulation of industry objectives and strategies.

Chapter 3 describes the international environment, flower production and marketing in selected countries in Africa, Western Europe and Australia. Countries on these continents were selected because they constitute the major competitors and markets for South African producers. African countries are regarded as some of South Africa's main competitors on European markets, for example in 1996 Kenya was the world's third-largest exporter of flowers, with exports valued at $[1]105 350 000. Zimbabwe followed in 7th place with $52 818 000 worth of exports, while South Africa lagged behind in the 17th position with exports valued at $10 172 000. As far as large markets for South African cut flowers is concerned, the study of Western European countries will provide important information. In 1996 South Africa exported flowers to the value of $4 118 000 to Germany, $3 182 000 to the Netherlands and $1 176 000 to Switzerland.

Then the study focuses on the competitiveness of the industry. Chapter 4 gives an overview of the theories formulated to address the issue of competitiveness and also introduces the methodology used in this study.

[1] In this study the $-sign will refer to the currency of the United States of America.

Chapter 5 gives an analysis of the South African flower industry's competitive position by applying the methodology to compare its position with that of Australia. Australia was included in this study because the rivalry between the South African and Australian flower industries has intensified in recent years. Australia has also attempted, through a research and development focus, to enhance the competitiveness of its flower industry.

The competitive interaction is visible firstly in the fact that both Australia and South Africa can produce a wide variety of increasingly popular indigenous flower varieties and compete for market share in the large world markets such as the EU, Japan and the USA. Second, Australia is probably South Africa's fastest-growing market and South Africa is Australia's second-largest supplier. Large quantities of roses, carnations and chrysanthemums valued at $730 000 in 1996 increased by almost 120% to $1 600 000 in 1997 (FECA, 1997). Thirdly, the South African and Australian flower industries have some similarities, such as geographical isolation from the major world markets, their size and the development stage of the respective industries. However, little attention has been given to understanding the nature of the competitiveness between the South African and Australian flower industries. This shortcoming gives rise to an opportunity to include in this study an analysis of the competitive position of the Australian flower industry compared to that of the South African flower industry.

The conclusions drawn are stated in Chapter 6.

CHAPTER 2
THE SOUTH AFRICAN FLOWER INDUSTRY

2.1 Introduction

This chapter analyses the structure and economy of the South African flower industry. Firstly, the major features of the South African flower industry are discussed, such as the products, growers, consumption, grower information systems and associations. Secondly, the South African indigenous flower industry (fynbos industry) is briefly described. Thirdly, the development contributions of the South African flower industry are discussed. Fourthly, the characteristics of the distribution system for flowers produced and flowers consumed in South Africa are noted. The final section of this chapter reports on a case study of the economic aspects of a few growers in the Pretoria and Johannesburg area.

2.2 The major features of the industry

Products

The South African cut flower industry consists of a wide variety of flowers including roses, chrysanthemums, carnations, gypsophila, asiatics, irises and indigenous cut flowers such as proteas, freesias, Guernsey lilies and gladioli. The South African cut flower industry is currently valued at approximately R400 million and consists of approximately 420 ha of production area and 20 000 ha of natural environment where proteas, pincushions and ferns are harvested (Taschner, 1997b).

Growers

Most of South Africa's 935 flower growers are located within 300 kilometres of Johannesburg and supply approximately 70% of their produce to the Multiflora auctions in Pretoria and Johannesburg. Large growers (with about 5 ha) dominate this sector in South Africa and they supply the local market and have been involved in floriculture for many decades. In the Cape region there are also a few hundred export-oriented protea growers. This group ranges from "growers" who pick from wild tracts of veld to farmers who cultivate irrigated, orchard-style plantations of selected varieties. Many protea growers are retired urban professionals engaging in a second career as hobby-farmers in the hills around Cape Town.

South Africa also has a small but increasing number of commercial farmers who are beginning to diversify into floriculture. Despite these farmers' stated intention of exporting, most of their production has been directed at the local market (Anseew, 1998; Malter, Reitenbagh, Jaffee and Lambada, 1996).

Consumption

From an international perspective the South African flower industry is still marginal. Out of 24 international countries, South Africa was ranked last with an annual per capita expenditure of approximately R3,78 on flowers (see calculation below). Switzerland was ranked first with a per capita expenditure of R385,00 per annum; Germany was ranked sixth with a per capita expenditure of just over R200,00 per annum; the Netherlands seventh with R170,14 per annum; Japan was ranked eighth; Britain fifteenth and the USA thirteenth, as illustrated in Table 2.1.

Table 2.1: Per capita flower expenditure projections

Country	Rank	Per capita expenditure			Projected Growth rate
		1993 (R)*	1995 (R)*	2000(R)*	
Switzerland	1	206,34	385,53	445,26	13%
Norway	2	213,58	238,92	302,27	21%
Finland	3		219,01	253,40	14%
Austria	4		206,34	235,30	12%
Belgium	5		177,38	217,20	18%
Germany	6	170,14	173,76	177,38	2%
Netherlands	7	152,04	170,14	184,62	8%
Japan	8		170,14	182,81	7%
Denmark	9		168,33	204,53	18%
Sweden	10		155,66	184,62	16%
Italy	11		126,70	132,13	4%
France	12		115,84	146,61	21%
United States	13	86,88	101,36	148,42	32%
Slovenia	14		79,64	121,27	34%
Great Britain	15	76,02	68,78	83,26	17%
Greece	16		59,73	90,50	34%
Spain	17		50,68	65,16	22%
Ireland	18		48,87	43,44	-1%
Portugal	19		43,44	65,16	33%
Hungary	20		28,96	36,20	20%
Croatia	21		28,96	39,82	27%
Czech Republic	22		25,34	38,01	33%
Poland	23		18,10	28,96	38%
South Africa	24		3,04		

* : 1995 as basis year

Source: Flower Council of Holland, Leyden, the Netherlands

According to various sources and opinions (Taschner, 1997b; Van der Meer, 1996) approximately 70% of the flowers produced in South Africa are distributed via the Multiflora auctions. The annual auction turnover for 1993 - 1997 is shown in Table 2.2 An increasing trend can be seen, with an overall growth rate of almost 100% over the past 5 years and an average growth rate of 19%. A gradual decrease in the growth rate can be seen from 1993 to 1996 and a sharp decrease to only 9% occurred in 1997. The significance of this sharp decrease on future sales still has to be seen.

If the above figures are taken into account it is possible to calculate the per capita consumption of South Africa's population of 41 244 000 (in 1995) with an average growth rate of 1,7% per year over the past 5 years (from 1991 to 1995) (AAS, 1998).

Table 2.2: Total fresh flower sales on Multiflora auctions

	1997	1996	1995	1994	1993
Total sales (R)	126 815 139	116 248 494	96 477 774	79 044 661	64 377 951

(a) Per capita consumption in 1995 = R 96 477 774 (auction turnover in 1995) + 30% (produce not distributed through Multiflora) / 41 244 000 (SA population)
= R 125 421 106 / 41 244 000
= R 3,04

Scientific information systems

South Africa has a good history of agricultural research and, as a result, data on general climate and soil have been collected in South Africa for many decades. This research information is used by some local floriculture advisers. Although scientific floriculture information systems are limited in capacity, the following institutions support the knowledge information system available to South African growers:

- the Agricultural Research Council (ARC) - Roodeplaat Diagnostic Centre, does research on (a) soil samples (b) identification of diseases (viruses, fungi and bacteria) and (c) pest identification (Niederwieser, 1997).
- Potchefstroom University is the only academic institution conducting significant floriculture research in the region. Some local technical advisers have contracts with the laboratory at Potchefstroom for the analysis of soil and plant samples.
- The University of Pretoria does not do any major research on cut flower production but distributes the information gathered by the ARC in lectures on plant production.
- Consultants: various consultants serve the industry.

Associations

Floriculture sector institutions in South Africa are mostly oriented towards the local market:

- *Multiflora*. About 660 South African growers in Johannesburg, Pretoria and the surrounding regions are members of the Multiflora auctions. The annual report from Multiflora is therefore a good indication of flower sales in South Africa. Multiflora auctions in Johannesburg and Pretoria are run strictly according to the Dutch clock system. Flowers are distributed from all the cities and villages in South Africa (Taschner, 1997a). The turnover at Multiflora auctions from 1/3/1995 to 28/2/1996 in Johannesburg was R95 million and in Pretoria R9 million. The past seven years show a growth in the auction turnover of between 15% and 20% per year (Anseew, 1998; Van der Meer, 1996).
- *The South African Flower Growers Association* concentrates on serving growers who primarily supply the domestic market.
- *The South African Protea Producers and Exporters (SAPPEX)* organisation is based in the Western Cape region and is the grower- and exporter-based sector organisation for the export-oriented protea industry. SAPPEX sponsors research, disseminates information and conducts trade promotion activities on behalf of the floriculture subsector specialising in proteas and other flora native to the Cape region.
- *Association for Cut Rose Growers in South Africa* serves its 170 members by supplying information about new production research that is published in international journals, and informing its members of marketing and market trends
- *Florimex*, the world's leading cut flower trading company, is owned by Dibrell Brothers, an American tobacco company, and has run export offices in Johannesburg and Cape Town for many years.
- *Gardenex*, a horticultural, agricultural and gardening exhibition, is held annually to promote the industry.

2.3 Fynbos

The indigenous flower industry in South Africa is botanically classified as Flora Capensis or Fynbos Biome. Flora Capensis is a gene pool of flowers such as freesias, Guernsey lilies and gladioli. Protea cut flowers are regarded as the backbone of the indigenous flower industry. This industry originated in the Western Cape area, when harvesters from disadvantaged communities started picking flowers from their natural habitat, the veld, and selling them on the flower markets and streets of Cape Town. The economic potential of fynbos was soon realised and after the first exports of Proteaceae in 1960, the industry developed into a considerable horticultural export industry with a continuous demand for the species

throughout the season. An estimated 2 500 metric tons of fresh material is currently exported each year. The value of the industry was estimated at approximately R81,7 million in 1997 and about 700 producers employ more than 4 000 people (Wessels *et al.*, 1997).

The wildflower market consists of fresh and dried products: fresh flowers represent 60% (R32,7 million) of the market and dried flowers 40% or R48,85 million. Exports of wildflowers were valued at approximately R60 million in 1996 when fresh wildflowers valued at approximately R33,5 million were exported and R14,5 million were sold on the local markets. Of the dried flowers marketed, only 20% (R6,48 million) were marketed domestically and 80% (R26,3 million) were exported. These figures are shown in Figure 2.1. According to Wessels et al.(1997) 90% of the exports are channelled to Europe and the rest to Japan and the USA. Among the European countries, the Netherlands is the largest importer (60%) followed by Germany (25%).

The quantities of flowering proteas in South Africa increase from May onwards and reach a peak during the South African winter and early spring. This, however, does not coincide with the European demand, which is highest during the European winter (November to March).

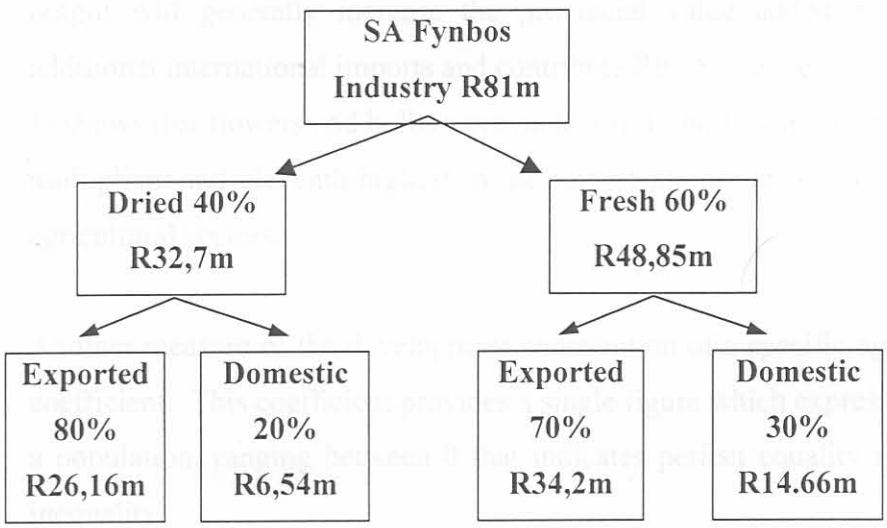


Figure 2.1: SA wildflower industry
Source: Wessels *et al.*, 1997

The domestic market is often used for wildflowers that are not suitable for export. The best quality products are usually exported to compete on the international markets. The most

important domestic sales points are Multiflora auctions, florists and other retail selling points, street markets, road stalls and chain stores (Wessels *et al.*, 1997).

2.4 Development contributions of the SA flower industry

Flower production is a capital, management and labour intensive agricultural industry. A recent study conducted in the Western Cape Province, gives an interesting perspective on the significance of this sector. The Western Cape Department of Agriculture and the Development Impact Analysis Unit of the ARC conducted this study. Fixed price multipliers (FPM) for employment, value added, imports and government revenue were used as variables in an agricultural social-accounting matrix describing the contribution of different agricultural industries and commodities in the Western Cape (Eckert, Liebenberg and Trotskie, 1997).

The FPM values for flowers and bulbs in Table 2 (Annex 1) can be explained as follows: The employment figures indicate that 114,4 person years of employment are created from a R1 million increase in additional final demand. The value added, imports and government revenue columns indicate the ratio of the expected change in the value for a given change in final demand. Therefore, every R1,00 of additional demand for the agricultural sector's output will generally increase the provincial value added by R1,45, require R0,40 of additional international imports and contribute R0,25 to government revenue. Table 3 (Annex 1) shows that flowers and bulbs were ranked sixth-highest in the employment and value added multipliers and eleventh-highest in the import multipliers of both the agricultural and non-agricultural sectors.

Another measure of the development contribution of a specific agricultural sector is the Gini coefficient. This coefficient provides a single figure which expresses the level of inequality in a population, ranging between 0 that indicates perfect equality and 1 that indicates perfect inequality.

Every sector in the economy contributes to household incomes with different levels of inequality in distribution. The flowers and bulbs sector has a relatively low Gini coefficient of 0,384 indicating relative equality in the distribution of household incomes. The flower and bulb sector's Gini coefficient was ranked fourth best among both the non-agricultural and agricultural sectors in the Western Cape.

In this study the Gini coefficient is an indicator of the extent to which a change in the final demand of an industry or sector will impact on the equality of the incomes generated. As such, the flower and bulb industry ranks forth in terms of its impact on equalising income distribution. In other words, a greater share of the income generated from increased final demand reaches the poorer sections of the households in the Western Cape. The coefficient also to some extent is indicative of the low wages paid to workers in the industry.

The Western Cape Agricultural Social Accounting Matrix (WCAGRSAM) ranked the different agricultural and non-agricultural sectors in the Western Cape according to their contribution to development on the basis of the FPM and Gini coefficients, shown in Table 3 (Annex 1). Flowers and bulbs were ranked the third-highest contributor to development. The development contribution of fynbos in the Western Cape can be derived from the WCAGRSAM done by Eckert et al. (1997).

In this study, the fynbos sector was ranked the ninth-highest contributor to development out of 48 sectors. The employment multiplier was ranked 28th, the value-added multiplier 4th, the import multiplier 5th and the Gini coefficient of 0,456 was ranked 15th. This also shows that the fynbos industry is an efficient contributor to economic development.

A summary of the study by Eckert et al. (1997) indicates that flower production plays a surprisingly significant role in the Western Cape's economy and it can be assumed that the contribution of the industry has a similar effect in the rest of South Africa. It is therefore assumed that flower production is ranked as one of the most efficient contributors to development and growth in the South African economy, so it can be concluded that the flower industry can make a major contribution to economic growth, redistribution and development in South Africa.

2.5 Distribution

Structure

The findings of a study by Anseew (1998) are highlighted as they give a good indication of a typical flower distribution structure in South Africa. This study identified different distribution channels in the flower market. The main role players in these channels are: flower growers, Multiflora auctions (the main link in the distribution channel), export and import agents, wholesalers, garages, street vendors, supermarkets, vegetable shops, and florists. These role players are all interlinked in the process of getting the cut flowers to the consumer. These interlinked channels and different role players are illustrated in Figure 2.2.

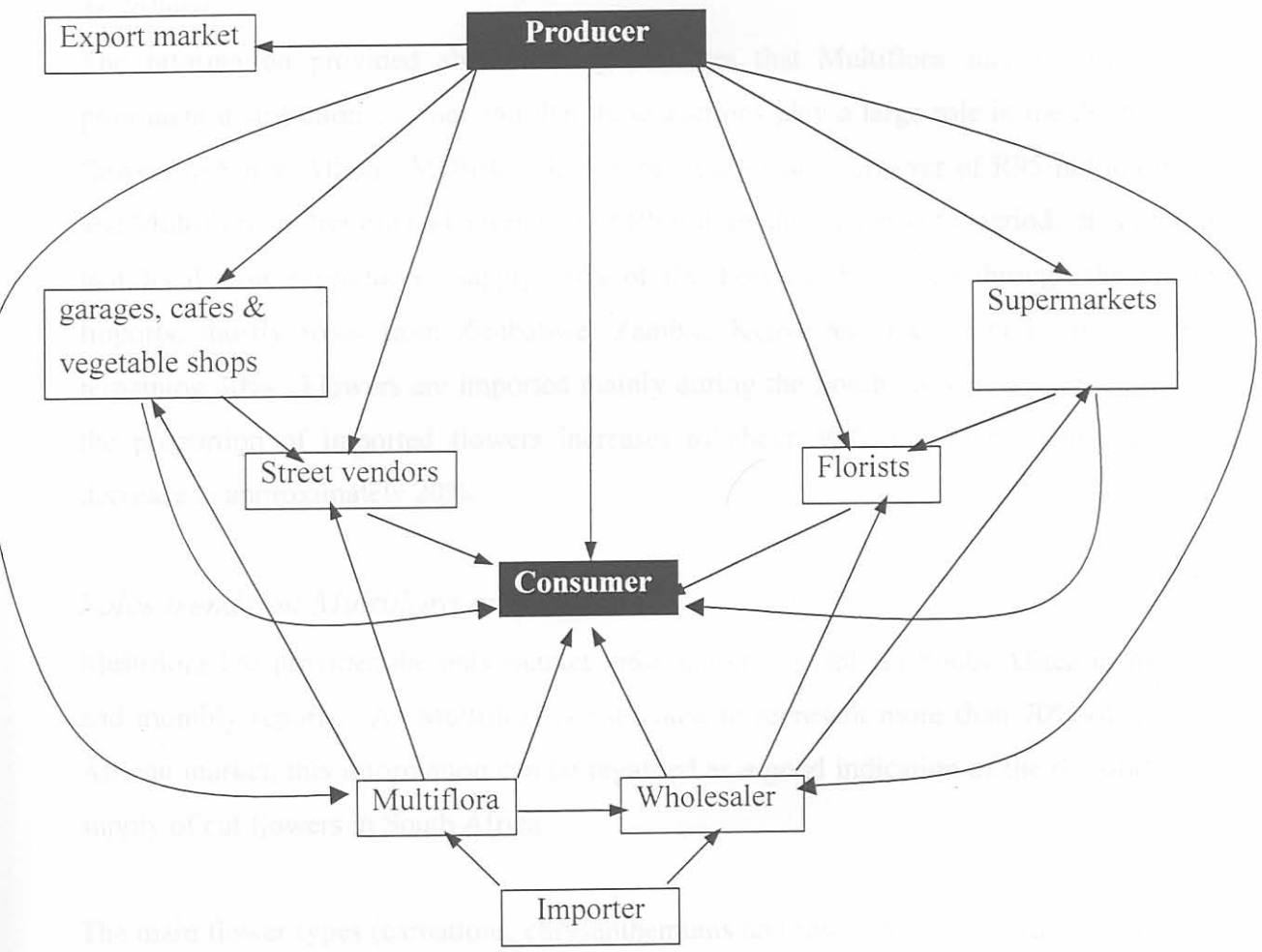


Figure 2.2: Flow chart of possible distribution channels

Source: Anseew (1998)

The findings of a study (see 2.6 below) conducted on a sample of farmers in the Pretoria and Johannesburg area, indicate that approximately 60% of growers sell their produce at

Multiflora auctions, 15% supply directly to wholesalers and retailers, 13% export through an agent and 10% cut out the middleman and export directly. Information from other sources indicates the following. According to Van Der Meer (1996) 60% of produced cut flowers is distributed through Multiflora auctions, 30% through other domestic channels (in the same article a contradictory statistic of 40% is given, calling the credibility of the source into question) and 10% is exported. Taschner (1997a) estimates that 70% of South African produced cut flowers are sold via the auctions and the rest directly to wholesalers, florists and the public.

Role players

Multiflora

The information provided above clearly indicates that Multiflora auctions are the most prominent distribution channel and that these auctions play a large role in the distribution of flowers in South Africa. Multiflora in Johannesburg had a turnover of R95 million in 1995 and Multiflora in Pretoria had a turnover of R9 million during the same period. It is estimated that local flower producers supply 70% of the flowers channelled through the auctions. Imports, mostly roses from Zimbabwe, Zambia, Kenya and the Netherlands, supply the remaining 30%. Flowers are imported mainly during the South African winter season when the proportion of imported flowers increases to about 40%, but in the summer imports decrease to approximately 20%.

Sales trends on Multiflora auctions

Multiflora Ltd provides the only market information available in South Africa in its annual and monthly reports. As Multiflora is estimated to represent more than 70% of the South African market, this information can be regarded as a good indication of the demand for and supply of cut flowers in South Africa.

The main flower types (carnations, chrysanthemums and roses) sold on Multiflora auctions in Johannesburg and Pretoria are shown in Figure 2.3 and Figure 2.4 respectively. The trends of Multiflora auctions in Johannesburg are analysed in Figure 2.3 and indicate the following: During the 1992/93 season, carnations topped the sales with a 24% share of the total value of Multiflora sales, chrysanthemums and roses followed with 18% and 11% respectively. During 1993/94 the percentage of carnations and chrysanthemums sold declined slightly

although sales of roses remained stable. From the 1994/95 to the 1995/96 season, sales of roses and chrysanthemums increased but sales of carnations decreased even more rapidly. During the 1996/97 season roses increased their share of sales to 19% of the total auction value, surpassing carnations (14%) and chrysanthemums (18%) and turning the whole picture around. Figure 2.4 shows the main flower types sold at Multiflora Pretoria, where carnations, chrysanthemums and roses each recorded an 18% share of the total value during the 1992/93 season. Over the next four-year period until the end of the 1996/97 season, sales of roses increased their market share to almost 24% while sales of chrysanthemums remained relatively constant with a share of 19%. By contrast, sales of carnations decreased their market share to below 12% of the total auction value.

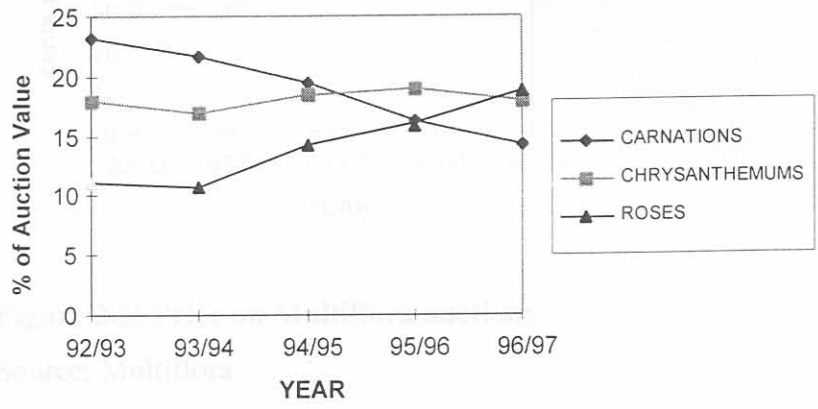


Figure 2.3: Multiflora Johannesburg: Performance of the main flower types

Source: Multiflora

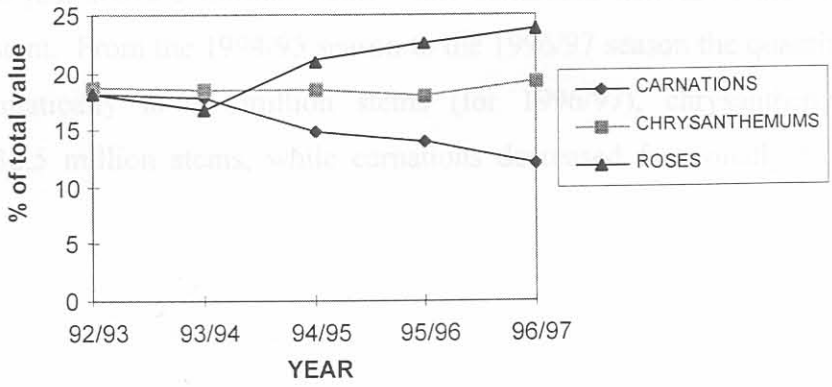


Figure 2.4: Multiflora Pretoria: Performance of the main flower types

Source: Multiflora

Prices for the three main flower types on Multiflora auctions are illustrated in Figure 2.3. All of the prices show an increasing trend from the 1992/93 to the 1996/97 season. Chrysanthemums remained the highest-priced flowers per stem, increasing from 42c per stem in 1992/93 to 66c per stem in the 1996/97 season. Carnations increased from 40c per stem to 54c per stem and roses increased from 32c to 46c per stem during the same period.

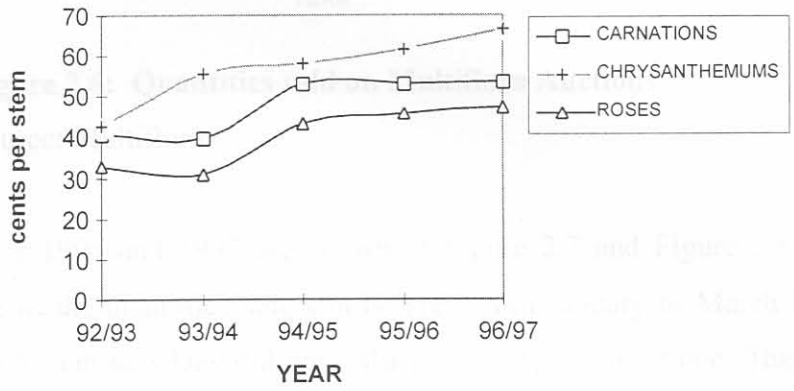


Figure 2.5: Price on Multiflora auctions

Source: Multiflora

Figure 2.6 illustrates the quantities of carnations, chrysanthemums and roses sold on the Multiflora auctions. During the 1992/93 season carnations recorded the highest quantity sold 32,5 million stems, with chrysanthemums in the second place with just below 25 million stems and roses with just above 20 million stems. During the 1993/94 season roses dropped dramatically to just above 5 million stems while carnations increased and chrysanthemums remained constant. From the 1994/95 season to the 1996/97 season the quantity of roses sold increased dramatically to 75 million stems (for 1996/97), chrysanthemums increased gradually to 32,5 million stems, while carnations decreased fractionally to just above 30 million stems.

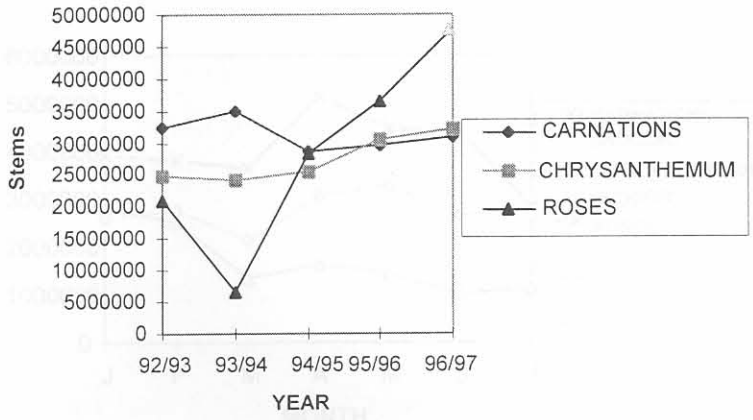


Figure 2.6: Quantities sold on Multiflora Auctions

Source: Multiflora

Monthly trends for 1996 and 1997 are shown in Figure 2.7 and Figure 2.8. A generally consistent decline in the quantities sold can be seen from January to March (even the high quantities sold on Valentine's Day did not influence the decreasing trend. This indicates that consumers decreased their expenditure on flowers before and after Valentine's Day, causing a constant or even a declining trend). Sales reach a low point in March and tend to increase during April, when sales of roses and chrysanthemums tend to increase quite rapidly. In 1996 (Figure 2.7) there was a decreasing trend from April to August and a sharp increase from September to October, followed by a decrease in November.

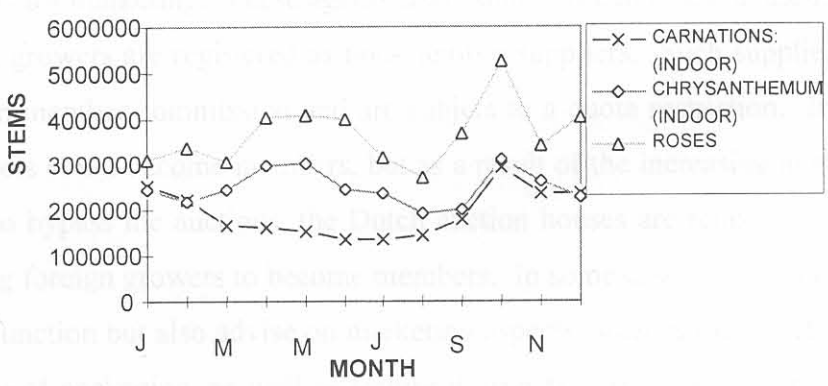


Figure 2.7: Quantities sold on Multiflora auctions (Jhb & Pta) 1996

Source: Multiflora

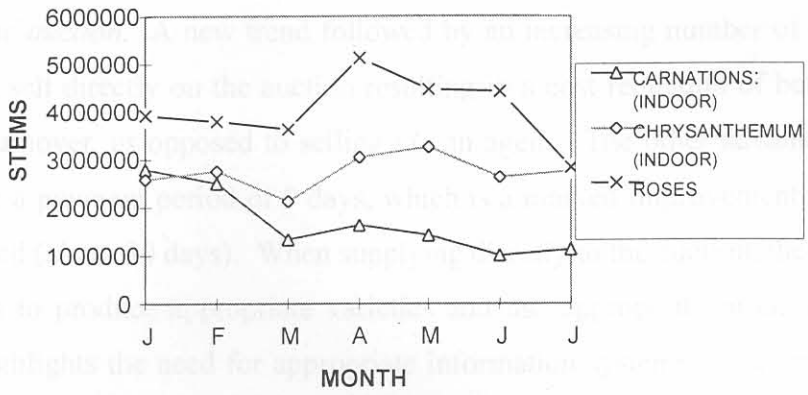


Figure 2.8: Quantities sold per month on Multiflora auctions 1997 (Jhb & Pta)
Source: Multiflora

2.6 Flower export market

Taschner (1997b) states that there is definitely a market for South African cut flowers, especially for roses, in Europe, the Middle East and the Far East. However the future success of the South African cut flower industry will depend on the correct utilisation of the available distribution channels. The most significant export channel for cut roses is the Dutch auctions, as these auctions serve suppliers and traders from around the world, and the prices established there influence the prices on markets worldwide. The grower can reach the Dutch auction either via an agent or directly:

- *Reaching the auction via an agent*. A number of South African growers previously utilised Dutch agents for marketing. These agents sold South African roses on the Dutch auctions, where these growers are registered as non-member suppliers. Such suppliers are required to pay a non-member commission and are subject to a quota restriction. In the past only Dutch growers could become members, but as a result of the increasing number of foreign growers who bypass the auctions, the Dutch auction houses are relaxing their restrictions and allowing foreign growers to become members. In some cases, agents not only perform the selling function but also advise on marketing aspects, such as the varieties to be grown and the type of packaging, as well as technical aspects. Another advantage of exporting via an agent is that the agent can combine shipments from different growers to reduce unit costs. These agents usually charge a commission of between 7% and 10% and pay the grower after about 30 days. However, South African growers are increasingly utilising other export channels where they can bypass the agent and eliminate the commission paid

to the agent. As a result of this trend, new distribution channels have been developed and some agents have ceased operating in South Africa.

- *Directly to the auction.* A new trend followed by an increasing number of South African growers is to sell directly on the auction resulting in a cost reduction of between 7% and 10% of the turnover, as opposed to selling via an agent. The other advantage is that the auctions have a payment period of 5 days, which is a marked improvement on the agent's payment period (about 30 days). When supplying directly to the auction, the onus is on the local growers to produce appropriate varieties and use appropriate production practices. This point highlights the need for appropriate information systems. The option of selling directly on the auctions is considered viable for the grower, or group of growers, who can obtain a licence from an auction house.
- *To wholesalers via an agent.* The major advantage of bypassing the auctions is the saving in auction costs, but a commission of between 4% and 10% of the turnover would still need to be paid to the agent. The agents are usually based in the Netherlands and they often direct the flowers to a wholesaler based in a different country. The advantage of dealing via an agent is that some of the price fluctuations can be avoided, since prices can sometimes be negotiated in advance. The disadvantage is that eliminating the auction as a reputable intermediary entails greater risk.
- *Exporting directly to the consumer country.* Many distribution channels involve selling from South Africa via the Netherlands, possibly to a third country. Therefore selling directly to wholesalers (or even retailers) through an agent that typically charges between 15% and 20% of the turnover can reduce distribution cost (mark-ups, handling and transport costs). Some South African growers make use of other South African based growers who have associates mainly in Eastern Europe. Dealing with these locally based agents has the advantage that prices can be fixed and quality determined before exporting.
- *Bypassing the agent.* Bypassing the agent and selling directly to the trader means that growers can shorten the distribution channel and increase their prices, but this will increase the risk because the growers do not have a foreign representative if a dispute arises about quality and price (IDC, 1996).

Table 2.3: South African flower export trends on major markets ($'000)

Export destination	Year	All flowers	Roses	Carnations	Treated flowers	Chrysanthemums	Other flowers
Denmark	1993	1			1		
	1994	62	40	9	13		
	1995	58	16	13	29		
	1996	71	24				47
France	1993	297	5		117		175
	1994	397	20		154		223
	1995	449	21		221		207
	1996	446	6		89		351
Germany	1993	4 612	128	3 251	1 090	124	19
	1994	4 203	76	2 900	1 148	68	11
	1995	4 862	59	3 430	1 345	26	2
	1996	4 118	3		1 543	3	2 569
Netherlands	1993	2 152	2		156	32	1 962
	1994	2 479	324		195	18	1 942
	1995	3 062	350		443	29	2 240
	1996	3 182	442		281	2	2 212
Italy	1993	890	45		106		739
	1994	853	15		101		737
	1995	816	24		122		670
	1996	673	9		102		562
UK	1993	332					
	1994	562					
	1995	694					
	1996	378					
Switzerland	1995	1 482					
	1996	1 176					
USA	1995	1 046					
	1996	1 239					
Japan	1995	2 131					
	1996	1 946					
Belg/Lux	1995	305					
	1996	161					
Spain	1995	48					
	1996	100					
Sweden	1996	171					

Source: IFTS, 1997

The above trade statistics indicate clearly that the value of flower exports is increasing steadily from year to year. This trend is illustrated in Figure 2.9. In 1994, 1995 and 1996 South Africa exported flowers to the value of $11 71 000, $12 609 000 and $13 357 000 respectively.

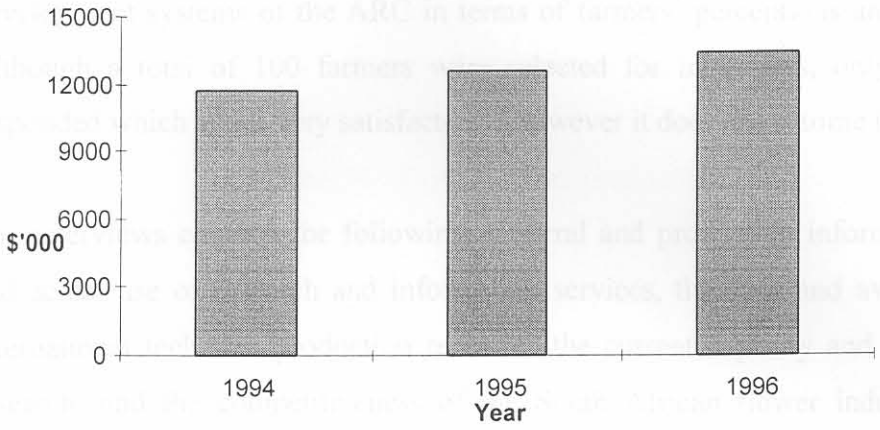


Figure 2.9: SA flower exports

Source: IFTS, 1997

This increasing trend may look promising but in comparison with the rest of the world, South Africa is losing ground. For example in 1993 and 1994 South Africa was ranked the 15th largest cut flower exporter in the world, but in 1995 and 1996 this position deteriorated to 17th place. South Africa's share of world exports is also deteriorating. In 1994 South African flower exports made up 0,412% of world flower exports, but in 1995 this decreased to 0,3748% and the slight rise to 0,3796% in 1996 will not make much impression on the current downward trend. From the export statistics (see Table 2.3) it seems that there is a growing market for South African flowers in the USA, UK, the Netherlands, France and Denmark. These growing markets will probably present more opportunities to South African exporters of flowers than markets such as Japan, Switzerland, Italy and Germany which are currently showing a decreasing trend.

2.7 A case study of flower growers in the Johannesburg / Pretoria area

2.7.1 Introduction

This case study reports on an investigation of cut flower producers during October 1997 in the Johannesburg/Pretoria area. The objective was to assess the technology, research and development systems of the ARC in terms of farmers' perceptions and marketing activities. Although a total of 100 farmers were selected for interviews, only a small number (7) responded which is not very satisfactory. However it does show some interesting perceptions.

The interviews covered the following: General and production information, the availability and actual use of research and information services, the state and availability of local and international technical production research, the current capacity and availability of market research, and the competitiveness of the South African flower industry. (A copy of the questionnaire developed with the aid of ARC - Roodeplaat appears in Annex 5.) The results of these questionnaires are discussed in section 4.3. In section 4.4. the farmers' problems are identified and logically linked together by using the Objective Oriented Intervention Planning (OOIP) method (ABOS, 1994). This procedure provides the basis for formulating objectives and strategies.

2.7.2 Production

Total cut flower production in South Africa is currently valued at an estimated R400 million produced from approximately 420 ha of protected area and 20 000 ha of the natural environment where cut flowers are harvested in their natural state. Roses generally dominate the markets, followed by chrysanthemums and carnations. The following information is typical of the industry:

- 45% of the production area is unprotected, 27% under shade netting, 16% in greenhouses with natural ventilation and 12% with fan ventilation (as illustrated in Figure 2.10).

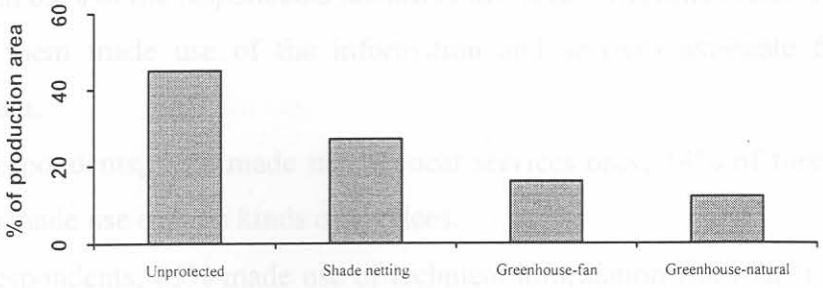


Figure 2.10: Production practices

- Figure 2.11 shows that 59 % of the total production area is utilised for roses, 13% for carnations and 25% for chrysanthemums.

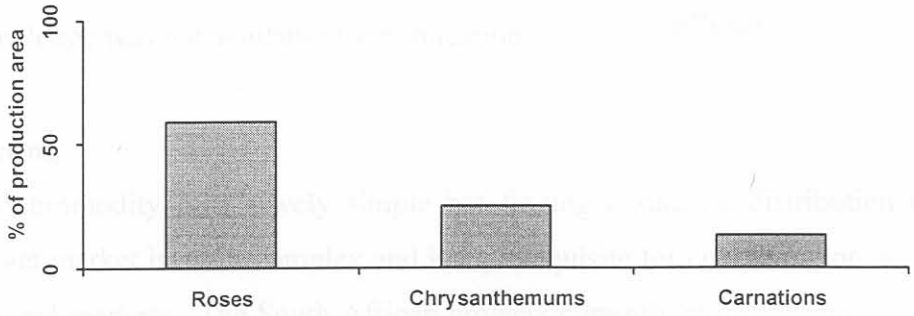


Figure 2.11: Flower types

- The growers have on average more than 33 years of experience in growing flowers for cutting.
- The average size farm is 4,5 ha.
- Growers employ approximately 16 full-time and 3 part-time labourers per hectare.

Growers have to keep informed about the latest research and scientific development so that they can remain competitive and meet the ever-increasing demands for quality and quantity.

2.7.3 Research and information services

South Africa's scientific floriculture research and information systems are currently constrained by their lack of capacity. Government support is limited and producers are not yet sufficiently mobilised to contribute significantly. The following interesting statistics about research and development were obtained from the study:

- All respondents make use of research and information services.
- More than 85% of the respondents identified the need for formalised research but less than 60% of them made use of the information and services available from the ARC – Roodeplaat.
- Of the respondents, 42% made use of local services only, 14% of foreign services only and 57% made use of both kinds of services.
- Of the respondents, 85% made use of technical information from input distributors, 14% of an export agent and 71% of private consultants.
- Growers spent an average of R5 571 (per capita) per year on these services and R8 285 (per capita) on their own (self-conducted) research (time + expenses).
- Of the respondents, 60% stated they were willing to make available for publication such information and the knowledge they had accumulated, but the remaining 40% stated that their knowledge was not available for publication.

2.7.3 Marketing

Producing a commodity is relatively simple but finding a suitable distribution channel to reach the target market is more complex and is a prerequisite for competing on both the local and international markets. The South African growers currently still focus on the production side rather than on marketing. This is apparent in the lack of developed distribution channels available (especially export channels) to the growers. The following confirm the lack of attention paid to aspects of marketing:

- Only 42% of the growers had embarked on some form of market research.
- Less than 60% of the growers had identified the need for formal market research.
- More than 50% of the production area was reserved for producing cut flowers to be distributed through Multiflora, 16% of production was exported through an agent, 6% exported directly, 12% sold to local wholesalers and 11% directly to the public.

South Africa could and should improve its competitive position in international floriculture by creating a strong marketing and production infrastructure.

2.7.5 View's on the competitiveness of the industry

This final section summarises the factors that flower growers identified as adversely affecting their competitiveness individually and the extent to which these factors influence the competitiveness of the South African flower industry as a whole. These findings are illustrated in Figure 2.12 giving values ranging between 0 and 3, where a low value indicates a weak negative influence and a high value indicates a strong negative influence on competitiveness.

The respondent growers stated that labour problems such as low productivity and high wage rates, which scored 2,4 and 2,5 respectively, had the greatest negative effect on South Africa's competitiveness compared with other African countries. The availability of affordable credit scored a 2 indicting the strong negative effect that this factor has on competitiveness. Limited affordable credit is followed closely by unfavourable climate (1,63); ineffective information services (1,5); lack of research support (1,25); and the high cost of plant material (1,13). The remaining factors scored values below 1 indicating a small negative effect on competitiveness, namely timely delivery of input materials (0,87); currency exchange rate (0,86); transport costs (0,85); availability of new varieties (0,57); cost of information (0,5); inefficient domestic markets (0,38).

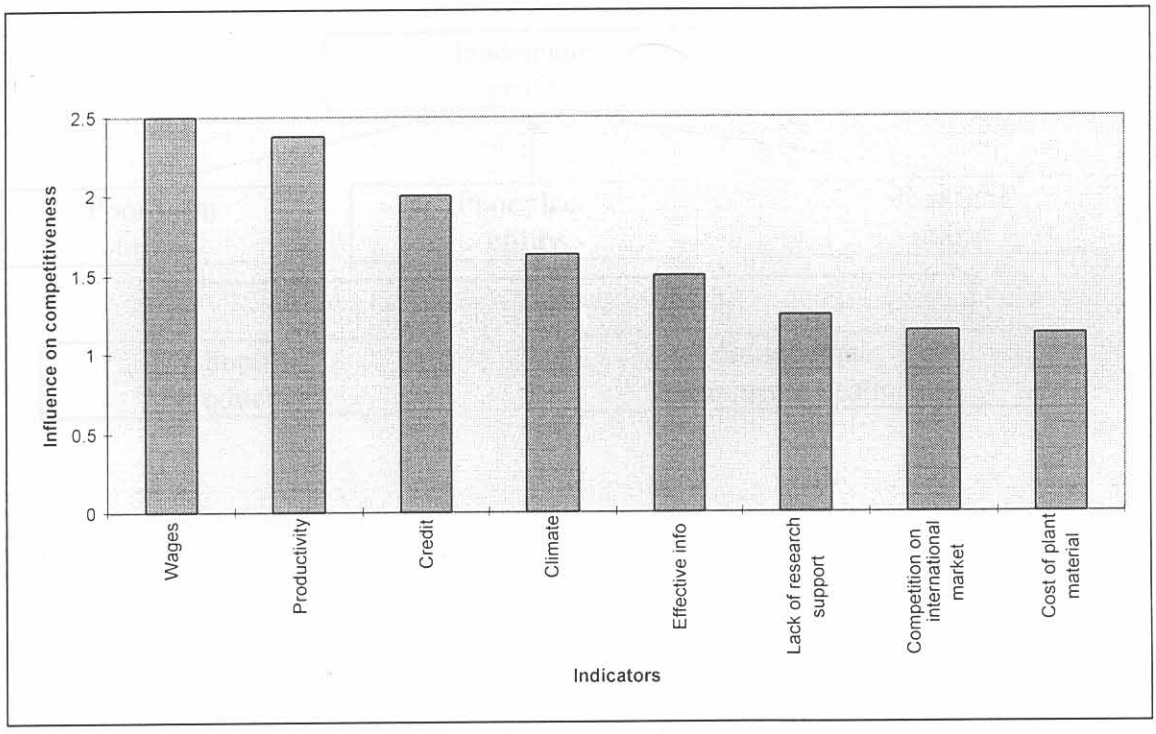


Figure 2.12: Competitiveness indicators according to producer perceptions

2.7.6 Strategic analysis: problems, objectives and strategies

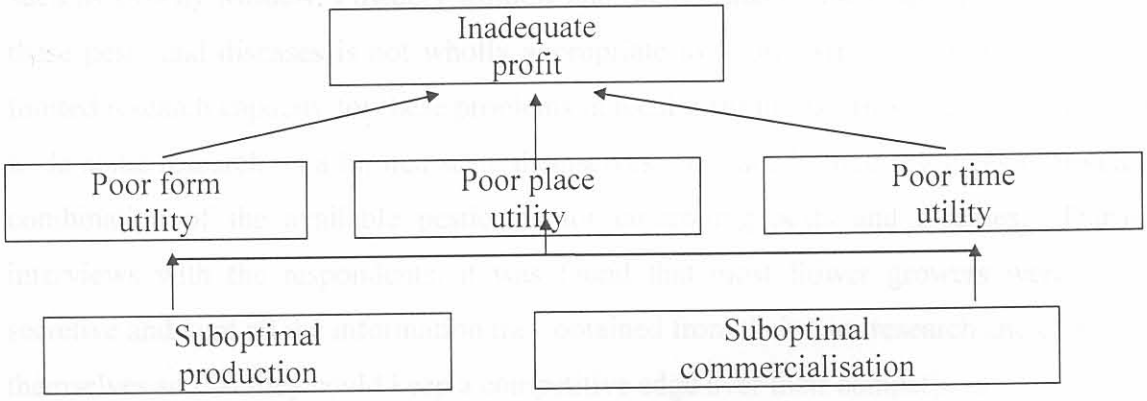
In the strategic analysis, the information obtained from the growers and correlated with expert opinions is analysed according to the Objective Oriented Intervention Planning (OOIP) method (ABOS, 1994). The first step determines the logical sequence of problems (or negative states) as expressed by the growers interviewed. This sequence is depicted by means of a "problem tree". This is used to reverse the negative states into positive actions which become the objectives for strategic interventions (objective tree). The grouping of objectives and related activities provides the framework for the different strategies.

2.7.6.1 Problems identified by growers of cut flowers

Commercial cut flower production (Described in Problem Tree 1)

Low profits seem to be the main problem among growers of cut flowers in South Africa. This is linked to the poor utilisation of form, place and time utility. In turn, suboptimal production and suboptimal commercialisation lead to poor form, place and time utility.

Problem Tree 1 - Commercial cut flower production



Suboptimal production (Described in Problem Tree 1.1)

Production was generally considered to be suboptimal in terms of elements that sustain high-quality farming practices. The major reasons for this suboptimal production are given below.

Inefficient management of labour

Wages in South Africa are much higher than those in other African countries that produce and export cut flowers. South Africa has to be able to compete with these countries on the South African and the European markets. To become more competitive, South African growers will have to maximise labour productivity through longer and intensified working hours but this could cause dissatisfaction among the workforce. The wages of uneducated farm workers are generally lower than the wages of uneducated urban workers. Since most of the flower farms are close to an urban centre, the labourers can relatively easily find urban work and leave the farm work. Therefore if the labourers are dissatisfied with the wages or the long hours needed to meet productivity requirements, it is easy for them to resign and work elsewhere.

Inappropriate disease and pest control

Farmers identified the lack of appropriate chemical fungicides and pesticides that would prevent and control insects or diseases, in particular pests such as Red Spider and diseases such as Downy Mildew, Powdery Mildew and Stem Canker. International research done on these pests and diseases is not wholly appropriate to South African conditions and there is limited research capacity for these problems in local institutions. However, the farmers do try to do some research on a limited scale themselves, but have limited resources to find a better combination of the available pesticides for controlling pests and diseases. During the interviews with the respondents, it was found that most flower growers were extremely secretive and kept all the information they obtained from their own research and experience to themselves so that they could keep a competitive edge over their competitors.

Weak knowledge base

Production technology is imported mainly from Europe and is then adjusted by consultants, growers, input suppliers and institutions to make it more suitable to South African conditions. This technology increases productivity but producers have to realise that this technology was developed under vastly different conditions than those experienced in South Africa. The main problems with the European technology are –

- comparatively adverse weather conditions;

- limited arable land available; and
- the high cost of labour.

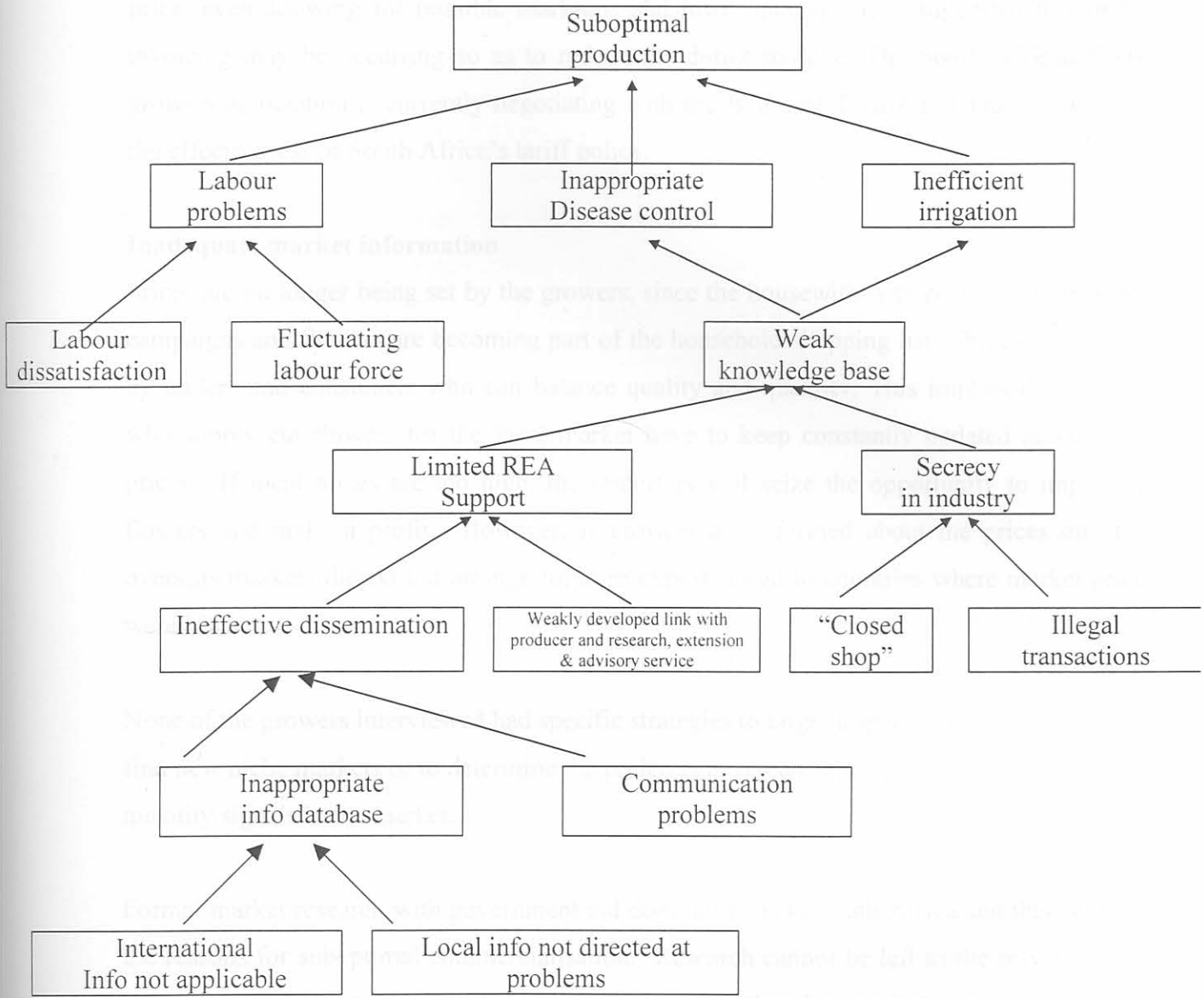
In Europe these problems encourage technological innovations that can mitigate the effect of bad weather conditions on flower production and restrict the number of labourers required, in other words they will lead to the development of capital-intensive technology.

By contrast, labour is relatively cheap in South Africa and weather conditions are more favourable than in Europe, therefore South Africa will demand more labour-intensive technological innovations.

Secrecy in the cut flower industry

South African producers see one another as competitors instead of colleagues. Secrecy in the industry gives local growers a competitive edge over their domestic rivals, but will reduce the competitiveness of the South African flower industry on international markets. By working together and sharing their knowledge, South African farmers could find ways to cut their production and transport costs and optimise their production practices so that they would eventually become far more competitive on international markets.

Problem Tree 1.1. - Suboptimal production



Suboptimal commercialisation (described in Problem Tree 1.2)

Unfair international competition

The Lomé Convention implies that developing countries can gain duty-free access to the European Union, yet South Africa has to pay an 18% tariff from 1 June to 30 October and a 12.7% tariff from 1 November to 31 May.

South African growers also face unfair competition from African imports. A duty of 20% is levied on cut flower imports to South Africa. A rough calculation based on import statistics indicates an average import price of R0,15 per stem, i.e. about one-third of the Multiflora price, even allowing for possible mark-ups and lower quality. It is suggested that under-invoicing may be occurring so as to reduce the duties payable. The South African flower growers association is currently negotiating with the Board of Tariffs and Trade to increase the effectiveness of South Africa's tariff policy.

Inadequate market information

Prices are no longer being set by the growers, since the housewife is targeted by promotional campaigns and flowers are becoming part of the household shopping list. Prices are now set by traders and consumers who can balance quality and quantity. This implies that growers who supply cut flowers for the local market have to keep constantly updated about world prices. If local prices are too high, the importers will seize the opportunity to import cut flowers and make a profit. However, if growers are informed about the prices on other overseas markets they could arrange for their exports to go to countries where market prices were highest.

None of the growers interviewed had specific strategies to target a specific market segment, to find new niche markets or to determine the preferences of consumers, except for the price and quantity signals in the market.

Formal market research with government aid does not exist in South Africa and this is one of the reasons for suboptimal commercialisation. Research cannot be left to the private sector, since research is generally regarded as a public benefit rather than a private gain.

Relatively high wage rate

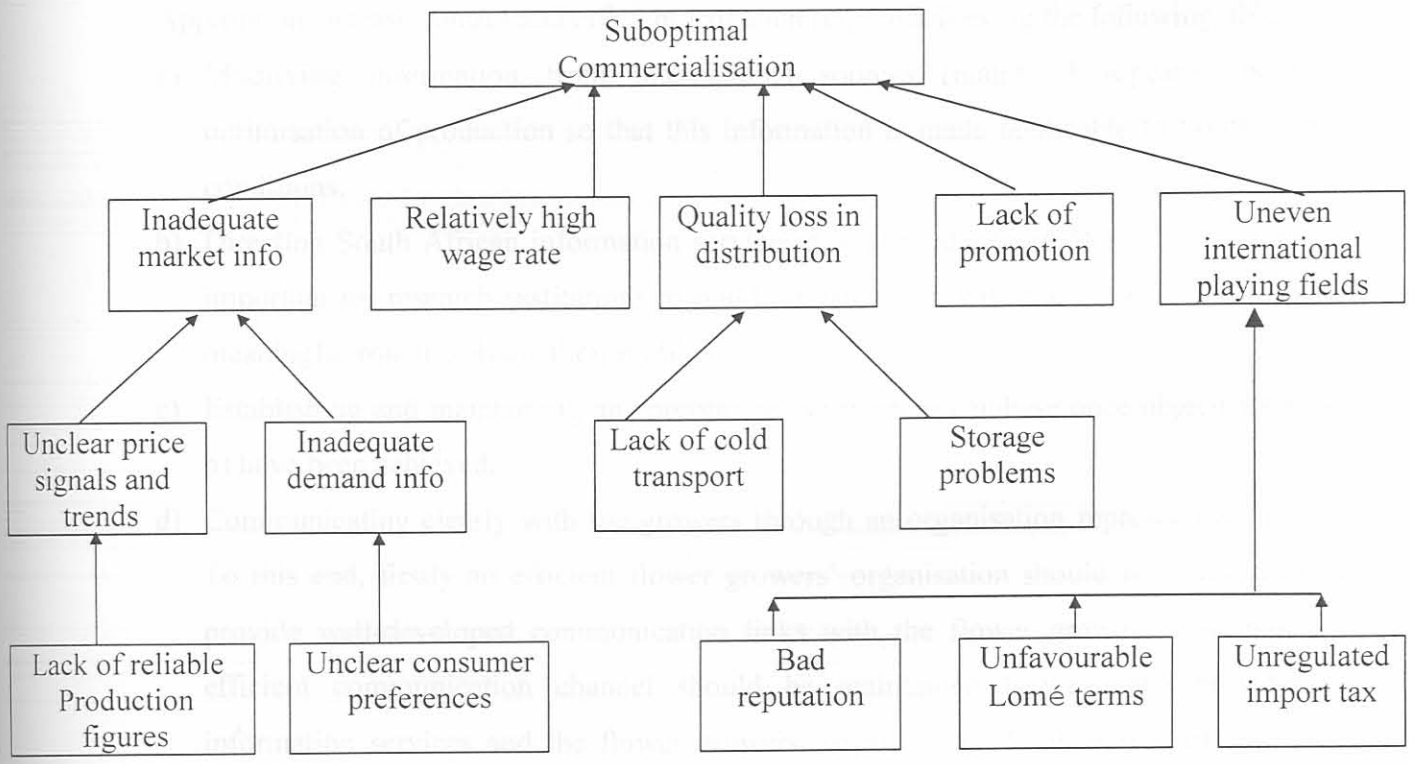
South Africa's wage rate is much higher than that of other African countries. In South Africa labour costs range between 10% and 20% of annual operating costs (excluding manager cost). By contrast, labour costs in Zimbabwe and Zambia range between 6% and 8% of annual operating costs (including manager cost). There is a great deal of European direct investment in African countries such as Zimbabwe, Zambia, Uganda, Kenya and Malawi because of the cheap labour available. South Africa's high wage rate makes the country less competitive in this respect. However, this disadvantage is an advantage if South African wage rates are

compared to those in Europe which range between 30% and 40% of the European growers' annual operating costs.

Quality loss in distribution

Few of the South African cut flower producers use cold trucks to transport their produce. This leads to a loss of the quality of flowers between the farm and wholesaler, retailer or consumer. This issue is critical if producers want to compete with the high quality of flowers on export markets. Cut flowers are highly perishable goods and every hour lost after harvesting, even in cold storage rooms and cold transport, causes a decline in quality. Consequently exporters cannot expect to compete with the fresh flowers, offered for sale sometimes only a hour after harvesting, on the European markets without making use of cold transport from the farm to the airport.

Problem Tree 1.2 - suboptimal commercialisation



2.7.6.2 Objectives and strategies

Objective 1- Commercial cut flower production *(described in Objective Tree 1)*

The major objective is to obtain adequate profit by increasing the place, time and form utility illustrated in Objective Tree 1. Production and commercialisation have to be improved so that utility can be increased. Increased production and increased commercialisation are depicted in Objective Tree 1.1 and 1.2 respectively, and described below.

Objective 1.1- Improved production (described in Objective Tree 1.1)

The strategies for improved production may require the following activities:

Improved management of labour

Better management of labour will require measures including training, wage negotiations and healthy management practices combined with incentive schemes, to retain the best people so that the labour force will be stable and content.

Applying appropriate disease control and efficient irrigation

Appropriate disease control and efficient irrigation require achieving the following objectives:

a) Modifying information from international sources (mainly European) about the optimisation of production so that this information is made applicable to South African conditions.
b) Directing South African information services at real producer problems. Therefore it is important for research institutions to build a relationship with the growers and to play a meaningful role in solving their problems.
c) Establishing and maintaining an appropriate information database once objectives a) and b) have been achieved.
d) Communicating clearly with the growers through an organisation representing them all. To this end, firstly an efficient flower growers' organisation should be established and provide well-developed communication links with the flower growers. Secondly, an efficient communication channel should be maintained between the providers of information services and the flower growers' organisation. If objectives c) and d) are combined, information would be disseminated with greater efficiency.
e) Establishing a stronger link between the growers and research, extension and advisory services (REA). If objectives d) and e) are combined, it would be possible to increase the efficiency of REA.

f) Improving the collaboration among producers and also between producers and researchers. Producer/producer collaboration could increase their bargaining power to minimise marketing costs and maximise marketing opportunities. It could also optimise production practices by sharing production information. Combining objectives e) and f) could help to establish a strong knowledge base from which answers about appropriate disease control and efficient irrigation would be available.

Objective 1.2 -Increased commercialisation (described in Objective Tree 1.2)

For greater commercialisation, adequate market information has to be available, there should be minimal loss of quality during the distribution of flowers and more equitable opportunities on international markets.

Adequate market information

Gathering adequate market information requires firstly a sufficient supply of reliable production figures, price signals and trends. Secondly, knowledge of consumer preferences will result in better information about demand, which is a prerequisite for adequate market information.

Minimising loss of quality during distribution

Competing effectively on the international market requires sufficient cold storage and cold transport facilities for every minute that cut flowers take to reach the market, since the quality of the flowers deteriorates when they are not kept cool.

Creating more equitable opportunities on the international market

Three strategies should be employed to create a level international playing field:

a) Improving the poor reputation (low quality, inconsistent supply) of South African cut flowers, for example through the flower-labelling programme. This programme was initiated by the Association of German Flower Wholesalers and Importers. Flowers carrying this label will be positively promoted on the international market. Growers who want their flowers marketed under this label will have to open their farms to a panel of inspectors who will check the produce and allocate points according to set criteria. The main requirements are the proper use and storage of pesticides and proper training of staff.

The issues of protective clothing and the keeping of proper records of spraying and fertiliser programmes are also part of the labelling programme. If flowers from other sources are included in the farmer's own market mix, these sources will have to be accurately recorded to prevent uninspected, unlicensed produce from reaching the market under false pretences. A licensed grower may not use pesticides whose use is prohibited in the purchasing country. Paying staff at least a minimum wage is also one of the criteria and child labour is prohibited. The label affixed to each export carton costs US$1 (Taschner, 1997a).

b) Negotiating a decrease in the tariffs paid on European markets.

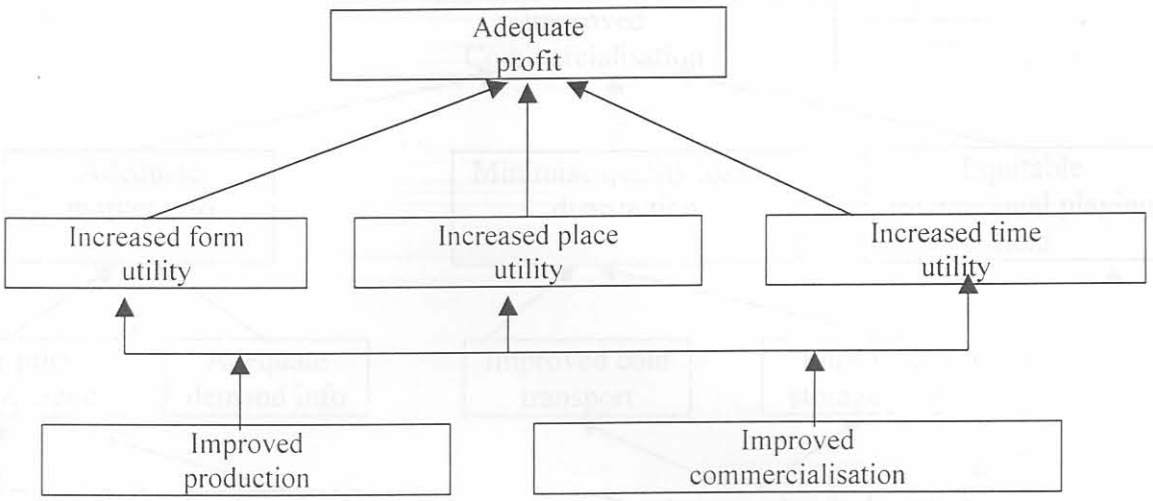
c) Negotiating with the Department of Trade and Tariffs to ensure the correct enforcement of tariffs on imports of flowers.

2.7.7 Conclusion

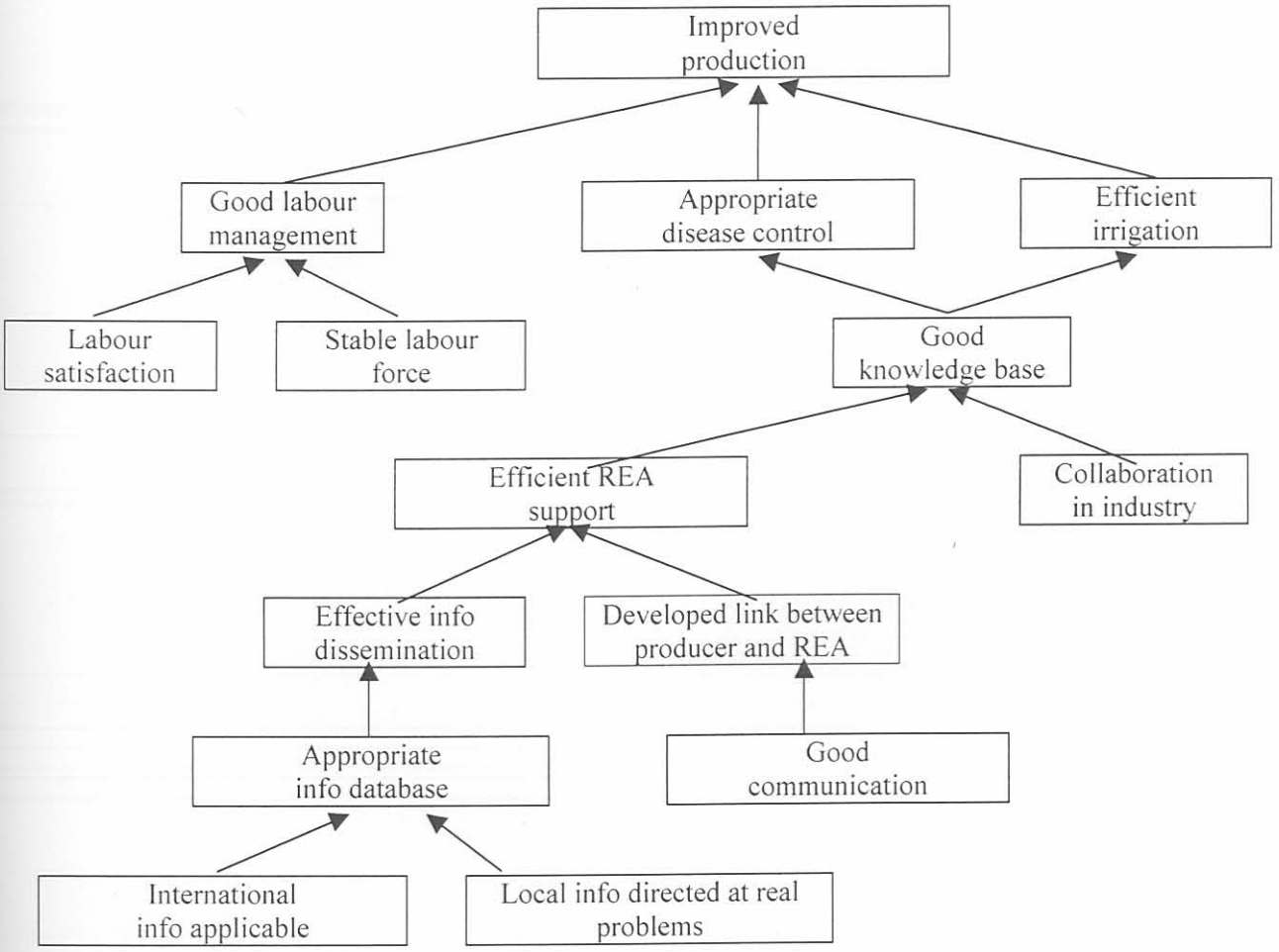
Identifying and structuring the problems experienced in the cut flower industry would be an effective way to establish the need for change in the system. By attending to these needs, South Africa's competitive position regarding the production and export of cut flowers would increase substantially. South Africa's competitive position could be improved either by supportive government intervention and policy formulation or private initiative.

The "problem trees" above indicate that there are enormous gaps to be filled, most of which could lead to profitable private initiatives. These include gaps or weakly developed links in the information infrastructure and marketing channels.

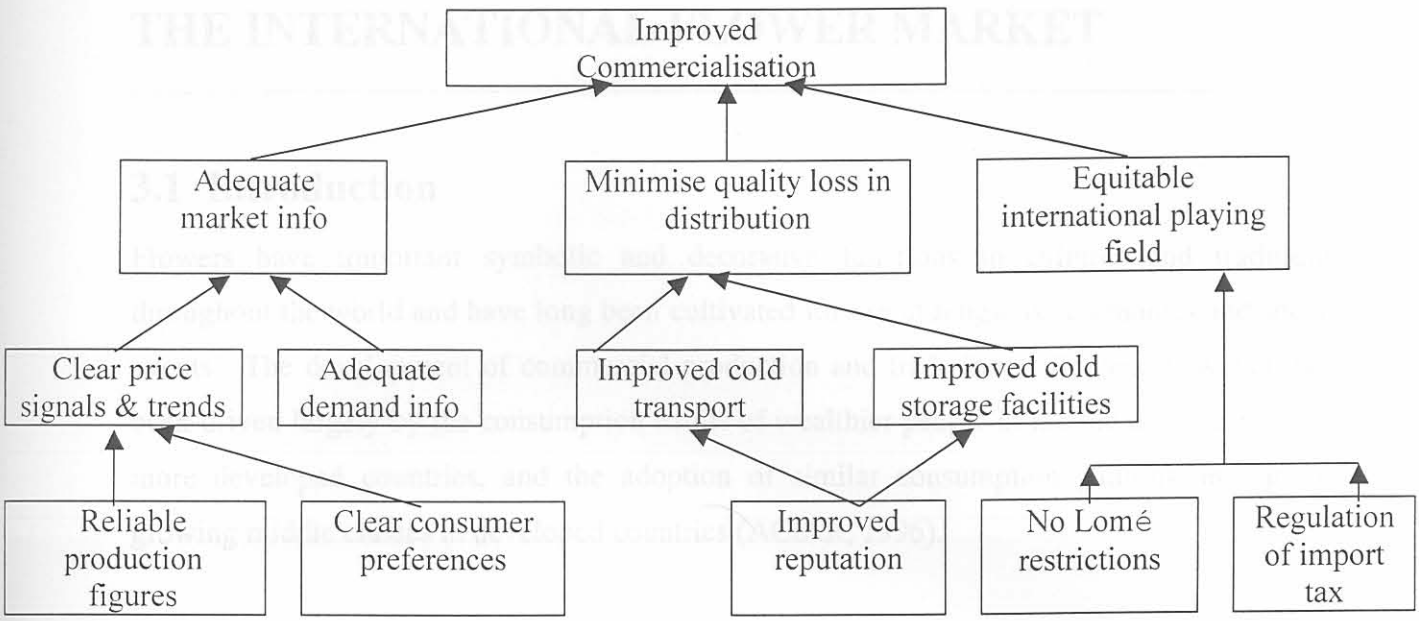
Objective Tree 1. - Commercial cut flower production



Objective Tree 1.1. - Improved production



Objective tree 1.2. - Improved commercialisation



CHAPTER 3
THE INTERNATIONAL FLOWER MARKET

3.1 Introduction

Flowers have important symbolic and decorative functions in cultures and traditions throughout the world and have long been cultivated for use at religious ceremonies and social events. The development of commercial production and trade in cut flowers, however, has been driven largely by the consumption habits of wealthier people in the urban centres of the more developed countries, and the adoption of similar consumption patterns among the growing middle classes in developed countries (ACIAR, 1996).

This chapter contains a four-part overview of the international environment in which the South African flower industry operates. First there is a short overview of the world flower industry. Second, there are profiles of countries such as Zimbabwe, Malawi, Zambia, Kenya and Uganda, which are regarded as South Africa's major competitors in the world flower market. The third part focuses on the Western European markets. The fourth and final part gives a profile of the Australian flower industry, which is regarded both as a potential competitor and as a potential market. The overview provides a basis for the analysis appearing in Chapter 5.

3.2 The world flower industry

World floricultural production is valued at more than $16 billion at the farm gate and is estimated to cover more than 189 000 hectares (Wessels, 1998). The Netherlands, USA and Japan dominate world flower production and not only account for nearly 50% of the global production value, but also cover more than 20% of the production area. The major types of flowers produced are the traditional flowers such as roses, chrysanthemums, carnations, orchids, lilies, tulips and gypsophila (James, 1996). Floriculture is also an emerging high-value industry in sub-Saharan African economies such as Zimbabwe, Kenya and South Africa (Wessels, 1998). Flower production is becoming globalised and tends to locate where there are out-of-season or low-cost factor advantages, such as in Southern Africa or South America, at the expense of established high-technology producer countries like the Netherlands. The

recent lifting of sanctions against South Africa has particular relevance for Australia's floricultural producers in the European, USA and Asian markets (Karingal Consultants, 1997).

3.2.1 World flower trade

Cut flowers are the most important and globally the most widely traded floricultural product, valued at R23,67 billion (farm gate) in 1995 (Niederwieser, *et al.,* 1997). The world's main flower exporter is the Netherlands which exports flowers valued at R8,4 billion. This is more than half of total world flower exports valued at R15 billion. The second-largest exporter is Colombia, exporting flowers valued at $2,3 billion; Israel is third ($203 million) and Kenya fourth ($136 million). Table 3.1 lists the top 20 flower-exporting countries and also the value of exports for 1996 (IFTS, 1997).

Table 3.1: Flower exports to main world markets by source country (1996)

	Source country	$ CIF (1996)
	World	**3 518 679 000**
1	Netherlands	1 980 540 000
2	Colombia	539 611 000
3	Israel	158 842 000
4	Ecuador	121 452 000
5	Kenya	106 140 000
6	Italy	80 199 000
7	Thailand	61 142 000
8	Spain	55 987 000
9	Zimbabwe	53 679 000
10	France	32 095 000
11	New Zealand	29 380 000
12	Costa Rica	23 691 000
13	Germany	22 644 000
14	Mexico	21 873 000
15	Bel/Lux	19 724 000
16	Australia	17 904 000
17	Turkey	15 121 000
18	Singapore	14 837 000
19	India	14 204 000
20	South Africa	13 357 000

Source: IFTS, 1997

3.2.2 World flower consumption

Consumption expenditure is centred on three northern hemisphere locations, namely the EU, North America and Japan, each with purchases of flowers amounting to about $8 billion in 1990. Italy and Germany are also relatively large markets with consumption of around $5 billion and $4 billion respectively. Western Europe accounts for over half of world consumption of cut flowers (ACIAR, 1996).

The global flower and ornamental market is currently estimated at $59,4 billion and is projected to increase continuously as the world population shifts from rural to urban areas and consumer wealth grows. According to Karingal Consultants (1996), the world cut flower markets are currently growing at a rate of 6% - 9% per annum. It is therefore expected that developing economies, e.g. Taiwan, Korea, Singapore, Eastern Europe, Argentina and Mexico, may become increasingly important as users of flower products (Niederwieser, *et al.*, 1997).

Traditional flowers such as roses, chrysanthemums and carnations have dominated consumption in the major markets. However, markets with more developed taste and higher per capita consumption expenditure, such as Japan and the Netherlands, have shown greater interest in other types of flowers, such as South African and Australian indigenous flowers (ACIAR, 1996). In 1990 South African and Australian native flowers were estimated to account for wholesale sales of $400 million or about 1% of world wholesale value (Karingal Consultants, 1997).

A 1995 study (FCH, 1996) of 24 countries ranked Switzerland in first place with a per capita consumption expenditure of $ 143,12; Germany was ranked sixth with a per capita consumption of just over $ 74,35; the Netherlands seventh with $ 63,25; Japan eighth; Britain fifteenth and the USA thirteenth. In 1997 Australia's per capita consumption expenditure on flowers was estimated at between $ 14 and $ 17 per annum (Karingal Consultants, 1997). South Africa has a per capita consumption of approximately $ 1,17 (R3,04) per annum and is ranked last (see 2.2 above). A complete list of per capita consumption statistics is given in Table 2.1.

3.3 Major international competitors

Zimbabwe, Zambia and Malawi are among South Africa's greatest rivals on both the local and European markets. South African growers have expressed concern, since policy (the Lomé Convention) favouring these countries prevents equitable competition and induces foreign investors to invest in Zimbabwe, Zambia or Malawi rather than in South Africa. Consequently it is crucial for South African growers to take note of the structure of the industry. This section discusses the structure of floriculture in other Southern African countries (excluding South Africa). The general structure of the floriculture industry includes

growers of cut flowers, grower-based sector organisations and a network of local and foreign firms supplying production input, technical advice and export marketing services. The section also contains an analysis of the sales performance of and development opportunities for cut-flower exports, a description of the established infrastructure and of the competitiveness of the respective industries, prospects for future development and lastly of constraints and solutions.

3.3.1 Zimbabwe

Growers

Zimbabwe is one of the most promising flower-producing countries in the developing world. This country has a fairly long experience with and a good reputation for exporting quality flowers. In Zimbabwe most growers of cut flowers are commercial farmers with experience in growing tobacco and other irrigated crops. Tobacco farmers can adapt relatively easily to floriculture because of the similarities between tobacco and floriculture. These similarities include the following:

- Great attention to detail
- Selective harvesting by hand
- Complex post-harvest sorting
- Grading and treatment
- Experience with auction sales
- Awareness of the importance of maintaining a strong reputation with buyers

An increasing number of Zimbabwean cut-flower growers are urban professionals and business people. Most growers of cut flowers in Zimbabwe are located within 150 kilometres of Harare. The industry in Zimbabwe has attracted some large corporate investors; for example Royal Dutch Shell is engaged in a joint venture with some of the most successful floriculture operations in Zimbabwe.

Trade

Table 3.2 illustrates the importance and growth of the Zimbabwean flower industry. One of the important trends is the increase in exports to the Netherlands, rising from $36 393 000 in 1995 to $37 343 000 in 1996. Exports to Germany increased from $5 331 000 to $6 219 000 over the same period. Other large countries importing flowers from Zimbabwe are the UK, Italy, France and Sweden.

Table 3.2: Total flower exports from Zimbabwe ($1000)

Country	1995	1996
France	362	323
Belg-Lux	360	50
The Netherlands	36 393	37 343
Germany	5331	6 219
Italy	826	818
UK	3 852	3 875
Sweden		324
Switzerland	3 540	4 153
USA	626	705
Japan	316	156

Source: IFTS, 1997

Commodity associations

In Zimbabwe, the Horticultural Promotion Council (HPC) is an independent body established by growers in 1986 for the purpose of organising airfreight and expanding the horticultural industry. The HPC is funded by a "voluntary" 0.5% levy on the value of horticultural exports by its members. Though HPC membership is not mandatory, growers must become members in order to receive a farming license that entitles them to an exemption from the 12.5% sales tax on purchased inputs. The HPC's charter gives it broad responsibilities for providing many essential support services to the industry, but its limited resources can only support a staff of two professionals who direct most of their efforts toward organising air freight and collecting basic industry statistics. Another organisation the Export Flower Growers Association of Zimbabwe (EFGAZ) was formed in 1991 as a separate and more specialised association of cut flower growers within the HPC. EFGAZ aims to provide greater structure and organisation for the floriculture industry - one that is initiated and established by growers for growers - to discourage the government from attempting to impose an industry structure on the growers, e.g. proposals (since withdrawn) for parastatals such as the Horticulture Promotion Authority or the Horticulture Promotion Board.

Competitiveness

Zimbabwe has become the largest, strongest and most complete floriculture export industry in the Southern African region. Zimbabwe has relatively long experience and a good reputation for exporting quality flowers and being up to date with the latest European fashions. The sector has now reached a critical mass, which will lead to self-sustaining growth in the future. Of all Southern African countries, Zimbabwe has the most export growers, the widest dispersion of growers, the largest assortment of products and the greatest concentration of firms offering support services to growers. In this way Zimbabwe has become the engine of regional growth in floriculture and a model for imitation by neighbouring countries (Malter *et al.,* 1996).

For a typical rose farm in Zimbabwe the capital and operating costs amounts to $\$29.64/m^2$ and $\$30.50/m^2$ respectively. The costs is similar to that of a typical rose farm in Zambia, marginally lower than one in Kenya and higher than one in Uganda (see Table 3.8 and 3.9) (White, 1996).

The capital costs (Table 3.3) are based on 3-hectare metal-framed greenhouses with infrastructure for a 6-hectare project. The project has capital costs of $941 700 ($31.39 / square metre). The annual operating costs (Table 3.4) of $748 000 in year 1 ($ $24.93/m^2$) inclusive of air freight costs and $915 000 ($30.5/m^2) in full production and inclusive of air freight costs. The project include a small senior management expense but excluding travel costs to Europe. An Analysis of annual operating costs are shown in Table 3.3.

Table 3.3: Zambia / Zimbabwe 3ha rose farm – capital costs

	Write off Period (years)	Costs $	Annual write off $
Land		10 000	
Greenhouses	10	180 000	12 000
Irrigation & pumps	10	52 000	5 230
Buildings	20	106 000	5 300
Other tech. Materials	5	14 800	2 960
Tools, Office equip	3	6 200	2 067
Plastic	4	30 000	7 500
Generator	10	16200	1 620
Communication equip	5	8 500	1 700
Plant materials	5	344 500	68 900
Cool areas	10	60 000	6 000
2nd hand vehicles	3	70 000	23 333
Land preparation	6	42 500	7 083
Total		**940700**	**143693**

Table 3.4: Zambia/ Zimbabwe 3ha rose farm – annual costs (%)

Air freight and marketing (Air freight $ 2.35/kg)	61
Labour costs inclusive of management costs	7.6
Depreciation	16.1
Bank interest	2.6
Production inputs	5.2
Energy / fuel	0.9
Others	6.6
Total	**100**

Source: ABN AMRO BANK, Netherlands

Infrastructure Even though Zimbabwe's flower export industry is booming they still have significant infrastructure deficiencies in telecommunications. Many Zimbabwean growers, even those just outside of Harare, still do not have access to a private telephone/fax line, which prevents them from communication directly and easily with agents in Harare or buyers overseas. Each of the marketing groups in Zimbabwe has to rely on radio communications to contact growers. Local industry organisations EFGAZ and HPC have discussed the possibility of linking growers with some type of electronic mail system, but this will also require that each grower have a private telephone line. This is a critical issue, as it is

impossible to respond to rapidly changing market conditions in a dynamic, information-intensive global industry without efficient and reliable communications.(Maharaj *et al.,* 1995; Malter *et al.*, 1996; White, 1996)

3.3.2 Zambia

Growers

Most of the investors in floriculture in Zambia are urban-based business people. Most have invested in floriculture strictly as a business venture, which has given the sector in Zambia a more business-like character. Of the 16 floriculture projects in Zambia in 1995, only two were owned by black African businessmen and a third had a black African as a partner; all the rest were owned by entrepreneurs of European or Asian descent, most of whom were either natives of long-time residents of Zambia or immigrants from Zimbabwe, South Africa, Kenya, or Europe. Some larger growers are considering out-grower schemes involving smaller-scale black African farmers, but such schemes are considered more promising for vegetables than for flowers. All of the existing floriculture projects are located around Lusaka. The industrial giant in India, TATA has shown increased interest in Zambia by adding roses and summer flowers to its agribusiness operations in Zambia. The Commonwealth Development Corporation is also investing in the Zambian cut flower industry by buying one of the largest cut flower (and vegetable) farms in Zambia.

Trade

Zambia has the potential to be one of the main competitors on the international markets. This potential is evident in the growth of exports to the Netherlands between 1995 and 1996, which increased from $4 995 000 to $7 232 000. Exports to Germany, the second largest export destination for Zambian flowers increased from $376 000 in 1995 to $391 000. Zambia also export to Italy, UK, France, Belgium and Sweden (Table 3.5).

Table 3.5: Total flower exports from Zambia ($'000)

Country	1995	1996
France	41	30
Belg-Lux		20
Nehterlands	4995	7232
Germany	376	391
Italy	29	278
UK	199	160
Sweden		4

Source: IFTS, 1997

Commodity associations

The Zambian Export Growers Association (ZEGA) was founded in 1988 to help promote the development of fresh horticultural exports from Zambia and consists of two parts: the ZEGA association (of growers) and ZEGA Limited, and organisation, which engage in commercial activities on behalf of the growers. Although ZAGA Ltd. Is fullfilling a supporting role growers are experiancing the following problems with ZEGA:

- ZEGA is importing bulk production inputs for the growers but the expansion of the sector makes it difficult to reach agreements on input purchases.
- ZEGA has the financial responsibility of operating the cold-storage facility (many times the size needed by the industry) at the airport financed by the European Investment Bank.
- Growers are also experiancing problems with ZEGA's Charter flight bookings.

ZEGA is currently chaired by a prominent rose grower and controlled by current flower grower/exporters.

Grower-based sector institutions provide certain essential services to the floriculture industry. In Zimbabwe and Zambia, new groups have organised to specifically represent cut flower growers for example the Export Flower Growers Association of Zimbabwe - EFGAZ or even crop-specific subgroups of cut flower growers for example the Zimbabwe Protea Growers Association. There are also independent statutory organisations, such as Zimtrade in Zimbabwe, which conduct trade promotion activities (e.g. participating in trade fairs) for floriculture and other export industries and co-ordinate their efforts with floriculture sector institutions (Malter, *et al.*, 1996).

Competitiveness

Zambia has been a somewhat later entrant to floriculture, beginning its takeoff only in the past two to three years, but has been able to begin on a relatively high and sophisticated level. Zambia is trying to emulate Zimbabwe's success, but will lag somewhat behind in the foreseeable future. Zambia's floriculture sector is much less diversified than Zimbabwe's, being almost exclusively oriented toward roses and marketing almost exclusively via the Dutch auctions, though some Zambian growers are trying to change this trend. As mentioned before Zimbabwe and Zambia's capital and operating costs are more or less the same at $\$29.64/m^2$ and $\$30.50/m^2$ respectively (see Table 3.3 and 3.4).

(Maharaj *et al.,* 1995; Malter *et al.,* 1996; White, 1996)

3.3.3 Malawi

Growers

In Malawi, two exporting cut flower projects were initiated as a business venture, with the largest one being backed by overseas investors. Both projects are near Lilongwe, even though other areas of Malawi have better climatic conditions for floriculture production. Overseas interest in Malawi came in the form of EDESA (the Swiss development bank) a major banker of the largest rose farm in Malawi

(Maharaj *et al.,* 1995; Malter, *et al.*, 1996).

Trade

Exports statistics (Table 3.6) shows that the Netherlands is Malawi's largest export destination with exports valued at $2 352 000 in 1996, second are Germany with $934 000 in 1996 and the UK with $40 000.

Table 3.6: Total flower exports from Malawi ($'000)

Country	1995	1996
Netherlands	2574	2352
Germany		934
UK		40
Total	2574	3326

Source: IFTS, 1997

*Competitiveness*Malawi appears to have few chances at present to develop floriculture exports beyond their current level. Even though Malawi have good climatic conditions for floricultural production too many necessary factors are missing. Factors such as a well developed infrastructure, research and development resources, and a strong input supplier base is absent. It seems as if Malawi will continue to lag further behind its neighbours in the foreseeable future. The few existing producers seem resigned to supplying lower quality products to the lower-quality segment of the market (Malter *et al.*, 1996).

3.3.4 Kenya

Horticulture in Kenya is a vitally important industry. Kenya is an agricultural country and depend on agricultural exports to earn foreign exchange. Cut flowers are more than 50% (1991) of the total Free on Board (FOB) value of fresh horticultural produce. Kenya is also a powerful player on the international scene being the third largest flower exporter to Germany (the largest importing country in the world) in 1995 with exports valued at $24 115 000 but in 1996 exports decreased to $16 463 000. Kenya was also the second largest flower exporter to the Netherlands, exporting $60 979 000 worth of flowers in 1995 and $69 311 000 in 1996. Kenya is the trend setter in Africa as far as flower production and exports are concerned. (IFTS, 1997; Maharaj *et al.*, 1995)

Production

In 1995 Kenya had 1329.4 hectares of land reserved for the production of about 25 000 tons of cut flowers and cut foliage. The Kenyan production season are illustrated in Figure 3.1 and represent the quantity produced in metric tons. The season peaks between October and February when production reach on average about 3 000 metric tons. There has also been a more consistent year round supply of flowers in resent years. This is visible in the increasing trend (from 1992 to 1994) in production during Kenya's off season (IFTS - Export Statistics, Horticultural Crops Development Authority Kenya, 1996).

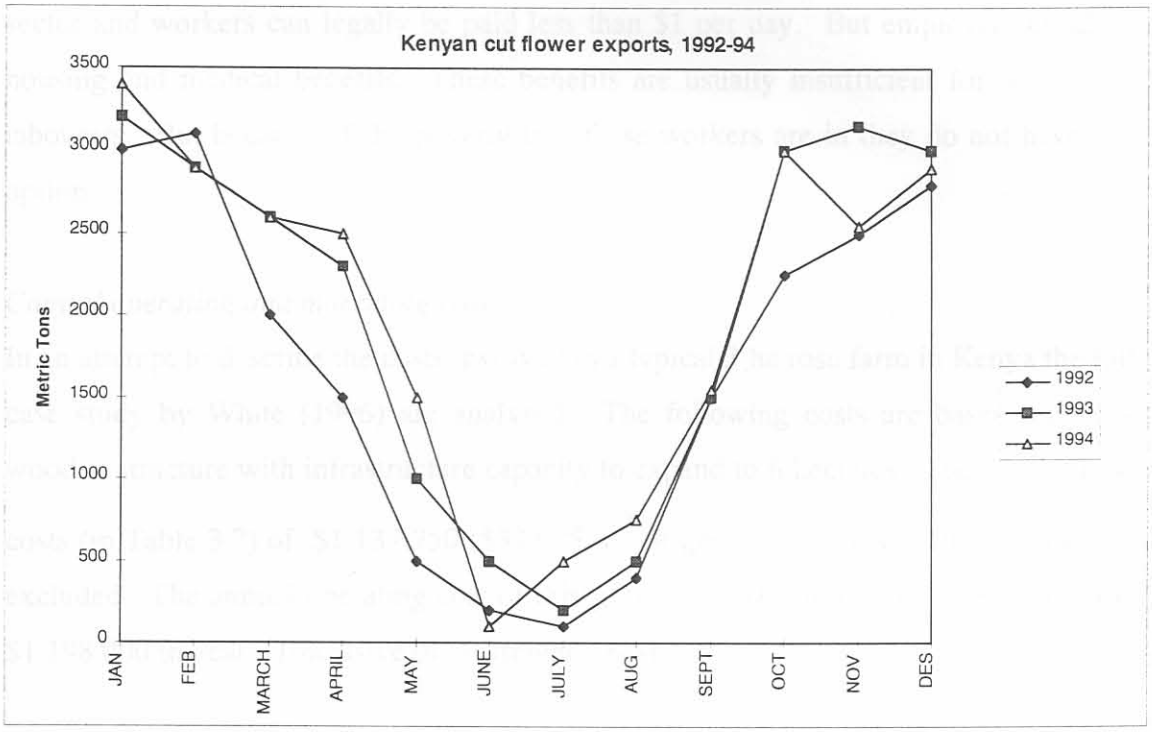


Figure 3.1: Kenyan cut flower exports, 1992-1994

Source: International Floriculture Quarterly report, volume 5 no. 2 in IFTS, 1996

During high season one farm alone dispatched 5 plane loads of flowers per week while a transport firm ships another 12 plane loads. An example to illustrate the investment in Kenya is that of Sulmac, a flower company owned by Unilever, the Giant Anglo-Dutch multinational. Sulmac exports well over 250 million stems (8000 tons) each year and had a turnover of over 20 million pounds sterling in 1991. In 1992 seven growers had above 10 hectares under flower production and three of them having their own handling facilities at Jomo Kenyatta International Airport.

Inputs

The costs of plants from Europe even if propagated locally include a royalties payment of 50% (excluding the transport cost to Kenya). For example, if you buy a rose plant of $1,20, half of that price is royalties and you still have to pay the price of flying it to Kenya.

Fertilisers, chemicals, fuels, consultants, growers and expatriate managers are inputs that all have to be imported at extremely high costs. The only local input is labour. The developed countries are trying to shift their production because of the low price of land and labour. Their are more than 30 000 labourers (of which many are woman) employed in the flower sector and workers can legally be paid less than $1 per day. But employers usually supply housing and medical benefits. These benefits are usually insufficient for the needs of the labourers. But because of the poverty trap these workers are in they do not have any other option.

Capital operating and marketing costs

In an attempt to describe the costs involved in a typical 3 ha rose farm in Kenya the following case study by White (1996) are analysed. The following costs are based on a 3-hectare wooden structure with infrastructure capacity to expand to 6 hectares. The project has capital costs (in Table 3.7) of $1 137 750 ($37 925/m^2 of greenhouse area). Office set up costs are excluded. The annual operating cost of this project are $1 134 000 ($ 37,8/m) in year 1 and $1 198 000 in year 2 (inclusive of air freight costs).

The estimated Marketing costs of a Kenyan producer exporting via the Dutch auctions can be summed up as follow:

- Air freight are +/- 50% of the wholesale price. the freight rate have dropped the past three years from $2,15 per Kg (1993) to $1,70 per Kg (1996)
- Commission of 10% to the middle man in Europe.
- Auction costs: 6% commission, and 1,5% for advertising, handling, preparing and other.

(IFTS, 1996; Maharaj *et al.,* 1995; White, 1996).

Growers

Most of the farms belong to foreign owners that have experience in the flower business. Approximately 50% of the 45 flower companies are owned by Dutch, German, United States and Swiss investors. 35% of the other farms are owned by white Kenyans and only 3% belong to black Kenyans. (International trade statistics, 1996; Maharaj *et al.*, 1995).

Table 3.7: Kenyan 3ha rose farm- Capital Costs

	Write off period (years)	Cost($)	Annual Write off($)
Land		125 000	
Greenhouses	15	105 000	10 500
Irrigation & Pumps	10	76 150	7 650
Buildings	20	119 000	5 950
Other tech materials	5	22 800	4 560
Tools & office equip	3	13 700	4 567
Plastic	4	30 000	7 500
Generator	10	16 200	1 620
Communic equip	5	11 900	2 380
Plant materials	5	344 000	68 800
Cool Area	10	74 000	7 400
2nd hand vehicles	3	74 000	24 667
Land preperation	6	126 000	21 000
TOTAL		1 137 750	166 558

Source: ABN AMRO BANK, Netherlands.

The role of government

According to Mr. Waithaka the technical services manager of the Horticultural Development Crops Authority, the Kenyan government is involved in the following activities:

- The implementation of a research programme and advisory service for small scale growers.
- Construction of a cold storage facility at Nairobi airport.

- To release government funds for the improvement of the road from one of the key production areas (Naivasha) to Nairobi airport.
- In 1991 the army bulldozed 40 acres of tropical forest to make way for a rose plantation.

(Maharaj *et al.,* 1995)

Illegal business practices

Trade in cut flowers has not made any substantial contribution via taxes. As early as 1977 the Nairobi Times published a report accusing horticultural exporters of defrauding the Kenyan Central Bank by failing to declare their full profits and thus depriving the country of tax revenue. This have not changed since, and it is estimated that horticultural traders had cheated the country of 500 million shillings since they began business in Kenya. The cut flower sector is simply too modern for governments to monitor and too much a part of the current culture of international business, which defies the control of any government.

(Maharaj *et al.,* 1995)

Trade

The largest export destination for Kenyan flowers are the Netherlands with exports valued at $69 311 000 in 1996. Germany is the second largest destination with exports that decreased from $24 046 000 in 1995 to $16 463 000 in 1996. Exports to the UK have increased from $10 485 000 in 1995 to $13 545 000 in 1996. A more detailed description of the Kenyan trade statistics can be found in Table 3.8.

Table 3.8: Total flower exports from Kenya ($'000)

Country	1995	1996
France	393	1203
Belgium-Luxembourg	166	242
the Netherlands	60979	69311
Germany	24046	16463
Italy	277	769
UK	10485	13545
Denmark	136	43
Spain	33	77
Sweden		1653
Switzerland	2932	3247
USA	23	14
Japan	589	776
TOTAL	100059	107343

Source: IFTS, 1997

3.3.5 Uganda

Uganda is a country with the potential to grow to an important producer for the international market. The Ugandan rose industry started in 1993 and has grown to more than $10 million in gross sales in 1996. The Ministry of Trade has challenged rose growers to expand the industry to $60 million and 200 ha in the year 2000 which will cause Uganda to have a 3% share in the European rose market. This expectation may seem a bit too ambitious but according to Clive Drew of the Agribusiness Development Centre, the rose growers are capable to reach this target (Galinsky, 1996; White, 1996).

Production

In 1996 the rose industry in Uganda consisted of 12 farms on about 40 ha, producing varieties like, First Red, Frisco, Prophyta, Konfetti and Souvenir. Growers harvest flowers daily during a nine month production season from September to May (Galinsky 1996).

Marketing

During the production season growers harvest flowers on a daily basis and export it three to four times per week from Entebbe to Europe on several air lines including, Sabena, Alliance Airways, Air France and British Airways. Air rates average about $1,77 per kilogram.

Most Ugandan exporters market their roses through the Dutch auctions because of the large number of buyers to which the roses are exposed. Another advantage is the speedy, guaranteed payment of the Dutch auction system. On average Ugandan roses receive below average auction prices for their roses. Another marketing channel is direct sales to importers or supermarkets with the advantage of higher possible returns and the disadvantage of higher risk of client dissatisfaction resulting in no payment (Galinsky, 1996; White, 1996).

Government support

Currently the Ugandan rose growers are earning a substantial sum of hard currency which widen the governments tax base. Further more it have created 300 new jobs in rural areas decreasing the rate of urbanisation. Another positive contribution is the fact that 85% of the employees are women which will increase the welfare of the rural family where the woman usually are the head of the household.

If Uganda can reach the $60 million or 200 ha mark in the year 2000, Uganda will produce +/- 270 million stems per year at a value of $37 million and employ more than 9000 people. According to Clive Drew this will only be possible with investment in the industry from private and government sources in the order of $60-$80 million. (Galinsky 1996)

Competitiveness

Uganda's comparative advantage lies in short- to medium-stem roses which is in high demand by European and UK supermarkets. The relatively hot climate cause the buds to be relatively small and small buds goes together with shorter stems. Even though long stems are capable of higher prices per stem, the short stemmed rose's yield per square meter is much higher and the freight cost per stem is much lower. These two factors more than makeup for the lower price per stem. Uganda is capable to produce shorter stemmed varieties at lower cost than Kenya.

Other factors that increase the competitiveness of Uganda includes (a) a stable political and economic climate for the past 11 years are boosting investment confidence in the Ugandan flower industry, (b) inexpensive and fertile land, (c) a tropical climate at high altitudes, (d) available water, (e) low cost labour, capital and freight, and (f) a supportive government and international community.

According to White (1996) Uganda also shows a comparative advantage as far as capital and operating costs are concerned. When capital costs (Table 3.9)are compared, the Netherlands are the most expensive with $\$108/m^2$, Kenya, Zambia and Zimbabwe showed a capital cost of just below $\$30/m^2$ while capital cost in Uganda are estimated at $\$27,68/m^2$

Table 3.9: Rose farm - capital cost

Country	$/m^2
Kenya	29,56
Zambia/Zimbabwe	29,64
Uganda	27,68
Netherlands	108,50

Source: White, (1996)

The comparison of annual operating costs is shown in Table 3.10 It is evident that Uganda, in both region A and region B has got a comparative advantage as far as operating costs are concerned.

Table 3.10: Rose Farm Annual Operating Cost ($/m^2)

Country	$/m^2
Kenya	39,93
Zambia/Zimbabwe	30,50
Uganda A	28,12
Uganda B	22,68
Netherlands	50,70

Source: White, (1996)

Constraints

Several constraints can be identified that have to be dealt with in order to reveal Uganda's full potential. The following factors stand in the way of expansion of Uganda's rose industry: (a) Inadequate power supplies, (b) contradictory government policies on capital imports, (c) banks are unfamiliar with agricultural lending, (d) lack of local technical expertise, (e) poor post harvest handling techniques and (f) a lack of cold storage and handling facilities at the airport. A natural constraint is the high rainfall and high humidity which is highly favourable for development of mildews and other fungal diseases (Galinsky, 1996; White, 1996).

Trade statistics

The main export destination for Ugandan flowers is the Netherlands with exports valued at $2 181 000 in 1995 and $3 226 000 in 1996. Germany is the second largest market for Ugandan flowers with exports increasing from $381 000 in 1995 to $471 000 in 1996. Other export markets include France Sweden, Belgium, Italy, the UK and Switzerland. More Ugandan flower export figures are given in Table 3.11.

Table 3.11: Total flower exports from Uganda ($'000)

Country	1995	1996
France		92
Belg-Lux		1
the Nehterlands	2 181	3 226
Germany	381	471
Italy		5
UK		3
Sweden		137
Switzerland		75
Total		**4 010**

Source: IFTS, 1997

3.4 Major international markets for cut flowers

The Western European markets are the main destination for export flowers from South Africa. For South Africa it will be important to be aware of the structure of these markets, to identify opportunities for expansion. In this section aspects like demand and supply, consumer preferences, the trade structure, competition, prices, promotion, market access and market opportunities, are discussed for Germany, France, United Kingdom, and the Netherlands.

3.4.1 Germany

Demand and Supply

Germany is the largest import market in the world, in 1996 Germany imported flowers valued at $1.8 Billion. Germany's per capita consumption of flowers is the sixth highest in the world with R173.76 for 1995 (FCH, 1996). Total imports into Germany have shown a steady increase during recent years. Germany imported flowers from 26 countries in 1990 and 34 countries in 1994. Germany's major suppliers are mentioned below:

- The Netherlands is the largest supplier of cut flowers with an import market share of about 86%.
- Italy is the second largest supplier with an import market share of 5.2% in 1994 which decreased to 3.2% in 1995.
- Israel and Colombia is the third and fourth largest supplier, with both less than 2% of total imports in 1994.
- *South Africa* exports proteas and various summer flowers , some of which are produced in Swaziland. Germany is South Africa's largest flower export destination.

(AIPH, 1995; Bjarke, 1997; The Flower Council of Holland, 1995; IFTS, 1997)

Consumer Preferences

German consumers buy flowers and plants all year round. However, consumption shows seasonal variation. Demand declines considerably during May-Sept., and rises substantially during the holiday and festivals such as:

- St. Valentine's day,
- Easter week and the preceding week,
- Mother's Day (the second Sunday in May),
- All Saints day (1 November),
- Sunday for the Commemoration of the Dead (second half of November) and

- Christmas.

The Centrale Marketinggesellschsft der Deutschen Agrarwirtschaft (CMA) (1991) conducted a survey on the types of flowers that had been purchased. The following was revealed:

Roses	18.0%
Carnations	11.9%
Tulips	7.8%
Orchids	4.9%
Chrysanthemums	3.2%
Other cut flowers	7.9%
Mixed bunches	38.3%
Arrangements	8.0%

Reports suggest that, with the exemption of roses, there is a tendency for the share of traditional flowers in the total consumption to decline. Consumers are apparently looking for an ever-wider selection of flowers. The colour preferred tends to be in softer shades such as pink and lilac (SMFCFWE, 1996).

Trade Structure

Retail Trade:

Projections, based on the CMA survey indicate that traditional florist, is expected to decrease its share in the trade structure from a estimated 64% in 1990 to an estimated 57% in 1996. However, Multiple food assortment (like supermarkets and chain stores), trade is expected to increase its share from 11% to 15% during the same period.

Terminal Markets:

The number and importance of terminal markets have declined with increased competition from direct sales to florist shops by large number of Netherlands exporters and German secondary wholesaler / importers.

Producer Owned Auction Markets:

There are four producer owned auction markets in Germany under the same management. All four auctions operate a Dutch style clock system. They have the advantage (to countries with lower quality cut flowers) of often accepting lower quality than the Dutch auctions.

Import and Wholesale Trade:

There are an estimated 2 000 wholesalers of cut flowers in Germany, many of these companies import flowers directly from the Netherlands. Traditionally importers will buy on a fixed price basis with prices established weekly or monthly (SMFCFWE, 1996).

Competition

Foreign suppliers are mainly competing with fresh flowers from the Netherlands and with very high quality. New suppliers in other developing countries will also have to compete with established exporters in developing countries. Kenya, for example, has a well-organised import distribution network in Germany.

Prices

As in all countries, there can be wide variations in prices which do not always reflect quality. Thus, many small exporters report that Germany is both a highly competitive market and not always a high priced market. An advantage of supplying one or more of the German auctions is that it provides access to accurate price information. Since Germany, as most Western European countries, has a high stable demand throughout the year, prices will vary less than in the United States, where demand is lower but with a big increase in demand during the festive periods.

Promotion

Limited advertising is undertaken by the Deutche Blumenwerbung GmbH, (DBG), an organisation financed by the domestic flower industry and by public funds. All domestic flower producers are obliged by law to contribute to DGB an amount related to production. Flower producers in the Netherlands also grant considerable amounts to DBG. The organisation carries out market research and advertising campaigns, in addition to providing point-of-sale materials (SMFCFWE, 1996).

Market Opportunities

Germany remains the largest market for cut flowers in the world with as much as 38% of world's imports in 1994. However, competition is increasing, as well and there is currently, with the exception of the peak holiday periods, no shortage of supplies. Market opportunities exist for foreign producers who are able to take advantage of better weather conditions and lower production costs in their countries of origin, especially during the European winter

season. However, they would be well advised to establish close contacts with reputable importers before commencing production for export to this market.

The small German auctions may be considered as potential outlets since they are generally interested in importing directly from developing countries and to compete with the much larger auctions in the Netherlands. German auctions have the advantage of accepting lower quality flowers than the Dutch auctions (SMFCFWE, 1996).

3.4.2 France

Demand and Supply

In 1991 France was, the third biggest importer of flowers in the world, after Germany and the United States. France is also a large producer of flowers. The main species grown in 1990 in terms of area were: Gladioli (492 ha), roses (420 ha), carnations (142 ha), tulips (142 ha) and chrysanthemums (140 ha) in total +/-1336ha are cultivated in France. *The Flower Council of Holland, (1995)* has estimated the per capita consumption of France's consumers were R115.84 in 1995 and estimated to be R146.61 in 2000 (Table 2.1).

Total imports have increased at a high rate during recent years, making France not only the third largest import market in the world but also a very dynamic import market for the following countries:

- *The Netherlands,* share of total imports to France was 87,4% in 1990 and 89,2% ($226 815 000) in 1994 imports increased by 32% in 1995 and a further 4% in 1996. It offers a wide range of species and varieties, speedy delivery excellent service and usually a high and consistent quality.
- *Belgium and Luxembourg,* is the second largest importer with imports valued at $7 751 000 in 1994 increasing to $13 063 000 in 1995 and decreasing to $12 959 000 in 1996 (AIPH, 1995; IFTS, 1997).

One of the features of French trade is the large size of the rose imports, which almost doubled during the period 1989 - 1994. France is the leading producer of rose plants in the world, but is steadily producing less roses and importing more. In 1994 imports into France were 12 times that to exports in terms of value. South Africa exported cut flowers valued at $2 394 000 to France in 1994 (Table 2.3).

Consumer Preference

The rose is the most popular flower in France followed by the tulip, the carnation and the chrysanthemums. There is a growing demand for a wider range of flowers, including summer flowers and the tropical flowers, in particular anthurium. Red is the most popular colour for roses with an estimated 55% to 60% of the market, followed by pastel shades (30-35%), white (5%) and yellow (5%) (SMFCFWE, 1996).

Trade Structure

The Retail Trade: The traditional florist shop, of which there are around 10 000 is estimated to have a 50% market share. In France the street and market vendors are more important than in other Western European country and probably account for as much as 20% of total flower sales. However a consumer survey in 1989 showed that only 14% of all flower purchases in France had been made in supermarkets which is probably one of the main reasons why flower consumption in France is relatively low (AIPH, 1995).

Import and Wholesale Trade: France has a few very large flower importers, mainly in Paris and Nice. They handle a considerable proportion of imports from developing countries. These importers distribute their products primarily to other wholesales, rarely dealing with retailers other than the larger food stores. Few retailers import direct; the exceptions are supermarket chain stores which are increasing their participation in the import trade. The wholesale trade plays a dominant role in the distribution of the cut flowers and foliage in France. Wholesalers handle most imports of cut flowers and decorative cut foliage (SMFCFWE, 1996).

Competition and Prices

Given France's close links with the Netherlands, competition is intense. The prices closely follow the prices of the Dutch auction. As in other countries, there are peaks during festivals. These sometimes also occur during different periods from those in other European countries. For instance, Mother's Day in France, (and Sweden), is last Sunday in May and not early or mid May as in most countries and Father's Day is in June.

Market Access

France is an EU member country and is not restricted by quantitative restrictions on imports of cut flowers. Requirements with regards to quality, grading and packaging are similar to those in the Netherlands. In France the market based import wholesalers require flowers to be well open and the larger importers are more interested in obtaining flowers which are in bud with the maximum possible vase life.

Market Opportunities

In a large and expanding import market there will always be opportunities for efficient producers and exporters. However, France is a particularly difficult country for exporters in far away countries like South Africa. This is mainly due to the dominant position of the Netherlands, which had a 90% share of the import market for flowers in 1993. Dutch growers/exporters consider France almost at their home market where flowers can be transported by truck and often by water systems, everywhere (SMFCFWE, 1996).

3.4.3 United Kingdom

The United Kingdom (UK) is the fourth-largest import market for cut flowers in the world after Germany, the United States of America and France. The UK is a very dynamic market where total imports increased by as much as 73% from 1987 to 1993. Although the per capita consumption of floricultural products is increasing rapidly, it is still comparatively low in the UK (Table 2.1). The 1995 figures for flowers showed that annual per capita consumption in the UK was R76,02 in 1993, declining to R68,78 in 1995 and is projected to rise to R83,26 in 2000 (FCH, 1995).

The following countries export large quantities of floricultural products to the UK:

- *The Netherlands* is the major supplier with 70% of the value and 65% of volume of all such imports in 1993.
- *Colombia* supplied 12,7% of total value and 14,2% of total volume of imports in 1993.
- *Israel* provided 6,2% of the total value of imports and 3,7% of total volume in 1992.
- *Other*, Turkey, followed by Spain, the United States and Italy (AIPH, 1995).

Distribution structure

Retail trade - The retail market in the UK is still dominated by about 5 000 florist shops, but their share of the market is decreasing from around 50% in 1989 to well below 40% in 1995. As is the case in other countries, supermarkets are becoming increasingly important. The estimated market share of the supermarkets increased from 5% to 15% in 1990. By 1995 it probably increased to over 20%. Greengrocers have traditionally sold cut flowers along with their usual range of fresh fruit and vegetables. Their market share is estimated at 10% and has remained constant during recent years. Market Stalls/Street Traders are estimated to account for about 10% - 15% of the UK's flower sales (SWFCFWE, 1996).

Wholesale trade - In recent years the role of the wholesale markets has shown some decline. There are several areas of wholesale trade. Firstly, as regards flower markets, the only specialist flower market in the UK is at New Covent Garden Market. The volume of flower sales has been increasing annually to £53 million in 1988 and to £79,6 million in 1994. It is estimated that around 50% of all sales in the New Covent Garden Market are of Dutch flowers.

Secondly, there are importing wholesalers. These companies operate primarily from outside the wholesale markets and invariably have extensive cold storage and repackaging facilities. The market-based importer probably still provides the best channel for the new exporter, given the often highly specific requirements of the non-market importers and the fact that problems can, and do, occur with early consignments from new suppliers. On the wholesale markets, cut flowers from UK producers have traditionally been sold on commission at rates ranging roughly from 10% to 15%. This is in contrast to imported cut flowers, which are normally purchased at an agreed price. Even when flowers are purchased at a firm price, there may still be deductions for handling and transport. It is essential for suppliers to establish precise trading terms and above all to assess the credit status of their importers. The terms of payment for imports are commonly 28 days.

Thirdly, there are the secondary wholesalers/distributors in the area of wholesale trade. These companies buy mainly from the major importing companies and increasingly from the Dutch auction import/export businesses. They offer delivery services to retailers and prepare bouquets for sale to garages (forecourt sales) and supermarkets.

Fourthly there are the van salesmen, where there has recently been some growth. These traders are usually small businesses buying direct from producers and wholesale markets in the UK or increasingly from the auctions in the Netherlands.

The fifth group is the flower packer importing wholesalers. There is a small but growing number of flower packers whose businesses are founded primarily on imported flowers. It is these companies who are at the forefront of bouquet sales to the supermarkets and multiple stores. Some of these companies have established UK flower production businesses. For example, Zwetlots, a large UK flower producer, is a major importer of flowers from Carmel (an Israeli company) and supplier of bouquets to the supermarkets. Lingarden, the UK's largest bulb-producing co-operative, packs UK flowers and is also a major importer and distributor (SMFCFWE, 1996).

Consumer preferences

Even though red carnations are still the most popular flower in the UK, they are losing ground to the rapidly rising popularity of the white carnation. Chrysanthemums and roses (red and pink shades) are also still very popular. Tulips and narcissus are seasonally important and lilies, gypsophila and alstroemeria are all reported to be gaining in popularity. However, there is a low demand for the minor species.

The UK wholesaler can import (from the Dutch auctions) small quantities of specific varieties, colours and quality to meet any demand. For exporters, this implies that where the minor species are concerned, the risks of over-supplying the market can be considerable.

The overall trend favours pastel shades and seasonal demand also has a strong influence on colour: white in Easter, winter and Christmas; red, yellow, pastel shades and softer colours in spring and the bronzes and yellows in autumn.

The level of consumption varies between seasons. In spring the demand peaks from March to May, and is highest at Easter, which falls either in March or in April. The elevated demand in May is closely linked to Mother's Day. In autumn the total demand declines but the demand for roses becomes relatively high, and chrysanthemum sales are also greatest in autumn. In winter there is a further decline in demand, but it picks up again at Christmas. There are large

increases in flower trade on St Valentine's Day. Carnation sales remain fairly constant throughout the year.

Importers' requirements

Quality and grading: It is generally accepted that the UK is inclined to accept lower quality flowers than many other European markets, such as Switzerland, the Netherlands and Germany, but the UK is much stricter than the markets in for example the United States of America and Hong Kong.

Competition: With its efficient air connections, the UK receives regular consignments of cut flowers from all over the world. In addition, there are seldom supply shortages because of its proximity to the Dutch auctions.

Prices: UK prices closely follow the pattern of the Netherlands auctions. In general, wholesale prices are between 15% and 20% higher than the auction prices.

Market access

The UK has no quantitative restrictions on imports of flowers. As far as regulations on labelling are concerned, there are no statutory labelling requirements but it is recommended that EU standards should be adhered to.

Most flower imports require a phytosanitary certificate. The requirements are subject to changes and amendments and are currently being reviewed by the EU. Exporters would be well advised to check with the importers to establish the current situation before producing flowers for export.

Market opportunities

The per capita consumption (Table 2.1) of cut flowers and pot plants in the UK is recognised as one of the lowest in Europe. There has been optimism about greater demand, however, since the establishment of the Flowers and Plants Association. For the first time, this association has made available a budget for media advertising. The entry of supermarkets and chain stores into cut flower marketing also offers good prospects for a significant expansion in the market for flowers in the UK.

The performance of specific flowers

During the period from 1989 to 1994 imports of roses increased by 65%, but during 1994 there was no increase in rose imports. Prospects are not promising for suppliers of chrysanthemums from developing countries. The key to market entry is a competitive freight rate (SMFCFWE, 1996).

3.4.4 The Netherlands

The Netherlands is the largest producer of cut flowers in the world. It is also the largest exporter and had as much as 63,9% of total world exports in 1994 (CIF values). The Netherlands is also the fifth-largest importer of cut flowers in the world. The per capita consumption of cut flowers in the Netherlands was R152,04 in 1993, R 170,14 in 1995 and it is estimated this will rise to R184,62 in 2000 (see Table 2.1) (the Flower Council of Holland, 1995).

Total imports increased by 63% during 1989 - 1994 and this market is therefore a dynamic import market with the following countries as major importers:

- *Israel* is the leading source of flower imports to the Netherlands. Imports from Israel are also increasing by between 8% and 10% per annum.
- *Kenya*. Kenyan exports increased dramatically from $48 037 000 in 1994 to $60 979 000 in 1995 and $69 796 000 in 1996.
- *Zimbabwe*. Between 1994 and 1995 Zimbabwean exports to the Netherlands increased by 37% to $36 393 000. Zimbabwe seemed able to maintain this high level of exports in 1996 with exports valued at $37 669 000.
- *Spain* was the second-biggest source of flower imports to the Netherlands in 1993, but dropped to third place in 1994 and fourth in 1995 and 1996.
- *Colombia* is the fifth most important source of imports as it is one of the leading world suppliers of standard carnations (see Table 2, Annex 1) (AIPH, 1995; IFTS, 1997).

Distribution structure

There are probably as many as 10 000 different retail outlets in the Netherlands. The retail market is characterised by the wide variety of outlets and the importance of street and market

traders. These traders have low overheads and can therefore trade at lower prices than florist shops. They are also often on prime sites, thus encouraging impulse buying.

There are no wholesale markets of the kind normally found in other Western European countries. Practically all locally produced flowers and the majority of pot plants are sold through the auctions.

With a few exceptions, producers are committed to supplying their entire production to a designated auction. The auction sells and guarantees payment (within seven days), provides packaging materials and rents out loading trolleys. In return, the producer pays a commission of between 4,7% and 8% of the sales prices. The wide range of flowers of many different varieties and qualities on offer enables buyers to make speedy purchases for export purposes. The auction centres have offices for wholesale, export, road transport and airline companies, research establishments and banking facilities. In addition, many major buyers have offices and packing facilities in the auction building complex, enabling them to repack goods and to prepare bouquets and bunches to the specific requirements of customers worldwide. There is a total of seven flower auctions under the Federation of Dutch Flower Auctions (VBN). The three largest auctioneers, Aalsmeer (VBA), Naaldwijk (Westland) and Rijnsburg (Flora) account for 95% of total cut flower auction sales. The auctions give developing countries a point of entry into the Dutch market. However, they have stringent quality standards and these organisations will only grant an import licence to a supplier if they are satisfied that quality is of a satisfactory standard and continuity of supply can be maintained. The auctions set annual maximum quotas for imports. The quotas are usually increased every year. For example, the Aalsmeer auction established a ceiling of 300 million stems in 1985 and increased it to over 400 million stems in 1992 including 130 million stems for roses, 135 million stems for spray and 55 million stems for standard carnations, 40 million stems for gypsophila, 14 million stems for alstroemeria and 9 million stems for asters. No ceiling was set for imports of chrysanthemums. In addition to preparing flowers for auction, all flowers are inspected prior to sale and each consignment is given an inspection code. The various codes are as follows:

No remarks = 0;

Flower not perfect / damaged = 1;

Supply phase incorrect = 2;

Sorting unequal lengths = 3;

Stalk, limp, curved = 4;

Foliage deviations = 5;

Pests: aphids, red spider, trips, etc. = 6;

Fungi: botrytis, mildew, etc. = 7;

Growth deviations = 8;

Warning code = 9.

A product may be given a combination of two codes if there is more than one defect. If there are more than two defects the product may be withdrawn from the auction. These quality standards are constantly under review and rose imports are now subject to a mandatory bacterial count of the basal stem. A high bacterial count signifies a reduced vase life. In circumstances where products are in oversupply, which was often the case during 1991/92, it is not uncommon for buyers only to buy products with nil defects, or at worst only very minor defects. The presence of a serious defect could easily reduce prices by up to 50% and a minor defect by 5% - 10% (SMFCFWE, 1996).

The import trade - Most imports are bought at the auctions but there are also traditional importers buying directly from foreign suppliers. The Dutch auctions are becoming increasingly important as outlets for imports. The reason is that although the exporters may not obtain the highest prices, they will be fair and payment will be made quickly. In practice, most importing companies also participate actively in the export trade as well as in the domestic trade. Importers will also buying on auction and on their premises will offer their customers a complete range of services, including bunching, the preparation of bouquets and repacking. Their customers include retail florists, supermarkets and wholesalers. Many importers will also place imported flowers on the auction. In these circumstances the supplier will pay all the auction charges as well as the importer's commission charges. Though this may appear to be an unnecessary additional cost to the exporter of consistently high-quality flowers (i.e. an extra commission charge), the importer may well be in a position to sell privately a consignment which may have been heavily discounted for defects by the auction inspectors. The majority of imports are bought on a fixed-price basis by importers. It is, however, increasingly common for importers to trade on a consignment basis and charge a usual commission of 10% (SMFCFWE, 1996).

Consumer preferences

Consumption throughout the year is fairly consistent and a large proportion of purchases is made on impulse. Peak sales occur on occasions such as Mother's Day (the second Sunday in May), Easter, Christmas and Valentine's Day. The main preference in the Netherlands is for roses, followed by chrysanthemums and carnations.

Competition

The Netherlands has the largest and most efficient flower and plant producers in the world. These producers have access to the most advanced technical and research services. The large and efficient auctions have the greatest concentration of these products in the world. Quality standards are exceptionally high and the market has no place for products of lower quality. This does not suggest that it offers no opportunities to new suppliers, but it does emphasise that quality is of great importance (SMFCFWE, 1996).

Prices

Market forces dictate the price. Up-to-date price information can be obtained from the auctions and, for selected flowers of special interest to developing countries, from the ITC Market News Service, (MNS). Prices can vary widely, from one day to the next and from one quality grade to another. A weekly periodical, the *Vakblad voor de Bloemisterij*, provides information on markets and auction prices.

Promotion

The Netherlands conducts domestic and worldwide promotional campaigns for flowers and plants. These campaigns are co-ordinated by the Marketing Group for Floricultural Products comprising members of the Produktscap voor Siergewassen (the commodity board for floricultural products), the Board of Floricultural Wholesalers, the Federation of Dutch Flower Auctions and the Flower Council of Holland (Bloemenbureau Holland). The group is funded by contributions from horticulturists and the trade. A number of annual trade fairs are held, including several of relevance to potential exporters. The National Professional Flower Exhibitions, held in Aalsmeer in November, disseminate marketing and technical information about the cut flower and pot plant industries. NTV, the horticultural trade fair, is held at Bleiswijk in February and is aimed primarily at promoting the latest technical developments; it also provides some marketing information. The Westland Plant Exhibition held in March

and September at the Westland auction provides a forum for importers and exporters (Seminar on marketing fruits and cut flowers to Western Europe, 1996).

Market opportunities

The market for imported flowers has expanded rapidly in recent years. The Netherlands is a particularly important market for exporters in developing countries, because in 1994 these countries contributed close to 29% of Dutch imports and this share is increasing. The following factors hinder opportunities:

- Competition is strong and expected to become stronger.
- The Netherlands has some of the largest and most efficient producers of cut flowers in the world. Located as they are near to the auctions they are in a position to supply and offer flowers of the highest standard of quality.
- Supplies come from many other countries, especially Israel, where the quality standards are also high.
- Unless quality standards are maintained at a very high level, long-term prospects are limited.
- Prices are likely to continue to decline in real terms.
- Unless exporters can eliminate flowers of inconsistent quality, they will not have direct access to the auctions in future.

The major advantages of the auction system, in addition to fast and reliable payment procedures, are the unbiased quality reports on all consignments. However, the risks of marketing in the Netherlands can be high for those producers unable to maintain uniformly high quality and consistent grading.

The importance of specific flowers

Roses are the most popular flowers in the Netherlands, but only just over 8% of demand is met through imports (1994). Imports are increasing at a very high rate; volume increased more than three times during the five-year period from 1989 to 1994. Around 90% of all roses are imported by the auctioneers. Two-thirds of these imports are of the small flowered varieties and only one-third the large flowered roses. Auction imports of the large flowered varieties increased by 20% from 1993 to 1994, while imports of the small flowered varieties increased only marginally. Between 80% and 90% of all imports occur during the European

winter (1 November to 31 May). Major sources of imports are Israel, Kenya and Zimbabwe. In 1993, Ecuador was the fourth-largest source of imports during the winter period. In the expanding Dutch rose import market, there are clearly opportunities for producers in Malaysia and South Africa during the winter period, particularly from December to the end of February. Before starting production for export, the exporter should bear in mind that the rose is a delicate flower, requiring careful treatment and handling. Distant suppliers are vulnerable to quality problems if delivery is delayed or if the roses are subjected to high temperatures in transit. Given the heavy price discounting for any quality defects and a well-supplied market, the Netherlands presents large risks to all but high-quality, low-cost producers.

The chrysanthemum is the second most important flower in the Netherlands markets. Only an estimated 1% is imported, mainly from Israel and Zimbabwe and only from December to February. Chrysanthemums have a high volume and low weight which usually entails high freight rates, making this relatively cheap flower uncompetitive when transported from a remote location.

Carnations are extremely important in the international flower trade. The total imports in 1993 of 582 million stems represent approximately 50% of total Dutch auction sales. Approximately 80% of imports are of the spray varieties and 20% standard varieties. It should be noted that in 1995 the split between the two changed to 75% spray varieties and 25% standard varieties. The market prospects are not easy to define. The following factors should be taken into consideration: (a) Import demand is increasing as local Dutch production is decreasing, (b) supply is increasing faster than demand as more and more countries produce carnations for export, (c) reports indicate considerable increases in Spanish production and (d) downward pressure on prices. Market opportunities do exist, although it will become increasingly difficult for non-European producers to gain access to this market. There will always be room for the best producers, with high-quality flowers at competitive prices. It is vital for producers in South Africa to obtain reasonable airfreight rates.

Many different species of summer flowers are produced in the Netherlands, both under glass and in the open. In addition there are significant imports of several species. However, the total supply of many of these species is small and consequently these flowers are vulnerable to oversupply.

The opportunities for tropical flowers are extremely limited. Competition is keen from local producers, from orchid growers in Thailand and from anthurium growers in Jamaica and Mauritius (SMFCFWE, 1996).

Production costs

A comparative analysis (White, 1996) of Uganda, the Netherlands, Kenya, Zambia and Zimbabwe estimated the operating and capital costs of a one-hectare rose farm in the Netherlands. Table 3.12 gives the estimated minimum capital costs of building a modern rose farm in the Netherlands.

Table 3.12: The Netherlands: Capital costs of 1-hectare rose farm

Item	$
Glasshouse (basic structure) Venlo design	400 000
Boiler heating and pipework	160 000
Computer control / thermal screens	90 000
Hydroponics / substrate equipment	80 000
Lighting	200 000
Rose plants	155 000
Total	1 085 000

Source: White, 1996.

Using the standard production costs prepared by the Netherlands Ministry of agriculture, the annual operating costs of an average producer in the Netherlands, excluding greenhouse depreciation of $38.75/m^2 and depreciation and interest costs of $12.0/m^2, amount to a total of $50.75/m^2. At these costs the producer will lose money unless he achieves high yields of high quality. Table 3.13 presents the annual operating costs of a rose farm in the Netherlands:

Table 3.13: The Netherlands rose farm - annual costs (%)

	$	$/m^2
Output	560 000	56
Labour costs	180 000	18
Plant depreciation over 5 years	22 000	2,2
Heating and lighting	95 000	9,5
Chemicals and fertiliser	14 000	1,4
Repairs and maintenance	25 000	2,5
Marketing costs	45 500	4,55
Depreciation	120 000	12
Total	507 500	50,7

Source: White, 1996

3.5 The Australian flower industry

3.5.1 Introduction

Australia was included in this study because the rivalry between the South African and Australian flower industries has intensified in recent years. This competitive interaction is seen firstly in the fact that both Australia and South Africa can produce a wide variety of increasingly popular native flower varieties and compete for market share in the large world markets such as the EU, Japan and the USA. Secondly, Australia is probably South Africa's largest and fastest-growing market and Australia's second-largest supplier. South Africa exported large quantities of roses, carnations and chrysanthemums valued at R2,5 million to Australia in 1996. This increased by more than 220% to R5,5 million in 1997 (FECA, 1997). The rest of this section will discuss factors such as production, marketing and trade.

3.5.2 Production

There are 26 major flower-producing countries in the world. Total production by the top 15 countries accounts for a consumption of cut flowers amounting to $33 billion (1996). By comparison, Australian floricultural production comprises less than 1% of world flower trade (Karingal Consultants; 1997). Domestic production is estimated to be valued at R918 million at the farm gate and R1190 million at the retail level. Although these projections do not appear to be based on any published detailed survey work, these values are quoted by industry

experts in various publications (Karingal Consultants; 1997; ACIAR, 1996; Lewis *et al.*, 1997).

The Australian cut flower industry can be regarded as consisting of two broad subindustries – one involved in growing and harvesting Australian native flowers and the other in producing the traditional temperate flowers, mostly exotic, that dominate commercial production and consumption throughout the world (ACIAR, 1996).

3.5.2.1 Wildflowers

The wildflower industry in Australia is significantly export-oriented. Western Australia and Queensland are the main production areas (FECA, 1996). The wildflower industry in Australia includes Australian native flower species and South African proteaceae species. The Australian native flowers grown or picked exclusively for the fresh flower export market include Australian waxflower, kangaroo paw, banksia, waratah, snowflower and boronia. The South African proteas grown in Australia consist of pincushions, sylvan red, safari sunset and protea pink ice which form the basis of Australia's protea plantations (James, 1996).

Native Australian flowers are produced in many other countries in the world and the estimated size of Australian native flower production worldwide is estimated at R1,3 billion (wholesale). Australia produces wildflowers worth about R284 million. In world terms, Australian production of Australian native flowers and exotic proteas comprises only 10% of world production, although industry sources suggest that Australia produces about 30% of world waxflower production (FECA, 1996).

3.5.2.2 Traditional flowers

The vast majority (about 90%) of flowers grown in Australia are traditional flowers such as roses, carnations, orchids, lilies, statice, alstroemeria, lisianthus, calla lily, tulips, freesias and gypsophila. They are grown primarily to service the domestic market and to a lesser extent, the export sector

At present, most traditional flowers are grown in Victoria, New South Wales (NSW) and Tasmania. Victoria is the largest producer state in value terms, followed by Queensland, NSW and Tasmania. Growers tend to locate close to the major markets. Most of the growers

depend on longstanding ties with overseas breeders and technology suppliers in the Netherlands, USA and Japan (James, 1996).

Australia is beginning to face import competition from low-cost growers in Africa and Asia who are extensively involved in greenhouse production.

There is a tendency by authors to ignore the fact that about 90% of the Australian flower industry consists of traditional flower production and consumption, yet no real attempt has been made to make information available to producers and marketers.

3.5.3 Domestic marketing

As mentioned previously, the domestic market in Australia is dominated by traditional flowers such as roses, chrysanthemums, carnations and orchids.

The distribution structure of the Australian flower industry consists of the following elements: there are 2 600 flower growers in Australia and 7% of production is exported by 100 exporters. The remaining 93% and additional imports from 15 importing firms are distributed through several distribution channels to reach the consumer. The rest of the marketing structure includes wholesalers, central markets, 2 300 florists, 4 500 fruit and vegetable shops, 900 hawkers, 1 450 supermarkets and 9 000 other retailers. This situation is illustrated below in Figure 3.2. The relative importance of each element in the distribution channel is indicated by a percentage.

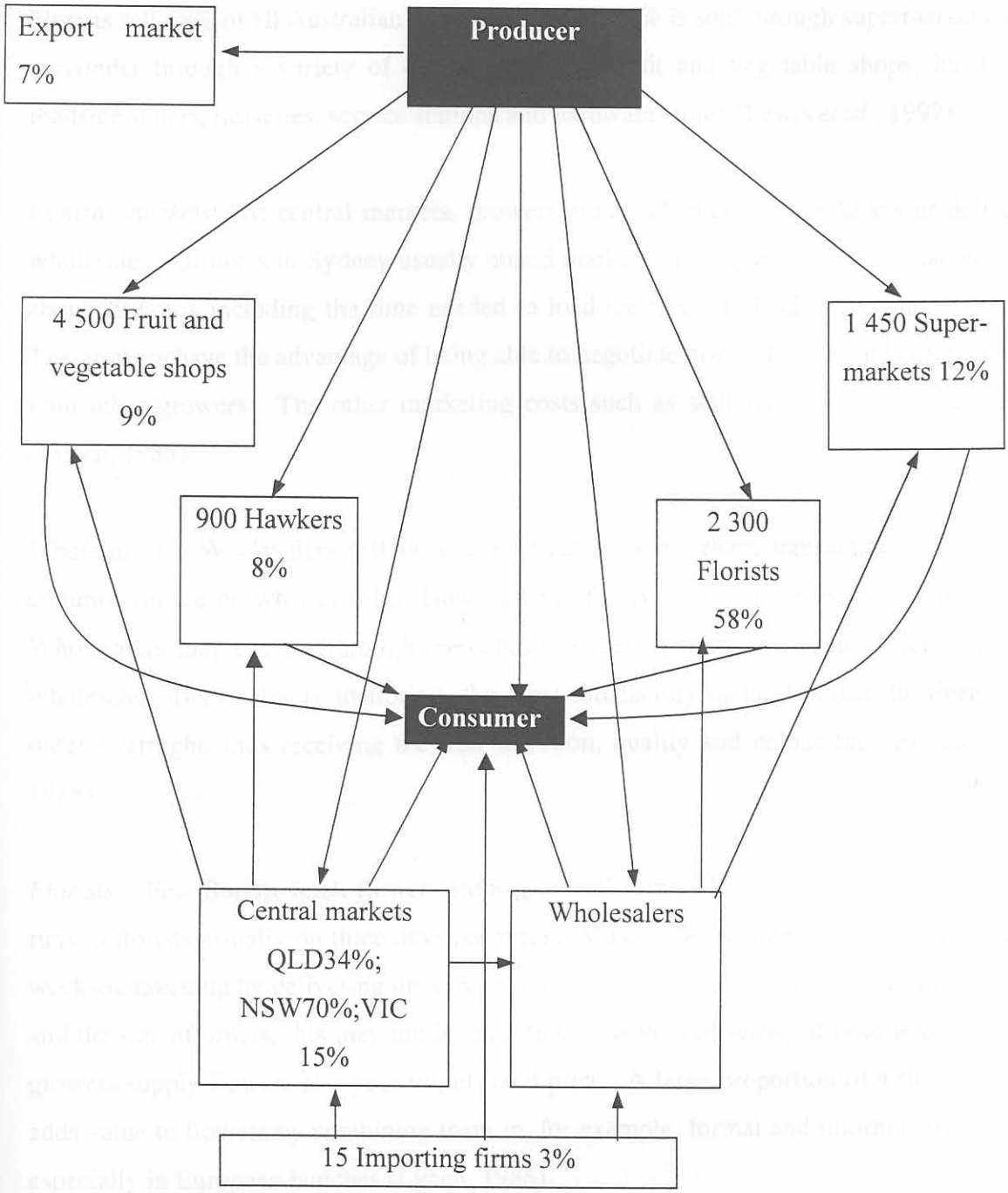


Figure 3.2: Flowchart of the relative importance of different distribution channels in the Australian market. Source: Lewis *et al.*, 1997

There is no single strong central market for cut flowers in Australia. Growers distribute flowers directly to local outlets, through metropolitan and regional flower markets (as grower vendors or through agents) or to independent wholesalers. Central markets in Brisbane, Sydney and Melbourne handle 34%, 70% and 18% respectively of all flowers from their respective states.

Florists sell 58% of all Australian flowers, of which 12% is sold through supermarkets and the remainder through a variety of outlets, including fruit and vegetable shops, hawkers and roadside sellers, nurseries, service stations and hardware stores (Lewis *et al.,* 1997).

Central markets: At central markets, growers either sell their own products or deliver to a wholesaler. Growers in Sydney usually attend markets three days a week, which would take about 20 hours including the time needed to load the truck, unload at the markets and sell. The growers have the advantage of being able to negotiate prices directly and compare quality with other growers. The other marketing costs such as stall rental are comparatively low (Lynch, 1988).

Wholesalers: Wholesalers sell on consignment as a merchant transaction or claim a flat commission fee on what is sold. However, the flat commission fee is becoming very rare. Wholesalers may operate through the central market or from a separate warehouse. If the wholesaler offers delivery to florists, the most satisfactory method is that the florist should order overnight, thus receiving the best selection, quality and colour the next day (Lynch, 1988).

Florists: Few florists fetch flowers from growers' farms. Therefore growers have delivery runs to florists, usually on three days per week. Most growers state that at least 15 hours per week are taken up by delivering directly to florists. In terms of the number of florists serviced and the size of orders, this may not be an efficient method of selling if time is costed. Many growers supply flowers at a year-round fixed price. A large proportion of a florists business adds value to flowers by combining them in, for example, formal and informal arrangements, especially in European bunches (Lynch, 1988).

Supermarkets: This is a sales area that has been steadily increasing as it follows overseas trends. In the USA a large percentage of flowers are sold through supermarkets. It is usual that one wholesaler per state supplies supermarket chains. Presentation is improving dramatically and competitive pricing should ensure that flower purchases become a more routine event for consumers (Lynch, 1988).

Dealers: Dealers usually collect flowers from growers' farms and deliver to outer metropolitan or country florists (Lynch, 1988).

Fruit shops: Fruit shops rely mainly on impulse buyers. They usually have low quality flowers displayed in front of the shop where they are exposed to heat, direct sunlight and car exhaust fumes; and usually keep better-quality more expensive flowers in a cool room (Lynch, 1988).

Roadside sellers: Roadside sellers rely on impulse buying and supply lower quality flowers at lower prices. In terms of most council by-laws, roadside selling is illegal but tolerated. The prices of flowers sold in this way, have remained static (Lynch, 1988).

3.5.4 Exports

Australian flower exports have grown rapidly over the past few years, from A$2,9 million in 1980/81 to A$30.1million in 1995/96 (Table 3.14).

Table 3.14: Australian flower exports

AUSTRALIAN FLOWER EXPORTS		
Year	**A$(FOB)**	**%Change**
1980/81	2 900 000	6,1
1982/83	2 600 000	-3,33
1984/85	3 500 000	34,61
1986/87	7 400 000	111,42
1988/89	14 500 000	95,94
1990/91	17 600 000	21,37
1992/93	23 100 000	31,25
1993/94	25 700 000	11,25
1994/95	26 600 000	3,5
1995/96	30 100 000	13,15

Source: ABS

Australia's main export destinations are Japan, USA and the Netherlands, absorbing approximately 48%, 15% and 10% respectively of total exports in 1996. This is illustrated in Table 3.15.

Table 3.15: Major export markets

MAJOR MARKETS FOR AUSTRALIAN FLOWERS				
Country	**Value A$m**	**%**	**Volume (mt)**	**%**
Japan	14,43	47,81	1928	44,13
USA	4,61	15,28	699	16,00
The Netherlands	3,16	10,48	456	10,43
Germany	2,24	7,43	352	8,05
Canada	0,97	3,24	430	9,84
Switzerland	0,92	3,07	114	2,60
Hong Kong	0,81	2,68	216	4,94
Italy	0,64	2,15	121	2,77
Taiwan	0.64	2,15	66	1,51
Singapore	0,34	1,15	48	1,09
New Zealand	0,24	0,80	18	0,41
Malaysia	0,23	0,78	40	0,91

Source: ABS

Australia is the fifth-largest exporter of cut flowers into Japan. After a 17% increase in exports to Japan from 1994 to 1995, there was a 10% decline between 1995 and 1996. Australian cut flower exports to Japan were valued at $10 335 000 in 1994, $12 086 000 in 1995 and $10 895 000 in 1996. Australia is the eleventh-largest exporter of cut flowers into the USA. Exports of Australian cut flowers to the USA decreased by 11% from $4 227 000 in 1994 to $3 783 000 in 1995 and decreased a further 1% to $3 728 000 in 1996. Australian exports to the Netherlands also decreased over the last couple of years. Exports valued at $1 289 000 in 1994 decreased to $1 283 000 in 1995 and decreased by a further 14% to $1 107 000 in 1996. This situation is illustrated in Figure 3.3 below (IFTS, 1997).

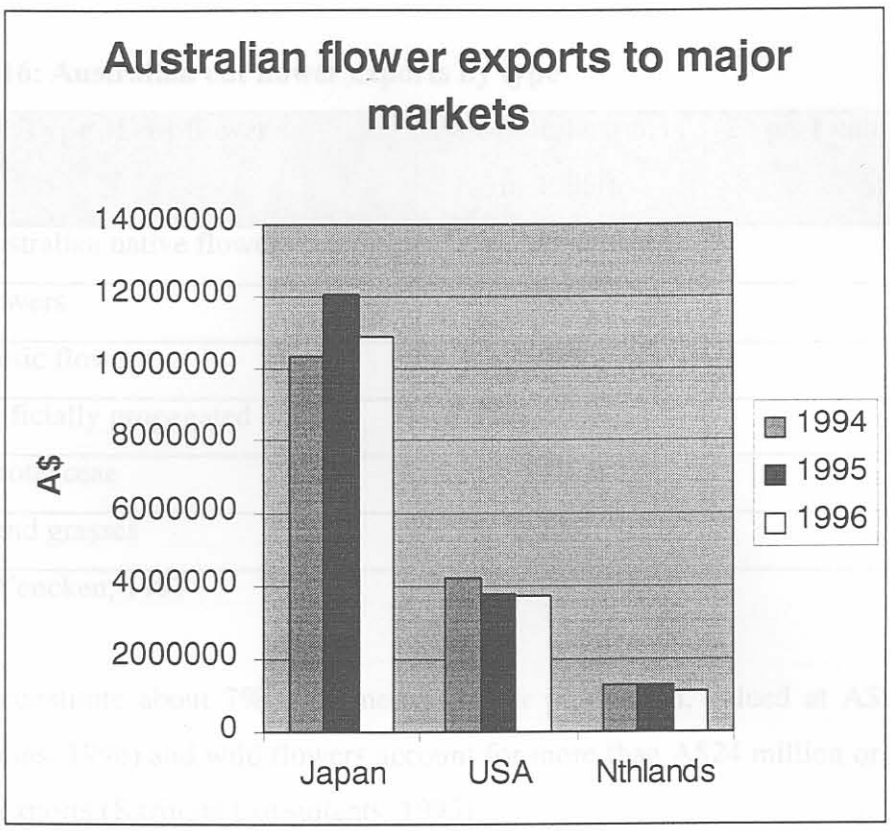


Figure 3.3: Australian flower exports to major markets

Source: IFTS, 1997

When analysing Australia's export statistics it is evident that Australia's exports are increasing (ABS, various years). However, decreases in exports to major countries have occurred in recent years (IFTS, 1997). This might be an indication that Australian flower exporters are starting to move away from the major export markets such as Japan, the USA and the Netherlands, and are finding more lucrative markets elsewhere.

Table 3.16: Australian cut flower exports by type

Type of cut flower	% of total exports in 1995/6	Export value (1995/6) A$
Fresh Australian native flowers	49%	14 749 000
Dried flowers	38%	11 438 000
Fresh exotic flowers	9%	2 709 000
Fresh artificially propagated orchids	2%	602 000
Exotic Proteaceae	1%	302 000
Foliage and grasses	1%	302 000

Source: Yencken, 1997

Exports constitute about 7% of domestic flower production, valued at A$26,67 million in 1996 (James, 1996) and wild flowers account for more than A$24 million or over 90% of the value of exports (Karingal Consultants, 1993).

Fresh and dried flowers

The value of Australian exports of fresh flowers (excluding orchids) to major final destinations more than doubled from A$7,8 million (f.o.b.) in 1990/91 to A$15.9 million in 1992/93, but fell markedly to A$12 million in 1993/94 and to A$10,4 million in 1994/95. According to the Japan Tariff Association, in 1991 Australia exported 1 053 tonnes of fresh cut flowers to Japan, valued at ¥1 280 million (JTA, 1991-1995). In 1995 the figures were 1 302 tonnes valued at ¥1 108 million. The average return per kg for fresh cut flowers exported to Japan fell markedly over this period. It is clear that Australia's flower exporters achieved increased exports at the expense of price (Lewis et al., 1997).

The value of Australian exports of dried flowers (excluding orchids) to major final destinations increased by more than 120% from A$6,5 million (f.o.b.) in 1990/91 to A$14,3 million in 1994/95. Therefore in 1994/95 the value of dried flower exports greatly exceeded that of fresh flower exports. Japan was once again the main export destination, accounting for approximately 42% of the total value. Japanese flower imports trebled in value from A$2 million (f.o.b.) in 1990/91 to A$6,1 million in 1994/95. Other major countries of final destination are the United States, Germany and the Netherlands

Export forecasts

Even though there are decreases in exports to Australia's major markets, the Flower Export Council of Australia (FECA) still believe that the overseas demand for Australian floricultural products is increasing. The five-year forecast for increased exports by region is illustrated in Table 3.17 and shows that al major markets are expected to grow

Table 3.17: Forecasted demand increase for Australian floricultural products

Region	Forecasted demand increase per annum
North Asia	9%
South Asia	15%
Europe	6%
North America	8%
Other markets	10%

Source: FECA, 1996

Predictions of strong demand have been received from the Japan Cut Flower Importer Association (JCIA) for the next decade and this leads Australian flower exporters to believe that exports to Japan can be increased from $30 million in 1996 to $40 million in 2000 (FECA, 1996).

3.5.5 Imports

Flower imports still supply a very small percentage of the market in Australia. In 1996 Australia imported flowers to the value of A$6 million, increasing by 25% to A$8 million in 1997. The exact statistics appear in Table 3.18 (ABS, 1996-1997). The major import products are roses, chrysanthemums, orchids and tulips. These are sourced mainly from Zimbabwe, South Africa, Singapore, Malaysia, Mauritius and Thailand (ABS, 1996-1997). The role of the Netherlands as a main source is declining as countries such as Zimbabwe and South Africa become more important sources, primarily of roses and chrysanthemums, while tropical orchids are the major imports from Singapore, Malaysia and Thailand (James, 1996).

Table 3.18: Flowers imported into Australia

Country	$m 1996	$m 1997	Tonnes 1996	Tonnes 1997
Zimbabwe	1 540 492	2 040 320	143 464	205 695
South Africa	733 793	1 609 242	68 662	149 868
Malaysia	890 877	1 061 263	120 815	157 185
Singapore	755 451	894 740	81 534	134 748
Mauritius	677 422	685 321	39 254	40 043
Thailand	166 548	168 352	2 673	31 872
Other	1 197 592	1 527 409	97 798	146 756
Total	59 62 175	7 986 647	578 257	866 167

Source: ABS, 1998

3.6 Conclusion

This chapter contains an overview of the international environment in which the South African flower industry operates. A short overview of the world flower industry, profiles of South Africa's major competitors in the world flower market, the Western European markets and a profile of the Australian flower industry, which is regarded both as a potential competitor and as a potential market will provide a basis for the analysis appearing in Chapter 5.

CHAPTER 4

METHODOLOGIES FOR COMPETITIVE ANALYSIS

4.1 Introduction

This study attempts to establish the extent to which South Africa and Australia are able to compete in the international flower industry. It will also attempt to indicate the extent to which South Africa and Australia will be able to compete with each other in an internationally competitive environment where direct competition is destined to intensify between these two countries.

The first part of this chapter provides a literature survey of the methodologies available for describing and estimating competitiveness. However, for the purpose of this study, the South African and Australian flower industries will be analysed according to the three methods described in the latter part of this chapter. The first method used is the determinants of competitiveness as proposed by Porter (1990). The second is the application of Balassa's (1989) Revealed Comparative Advantage model and the third, the application of the Policy Analysis Matrix (Monke and Pearson, 1990).

4.2 Literature survey

Two concepts can be identified in the literature. These concepts are frequently used to explain the issue of competitiveness. The first is the concept of comparative advantage and the second, the concept of competitive advantage. Porter (1990) describes the interaction between the two concepts and suggests that businesses generally should develop a hierarchy of competitive advantage. Comparative advantage or factor costs would be the lowest level in such a hierarchy. Economies of scale might be the next level, with technology and a highly skilled work force on the following levels.

4.2.1 Comparative advantage

The concept of comparative advantage suggests that the patterns of trade and the location of production are determined by comparing the cost of production with the cost of importing. If it costs less to produce locally than to import from abroad, then the country is deemed to have a comparative advantage.

Comparative advantage is the benefits that a business obtains as a product of the physical environment in which it operates. A business may passively gain a comparative advantage simply by being located in a country that has this advantage.

The theory of comparative advantage, as proposed by Ricardo in 1817, suggests that a country will export those goods that most intensely use that country's most abundant factors of production. Two approaches were developed to calculate a comparative advantage. Firstly Heckscher and Ohlin formulated a theory in 1933, but the assumptions of perfect competition and a world with only two nations makes this model inappropriate in practice.

A method developed by Balassa (1989), known as the Revealed Comparative Advantage method, bases its results on a country's trade performance in the specific commodity. Another method to calculate comparative advantage is the Policy Analysis Matrix (PAM) developed by Monke and Pearson (1990) in which social profits (shadow prices) measure the efficiency or comparative advantage of a firm or commodity system. The previous two methods approach the issue of comparative advantage from two different viewpoints. By contrast, the Revealed Comparative Advantage method approaches the issue from a macroeconomic perspective taking trade data into consideration, whereas the PAM approach calculate comparative advantage from a micro-level perspective taking production and marketing costs into consideration. It will therefore be useful to apply both methods to achieve a balanced view of comparative advantages for both South Africa and Australia.

4.2.2 Competitive advantage

Competitive advantage involves a more active approach to business than that of comparative advantage. Competitiveness relies on two factors: productivity and responsiveness to requirements in the market place.

Freebairn (1986) argues that industries are competitive when they are able to deliver products to overseas buyers at prices as good as or better than other suppliers, and they are capable of attracting resources of capital, land, and labour from other economic activities. This implies that without assistance, firms can pay at least the market rate of return for the resources they employ. This view suggests that competition lies between individual firms within a country. It has been shown (Stoneham, 1992) that export-competitive industries are those that have the ability to export and hold resources without government assistance. It was for this reason that Monke and Pearson (1990) developed the Policy Analysis Matrix that measures the effect of government intervention and other distortions on the competitiveness and efficiency (comparative advantage) of commodity systems. Porter (1990) identifies the determinants of competitive advantage as factor conditions, demand conditions, related and supporting industries, firm strategy, structure and rivalry, the government and the role of chance. Day (1984) devised another popular method of conducting strategic analysis and determining competitive advantage. Using this analysis, the firm's strengths and weaknesses as well as opportunities and threats are identified. Note that the first letters in each of these words form the acronym SWOT. The SWOT analysis views the firm's strengths and weaknesses as internal factors, while threats and opportunities are regarded as specifically involving scanning the external environments.

In the present study there is a need for a broad overview of the factors influencing competitive advantage in the South African and Australian flower industries. This objective will be achieved by applying the method proposed by Porter (1990). As this method was not specifically developed as a tool for comparing the competitive advantages of different industries in different countries, the Policy Analysis Matrix is used where the measurement and comparison of competitive advantages are possible (Monke and Pearson, 1990).

4.3 Determinants of competitive advantage

When is an industry internationally competitive? To answer this question, a second question posed by Porter (1990) should first be addressed:

"Why does a nation achieve international success in a particular industry?"

Porter believes the answer lies in the six broad attributes of a nation that shape the environment in which local firms can compete, and that foster a competitive advantage (see Figure 4.1).

- Factor conditions. The nation's position in the factors of production, such as skilled labour or infrastructure, needed to compete in a given industry.
- Demand conditions. The nature of home demand for the industry's product and service.
- Related and supporting industries. The presence or absence in the nation of supplier industries and related industries that are internationally competitive.
- Company strategy, structure and rivalry. The conditions in the nation governing how companies are created, organised and managed, and the nature of domestic rivalry.
- Government. The government plays a vital role, if not the most important role in international competitiveness. Government can be influenced by and influence each of the above determinants either positively or negatively. This is why government, as a determinant of competitiveness, can be viewed separately from the four determinants mentioned above.
- The role of chance. Chance events are occurrences that have little to do with conditions in a nation and are often largely beyond the control of firms (and often the national government). Chance events may include wars, political decisions by foreign governments, large increases in demand, shifts in world financial markets and exchange rates, discontinuity of technology and input demand.

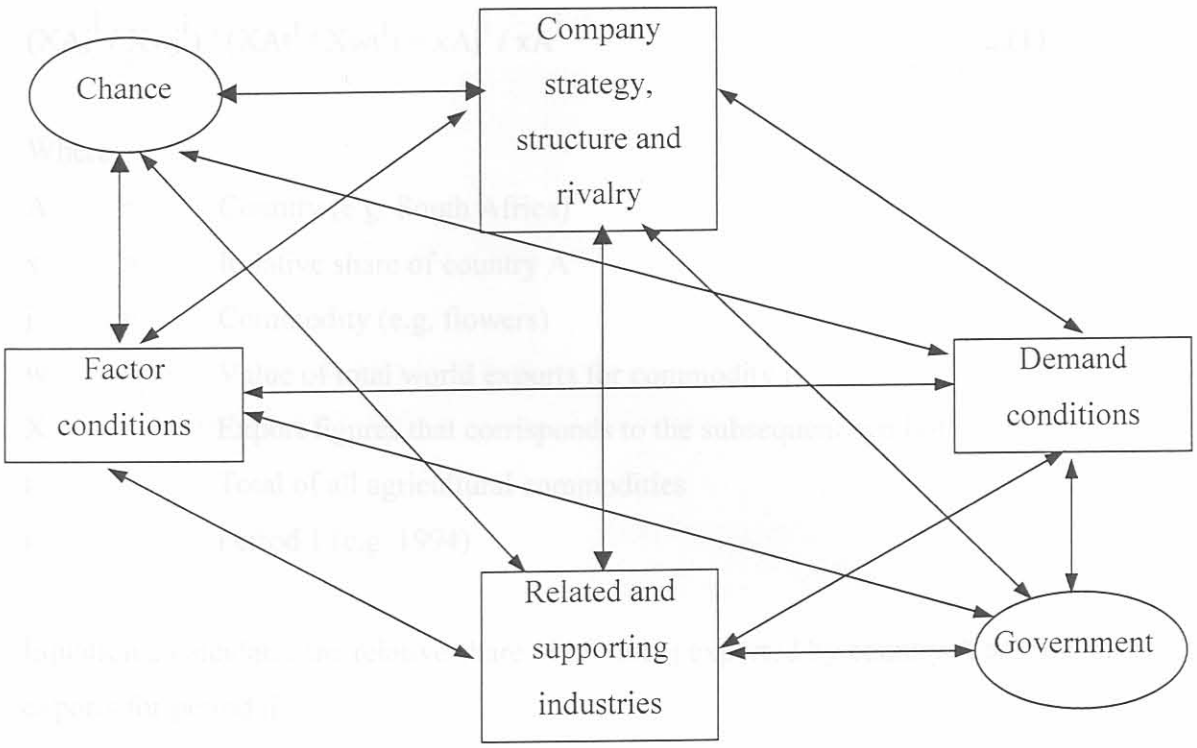


Figure 4.1: The determinants of competitive advantage

4.4 Revealed Comparative Advantage

Using the Revealed Comparative Advantage Model, the individual country's trade performances are analysed to determine the following (Balassa, 1989):

- The country's relative share in world exports of a individual commodity, and
- how the share changes over time.

According to the Revealed Comparative Advantage model, the following equations are used to calculate the comparative advantage:

Equation 1 determines an indicator of comparative advantage of country A in commodity j in period 1:

$$(XAj^{i} / Xwj^{i}) / (XAt^{i} / Xwt^{i}) = xAj^{i} / xA^{i} \quad ...(1)$$

Where:

A	=	Country (e.g. South Africa)
x	=	Relative share of country A
j	=	Commodity (e.g. flowers)
w	=	Value of total world exports for commodity j
X	=	Export figures that corrisponds to the subsequent symbol
t	=	Total of all agricultural commodities
i	=	Period 1 (e.g. 1994)

Equation 2 calculates the relative share of product j exported by country A to the world exports for period ii:

$$(XAj^{ii} / Xwj^{ii}) / (XAt^{ii} / Xwt^{ii}) = xAj^{ii} / xA^{ii} \quad ...(2)$$

Where:

ii	=	Period 2 (e.g. 1995)

The third equation compares the relationship between the relative share in period 1 and the relative share in period 2:

$$(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i}) \quad ...(3)$$

To determine an index for comparative advantage, equations 1 and 2 (indicators of comparative advantage in period 1 and 2) must be combined with equation 3 (indicating the change in comparative advantage between period 1 and 2). Equation 4 combines these two equations as follows:

$$(xAj^{ii} / xA^{ii}).(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i}) \quad ...(4)$$

In equation 4 it is assumed that the change in a country's relative share will grow geometrically. Balassa (1989) states however that the assumption can be partially avoided by compromising. The average of equation 2 and equation 4 will result in the compromise equation, equation 5.

$$1/2\ [(xAj^{ii} / xA^{ii}) + (xAj^{ii} / xA^{ii}).(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i})] \qquad ...(5)$$

The assumption of the compromise equation (equation 5) is that past trends will still continue, but at a decreasing rate. Equation 5 can be used to create indices of each commodity.

A commodity with an index greater than one will have a comparative advantage but an index of less than one will indicate a comparative disadvantage.

4.5 Policy analysis matrix (PAM)

4.5.1 Introduction

A policy analysis matrix is essentially the product of two accounting identities. The first identity defines "profitability" in private (market) prices as the difference between revenues and costs. The second identity measures the effects of distortions, such as government intervention and market failures, in the form of social (shadow) prices as the difference between observed parameters and parameters that would exist if the divergences were removed. Table 4.1 illustrates the differences between private and social analysis of profitability.

Table 4.1: Differences between private and social analysis

	Private	Social
Subject	Private/individual/firm	Nation, region, society, public
Objective	Private profits	National income objectives, efficiency
Composition of revenues and costs	Add taxes, deduct subsidies	Deduct taxes and subsidies
Prices	Market prices for capital, forex, etc.	Social prices (Shadow prices)
Externalities	Excluded	Included
Social impact and intangibles	Excluded	Can be examined and weighed

Source: Anandajayasekeram *et al.*, 1996

Annex 2 contains a detailed description of methods to calculate social prices.

4.5.2 Construction of a Policy Analysis Matrix (PAM)

The following data are required to construct a PAM:

- Detailed farm budgets for the specific system analysed. This budget must show fixed establishment costs[1], operating costs, marketing costs and revenues over the lifespan of the operation.

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[1] The fixed cost accrued in the establishment of the enterprise must be converted into an annual payment that will repay the cost of the fixed input over the useful life of the input and will provide an economic rate of return on the investment, also known as the capital recovery cost (CRC). CRC can be calculated by using the following formula (Monke et al, 1989)

$$CRC = Z[(1+i)^n i]/[(1+i)^n-1]$$

With: Z = Cost of the fixed input

i = Risk free interest rate
South Africa: government bonds = 12%; Australia: 5%

n = Useful life of the input

- Information about costs, allowing for disaggregation in tradable[2] and domestic[3] costs.
- Information about the distortions present in the environment so as to construct a flow of social prices where the distortions are eliminated from the private prices, as illustrated in Table 4.1 above.
- The construction of the PAM is based on the period in which the system operates at full capacity (Monke and Pearson, 1990).

By determining the elements of the PAM it will be possible to address the following issues:

- Determine a commodity system's competitive advantage.
- Compare the competitive advantage of different commodity systems.
- Determine the commodity system's comparative advantage
- Compare the comparative advantage of different commodity systems.
- Assess the impact of policy on competitiveness and farm-level profits.
- Assess the influence of investment policy on economic efficiency.
- Assess the effects of agricultural research policy on changing technologies.

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[2] Tradable products and services exported are classified as follows

Free on board price (f.o.b. price) > domestic cost of production

Goods are tradable if the f.o.b. price received at the border for a product on the world market is higher than the cost of local production. In such a case it is therefore profitable to sell the product on the international market.

Domestic cost of production > cost, insurance and freight price (c.i.f. price)

This implies that a product is imported because the cost of local production is higher than the c.i.f. price at the border for the same product on the international market (Gittinger, 1982).

[3] Non-tradable products and services can be classified as follows

Cost, insurance and freight prices (c.i.f. prices) > Domestic cost of production > free on board prices (f.o.b. prices)

In other words the import price of a product is higher than the cost of local production, but the cost of production is higher than the price on the world market. Goods can therefore not be traded at a profit in the international market. Non-tradable items also include goods and services that are not freely tradable because of government intervention (Gittinger, 1982).

Each PAM contains a revenue column and cost columns. Subtracting the cost columns from the revenue column will create a third column that represents the profits (Monke *et al.*, 1998; Gittinger, 1982).

Table 4.2: Policy Analysis Matrix

	Benefits	Costs		Profits
	Gross revenues	Tradable input items	Domestic factors	
Private (market) prices	A	B	C	D[1]
Social (shadow) prices	E	F	G	H[2]
Policy effects (Divergences)	I[3]	J[4]	K[5]	L[6]

[1] Private profits, D, equal A minus B minus C. [2] Social profits, H, equal E minus F minus G.

[3] Output transfers, I, equal A minus E.

[4] Input transfers, J, equal B minus F.

[5] Factor transfers, K, equal C minus G.

[6] Net transfers, L, equal D minus H; they also equal I minus J minus K.

4.5.3 Ratio indicators for the comparison of unlike output

Private cost ratio (PCR) = C/(A-B)

Domestic resource cost ratio (DRC) = G/(E-F)

Nominal protection coefficient (NPC)

On tradable outputs (NPCO) = A/E

On tradable inputs (NPCI) = B/F

The usefulness of these ratios is now discussed with special reference to private profitability, social profitability and policy transfers.

4.5.3.1 Competitive advantage

Systems producing an identical output can be compared where private profits, D, indicate competitiveness under existing policies. A ratio has to be determined to permit comparisons among systems producing different commodities. Direct inspection of the data for private profits is not sufficient. Profitability results are residuals and might have come from systems using very different levels of input to produce output (products) with widely varying prices. This ambiguity is inherent in comparisons of private profits of systems producing different commodities with differing capital intensities.

The problem is circumvented by constructing a private cost ratio (PCR), the ratio of domestic costs (C) to value added in private prices (A-B); that is PCR=C/(A-B). Value added is the difference between the value of output and the costs of tradable input items; it shows how much the system can afford to pay the domestic factor (including a normal return on capital) and still remain competitive, that is, breaking even after earning normal profits, where (A-B-C) = D = 0. The entrepreneurs in the system prefer to earn excess profit (D>0), and they can achieve this if their private factor costs (C) are less than their value added in private prices (A-B). Therefore they try to minimise the private cost ratio by holding down factor and tradable input costs in order to maximise excess profits (Monke and Pearson, 1989).

4.5.3.2 Comparative advantage

Social profits measure efficiency or comparative advantage. Results can be taken directly from the second row of the PAM for a comparison of identical output items. Social profits equal social revenues less social costs: H = (E – F – G). When profits are negative, a system cannot survive without assistance at social costs that exceed the costs of importing. The choice is clear for efficiency-minded economic planners: enact new policies or remove existing ones to provide private incentives for the systems that generate social profits, subject to non-efficiency objectives.

When systems producing different output items are compared for relative efficiency, the domestic resource cost ratio (DRC), defined as G/(E – F), serves as a proxy measure for social profits. No new information beyond social revenues and costs is required to calculate a DRC. The DRC was developed to compare the relative efficiency or comparative advantage of different production systems. The DRC plays the same substitute role for social profits, as does the PCR for private profits; in both instances, the ratio equals 1 if its analogous

profitability measure equals 0. Minimising the DRC is therefore equivalent to maximising social profits. In cross-commodity comparisons, DRC ratios replace social profit measures as indicators of relative degrees of efficiency (Monke *et al.*, 1989).

4.5.3.3 Policy transfers

Transfers are shown in the third row of the PAM. If market failures are unimportant, these transfers measure mainly the effects of the distorting policy. Efficient systems earn excess profits without any help from the government, and subsidising policy (L>0) increases the final level of private profits. Because a subsidising policy allows inefficient systems to survive, the consequent waste of resources has to be justified in terms of non-efficiency objectives.

Comparisons of the extent of policy transfers between two or more systems with different output items also require the formation of ratios (for reasons analogous to those offered in the discussion of private and social profits). The nominal protection coefficient (NPC) is a ratio that contrasts the observed (private commodity price) with a commodity price that has a comparable world (social) price. The ratio indicates the impact of policy (and of any market failures not corrected by efficient policy). That causes a divergence between the two prices. The NPC on tradable output (NPCO), defined as A/E, indicates the degree of output transfer, for example, an NPC of 1.10 shows that policies are increasing the market price to a level 10% higher than the world price. Similarly the NPC on tradable input (NPCI), defined as B/F, shows the degree of tradable input transfer. An NPC of 0.80 on the input shows that policies are reducing input costs; the average market prices for this input are only 80% of world prices (Monke and Pearson, 1990).

4.6 Conclusion

A more complete insight into the competitiveness of the South African and Australian flower industries will be gained by applying the three above-mentioned approaches. A qualitative analysis, using the guidelines proposed by Porter (1990), will be done to lay a broad basis for the more detailed studies that follow. The RCA method will derive the comparative advantage from the trade performance of the respective industries. Although this will not give the whole picture, the PAM derives comparative (DRC) and competitive advantage (PCR) from farm level, analysing enterprise budgets in the different industries.

The results of these approaches will be compared and consistencies and inconsistencies will both be discussed.

CHAPTER 5

ANALYSING THE COMPETITIVENESS OF THE SOUTH AFRICAN AND AUSTRALIAN FLOWER INDUSTRIES

5.1 Introduction

This chapter approaches the issue of competitiveness of the South African flower industry by comparing the South African flower industry with the Australian flower industry from different viewpoints. By applying the methods identified and described in the preceding chapter, a better understanding will be gained of the ability of these two countries to compete in the international flower market and with each other.

The reason for comparing South Africa to Australia is because of the intensified rivalry between the two flower industries in recent years. This competitive interaction is visible firstly in the fact that both Australia and South Africa can produce a wide variety of increasingly popular indigenous flower varieties and compete for market share in the large world markets such as the EU, Japan and the USA. Second, Australia is probably South Africa's fastest-growing market and South Africa is Australia's second-largest supplier. Large quantities of roses, carnations and chrysanthemums valued at $730 000 in 1996 increased by almost 120% to $1 600 000 in 1997 (FECA, 1997). Thirdly, the South African and Australian flower industries have some similarities, such as geographical isolation from the major world markets, their size and the development stage of the respective industries. However, little attention has been given to understanding the nature of the competitiveness between the South African and Australian flower industries. This shortcoming gives rise to an opportunity to include in this study an analysis of the competitive position of the Australian flower industry compared to that of the South African flower industry.

For analysing the competitiveness of the South African and Australian flower industries three methods were chosen: the first defines the determinants of competitiveness (Porter, 1990); the second uses the Revealed Comparative Advantage model (Balassa, 1989) to determine the elements of each country's flower industry; and the third method involves the compilation of a Policy Analysis Matrix (PAM) (Monke, *et al.*, 1990).

5.2 Background

Can South Africa be competitive in the international flower market? The competitiveness of Zimbabwe and Kenya in the international arena prove that African countries have the ability and potential to compete in Europe.

South Africa could feature among the top ten flower exporters in the world. In 1993 and 1994 South Africa was ranked the fifteenth largest exporter of cut flowers but in 1995 and 1996 SA dropped to the seventeenth position (Table 5.1). South Africa's competitiveness in terms of the southern African region can be summed up as follows: South Africa has advantages in the form of the region's most advanced economic and physical infrastructure and the largest and most complete (domestic) floriculture industry and market. South African manufacturers can supply nearly any input needed for floriculture and the country has the best logistics and freight situation. However, South Africa also faces numerous disadvantages that are unique to the region. These include high import tariffs in the European Union, less favourable climatic conditions for floriculture production, relatively high and increasing labour costs, labour unrest, difficulty with organising growers who are scattered over such a large geographical area, a lack of motivation to export and a good local market, but one with low standards that do not prepare growers for competing overseas. So far, the balance of these factors has not stimulated the large-scale development of cut flowers for export (Van der Meer, 1996; Malter, *et al.*, 1996).

The production of local growers decreases during the relatively cold winter season in South Africa and Zimbabwean, Zambian and Kenyan growers target South Africa as an export destination. The relatively mild winters in Zimbabwe and Zambia allow growers there to continue producing from May until the end of September.

Table 5.1: Cut flower exports to European markets

Rank				Exporting country	1996	1995	1994	1993
96	95	94	93		$'000	$'000	$'000	$'000
1	1	1	1	Netherlands	1 848 130	1 766 963	1 524 603	1 332 336
2	2	2	2	Israel	151 783	144 721	136 855	110 820
3	4	4	4	Kenya	105 350	98 170	70 014	60 324
4	3	3	3	Colombia	102 679	107 651	101 207	110 915
5	5	5	5	Italy	78 962	78 006	67 344	46 848
6	7	6	6	Spain	55 174	43 082	42 670	28 346
7	6	7	7	Zimbabwe	52 818	50 264	34 376	27 153
8	8	10	12	Ecuador	34 335	29 823	19 349	11 630
9	9	8	9	France	28 269	29 680	27 654	13 525
10	12	12	10	Germany	22 595	17 739	13 715	12 578
11	10	9	8	Thailand	22 209	25 532	24 575	25 887
12	11	14	16	Bel/Lux	19 658	18 416	12 332	6 677
13	13	11	13	Turkey	14 761	12 729	12 587	12 022
14	14	13	11	Canary Islands	12 921	16 624	13 950	10 112
15	15	29	14	Morocco	12 442	14 210	12 991	11 560
16	16	16	17	United Kingdom	11 658	10 261	7 001	4 138
17	17	15	15	South Africa	10 172	9 433	8 930	7 589

Source: IFTS, 1997

In spite of the 20% tariff on imported cut flowers, these imports from African countries still offer competition for local producers during the winter months. However, most of the farmers interviewed stated that this increased supply of flowers has expanded the demand for cut flowers in the main SA production season. This corresponds with observations in other countries such as Mexico, where South American countries have entered the Mexican market (Van Rooyen, 1997).

5.3 Determinants of Competitiveness

This method as developed by Porter (1990) and described in Chapter 4 will now be used for presenting a broad overview of the factors influencing the competitiveness of the South African and Australian flower industries.

5.3.1 Factor conditions

In past years, factor conditions were regarded as almost the only way for a country to gain a competitive advantage. Factor theory can partly explain the increasing success of flower exports from such countries as Colombia, Kenya, Sri Lanka, Malaysia, Thailand and Zimbabwe; all of which, to varying degrees, are generally well endowed with the basic factors of production (Batt, 1994).

The position regarding the factors of production necessary to serve both the South African and Australian flower industries should be explored so as to define the role that these factors play in creating a competitive advantage. These factors can be categorised as human resources, physical resources and infrastructure, and are discussed below.

5.3.1.1 Human resources

The management and administration of the farm require skilled people. The owner usually takes care of the technical, financial and marketing management of the farming business, but it is not uncommon for the owner to employ a manager to assist with management tasks. An administrative person is usually appointed on a full-time basis. Porter (1990) states that the availability and degree of excellence of skilled people will ensure a strategic or sustainable competitive advantage. The superior production knowledge and efficiency of the Dutch flower growers and marketers are a good example of their sustainable competitive advantage over growers in other countries (Maharaj *et al.*, 1995).

Flower farming is a perfectionist activity requiring skill and talent from each labourer. Due to the emphasis on quality, labourers must be trained to perform precise and sometimes complex tasks, such as pruning, spraying, fertilising, harvesting, irrigation and packaging. Therefore the labourers have to be semiskilled, as well as able and willing to learn.

South Africa and Australia both have tertiary training facilities such as universities, colleges, and agricultural schools that offer a high standard of horticultural and farm management training, with the result that people skilled in these fields are available in both countries

In South Africa a typical traditional cut flower farm employs between 15 and 25 full-time labourers per hectare (de Bruin, 1998). However, labour requirements and costs vary from

one flower variety to another and from farm to farm. Labourers in South Africa are generally regarded as less expensive but also less productive than European or Australian labourers. Labour activism in South Africa is also regarded as a significant problem, owing to ongoing labour strikes and increasing friction with trade unions about wage increases (Malter *et al.*, 1996).

South Africa's wage rate is higher than in other African countries. In South Africa labour costs on traditional flower farms range between 10% and 20% of the annual operating costs (excluding manager cost) whereas labour costs in Zimbabwe and Zambia come to between 6% an 8% of their annual operating costs (including manager cost). There is a great deal of European investment in African countries like Zimbabwe, Zambia, Uganda, Kenya and Malawi because cheap labour is available. South Africa's higher wage rate hampers competition in this regard, but is still an advantage in comparison to the high labour costs in Europe, which range between 30% and 40% of annual operating costs (White, 1996).

Labour costs on traditional flower farms in Australia range between A$10 and A$13 per labourer per hour (Young, 1998) and are estimated to contribute to about 50% of operating cost (Hardy, 1993).

When comparing the labour costs for native flower production in Australia and South Africa, the following came to light: the labour cost of producing proteas in Australia will comprise almost 90% of annual operating costs, while labour makes up 81% of operating costs to produce waxflowers (Karingal Consultants, 1998). South Africa's labour cost is much lower as wages contribute to only 42% of the operating cost (Department of Agriculture – Western Cape, 1997).

To conclude, it is evident that South Africa has a strong competitive position regarding the availability of low-cost labour. By contrast, Australia has high labour costs which have been claimed to be the single most detrimental attribute affecting the competitiveness of the Australian flower industry (Young, 1998).

5.3.1.2 Physical resources

The influence of abundance, quality, accessibility, and cost of resources like land, water, soil, and climatic conditions have major influences on the competitiveness of an industry (Porter, 1990).

Biological diversity

Both South Africa's and Australia's strength in the world flower market lies in its biological diversity and the opportunity available to develop valuable 'new' lines of wildflowers for the world cut flower market (Nederwieser, *et al.*, 1997; Lewis, 1997). As Craig Musson (1998), Managing Director of Westralian Flora Exports commented "We have a gene pool which is the envy of every flower producing country in the world". For flowers with market appeal, it is the attribute of 'newness' that makes such flowers attractive to buyers. An opportunity exists for Australia to continually introduce new flowers ahead of competitors and obtain a premium price once the market accepts them. Development systems to continually bring new lines to the market will help the Australian industry increase its sales of flowers (Lewis, 1997).

Australia faces competition from countries such as South America and Southern Africa that can grow wild flowers, have lower production costs and are closer to potential markets. This places Australian growers in a weak position if they continue to rely on a limited range of flowers. Furthermore, if Australia does not develop its potential flower species, it risks having other countries developing more of its species and of growers losing that advantage. Australia also faces the threat of other countries developing their own wildflowers; South Africa, in particular, has a pool of potential cut flower species that could provide a competing source of 'new' flowers of a similar type to Australian flowers in the world market.

Thus, both Australia and South Africa have a large gene pool of potential flower species for the production of 'new flowers'. This attribute places them both in a very competitive position with respect to the rest of the world.

Land

In South Africa and Australia the soils are generally regarded to be of good quality and cut flowers can be produced without too many additives (Young, 1998). In South Africa the Muldersdrift / Honeydew area is are an example of ideal soil for flower production and a large percentage of growers have chosen this area for production (Malter, 1996). High quality land close to markets and transport links In both Australia and South Africa are estimated to be R40 000 / ha (Collins, 1998) and R50 000 / ha (De Bruin, 1998) respectively.

According to Young (1998) buying land for the specific purpose of producing native Australian flowers will not be economically viable; the establishment cost will be too high to cover. The option of renting land is also not feasible, since a rental market for agricultural land is virtually non-existent in Australia. All the growers of wild flowers either embarked on the production of flowers as a secondary farming activity to diversify risk or to occupy vacant pieces of land on their farm. Often low quality soils are used and sometimes preferred due to the greater control over the exact soil requirements.

In South Africa a rental market for agricultural land does exist and numerous flower growers make use of this option. This is especially common practice among native flower growers (Wessels, 1998).

In summary, it is difficult to establish which of the two countries are in the most competitive position with regard to land. Both seem to have abundant good quality soil at reasonable prices. However, in Australia a rental market for land is virtually nonexistent where as in South Africa the market for rental land is part of the system. It be concluded that South Africa will have a slight advantage over Australia.

Geographical position

A few years ago it was generally believed that African countries were going to supply Europe, South American countries were going to supply the United States and that Australia would supply Japan with flowers. But, this theory was proven to be weak by Colombia (the second largest producer of cut flowers) supplying most of its produce to European markets, and Australia supplying a large percentage to the United States (Young, 1998). South Africa's closest export market is the Western European market, only an eight-hour flight away. Australia is much closer to Japan and the U.S.

South Africa is in the same time zone as most Western European countries, making it possible for a South African grower, marketer to do business with European companies during a normal working day. In a world of instantaneous global communications, South African exporters to Europe (world wide the most popular export destination) will have this advantage over many other countries like Colombia, Australia etc. that compete in the same market. Australia is more or less in the same time zone as Japan and they will have similar advantages over South Africa when competing for Japanese market share than South Africa have over Australia when competing for European market share.

Climate

Flowers are very sensitive to climate and generally require high light intensity, mild temperatures, and high relative humidity of 65% to 70%. The light intensity should be as high as possible, but high levels of radiation can result in temperatures that are too high. The ideal day temperature is 24°C to 29°C, while the best night temperature is 15°C to 18°C. Higher day temperatures than the above are only acceptable when air humidity is raised and evaporation slowed. As the temperature rises a crop will show the following responses:

- Flower production increase if temperature is not above 27°C.
- Flower colour has the tendency to fade with increasing temperatures.
- The number of petals drops dramatically at higher temperatures; few petals produce a soft bud that opens quickly and has a short vase life.
- Stem length decreases with increasing temperature. On the world flower market, prices increase in proportion to stem length.

In general, higher temperatures give greater yields but lower quality (Plaisier, 1998).

The above description of ideal climatic conditions may imply that South Africa and Australia have a competitive advantage over the most large European flower producers where climatic conditions are far from ideal with long, cold and dark winters. However, in comparison to large flower producing countries in Africa, South America and the Middle East, South Africa and Australia does not have a competitive advantage. Local growers believe that unfavourable climatic conditions are the fourth largest factor that negatively influence South Africa's competitiveness with the rest of Africa (See Chapter 2, Figure 2.18).

Australia has at least ten geographic regions and varied climatic conditions, thus enabling it to produce a wide range of traditional, exotic and native flowers (FECA,1996). However, it is also believed that Australia's weather is both too extreme and too variable to create a competitive advantage over countries such as Zimbabwe, Kenya, and Colombia.

Both countries are generally regarded as countries with good weather conditions, long summers and mild winters. Most of the areas occupied by growers in Australia and South Africa have suitable climate for flower growing. Most of South Africa's growers are concentrated in the Johannesburg / Pretoria area where mild weather at high altetude are close to ideal for flower growing. Australia's growers are all situated around the major cities like Melbourn, Sydney and Brisbane where wheather conditions are less favourable than that of Johannesburg and Pretoria.

Physical infrastructure

Infrastructure is very important to the success of perishable exports. In comparison to other African flower producing countries, South Africa has very good infrastructure. In the past Zimbabwe made use of the developed South African infrastructure by transporting truck loads of cut flowers to Johannesburg International Airport and exporting from there. South Africa is serviced by 54 airlines and nearly 10 international flights per day, many direct to markets in Europe. South Africa pays less than other African exporters as shown in Table 5.1 due to more competition among carriers, more southbound cargo and a larger off-season volume.

Table 5.2: Guideline air freight rates from Africa to Europe ($ / kg) 1995

Type of aircraft	Product	Zambia	Zimbabwe	South Africa	Kenya
Passenger	Vegetables	1,50	1,60	1,35	1,50 – 1,60
Passenger	Flowers	2,60	2,55	1,87	
Freighter	Vegetables	1,45	1,83	1,35	
Freighter	Roses	2,22	2,80	1,87	1,95 – 2,22
Freighter	Summer flowers	1,81	2,29	1,87	1,60 – 1,80
Freighter – Total cost ($)		56 000	70 000	55 000	50 000 – 55 000

Notes: Rates shown include 5% freight forwarder's commission
Rates per kilogram were calculated from rate per pallet
Rates in some countries may vary by airline
Rates may be considerably less in off-season

Source: TDI/Landell Mills Ltd / Doxiadis Associates, Zega - Development of Air Freight Strategy, Zambia export development programme, June 1995

Another important form of infrastructure is cold transport. Even though there is a well-developed network of cold transport services available in South Africa, only a few South African producers make use of cold transport. When flowers are not kept cold during transport, the result is a loss in the quality of flowers between the farm and wholesaler, retailer or consumer. This loss in quality is a critical issue if producers want to produce high-quality flowers for the export market. Flowers are highly perishable and every hour after harvesting, even in cold storage rooms and cold transport, will cause a decline in quality. Therefore exporters cannot expect to compete with the fresh flowers available – sometimes only a hour after harvesting – on the European markets, unless they use cold transport from the farm to airport.

Australia also has a highly developed infrastructure with excellent roads, an extensive network of cold transport services and arguably the best communication system in the world (Musson, 1998). In Australia there is fierce competition among airlines, especially on routes to Japan and the USA, consequently freight costs are relatively low. However, over the peak

harvesting and export season (September to December) the limited air freight capacity is an increasing cause for concern as the air freight requirements for cut flowers are growing at a rate of 10% - 20% per annum (Karingal Consultants, 1997; Young, 1998).

Information infrastructure

The production technology for traditional flowers in both South Africa and Australia is mainly imported from Europe and adjusted by consultants, growers and institutions to make it more suitable for local conditions. This technology boosts productivity but producers have to realise that this technology was developed under vastly different conditions than those prevailing in South Africa or Australia. The main problems for European technology are as follows:

- Adverse weather conditions
- Limited availability of land
- High cost of labour

These conditions will encourage European technology to alter the effect of bad weather conditions on flower production and restrict the number of labourers by using capital-intensive technology. By contrast, labour is relatively cheap in South Africa and Australia, and this will require a more labour-intensive technology. Moreover weather conditions are better than in Europe.

In South Africa the information infrastructure that forms a link between the researchers and the growers of traditional flowers is weakly developed. There is virtually no contact between the informational centres in South Africa and the grower, largely because growers lack confidence in these institutions (see Chapter 2; section 2.6.3.1). As far as the South African indigenous flower industry is concerned, the growers rely more on the information disseminated by research institutions. The ARC - Fynbos information service is the most prominent source of information and consists of publications, extension services, consultations and training courses (Wessels *et al.*, 1997).

South Africa does have a history of research into agriculture and, as a result, general climate and soil data have been collected in South Africa for many decades and are used by some local floriculture advisers. Although scientific floriculture information systems are limited in capacity, there are some institutions to support the knowledge information system available to

South African growers. The efforts by several institutions were discussed in Chapter 2; section 2.2.

The informational infrastructure developed in Australia is mainly focused on the Australian wildflower industry. Numerous research reports have been published and the infrastructure to support growers with production and market research does exist (Young, 1998). Institutions developed for this purpose are the Native Flower Group, Rural Industries Research and Development Corporation (RIRDC), the Horticultural Research and Development Corporation (HRDC), universities, Austrade, the Department of Foreign Affairs and Trade and the Department of Primary Industry (Karingal Consultants, 1997).

5.3.2 Home demand conditions

The most important influence that home demand has on competitive advantage is the mix and the character of the household buyer's needs (Porter, 1990).

South African and Australian consumers do not have a culture of buying flowers. South Africa's per capita consumption expenditure on flowers averages approximately R3,04 (see Chapter 2; section 2.2). Australia's per capita consumption expenditure on flowers is estimated at between R48 and R58 per annum (Karingal Consultants, 1997). By contrast, Switzerland has the highest per capita consumption expenditure in the world, averaging R385,53 on flowers. A complete list of per capita consumption statistics is given in Table 2.3.

South Africa

The relative attractiveness of distant export markets has diminished for South African growers because of the domestic market that is large enough to purchase all their production at reasonable prices and without the competition and complications involved in export sales.

Another hindrance to competitiveness is that local buyers are not as quality conscious as European buyers. Therefore the local buyer does not pressure local growers to innovate faster and achieve more sophisticated competitive advantages than their foreign rivals.

Well-established flower growers in South Africa may have benefited unduly for many years by, until very recently, having an isolated domestic market. Some producers also seem to

lack the motivation to modernise and take the steps necessary to launch successful export drives or compete against new imports.

Growers in countries such as Zimbabwe and Kenya realised that the South African market with its relatively low quality demands would be an ideal market for the low-quality flowers that would not be acceptable on the European markets. These countries are now dumping large quantities of flowers (especially roses) on the South African market.

Conseqeuntly, it can be concluded that the domestic demand in South Africa does not contribute positively to South Africa's competitiveness in the international arena.

Australia

Australia has a small market for flowers seen in the context of the world flower trade, with a population of about 18 million (1995) and an estimated consumption expenditure of R1,2 billion on flowers (FECA, 1996; Karingal Consultants, 1998; James, 1996).

More than 90% of flowers purchased by Australian consumers are exotic or traditional flowers. Like South Africans, Australians do not have a culture of buying flowers. Purchasing trends are confined to special occasions, and per capita flower consumption is relatively low. Personal consumption expenditure appears to be closely linked to economic conditions. The market is also price sensitive. For example, a recent Sydney Market Authority survey indicated that there are price barriers at A$6 and A$12 for flowers for personal use and that the usual amount spent for special occasion purchases ranges from between A$20 to A$30. Such purchases face competition from other gift lines such as alcohol, confectionery, artificial flowers and soft toys. Supermarket and roadside sales have contributed to the increased impulse buying of flowers (Lewis *et al.*, 1997; Karingal Consultants, 1994).

When compared with countries in the northern hemisphere, countries such as Australia are poor consumers of cut flowers, but Australia is gradually catching up. The Australian population growth rate is about 1,1% per annum and flower consumption is projected to increase by 5% per annum (Yencken, 1997). Flowers are increasingly being distributed via supermarkets (following trends in the United States and more recently in Europe) and will reach more target customers and can provide better quality at more affordable prices. This

trend will have a positive effect on the per capita consumption expenditure on flowers (ACIAR, 1996).

The reason for South Africa and Australia's low per capita consumption expenditure on flowers is that consumers in these countries do not have to endure the harsh winters of countries like Germany or Switzerland, where a fresh bunch of cut flowers is essential to add colour to the grey and gloomy days. Most Australians and South Africans have home gardens but this is seldom the case in Japan or Europe (Lynch, 1988).

5.3.3 Related and supporting industries

The presence or absence in the nation of supplier industries and related industries that are internationally competitive, has a major influence on an industry's competitiveness (Porter, 1990). Both South Africa and Australia have excellent industries able to supply almost every input necessary for flower production at a price that can compete with that of imported products. These products include greenhouses, EC controllers and spray equipment, fertilisers, and chemicals.

5.3.4 Strategy, structure and rivalry

The fourth broad determinant of competitive advantage in an industry is the context in which entities in the flower industry are created, organised and managed as well as the nature of domestic rivalry (Porter, 1990).

As growers in both Australia and South Africa do not give much support to industry organisations, it is difficult for these organisations to create a structure and strategy for the industry (De Bruin, 1998; Young, 1998). The primary role of any industry organisation is to obtain benefits for and represent the interests of its members. This lobbying and representative role is crucial in dealing with government at all levels (Karingal Consultants, 1993). Governments will listen to the views of a well represented, coherent industry when given by an organisation that is clearly recognised as representing that industry.

There is a strong association between vigorous domestic rivalry and the creation and persistence of international competitive advantage in an industry (Porter, 1990). Nations with leading positions in the world almost invaribaly have a large number of strong local rivals

whereas firms with limited local rivalry are seldom highly competitive. The availability of close substitutes limits the price competitors that can charge without inducing substitution and eroding industry volume. A large number of competitors will push down margins as they seek to increase their market share (Porter, 1990).

South Africa

Figure 5.1 illustrates the factors that give structure to the floriculture sector in South Africa:

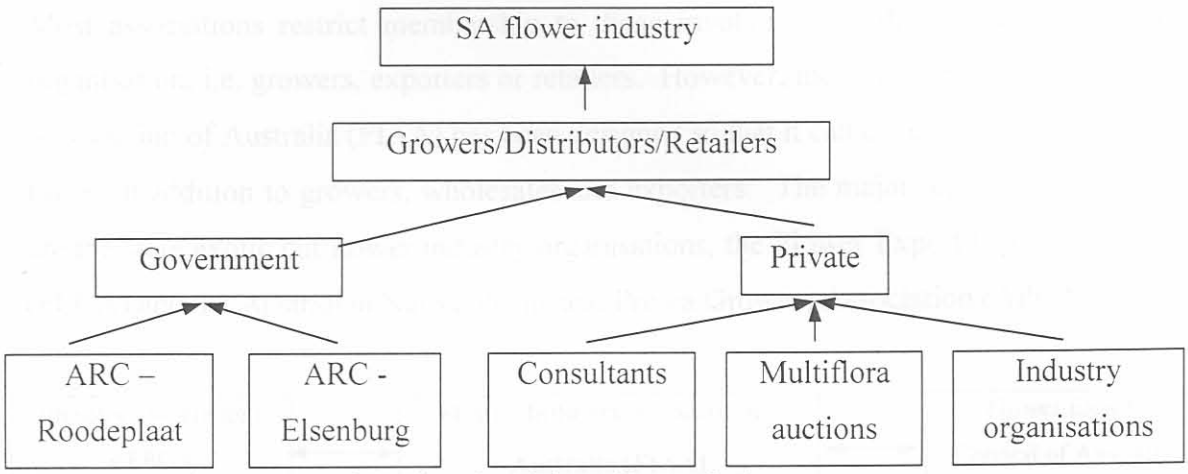


Figure: 5.1: Structure of the South African flower industry

The elements in this structure are discussed in Chapter 2, section 2.2.

There is strong competition on local markets in South Africa. Growers tend to be extremely secretive to maintain or create a competitive advantage. Most South African growers are situated in the Johannesburg and Pretoria region. The rivalry among growers in this area is intense, especially where there is a high concentration of growers in a particular area, often literally a stone's throw from one another. The reasons for this concentration are access to well-developed infrastructure, mild weather conditions, close proximity to the largest local distribution channel (Multiflora) and easy access to Johannesburg International Airport for exports.

The factors of strategy, structure and rivalry cannot be regarded as important to creating a competitive advantage for the South African flower industry. Flower growers are unable or unwilling to co-operated with increasing their production and marketing capacity. Even though domestic rivalry is apparently keen, it cannot prepare the grower to produce flowers of

a high quality for the export market. However, the Multiflora auctions, which are the central point of the distribution channel, can be regarded as a strategic part of the infrastructure.

Australia

In Australia fewer than 25% of the eligible people or organisations are members of their industry associations. However, in most cases the associations nevertheless represent a major proportion of production and are influential in the industry (Karingal Consultants, 1997). Most associations restrict membership to those involved with the primary interest of the organisation, i.e. growers, exporters or retailers. However, the newly created Flower Industry Association of Australia (FIAA) has been designed so that it can cover retail florists and allied trades in addition to growers, wholesales and exporters. The major representations of FIAA are the state exotic cut flower industry organisations, the Flower Export Council of Australia (FECA) and the Australian Native Plants and Protea Growers Association (APGA).

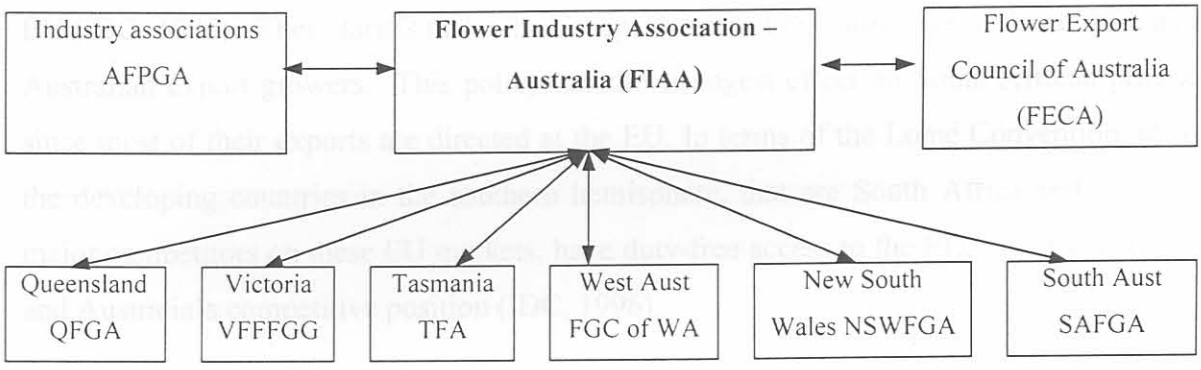


Figure 5.2: Flower industry organisations in Australia

Source: FECA (1996)

FECA is a key institution for the wildflower industry, since it exports more than 50% of its production and accounts at present for 94% of flower exports. FECA has been active in negotiations for market access, the promotion of trade (trade shows in Japan, USA, Taiwan and Indonesia) and the promotion and development of the quality assurance (QA) programme. FECA is highly regarded overseas especially in Japan (Young, 1998). However, FECA does not have the support of all growers.

The Australian and South African growers have a remarkably similar attitude. Australian growers tend to be very secretive about any knowledge they gain. This is especially obvious

in the relationship between Western Australian wildflower growers and East Coast growers, among whom no love is lost (Young, 1998).

5.3.5 Government

Porter (1990) claims that firms compete internationally, not nations. Governments cannot create competitive industries, as a government does not control nor is it the source of competitive advantage, it can only influence it. The role of the government should be to stimulate investment, to encourage the introduction of more sophisticated technology, assist firms to penetrate more advanced segments, encourage competition and upgrade demand conditions. In world floricultural production the influence of government intervention has a strong effect on the competitiveness of growers, especially in the EU.

Currently South African and Australian flower exporters have to pay an 18% tariff from 1 June to 30 October and a 12,7% tariff from 1 November to 31 May on goods exported to the EU (IDC, 1996). These tariffs make the European market less attractive to South African and Australian export growers. This policy has the strongest effect on South African producers since most of their exports are directed at the EU. In terms of the Lomé Convention, most of the developing countries in the southern hemisphere, that are South Africa and Australia's major competitors on these EU markets, have duty-free access to the EU, thus weakening SA and Australia's competitive position (IDC, 1996).

Both Australia and South Africa have to compete with flower growers, especially those in the EU, that receive government subsidies and grants in order to maintain their competitive position in the world. The Dutch government has recognised that floricultural production is an area in which the Netherlands has a lead, which should be maintained through technological development. In order to maintain this lead, grants and subsidies are available for companies conducting research into such areas as biotechnology, the cultivation of new species, the development of installations for the mechanisation of processes, environmental protection and energy conservation measures. Dr J W Vriethof of BNS states that it is possible to obtain from the Dutch government, grants of up to 40% for technological development and 50% - 60% for research. Further grants are available from European Union funds. Small and large companies are both eligible, but bigger companies have easier access to grants because their research projects tend to be more ambitious. Individual grants usually

range from 200 000 to 300 000 Dutch guilders, but bigger projects may receive up to one million guilders (Maharaj *et al.*, 1995).

South Africa

South African trade has for many years been handicapped by the economic sanctions that isolated South African producers from international competition. These sanctions denied South African flower growers access to the Dutch auctions and to other national markets where other Southern African countries had laid the groundwork for a takeoff in exports during the crucial years of the late 1980s (Malter *et al.*, 1996).

South African growers producing for the local market face stiff competition from Kenyan, Zimbabwean and Zambian exporters who are increasingly focusing on South Africa as an export destination. Imports of cut flowers grew by 67% during 1994, 49% in 1995 and 126% in the first 6 months of 1996. According to the IDC (1996), imports from these countries accounted for 40% of produce on the local market. However, 80% of this produce was imported during the South African winter when local production is low.

South African growers also complain about the unfair competition and under-invoicing that reduce the duties paid on the value of imported flowers. An *ad valorem* tariff of 20% is levied on imports and, according to trade statistics, the average import price for roses is about R0,15 per stem. These imports comprise about one-third of the low-quality flowers on Multiflora auctions (IDC, 1996). Another role that government could play is in improving phytosanitary supervision and control. Therefore it is important for the competitiveness of the industry on the local market that the government should enforce the correct payment of import tariffs. South African growers would also benefit if trade barriers on the imports of plant material were liberalised but this would require better phytosanitary supervision and control.

South African growers also have to compete on the European markets with countries where assistance from the government plays a vital role, but assistance from the South African government is virtually non-existent, except for the ARC that makes a limited contribution to research and the distribution of information.

Australia

As far as tariff and non-tariff barriers to trade are concerned, Australia's major market, Japan, does not charge an import tariff on flowers. But the United Sates of America, Australia's second largest export destination, charges the tariffs shown in Table 5.3.

Agricultural input items imported to Australia are generally not subject to import tariffs. Should there be a tariff it would probably not exceed 5%. Possible imported input items used by Australian flower growers are listed below in Table 5.4. Some of the items listed below were subject to sales tax, but a new Goods and Services Tax (GST) of 10% will be introduced shortly, which will be payable on all input and services.

Table 5.3: USA import tariffs on flowers

USA import Tariffs on Flowers	
Description	**Tariff**
Mini carnations	3,5%
Roses	7,2%
Standard carnations	6,9%
Orchids	6,9%
Chrysanthemums	6,9%
Anthuriums	6,9%
Other (including South African and Australian native flowers)	6,9%

Source: APEC, 1998

Table 5.4: Distortions on input items in Australia

Items	Import duty	Sales tax	GST
Equipment, tools, etc.	5%	20%	10%
Greenhouse	5%	20%	10%
Irrigation equipment	0%	0%	10%
Spray equipment	5%	20%	10%
Fertilisers	0%	0%	10%
Chemicals	0%	0%	10%
Pipes	5%	0%	10%
Electronic equipment	5%	20%	10%
Cold storage	0%	0%	
Water tanks, stands	0%	0%	10%
Pumps	0%	0%	10%
Tractor			10%
Utility vehicle		15%	10%

Source: Customs and Excise, 1998

Australia does not charge any tariffs on flower imports (APEC, 1998). Large producers of low-cost flowers, such as Zimbabwe, Malaysia and South Africa (FECA, 1998), are increasingly viewing Australia as a viable export destination. Australian exotic or traditional flower growers admit that they cannot compete with these countries and that there is growing uncertainty about the future for growers of roses, carnations and chrysanthemums (FECA Update, 1998).

Government research is mainly focused on the Australian wildflower industry. Numerous research reports have been published and the infrastructure to support growers with production and market research does exist (Young, 1998). The institutions established for this purpose are the Native Flower Group, Rural Industries Research and Development Corporation (RIRDC), the Horticultural Research and Development Corporation (HRDC), universities, Austrade, the Department of Foreign Affairs and Trade and the Department of Primary Industry. The RIRDC currently spends a rate of about 2,5% of gross Production

Value (PV) on the R&D of the wildflower industry, while other agencies and individuals have an expenditure of an approximate additional R3,4 million. Karingal Consultants (1997) suggest that there is a need for a progressive increase in R&D funding to at least R6,8 million per annum and an additional R7 million to R10 million over the next 10 years to fund the commercial development of new products from underdeveloped Australian native germ plasm.

Government research on the production and distribution of traditional or exotic flowers is non-existent and the growers of these flowers rely heavily on European consultants and the research conducted in Europe. However, the public sector makes grants and funds available for the development of agribusinesses. These funds and grants are potentially available to growers of indigenous and traditional flowers (Karingal Consultants, 1994).

In general, government research in Australia still tends to focus heavily upon the need for on-farm productivity gains without necessarily examining the opportunities for such gains throughout the entire supply chain (Gleeson *et al.*, 1994).

5.3.6 Interpreting the results

To "quantify" this qualitative analysis, a multicriteria analysis was conducted where values were awarded to each of the criteria identified above. An award schedule was developed in order to quantify performance. If a country has a low competitive advantage in a certain field identified it is awarded 1 point, a mediocre (Medium) competitive advantage scores 3, high competitiveness 5 and very high 8. A country can also score between low and mediocre which will be classified as "Low+" and 2 points will be awarded, and similarly for "Medium+", "High+ "and "Very High+". Table 5.5 represents the performance-award schedule.

The evaluation of the performance of the countries in a specific determinant was based on the published facts and general attitudes of industry experts, as portrayed in the literature studied.

Table 5.5: Performance-award schedule

Performance	Points awarded
Low	1
Low+	2
Medium	3
Medium+	4
High	5
High+	6
Very High	7
Very High+	8

Before conducting this analysis, the following assumptions had to be taken into consideration:

1) Each of the five determinants was weighted equally

- Factor conditions 20%
- Home consumption 20%
- Related and supporting industries 20%
- Structure, strategy an rivalry 20%
- Government 20%

2) The scale is linear

3) There are no absolute threshold values for any criterion

Table 5.6: Results derived from analysing the determinants of competitiveness

Criteria	Performance		Score	
	SA	Austr	SA	Austr
Factor conditions	**High**	**Medium+**	**4,8**	**3,8**
• Human recourses	High+	Low+	6	2
□ *Semiskilled labour (wages)*	*High+*	*Low+*	*6*	*2*
□ *Skilled labour*	*High*	*High+*		
• Physical resources	High	High	5	5
□ *Biodiversity*	*Very high*	*Very high*	*7*	*7*
□ *Land*	*High+*	*High*	*6*	*5*
□ *Climate*	*High*	*Medium+*	*5*	*4*
• Infrastructure	Medium+	High	3,5	4,5
□ *Physical infrastructure*	*High*	*High+*	*5*	*6*
□ *Informational infrastructure*	*Low+*	*Medium*	*2*	*3*
Home consumption	**Medium+**	**Medium**	**4**	**3**
Related & supporting industries	**High**	**High+**	**5**	**6**
Strategy, structure & rivalry	**Low+**	**Medium+**	**2,3**	**3,7**
• Domestic rivalry	Medium	Medium	3	3
• Structure	Low+	Medium+	2	4
• Strategy	Low+	Medium+	2	4
Government	**Medium**	**Medium**	**2,7**	**3,3**
• Research	Low+	Medium+	2	4
• Industry protection	Medium+	Low+	4	2
• Accessibility of export markets	Low+	Medium+	2	4
Total	**Medium+**	**Medium+**	**3,76**	**3,96**

It should be kept in mind that the main aim of this approach is to lay a broad foundation for a more specific study. As this method is mainly a descriptive analysis, the competitive position of the industries can be compared for the individual determinants. However, comparing the competitiveness of the industries by taking all the determinants into consideration would require a highly complex multicriteria analysis in which weights should be assigned to each industry's individual determinants. As stated in the assumptions above, each of the five

determinants is weighted equally in the present analysis. This can be regarded as a weakness and will decrease the validity of the results of this analysis, but this methodology will still provide some insights into the competitiveness of these industries, especially when comparing the individual determinants.

The results presented in Table 5.6 indicate that the Australian flower industry has a slight competitive advantage over the South African flower industry. The competitive advantage that Australia has over South Africa is due to (1) superior related and supporting industries, (2) greater capacity in its structure and strategy, (3) better developed physical and information infrastructure, (4) higher capacity of government research programmes and (5) greater access to export markets.

However, these determinants in which Australia and also large European flower-producing countries excel are not necessarily the most important. As floriculture is such a labour-intensive industry, countries with lower labour costs and suitable weather conditions, such as Colombia, Kenya, Zimbabwe and South Africa, have shown remarkable growth in recent years.

The determinants that can be considered to be the main contributors to South Africa's competitiveness when compared to those of Australia are: (1) low labour cost, (2) accessibility to land and a more favourable climate, (3) larger growth potential for home consumption and (4) greater government protection of the industry.

Both South Africa and Australia can be considered as mediocre competitors in the world flower industry. However, both countries have a great biological diversity of indigenous wildflower species, which are the envy of every flower-producing country in the world. As the flower industries in both countries are relatively young and underdeveloped, high growth rates can be expected.

5.4 Revealed Comparative Advantage

5.4.1 South Africa

Balassa's (1989) proposed Revealed Comparative Advantage / disadvantage (RCA) of the South African floriculture sector and also the subsectors within the floriculture sector can be calculated by substituting the trade data in Table 4 (Annex 1) into the equations developed by Balassa (1989) and described in Chapter 4. These subsectors include the flower, cut flower, cut foliage and house plant sectors. In the calculation 1994 and 1995 were regarded as time period 1 and time period 2 respectively.

Table 5.7: RCA analysis – South Africa

	Equations[1]	Results				
		Floriculture	Flowers	Cut flowers	Foliage	House plant
1	$(Xaj^{i} / Xwj^{i}) / (XAt^{i} / Xwt^{i}) = xAj^{i} / xA^{i}$	1,093	0,735	0,747	6,955	0,406
2	$(Xaj^{ii} / Xwj^{ii}) / (XAt^{ii} / Xwt^{ii}) = xAj^{ii} / xA^{ii}$	1,114	0,716	0,713	7,228	0,476
3	$(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i})$	1,019	0,974	0,955	1,039	1,174
4	$(xAj^{ii} / xA^{ii}).(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i})$	1,134	0,697	0,681	7,511	0,559
5	$1/2\ [(xAj^{ii} / xA^{ii}) + (xAj^{ii} / xA^{ii}).(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i})]$	1,124	0,707	0,697	7,370	0,518

The result of equation 5 indicates whether or not the sector will have a comparative advantage. The results are shown in Table 5.8.

Table 5.8: Results derived from the RCA analysis – South Africa

	Floriculture	Flowers	Cut flowers	Cut foliage	House plants
Comparative (dis)advantage	1,124	0,707	0,697	7,370	0,518

The results shown in Table 5.8 represent the comparative advantage (disadvantage) of the total floriculture, flower, cut flower, cut foliage and house plant sectors in South Africa, compared to the performance of other agricultural sectors and world exports. As described in Chapter 4 any figure greater (less) than 1 represents a comparative advantage (disadvantage).

[1] Symbols used in equations are defined in Chapter 3

The total floriculture sector shows a comparative advantage of 1,124. This comparative advantage is largely due to the high comparative advantage of cut foliage (7,37). However, the flower and cut flower sectors show a comparative disadvantage with figures below one, at 0,73 and 0,70 respectively.

It is important to note that the comparative advantage / disadvantage calculated for each sector represents firstly, the relative share that of the different South African floriculture sectors have in world exports, secondly, the export performance of other agricultural sectors and thirdly, how the share changed between 1994 and 1995.

The comparative disadvantages of the flower (0,70), and cut flower (0,69) sectors are mainly due to the relative share of world exports (of flowers and cut flowers) which is lower than the relative export share of the South African agricultural sector as a whole. For example, in 1994 the flower sector's share was only 0,4% and the cut flower sector only 0,41% (Table 6) while the share of agricultural exports as a whole in 1994 was 0,55%. This relatively low share of world exports by South Africa may be due to a combination of the following factors

(a) Political isolation forced the South African flower industry out of international competition.
(b) Large growers who supply the local market and who have been involved with floriculture for many decades dominate the South African flower industry. Most large flower growers concentrate on local demand and are reluctant to export.
(c) The distribution channels for South African exports are poorly developed.
(d) The South African market is satisfied with a much lower quality than the European market.

Consequently the growers are not prepared to produce flowers of consistently high quality so as to comply with international standards.

Between 1994 and 1995 South African flower exports increased in value from R30 347 030 to R33 918 210 and cut flower exports increased from R23 128 700 to R25 374 770. However, the comparative disadvantage of the flower and cut flower sectors has increased because the relative share of these two sectors in world exports declined between 1994 and 1995.

Owing to a lack of data for previous years, the actual growth rates in the relative share of the different sectors over the past few years are not accurately reflected in equation 5 and may give the wrong impression.

5.4.2 Australia

The Revealed Comparative Advantage / disadvantage (RCA) of the Australian flower industry as a whole and also subsectors within the flower industry was calculated as proposed by Balassa (1989). These subsectors include the wildflower industry, traditional flower industry and waxflower industry.

The data required to calculate the comparative advantage / disadvantage of the Australian flower industry were sourced from the FAO statistics web page, the Australian Bureau of Statistics (ABS) and the IFTS (1997). Time series data over the period 1994 to 1996 were used for calculating the RCA for the flower industry. Time series data to calculate the wildflower and waxflower industries were inadequate. However, by combining the estimates that industry experts made in various publications (ACIAR, 1996; Karingal Consultants, 1997; FECA, 1996) data could be gathered to calculate the comparative advantage for 1996 as shown in Table 5 (Annex 1). The RCA can be calculated by substituting the appropriate trade data (Table 5, Annex 1) into the equations in Table 5.9.

Table 5.9: RCA analysis - Australia

	Equations[2]	Results		
		Flower	Wildflower	Wax flower
1	$(XAj^{i} / Xwj^{i}) / (XAt^{i} / Xwt^{i}) = xAj^{i} / xA^{i}$	0,211	3,245	9,735
2	$(XAj^{ii} / Xwj^{ii}) / (Xat^{ii} / Xwt^{ii}) = xAj^{ii} / xA^{ii}$	0,192	No data available	
3	$(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i})$	0,911		
4	$(xAj^{ii} / xA^{ii}).(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i})$	0,175		
5	$1/2 [(xAj^{ii} / xA^{ii}) + (xAj^{ii} / xA^{ii}).(xAj^{ii} / xA^{ii}) / (xAj^{i} / xA^{i})]$	0,183		

According to Balassa (1989) the result of equation 5 will indicate whether or not the sector will have a comparative advantage. In this case only the flower sector had sufficient data to

[2] Symbols used in equations are defined in Chapter 4

yield a result for equation 5. However, Balassa (1989) indicates that the result of equation 1 also shows the comparative advantage but does not take change over a time period into consideration. The results are shown in Table 5.8.

Table 5.10: Results of the RCA analysis - Australia

	Flower industry	Wildflower	Wax flower
Comparative (dis)advantage	0,183	3,245	9,735

The results shown in Table 5.10 represent either a comparative advantage or a comparative disadvantage, as described previously.

The Australian flower industry as a whole scores a value of well below one (0,183) indicating a comparative disadvantage. However, this comparative disadvantage is largely due to the weak performance of the Australian traditional flower sector, since the wildflower sector and more specifically the waxflower sector score comparative advantages.

Australia is a dominant world player in the production and export of wildflowers. Australia produces and exports approximately 10% of the total world output of wildflowers, and 30% of world waxflowers (ACIAR, 1996; Karingal Consultants, 1997; FECA, 1996). This dominant position resulted in an RCA value of 3,245 for the wildflower sector and 9,735 for the waxflower sector.

The long-term prospects for Australia's competitive advantage in the wildflower sector are under threat because producer countries in Africa and South America are showing an increasing interest in producing inexpensive wildflowers. Australia also faces the threat that other countries may develop more of their own wildflowers; South Africa, in particular, has a pool of potential cut flower species that could be a competing source of wildflowers of a similar type to Australian flowers on world markets.

The only way that Australia can maintain its comparative advantage in this field is to make use of its biological diversity and the opportunity to develop valuable new lines of wildflowers for the world cut flower market. To this end, Australia will have to develop systems that will continually bring new lines onto the market.

5.4.3 Summary

The data allow a comparison of the flower industries in South Africa and Australia. Both these industries have a comparative disadvantage, though Australia has the greater (0,183) disadvantage. South Africa has a far smaller comparative disadvantage of 0,7 indicating that South Africa's flower industry has a comparative advantage over the Australian flower industry. However, Australia reveals a large comparative advantage as a producer of wildflowers. Even though no data were available to compute South Africa's comparative advantage in the production of wildflowers, South Africa would probably also have a comparative advantage in this area. Since the limited export data do not allow significant comparisons, an analysis of representative production systems would be useful. This analysis is in the form of a Policy Analysis Matrix.

5.5 Policy Analysis Matrix

5.5.1 Construction of Policy Analysis Matrices

Policy Analysis Matrices were constructed by deriving information from the enterprise budgets of the most representative flower crops in both South Africa and Australia. This type of analysis is done to establish the competitive and comparative advantages of each system, and also gives insight into the effect that government intervention has on the competitiveness of the systems.

5.5.1.1 South Africa

Rose (Long stemmed) / Gauteng Province / 1998

A PAM of the rose production and export system was constructed (Table 5.11) for South Africa, because roses are the largest export crop of traditional flowers and also the most popular flower on the local South African market (IFTS, 1997; Multiflora, 1998). A budget (Annex 3 and Annex 4, Table 3) for a typical rose export farm in the Johannesburg and Pretoria area (in Gauteng Province) was compiled for the specific purpose of constructing a PAM. The variety produced is long stemmed, large flowered roses, as this variety is believed to be the most profitable to produce and export (Taschner, 1997). Approximately 60% of the produce is exported to the Netherlands, and the remaining 40% sold on the local market. This production system will reach its full capacity in the second year of operations and this analysis is therefore based on the second year of production.

Table 5.11: Policy Analysis Matrix: Rose (long stemmed, large flowered), Johannesburg and Pretoria area

		Costs		
	Revenue	Tradables	Domestic factors	Profits
Private prices/ha	2 296 182,06	1 473 164,28	142 903,51	**680 114,27**
Social prices/ha	2 596 238,50	1 350 780,00	141 132,28	**1 104 326,22**
Divergences/ha	**-300 056,44**	**122,384,28**	**1 771,23**	**-424 211,95**

Protea / Western Cape Province / 1995

Another PAM was constructed (Table 5.12) for South Africa's largest export cut flower, the protea (Wessels *et al.*, 1997). This analysis was based on the budget of a farming system for exporting proteas (Annex 4, Table 4) in the Western Cape Province in 1995. It was estimated that approximately 80% of the produce would be exported and 20% distributed to the local market (Department of Agriculture - Western Cape, 1995). Wessels (1998) conducted an economic cost-benefit analysis (based on the 1995 protea budget) in which both social and private prices were calculated for revenues, tradable and domestic factors. The results of this economic cost-benefit analysis were modified in the construction of the PAM. This system will reach its full capacity in the fifth year of operations and this analysis will therefore be based on the fifth year.

Table 5.12: Policy Analysis Matrix: Proteas - South Africa

		Costs		
	Revenue	Tradables	Domestic factors	Profits
Private prices/ha	37 323,25	9 289,55	4 446,41	**23 587,29**
Social prices/ha	40 966,28	22 576,29	4 895,60	**13 494,39**
Divergences/ha	**-3 643,04**	**-13 286,75**	**-449,19**	**10 092,9**

5.5.1.2 Australia

Carnation / New South Wales / 1993[3]

Carnations are estimated to be the largest traditional flower crop produced in Australia (Haze, 1998). The PAM constructed (Table 5.13) is based on a budget (Annex 4, Table 1) compiled by Hardy (1993). A carnation production system of 1 hectare, undercover (igloo) and in soil, supplying only the local market was analysed. This system will reach its full capacity in the second year of operations and this analysis will therefore be based on the second year.

Table 5.13: Policy Analysis Matrix: Carnations - Australia

		Costs		
	Revenue	Tradables	Domestic factors	Profits
Private Prices/ha	680 625,00	130 334,42	409 964,86	**140 325,72**
Social Prices/ha	680 625,00	126 549,78	409 964,86	**144 110,37**
Divergences/ha	**0**	**3 784,65**	**0**	**-3 784,65**

Waxflower / Queensland / 1995

Waxflowers are Australia's largest export flower crop (Karingal Consultants, 1997; FECA, 1996) and analysing this crop will give significant insights into the competitiveness of the Australian flower industry. This PAM (Table 5.14) is based on a budget (Annex 4, Table 2) constructed by International Horticultural Marketing Pty Ltd in 1995 (DPI, 1995). This system will reach its full capacity in the fifth year of operations and this analysis will therefore be based on the fifth year.

[3] The most recent carnation budget available in Australia.

Table 5.14: Policy Analysis Matrix: Waxflowers - Australia

		Costs		
	Revenue	Tradables	Domestic factors	Profits
Private prices/ha	59 400,00	14 693,34	22 941,64	**21 765,02**
Social prices/ha	59 400,00	14 172,58	22 941,64	**22 285,78**
Divergences/ha	**0**	**520,76**	**0**	**(520,76)**

Protea / Queensland / 1995

South Africa's proteas are among the most popular wildflower crops produced in Australia. It was not possible to estimate the significance of proteas in the Australian flower industry, but as authors focus a great deal of attention on this crop and as protea systems can be compared for Australia and South Africa, this crop was selected for analysis. This PAM (Table 5.15) is based on a budget (Annex 4, Table 5) constructed by International Horticultural Marketing Pty Ltd in 1995 (DPI, 1995). This system will reach its full capacity in the seventh year of operations and this analysis will therefore be based on the seventh year.

Table 5.15: Policy Analysis Matrix: Protea-Australia

		Costs		
	Revenue	Tradables	Domestic factors	Profits
Private prices/ha	83 820,00	23 651,73	19 641,64	**40 526,63**
Social prices/ha	83 820,00	23 130,97	19 641,64	**41 047,39**
Divergences	**0**	**520,76**	**0**	**(520,76)**

5.5.2 Comparison of results

Table 5.16 shows the ratio indicators for the comparison of unlike output, such as the output of rose and protea systems in South Africa; and of carnation, waxflower and protea systems in Australia.

Table 5.16: Ratio indicators

	South Africa		Australia		
	Rose	Protea	Carnation	Waxflower	Protea
PRC	0,17	0,16	0,74	0,51	0,33
DRC	0,11	0,27	0,73	0,50	0,32
NPCO	0,88	0,91	1	1	1
NPCI	1,09	0,41	1,03	1,04	1,02

5.5.2.1 Competitive advantage

The competitiveness of each production system analysed, given current technologies, output values, input costs and policy transfers, is reflected in the value that represents the private profit. That is R680 114,27 (A$178 977,44) for roses (SA); R23 587,29 (A$8 768,50) for proteas (SA); A$140 325,72 for carnations (Australia); A$21 765,02 for waxflowers (Australia) and A$40 526,63 proteas (Australia).

It seems that the rose system has the capability to make the greatest profit per hectare. However, land is not the only limiting factor in question, so it would be inappropriate to compare only the private profits of the different systems.

An alternative measure is required to compare the competitiveness of different systems with one another. This measure is the private cost ratio (PCR) that was developed specifically to compare the competitiveness of different systems. PCR shows how much the system can afford to pay domestic factors and still remain competitive. If the PCR ratio equals 1 the profitability is zero, thus by minimising the PCR, private profits will be maximised.

Of the systems analysed (Table 5.16) South Africa's protea system proved to be the most competitive with a PRC of 0,16. The second most competitive system is South Africa's rose system 0,17; with Australia's protea system third with a PCR of 0,33; waxflower fourth and carnation fifth with PRCs of 0,51 and 0,74 respectively.

5.5.2.2 Comparative advantage

The efficiency or comparative advantage of this system is reflected by the social profitability. Efficient outcomes are achieved when an economy's resources are used in activities that create the highest levels of output and incomes. The systems analysed yielded the following results: R1 104 305,05 for roses (SA); R13 494,39 for proteas (SA); A$140 110,37 for carnations (Australia); A$22 285,78 for waxflowers (Australia) and A$41 047,39 for proteas (Australia). These results show the social profits that can be made on 1hectare of land for each of these crops. However, all of the systems differ widely and no significant conclusions can be drawn by comparing these figures. Nevertheless, these figures can be used to calculate the domestic resource cost ratio (DRC) which was developed to compare the relative efficiency or comparative advantage of these different systems. Similarly to the PCR, the DRC equals 1 if its profitability measure equals 0. Minimising the DRC is therefore equivalent to maximising social profits.

When comparing the different systems according to their DRCs (Table 4.16) South Africa's rose system proved to be the most efficient or to have the largest comparative advantage with a DRC of 0,11. The second most efficient system is the South African protea system with a DRC of 0,27; followed by the Australian protea system (DRC=0,32); the Australian waxflower system (DRC=0,5) and the Australian carnation system (DRC=0,73).

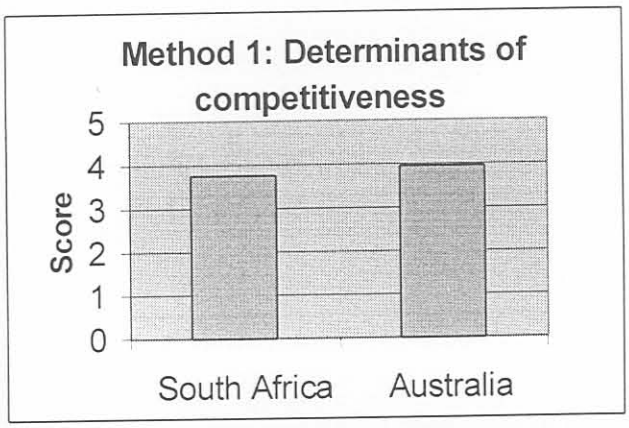
5.5.3 Summary

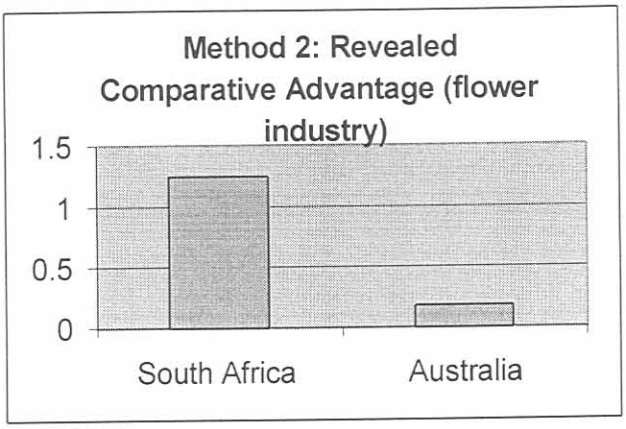
The results of the PAMs conducted indicate that the South African protea system which is South Africa's main floricultural export crop, is the most competitive (PRC=0,16) and the second most efficient system (DRC=0,27). South Africa's rose system is the most efficient (DRC=0,11) and the second most competitive system, whereas the Australian systems analysed were found to be less efficient and less competitive than the South African systems. Of the Australian systems analysed, the protea system seems to be the most competitive (PRC=0,33) and efficient (DRC=0,32), and is even more efficient and competitive than the waxflower system, which is the most prominent floricultural export crop (DRC=0,5; PRC=0,51). Carnations are the least efficient (DRC=0,73) and competitive (PRC=0,74) crop which explains the inability of this flower to compete on international markets and its vulnerability to imports from Zimbabwe and South Africa.

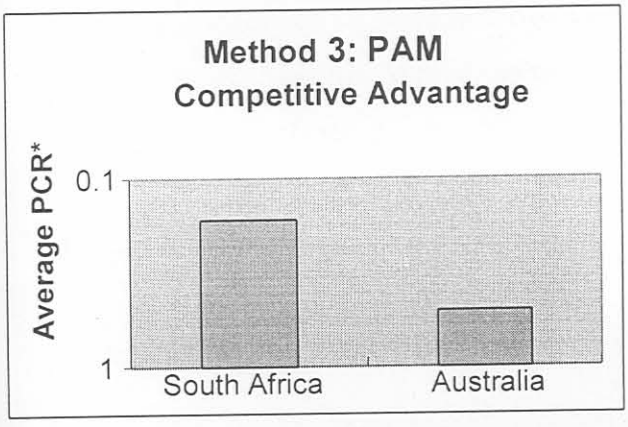
The analysis of the effect of government interventions shows that the South African flower systems analysed are more affected by government than the Australian flower systems analysed. Input prices are higher and output prices lower for the analyses of the South African flower systems. This change in prices has a negative effect on competitiveness. The Australian flower systems analysed were affected negatively as regards input prices, but output prices were not affected by government intervention.

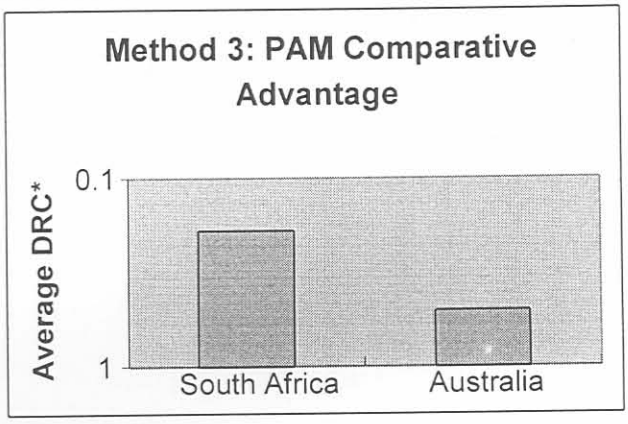
5.6 Conclusion

The results of the three methods are illustrated in the figures below.









*An average of the PCR and DRC values for different flowers was calculated.

Judging from the three approaches, it seems that South Africa is more competitive in producing flowers than Australia. Method 1 shows a slight advantage for Australia but the other two methods show that the South African flower industry has a distinct advantage over the Australian flower industry.

In this chapter the framework created for analysing the competitive position of an industry in comparison with the same industry in another country was practically implemented. This approach can also be refined to assist investment decisions by individual firms especially with regards to the selection of the most competitive cultivars. The generalised analysis in this study will however be very useful in determining policy and strategy support to a particular industry.

CHAPTER 6
CONCLUSION

6.1 Introduction

The preceding chapters contain an overview of major aspects of the South African flower industry and those of the international market for flowers in order to create a better understanding of the competitive environment in which the South African flower industry operates.

A suitable competitor had to be identified so as to address the issue of the competitiveness of the South African flower industry. Australia was identified as such a competitor as it has comparable market conditions, a similar geographical isolation from major markets overseas, a similar stage of development and industry size. Australia was also selected because it is a rapidly growing market for South African flowers, competes for the same export markets and also has a similar wealth of biological diversity of flower species as South Africa has.

Three methodologies (Determinants of Competitiveness; Revealed Comparative Advantage and the Policy Analysis Matrix) were employed to provide insights into the issue of the competitiveness of these two countries' flower industries. These methodologies were identified as being useful for contributing, each from a different viewpoint, to an understanding of the competitiveness of the South African and Australian flower industries.

6.2 Research objectives

- To contextualise South Africa's position in the international environment.
- To assess the perceptions and marketing activities of flower growers.
- To identify producer problems and discuss possible ways of overcoming these problems.
- To establish the extent to which South Africa and Australia are able to compete in the international flower industry.
- To indicate the extent to which South Africa and Australia are able to compete with each other.

6.3 Reaching research objectives

In Chapters 2 and 3 South Africa's position in the international environment was contextualised by describing, in some detail, the characteristics of the South African flower industry and the international environment in which it operates. Chapter 2 contains a report on a case study of grower perceptions and marketing activities.

6.3.1 Problems experienced by South African flower growers

Low profits seem to be the main problem of the cut flower growers in South Africa. This problem is linked to the poor utilisation of factors of form, place and time utility. However, poor form, place and time utility are a result of suboptimal production and suboptimal commercialisation.

Suboptimal production in the South African flower industry is caused by factors including the following:

- Inefficient labour management
- Inappropriate disease and pest control
- Weak knowledge base
- Secrecy in the industry

Suboptimal commercialisation in the South African flower industry is caused by the following factors:

- Unfair international competition
- Inadequate market information
- Relatively high wage rates for labour
- Loss of quality during distribution

An awareness of the problems present in the industry enables strategies to be identified that could improve the competitiveness of the industry.

6.3.2 The South African flower industry vs. the world flower industry

In terms of international competitiveness, South Africa can be described as a mediocre[1] competitor in the world flower industry. An analysis of South Africa's main constraints or weaknesses regarding its competitive position in the world flower industry found that they include the lack of informational infrastructure, the weak structure and strategy of the industry, low research capacity and barriers to entry to its main export markets in the EU. These constraints or weaknesses have entailed that the South African flower industry is still a relatively small exporter of flowers and has a Revealed Comparative Disadvantage of 0,71.

However, South Africa also has numerous determinants that favour its competitive position in the world flower industry. These factors include its unique biological diversity and ability to produce and develop new wildflower species; relatively low wage rates; the availability of skilled people; suitable soils and climate; well developed physical infrastructure; and strong allied and supporting industries.

The balance of these factors that have a positive or negative influence on South Africa's competitive position in the world flower market, will have a distinct impact on profits at farm level. The final analysis viewed farm-level profits as a proxy for the competitive advantage and efficiency (comparative advantage) of the commodity system analysed. Typical rose and protea systems in South Africa showed the capacity to be competitive by realising private profits of R680 114,27 / ha and R23 587,29 / ha respectively. The analysis of these systems' efficiency showed that the rose system is being taxed and that its social profit of R1 104 326,22 / ha shows a high comparative advantage which indicates that the system could realise even higher profits if distortions such as taxes and tariffs were liberalised. The protea system has a comparative advantage and showed a social profit of R13 494,39 / ha. Its social profit is lower than its private profit, indicating that the system is subsidised.

The balance of factors, identified above, would not stimulate large-scale flower production and exports to make South Africa a strong competitive force in the world cut flower industry. However, typical South African producers of protea and rose crops can still produce, export and compete profitably on major world markets.

[1] Result from analysis see Chapter 5, Table 5.6

6.3.3 Australian flower industry vs. the world flower industry

Australia's position in the world flower industry is similar to that of South Africa. Australia is also known as a mediocre[1] competitor. Australia's main constraints or weaknesses regarding its competitive position in the world flower industry are a high wage rate, lack of informational infrastructure, weak structure and strategy of the industry, low research capacity, low domestic consumption, little domestic rivalry among growers and no protection for the industry. These constraints or weaknesses contribute to the fact that the Australian flower industry is still a relatively small exporter of flowers and has a Revealed Comparative Disadvantage of 0,18.

However, Australia also has numerous factors that favour its competitive position in the world flower industry. Like South Africa, Australia has factors such as a unique biological diversity and ability to produce and develop new wildflower species, the availability of skilled people, suitable soils and climate, well-developed physical infrastructure, and strong allied and supporting industries. These favourable factors give Australia a large Revealed Comparative Advantage as a producer of wildflowers (3,25) in general, and more specifically of waxflowers (9,74).

The above-mentioned factors have a positive or negative influence on Australia's competitive position in the world flower market and therefore have a strong impact on farm-level profits. The final analysis viewed farm-level profits as a proxy for the competitive advantage and efficiency (comparative advantage) of the commodity system analysed. The typical carnation, waxflower and protea systems in Australia showed the capacity to be competitive by realising private profits of A$140 325,72 / ha, A$21 765,02 / ha and A$40 526,63 / ha respectively. The analysis of these systems' efficiency showed that the carnation, waxflower and protea systems are being taxed and that their social profits of A$144 110,37 / ha, $22 285,78 / ha and A$41 047,39 / ha respectively have a high comparative advantage, indicating that the systems could realise even higher profits if distortions such as taxes were liberalised.

The balance of factors, identified above, would not stimulate large-scale flower production and exports to make Australia a strong competitive force in the world cut flower industry. However, typical Australian producers of waxflower and protea crops can produce, export

and compete profitably on major world markets. Even though the carnation system cannot export its produce competitively it can compete on the local market.

6.3.4 The South African flower industry vs. the Australian flower industry

This discussion indicates the extent to which South Africa and Australia are able to compete with each other in an environment where direct competition between these two countries is destined to intensify.

The factors that can be regarded as the main contributors to South Africa's competitive advantage when compared to Australia are lower labour cost, greater accessibility to land, a more favourable climate, larger growth potential in domestic consumption and greater government protection of the industry.

However, there are many determinants of competitiveness in which South Africa cannot compete with Australia. Factors that give the Australian flower industry a competitive advantage over the South African flower industry, include Australia's superior allied and supporting industries, the greater capacity of its structure and strategy, better developed physical and information infrastructure, the higher capacity of government research programmes and better access to major export markets.

The South African and Australian flower industries both have a Revealed Comparative Disadvantage with Australia's being the greatest (0,18). South Africa has a much smaller Revealed Comparative Disadvantage of 0,71 indicating that the factors mentioned above as South Africa's main determinants of competitive advantage, have stimulated South Africa's flower industry so that it has a better revealed comparative advantage than the Australian flower industry.

The analysis of the competitive advantage and efficiency (comparative advantage) of representative flower systems in South Africa and Australia proved once again that the South African flower systems analysed can produce and compete on local and international markets more competitively and more efficiently than the Australian flower systems analysed. The most competitive system is the South African protea system (PRC=0,16), followed by the South African rose system (PRC=0,17), the Australian protea system (PRC=0,33), the Australian waxflower system (PRC=0,51) and the Australian carnation system (PRC=0,75).

The most efficient system is the South African rose system (DRC=0,11) followed by the South African protea system (DRC=0,27), the Australian protea system (DRC=0,32), the Australian waxflower system (DRC=0,50) and the Australian carnation system (DRC=0,73).

The analysis of the effect of government interventions showed that the South African flower systems analysed are more affected by government than the Australian flower systems analysed. The South African flower systems analysed, have higher input prices which are mainly due to taxes and import tariffs on input items. Furthermore, as a result of the tariffs on exports to the EU, revenue is lower and this has a negative effect on competitiveness. The Australian flower systems analysed were affected negatively as regards input prices (taxes increase input prices by between 2% and 4%), but output prices were not affected by government intervention.

From this study it can therefore be concluded that the South African flower industry has a more competitive position than the Australian flower industry. The South African industry seems to have a comparative advantage in the production of flowers over Australia. There is also evidence that South Africa can produce its major flower crops more efficiently and competitively than Australia can produce its major flower crops. The following implications for the South African and Australian flower industries emanate from these conclusions.

6.4 Implications

The implications of the findings on the South African and Australian flower industries' ability to compete with the international flower industry:

- Both industries will generally not be attractive to international investors.
- The greatest competitive advantage of the South African and Australian flower industries is their biological diversity of indigenous flower species and the potential to produce new lines of cut flowers. This strategic advantage will have to be developed and expanded to become the mainstay of both industries' competitive position in the international flower industry.
- Both flower industries have not shown sufficient capacity yet and that is why it is difficult to mobilise major government investment and support.
- However, the wildflower industries of both countries show that they are more competitive than the larger traditional flower industries and already more government and private funds are being allocated to the development and promotion of these industries.
- The prospect of liberalisation of trade barriers to the EU will create new, economically viable export market opportunities for Australia, and increase the competitiveness of South African flower exporters.
- If the inability to compete and the inefficiency of the Australian carnation system is an indication of the competitiveness and efficiency of the Australian traditional flower sector, imports by more effective producers such as Zimbabwe and South Africa could gradually erode local markets in Australia.

The implications of the findings on the ability of the South African and Australian flower industries to compete with each other:

- It seems that South Africa can produce flowers more efficiently and competitively than Australia.
- Firms operating in the South African flower industry will be less sensitive to price decreases on international and local markets than firms operating in the Australian flower industry.
- South Africa is becoming one of the largest exporters of flowers to Australia, as South Africa can produce and export relatively large quantities of traditional flowers at low cost and obtain relatively high prices on Australian markets.

- The growth potential of the South African flower industry seems to be higher than that of the Australian flower industry.
- A South African firm should be able to accept a lower price offer than an Australian firm when competing for the same market share.
- The South Africa flower industry should be more attractive to private and government investment than the Australian flower industry.
- If EU markets become liberalised, direct competition will intensify between South Africa and Australia.

ANNEX 1

Table 1: Foreign exchange conversions

Foreign Exchange Conversions					
	1993	**1994**	**1995**	**1996**	**1997**
Guilders/US$	1.9	1.8	1.6	1.7	2.0
US$/SA(rands)	3.27	3.55	3.63	4.30	4.61
A$/US$	0.68	0.73	0.74	0.78	0.74
A$/SA(rands)	2.22	2.59	2.69	3.35	3.41

Source: Australian Department of Foreign Affairs and Trade, 1998

Table 2: Fixed Price Multipliers for each agricultural sector

Sector	Employment	Value added	Imports	Government revenue
Wheat	26.1	0.988	0.488	0.271
Cereals	26.3	1.147	0.425	0.261
Canola	23.9	0.946	0.517	0.232
Hay	41.5	1.049	0.467	0.244
Other field crops	29.1	1.375	0.453	0.243
Viticulture	69.1	1.264	0.391	0.278
Grapes	113.9	1.435	0.454	0.225
Citrus	120.2	1.36	0.425	0.256
Deciduous fruit	115.7	1.487	0.392	0.217
Dry fruit	123.3	1.353	0.4	0.266
Potatoes	50	1.149	0.433	0.26
Field vegetables	82.2	1.464	0.394	0.253
Fynbos	**44.8**	**1.477**	**0.385**	**0.211**
Flowers and Bulbs	**114.4**	**1.452**	**0.399**	**0.251**
Indigenous teas	65.6	1.344	0.281	0.258
Other horticulture	100	1.49	0.424	0.259
Animal fibres	77.7	1.251	0.085	0.294
Small stock	81.4	0.997	0.453	0.302
Beef	48.9	1.161	0.418	0.265
Dairy	72.7	1.197	0.449	0.257
Ostriches	66.9	1.284	0.373	0.299
Pigs	72.1	1.311	0.496	0.233
Broilers	116.5	1.325	0.355	0.27
Layers	71.2	1.227	0.401	0.258
Other livestock	69.4	1.237	0.469	0.219

Source: Eckert et al (1997)

Table 3: Development Contribution Ranking of different sectors in the Western Cape

Sectors	Employment	Value added	Import content	Gini Coeff	Gini rank	Sum	Composite Rank
Deciduous fruit	5	3	9	0.413	9	26	1
Other horticulture	8	1	16	0.36	1	26	2
Flowers and bulbs	**6**	**6**	**11**	**0.384**	**4**	**27**	**3**
Field scale vegetables	10	5	10	0.384	5	30	4
Dried fruit	2	11	12	0.395	6	31	5
Citrus	3	10	18	0.411	8	39	6
Table grapes	7	7	23	0.404	7	44	7
Broilers	4	15	3	0.498	27	49	8
Fynbos	**28**	**4**	**5**	**0.456**	**15**	**52**	**9**
Viticulture	17	18	7	0.429	12	54	10
Animal fibres	12	21	6	0.486	19	58	11
Indigenous teas	19	13	1	0.51	31	64	12
Pigs	14	16	33	0.373	3	66	13
Other field crops	38	9	21	0.369	2	70	14
Government services	1	12	14	0.579	46	73	15
Other livestock	16	23	27	0.423	10	76	16
Ostrich	18	17	4	0.532	39	78	17
Beef	23	29	15	0.486	18	85	18
Not otherwise classified	9	14	29	0.52	35	87	19
Fruit, vegetable canning	21	22	28	0.482	17	88	20
Wholesale, retail trade	34	2	8	0.562	45	89	21
Distilleries, wineries	24	20	24	0.493	22	90	22
Small stock	11	39	22	0.487	20	92	23
Layers	15	25	13	0.551	42	95	24
Commercial services	37	8	2	0.628	48	95	25
Dairy	13	28	20	0.534	40	101	26
Potatoes	22	30	19	0.517	33	104	27
Forestry and fishing	20	36	38	0.429	11	105	28
Fish, edible oil canning	26	24	32	0.494	23	105	29
Other beverages	25	27	30	0.494	24	106	30
Textiles	33	26	37	0.45	14	110	31
Hay	31	38	26	0.481	16	111	32
Transport	35	19	25	0.523	36	115	33
Construction	27	34	41	0.438	13	115	34
Other cereals	39	32	17	0.508	30	118	35
Grain products	30	33	34	0.503	29	126	36
Animal feeds	29	35	39	0.512	32	135	37
Dairy products	32	42	42	0.492	21	137	38
Wheat	40	40	31	0.502	28	139	39
Wood, wood products	36	31	40	0.523	37	144	40
Canola	41	41	35	0.528	38	155	41
Meat processing	42	46	46	0.497	25	159	42
Electricity, gas, water	44	37	36	0.587	47	164	43
Agricultural machinery	48	47	48	0.498	26	169	44

Source: Eckert et al (1997)

Table 4: Export data - South Africa

Sector	Year	Exports SA (US$)	Exports World (US$)
Floriculture	1994	29044000	4809523000
	1995	32464000	5570410000
	1996	32269000	5990549000
Flowers	1994	11717000	2883733000
	1995	12609000	3364375000
	1996	14837000	3518679000
Cut flowers	1994	8930000	2163768000
	1995	9433000	2526009000
	1996	10172000	2651276000
Cut foliage	1994	13310000	346398000
	1995	15072000	398417000
	1996	14709000	427312000
House plants	1994	3052000	1361341000
	1995	3847000	1542796000
	1996	3281000	1723945000
*Total agriculture**	*1993*	*1579605000*	*335 939 200 000*
	1994	*217553000*	*383 296 500 000*
	1995	*2284348000*	*436 455 600 000*

*FAO, 1998**, TIFTS, 1997

Table 5: Export data - Australia

Sector	Year	Exports Australia (US$)	Exports World (US$)
Flowers	1994	18 761 000	2 883 733 000
	1995	19 684 000	3 364 375 000
	1996	23 478 000	3 518 679 000
Waxflower	1996	30%	100%
Wildflower	1996	21 130 200	211 302 000
Total agriculture*	1994	11 954 890 000	387 936 000 000
	1995	12 708 540 000	442 497 000 000
	1996	16 085 480 000	463 676 000 000

Sources: FAO, 1998*; ABS, 1997; FECA, 1996; IFTS, 1997; Karingal Consultants, 1997; ACIAR, 1996.

ANNEX 2

METHODOLOGIES FOR DETERMINING SOCIAL VALUES

The major problems with economic analysis centre not only on the identification of relevant project benefits and costs but also on the choice of the value indicators required to calculate the real economic value of these benefits and costs (Van Rooyen, 1986). A need for shadow prices will arise if indications that the working of the market is incomplete are proven correct (i.e. through market or government failure). The market price is therefore not the best reflection of the true economic value or opportunity cost of a commodity or service. Certain adjustments will then have to be made to the social value of a commodity or service.

There are three different approaches to determining social values, namely the opportunity cost approach, willingness to pay approach and world price approach. Tomek and Robinson (1991:57) define opportunity cost as follows: "The opportunity cost of producing commodity A is the income foregone by not producing another commodity." The opportunity cost approach can be followed to determine shadow values for non-tradable goods and services.

Another method to determine social values is known as the willingness to pay method. These social values can be taken as the amount that consumers are prepared to pay for final goods or services. However, the willingness to pay approach still makes use of market prices that may or may not be distorted in some way or other (Gittinger, 1982).

The third approach is the world price approach to shadow pricing. This approach originated from the opportunity cost approach. The objective of the world price approach is to find a practical method for calculating a number of shadow prices. This approach can only be used for tradable goods and services.

The conversion of private values to social values requires different adjustments for (a) direct transfer payments, (b) price distortions in traded items and (c) price distortions in non-traded items.

Direct transfer payments

Direct transfer payments are payments that do not represent the use of real resources but only the transfer of claims to real resources from one person in society to another. In agricultural projects, the most common transfer payments are taxes, direct subsidies and credit transactions that include loans, receipts, repayment of principal and interest payments (Gittinger, 1982).

Tradable items

Tradable products and services exported are classified as follows:

Free on board price (f.o.b. price) > domestic cost of production

Goods are tradable if the f.o.b. price received at the border for a product on the world market is higher than the cost of local production. In such a case it is therefore profitable to sell the product on the international market.

Domestic cost of production > cost, insurance and freight price (c.i.f. price)

This implies that a product is imported because the cost of local production is higher than the c.i.f. price at the border for the same product on the international market.

The world price approach is used to determine the value of tradable items. This approach gives an easily quantifiable shadow value for South African products because it can be accepted that the difference between local price and world price, at the border, is the level of the tariff applied. The tariff protection rate method is used (which is part of the world price approach) to calculate the shadow world prices of products and services. The following formula is used for this purpose (Bradfield, 1993):

$$B = W(1+T)$$

Where:

B = Local price

W = World price

T = Tariff protection rate

Non-tradable items

Non-tradable products and services can be defined as follows:

Cost, insurance and freight prices (c.i.f. prices) > Domestic cost of production > free on board prices (f.o.b. prices)

In other words, the import price of a product is higher than the cost of local production, but the cost of production is higher than the price on the world market. Therefore goods cannot be traded at a profit in the international market. Non-tradable items also include goods and services that are not freely tradable because of government intervention. In a situation where items are tradable but not traded due to government regulation, the international price cannot be used as the shadow price. In such a case the willingness to pay approach is used to determine the opportunity cost (Gittinger, 1982).

The social value of land

Land is unique because it is the only truly fixed factor in agriculture. To draw conclusions about the effects of policy distortions and market failures on the choice of agricultural activities, the social land rental value is usually measured as the value of the land in its most profitable alternative use, in other words the opportunity cost of land. Because the correct weights and social profits associated with each crop in the set are generally not known, it is convenient when assessing farming activities to reinterpret crop profits as rents to land and other fixed factors per hectare of land use (Monk and Pearson, 1989). Therefore the rental value of land is a good indication of the opportunity cost of land in an efficiently functioning

market, i.e. where market prices are a good reflection of social prices. The rental value of land is consequently an approximation of the real economic value of land.

With relatively small price distortions and in cases where there is an active rental market, the rental value provides a good indication of the net value of the production of the land and, hence, of the opportunity cost if the land use changes. A renter is not likely to pay a premium for the prestige of investment security and so will not pay a rent higher than the contribution that the land can make to the crop he proposes to grow (Gittinger, 1992).

From a theoretical point of view, land resources have a current market value equal to the present value of their expected future land rents. For property valuation purposes, a capitalisation formula is commonly used to indicate the discounting of expected future annual net rents that takes place in the computation of land values. The formula can be expressed as

$$V = [a/(1+r)^1 + a/(1+r)^2 + a/(1+r)^3 + \ldots + a/(1+r)^n]$$

where V = the private value of the property, a = the expected average annual land rent and r = the capitalisation interest rate. This formula reduces to

$$a = V.r$$

to calculate the expected annual rental value of land. (Barlow, 1978).

The social value of irrigation water

The market price of irrigation water is often subsidised and therefore does not reflect the real opportunity cost of irrigation water. Social shadow-prices should therefore be introduced in the analysis. The opportunity cost of water can be reflected in the shadow value of water. The shadow value of irrigation water can be calculated from the real cost of irrigation schemes. The social value includes the operational and maintenance cost, the capital cost and the tariff charged for using water from these schemes. All the costs of supplying water on the land are included in the calculation and this is therefore assumed to be the price of the water and consequently approximates the shadow value of irrigation water. For the purpose of this study, this approach is referred to as the production cost value of water.

The second approach, known as the marginal value product approach, is where the shadow value of water can be determined with a linear programming model (Louw and Van Zyl, 1997).

A third approach, alternative land use, can be followed by taking the difference in the rental value of land with and without irrigation. The difference will reflect the shadow price of irrigation water.

ANNEX 3
CONSTRUCTING A BUDGET FOR A ONE-HECTARE ROSE PRODUCTION UNIT IN GAUTENG PROVINCE

Knowing whether it is financially and socially profitable to produce an agricultural commodity in a specific part of the country requires proper analysis of the production process and marketing of that product. The production analysis will involve analysing critically the input requirements of the production process as well as the output that will be generated. A social analysis will make it possible to determine whether the scarce resources necessary for production are used effectively. In addition, it will also be possible to determine whether government policies allow the efficient allocation of resources.

1 Method

Step 1: Identify the product

For the purpose of this analysis, an enterprise budget will have to be compiled for the most prominent traditional flower. Roses of a large-flowered and long-stemmed variety were identified as the most prominent traditional flower produced (Multiflora, 1998).

Step 2: Identify the geographical area

The Pretoria / Johannesburg area was identified as approximately 80% of South Africa's commercial rose growers are situated there (Taschner, 1997a).

Step 3: Development of enterprise budgets

In order to compile a budget for a typical rose farm, the input of various parties such as growers, input suppliers, consultants and researchers was required. Personal interviews were conducted with all the available individual growers, input suppliers, consultants and researchers. A panel of experts was also constituted to confirm some of the results obtained from personal interviews. A budget was compiled that is generally believed to be a true representation of a typical rose farm.

The nature of the sample sizes (n), type of information and target groups are described in the table below.

Development of the enterprise budget

	N	Technique	Type of information	Questionnaire
Growers	10	Personal interview	Capital structure Cost structures Revenue structures	Annex 5
Growers	10	Panel	Confirmation	Annex 5
Input suppliers	20	Telephone enquiry	Input prices	Annex 5
Researchers	3	Personal interview	Input	Annex 5
Consultants	2	Personal interview	Input	Annex 5

Enterprise budget

A short description of the elements in an enterprise budget for cut roses will follow below. The figures yielded from the data collection process appear in Table 3, Annex 4. The reference numbers (Ref.No.) in the text below corresponds to those in the above mentioned Table.

Establishment cost

Site (Ref. No. 1)

The site chosen must have the following qualities:

(a) It should be in close proximity to the local market and/or airport for exports;

(b) the land must consist of excellent quality soil;

(c) a strong water source must be easily accessible;

(d) cheap labour should be available; and

(e) the site must be an open, even space where trees and hills do not cast shadows over greenhouses in the morning or afternoon, to ensure maximum exposure to sunlight.

A site with the above qualities will cost between R60 000 and R80 000 per hectare.

Preparation of the site

(a) Soil preparation (Ref. No. 2)

The site has to be levelled and the subsoil should be ripped to break up compaction and dislodge rocks, then the site should be disc harrowed and the soil should be fumigated with a liquid substance called E.D.B. to prevent nematodes. To ensure that the soil is thoroughly fertilised, 1 ton of superphosphate (monocalcium phosphate) and 1 ton of 3-2-1 must be added evenly per hectare.

If it is assumed that the soil on the site is fairly friable, Hutton type of red sandy loam, a layer of 5 cm of organic material should be worked into the top 30 cm of the soil. Apart from the organic material, the soil should have micro or trace elements added to it, such as iron (Fe); manganese (Mn); copper (Cu); zinc (Zn); boron (B); and molybdenum (Mo).

A fertile soil for roses should have the following elements per 100 grams of soil:

- 30 mg N
- 30 mg P (80 mg P_2O_5)
- 100 mg K (150 mg K_2O)
- 15 mg Mg
- 100 mg Ca (150 mg CaO)

It is recommended that roses should be grown in an alkaline soil with a pH of 7.5. Normal alkaline irrigation water with a pH of between 7.0 and 7.5 is also recommended.

(b) Drainage system (Ref. No. 3)

A trench of about 70 cm should be dug beneath each flowerbed. A 50 mm polythene pipe with horizontal holes drilled midway through both walls every 25 cm, should be laid at the bottom of

the trench. The drainage pipe should then be covered with stones and pebbles to at least 50 cm from the top of the trench. Due to the slight slope of the site, the drainage water can flow away (Taschner, 1992). The cost of such a drainage system will include labour costs, petrol, capital and drainage pipes.

Structures, systems and equipment

(a) Greenhouses (Ref. No. 4)

Three totally enclosed, environmentally controlled, dome greenhouse structures, each covering 5 000 m^2 will be erected. The structure will be covered with a double skin plastic covering.

(b) Heating and cooling systems (Ref. No. 5)

A cooling and heating system has to be installed to create a controlled environment. The cooling system will be a pad-and-fan system and the heating system, CO_2 burners. These will ensure that ideal day temperatures of between 24° and 29°C, and ideal night temperatures of between 15° and 18°C, are maintained throughout the year. The pad-and-fan system will also ensure an optimum level of humidity of between 65% and 70% (Plaisier, 1998).

(c) Irrigation system (Ref. No. 6)

Water is pumped from a water source into a 140 000 L concrete reservoir that is 1,5 metres deep and 10,9 metres in diameter. Water is pumped from the reservoir through the fertigation system that consists of a pump, tanks, EC controller and pH meter. The fertigation system will add the necessary nutrients to the irrigation water under highly controlled conditions. The fertilisers are pre-mixed in A, B and C tanks of 1 000 L each. Then the water is pumped to a system of polythene piping leading to the Eintal micro-jet sprinklers that distribute the water evenly to the plants.

(d) Spray equipment (Ref. No. 7)

The spray equipment consists of a 1 000 L tank, trolley, pump and pipes. The chemicals, pesticides and fungicides are mixed in the tank and sprayed evenly onto the plants to prevent or cure diseases or kill pests.

(e) Buildings (Ref. No. 8)

Buildings include an air-conditioned packing shed, a small office for administration and a 5 m^2 coldroom, which is necessary to cool flowers to a temperature of 5° - 6°C. The coldroom will halt the process of photosynthesis and bud development so that a flower with the highest possible quality can be put on the market.

(f) Electricity (Ref. No. 9)

The pumps, cooling system, packing shed, office and cold room have to be connected to an electrical power supply.

(g) Rose plants (Ref. No. 10)

A rose plant costs about R12 per plant. The cost of a rose plant includes the royalty that is paid to the original breeder. Plants are obtained from plant producers who obtain a licence from the original breeder to grow that variety.

Operating costs

Labour (Ref. No. 11)

A typical rose farm in South Africa employs 16 labourers per hectare. Labourers are paid R25 per 8-hour day and work 40 hours per week. Over peak months between November and March, workers are employed overtime at a rate of R3,00 per hour. A grower can budget for 42 hours of overtime in January and February, 26 hours in March, 18 hours in November and 36 hours in December for every hectare under production (Evens, 1996).

Because of the large emphasis on quality, labourers have to be trained to perform precise and sometimes complex tasks, such as pruning, spraying, fertilising, harvesting and packaging the roses.

An administrative person is usually appointed on a full-time basis.

Fertilisers (Ref. No. 12)

Tascher (1992) recommends that the following combination of elements should be included in a typical feeding programme:

Element	K	Ca	Mg	N	S
Concentration mol/l	3.5	2.0	1.1	8.0	1.1

Step 1. To achieve this combination of elements the following fertilisers have to be mixed and dissolved in 1 000 litres of water:

77 kg Limestone Ammonium Nitrate

20 kg Potassium Nitrate

3 kg Urea

Step 2. In the second drum the following have to be mixed in 1 000 litres of water:

48 kg Potassium Nitrate

52 kg Magnesium Sulphate

0.4kg Borax

Step 3. Dissolve the contents of the above-mentioned drums in one drum and inject 1 litre of the mixed concentration into every 1 000 litres of irrigation water.

In addition to the above programme, bear in mind that the levels of nitrogen in the fertilizer programme will have to be increased to boost sprouting and encourage growth after a crop has been harvested. In the winter months the nitrogen levels should be relatively high to allow plants to keep to their natural programming, without diminishing production.

Chemicals (Ref. No. 13)

A spraying programme with a good fungicide and pesticide is vital if the grower wants to deliver a high-quality product. Usually a prevent programme is followed to keep diseases, insects and pests at bay, for example red spider, spotted spider, black spot, rust, Powdery Mildew, Downy

Mildew, Aphids, American Bollworm, California Thrips and White Fly. A combination of at least two different chemicals per week will prevent diseases and insects from developing a resistance to poisonous chemicals. A typical preventive spraying programme was supplied by the ARC - Roodeplaat:

Week 1: Aterny S Talstar and Latron
Week 2: Sporgonorthene and Pentac
Week 3: Bravo Thiovit and Latron B
Week 4: Topsinflo and Previcure N
Week 5: Vydate Mitac and Denarin

This 5-week cycle has to be repeated throughout the year. In addition to the chemicals, a leaf feeding supplement like Vuxal or Folifert and an adjuvant like Viofilm should be added to the solution.

Water (Ref. No. 14)

Each rose plant needs about 2 300 litres of water per year. During the hottest summer weeks, water consumption will increase by up to 70 litres of water per plant per week and during winter months the consumption can drop to 20 litres of water per week. If 60 000 rose plants are planted per hectare, 13,8 million litres of water will be needed per year, per hectare.

If the grower uses water from a typical government water scheme (GWS) in Gauteng Province, such as the Pienaars River GWS, the water tariff is 3,32 cents per cubic metre or 1 000 litres. The total annual cost of irrigating one hectare will amount to R458,16 (Department of Water Affairs and Forestry, 1996).

Marketing costs (Ref. No. 15)

Packaging (domestic market):

Cellophane and elastic bands are used to wrap bunches of roses. This material will cost approximately R1 000 per month.

Transport to domestic market:

Flower growers are on average 60 km from a Multiflora auction. Flowers are transported in plastic containers that are rented from Multiflora at 10 cents per day. The transportation cost consists of two tradable components: firstly the cost of fuel and secondly the fixed costs associated with transport vehicles.

The estimated cost of transporting flowers to the market is about R600 per week in the first year of production and R1 000 per week from the second year onwards. The total transport cost for the first year of production will amount to R31 200 and from the second year, about R52 000.

Domestic auction fees:

- Suppliers pay a 9% commission on all sales at the Multiflora auctions.
- At the auction flowers are displayed on a trolley (two levels). A supplier must pay an additional R1,00 per trolley used.
- If flowers fail to find a buyer owing to low quality or low popularity, they are destroyed and the supplier must pay 20 cents per container (Anseew, 1998).

Packaging (export market):

Flowers are packed tightly together with wrapping material in a durable box. This will minimise loss of quality during long-distance shipping and ensure that the cargo complies with the strict phytosanitary regulations. One box usually contains 300 roses and weighs approximately 14 kilograms when full (Evens, 1996). These boxes cost R10,00 each.

Transport (export market):

- The distance from the flower farm to Johannesburg International Airport will be assumed to be 60 kilometres with an average of 3 shipments per week during the first production year and 5 shipments per week from the second year on.
- Shipping flowers from Johannesburg International Airport to Amsterdam will be subject to the standard IATA tariff that depends on the weight of the cargo as stipulated below:

1 kg –100 kg	=	R10.66/kg
100 kg – 250 kg	=	R8.90/kg
250 kg – 500 kg	=	R8.15/kg
500 kg plus	=	Depending on weight of cargo, regularity of shipping and the exporter's ability to negotiate.

(SAA Cargo Department, 1998)

Agent fees:

7% of total revenue (IDC, 1996)

Auction fees:

7% of total revenue and 0,45% on total revenue to cover additional auction costs (Evens, 1996).

Write-off periods (Ref. No. 16)

For a production analysis, the period for which a specific cost entity can be classified as economically useful must be established. In White (1996) reference is made to a classification by ABN AMRO BANK, Netherlands, regarding write-off periods for different cost items. This classification will be used in this analysis and is summed up in the table below.

Write-off periods

	Write-off period
Land	35 years
Greenhouse structures and electricity connections	15 years
Irrigation pumps, pipes and spray equipment	10 years
Buildings	20 years
Fertigation, heating and cooling system	5 years
Tools & office equipment	3 years
Plastic covering	4 years
Computer, fax machine	5 years
Plants	6 years
Cool room	10 years
2nd hand vehicle	3 years
Land preparation and drainage system	6 years

Financial revenue analysis (Ref. No. 17)

Production volumes

Production volumes per square metre vary, depending on the size of the flowers, length of the stems and the distance between plants.

A long-stemmed, large-flowered variety was chosen for the purpose this study. It is believed that the largest profits can be made with these varieties on both the European and local markets. The best time to begin planting roses is between July and August in order to start production in November later that year. The production season for the first production year will therefore continue until 1 May of the following year, from then on the production season will start on 1 May and end on 30 April. The production volumes for these periods are given as follows:

- For the first year 1 700 000 stems per hectare can be expected.

- From the second year onwards, production will increase and 2 500 000 stems per hectare can be expected (Taschner, 1992).

Roses grow in flushes that vary between 28 and 60 days depending on the temperature. By sequencing the planting and staggering the pruning, growers can ensure that they meet their customers' demands by supplying roses on a regular basis and by being able to meet the high demand on dates such as Valentine's Day and Mother's Day (Pertwee, 1992). The table below shows the proportion by which the production volumes vary each month for the first and second year onwards Evens (1996).

Estimated production volumes

Month	First year: stems/ha	Second year +: stems/ha
May	90 000	140 000
June	80 000	110 000
July	80 000	110 000
August	110 000	160 000
September	120 000	180 000
October	140 000	200 000
November	150 000	230 000
December	170 000	250 000
January	190 000	270 000
February	220 000	320 000
March	200 000	300 000
April	150 000	230 000
Total production	1 700 000	2 500 000

Maximum production is obtained by planting 6 - 7 rose bushes per square metre or between 60 000 and 70 000 plants per hectare. To achieve this, beds are made in 4 rows spaced 30 cm apart, with plants also spaced 30 cm apart in each row. A path 80 cm wide between the beds will be

ideal to enable labourers to reach all the stems for picking, culturing and spraying (Taschner, 1992).

Prices (Ref. No. 18)

Export market prices

According to *Taspo-gratenbaumagazine* (March 1998), the average producer price for large-flowered roses on the VBN flower auctions for the past year (March 1997 - March 1998) was 75ct* per stem (* Dutch cent), i.e. R1,72 per stem. Local growers confirmed that this price corresponds to the prices that they receive for exported flowers (Conversion factor: 2,3 rands for 1 Dutch guilder).

Local market prices

The average price for large-flowered roses on the Multiflora auction in Johannesburg during 1997 was 56 cents per stem (Multiflora, 1997/98).

Social analysis (Ref. No. 19)

Import duties

South African flower exporters sending flowers to the European Union have to pay an import duty of 18% in the European summer (1 June to 30 October) and 12,7% in the European winter (1 November to 31 May). This cost is taken as 18% or 12,7% of the value of export revenue. The weighed average tariff per year charged for a typical exporter of cut roses is 14,31%.

Tariff protection rates

Bradfield (1993) calculated the protection rates for different industries. It was found that the fertiliser, pesticide and fungicide industries in South Africa have a protection rate of 14%. This implies that the fertiliser, pesticide and fungicide prices in South Africa are 14% above the world prices for these products. The following formula can therefore be used to calculate the

undistorted world price (W) if the local prices (B) for fertilisers, pesticides and fungicides are known.

$W = B / (1+t)$

Where:

t = Protection rate.

South African producers are protected in the form of an *ad valorem* tariff of 20%. However, under-invoicing is suspected and there is proof that flowers are imported at less than one-third of the prices obtained at Multiflora auctions. Therefore, in reality a tariff of roughly 7% on the value of imports can be taken as the protection rate enjoyed by SA producers.

Value-added tax

Value-added tax of 14% is charged on sales transactions in South Africa.

Customs tariffs

The import tariff for relevant input items is as follows:

Petrol	R0,091/L
Oil	R0,183/L

ANNEX 4

TABLE 1: CARNATION / NEW SOUTH WALES / 1993

A. COSTS

1. Establishment cost

	Private costs		Distortions		Social costs	
	$/ha year 0	CRC $/ha/an	Sales Tax	Tariff	$/ha year 0	CRC $/ha/an
Land	15 000	916			15 000	916
Plastic igloo	150 000	14 451	20%	5%	112 500	10 839
Site preparation						
Pipe100 mm PVC	8 533	1 105		5%	8 107	1 050
Tractor hire	1 583	1 663			1 583	1 663
Fumigation	10 000	10 500			10 000	10 500
Fertiliser	714	749			714	749
Irrigation equipment	7 992	1 846			7 992	1 846
Plants	88 000	47 327			88 000	47 327
Bedding wire	19 800	10 649			19 800	10 649
Support stakes	17 000	9 143			17 000	9 143
Packing shed	5 000	401			5 000	401
Coolstore	6 000	777			6 000	777
Tables/buckets/tools	2 000	259	20%	5%	1 500	194
Spray unit	1 600	207	20%	5%	1 200	155
Labour - Layout	1 000	1 050			1 000	1 050
Levelling site	5 000	2 689			5 000	2 689
Soil preparation	1 667	1 750			1 667	1 750
Planting	18 333	9 860			18 333	9 860
Growing	4 000	4 200			4 000	4 200
Subtotal	**363 222**	**119 542**			**324 396**	**115 757**

2. Operating cost

	Private Costs	Distortions		Social Costs
	(R/ha/an)	Import tariff	Sales tax	(R/ha/an)
Fertigation	2 916			2 916
Chemicals	6 670			6 670
Administration				
Phone fax	1 200			1 200
Insurance	1 500			1 500
Subscriptions	300			300
Seminars	300			300
Legal/accounting	600			600
Bankcharges	600			600
Power/gas	1 200			1 200
Stationery	400			400
Research	250			250
Travel	500			500
Repairs and maintenance	1 200			1 200
Labour - Spray	12 000			12 000
Harvest	240 000			240 000
Postharvest	137 500			137 500
Subtotal	**407 136**			**407 136**

3. Marketing Cost

Delivery cost to market/agent	13 622
TOTAL COSTS	**783 980**

B. REVENUE

Assume 50% first grade and 50% second grade for local market

	Stems	Avg price A$	Total
1st Grade	1237 500	0.35	433 125
2nd Grade	1237 500	0.2	247 500
Total Revenue			**680 625**

(Source: Hardy, 1993)

TABLE 2: WAXFLOWER / QUEENSLAND / 1995

A. COST	Private costs		Distortions		Social costs	
1. Establishment cost	($/ha) year 0	CRC ($/ha/an)	Sales Tax	Tariff	$/ha year 0	CRC $/ha/an
Land	10 000	611			10 000	611
Plants	3 080	399			3 080	399
Irrigation installation	600	78			600	78
Irrigation estimate	3 300	427			3 300	427
Weedmat	3 300	427			3 300	427
Labour plant-out	550	71			550	71
Land preparation	600	118			600	118
Contingencies	500	99			500	99
Capital						
Packing shed	5 000	401			5 000	401
Coldstore	6 000	777			6 000	777
Irrigation headworks	8 000	1 036			8 000	1 036
Windbreaks	650	40			650	40
Tractor (used)	7 000	1 617	20%	5%	5 250	1 213
Spray unit	1 600	207	20%	5%	1 200	155
Tables/buckets/tools	2 000	259	20%	5%	1 500	194
Subtotal	**52 180**	**6 567**			**49 530**	**6 046**

2. Operating costs	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Private operating cost = Social operating cost							
Administration and overheads	1 610	1 610	1 610	1 610	1 610	1 610	1 610
Water (Power)	200	250	275	303	333	366	403
Fertiliser	200	220	242	266	293	322	354
Chemicals	650	715	757	865	952	1 047	1 152
Weeding and slashing	450	450	450	450	450	450	450
Spraying	450	450	450	450	450	450	450
Contingencies	500	800	800	800	800	800	800
Labour - preharvest	1 100	1 100	1 100	1 100	1 100	1 100	1 100
Harvesting & posthavest	0	1 760	5 280	15 840	21 120	21 120	21 120
Freight	0	330	990	2 970	3 960	3 960	3 960
Subtotal	**5 160**	**7 685**	**11 954**	**24 654**	**31 068**	**31 225**	**31 399**
B. REVENUE							
Bunches per plant	0	1	3	9	12	12	12
Total bunches	0	2 200	6 600	19 800	26 400	26 400	26 400
Price /bunch	2	2	2	2	2	2	2
Gross Income	0	4 950	14 850	44 550	59 400	59 400	59 400
NET PRIVATE PROFIT	**-11 727**	**-9 302**	**-3 671**	**13 329**	**21 765**	**21 608**	**21 434**
NET SOCIAL PROFIT	**-11 206**	**-8 781**	**-3 150**	**13 850**	**22 286**	**22 129**	**21 955**

(Source: DPI, 1995)

TABLE 3: ROSE / GAUTENG PROVENCE / 1998

A: COSTS

1. ESTABLISHMENT COSTS

Ref No. Annex 2	Items	Private Cost (R/ha) year 0	Private Cost CRC (R/ha/an)	Distortions (Ref no. 19) Import tariff	Distortions (Ref no. 19) VAT	Socal cost (R/ha) year 0	Socal cost CRC (R/ha/an)
1	Land	80 000	9 785		14%	65 520	8 014
	Site-levelling costs						
	Labour	5 000	1 216			5 000	1 216
	Petrol	900	219	0,091/L or 4.1%	14%	737	179
	Oil	100	24	R0,183/L or 2%	14%	84	20
2	Fertilisers and fumigation	3 500	851	14%	14%	2 520	613
3	Drainage system						
	Labour	8 000	1 946			8 000	1 946
	Petrol	400	97	0,091/L or 4.1%	14%	328	80
	Oil	100	24	R0,183/L or 2%	14%	84	20
	Drainage pipes (5000 m)	15 000	3 648		14%	12 900	3 138
	Structures, systems, equipment						
4	Greenhouse	1 030 000	151 229		14%	885 800	130 057
4	Greenhouse delivery	3 000	440		14%	2 580	379
5	Heating system	660 000	183 090		14%	567 600	157 458
6	100/400 water pump	9 741	1 724		14%	8 377	1 483
6	140 000L reservoir	33 500	5 929		14%	28 810	5 099
6	600m polythene pipes (25mm)	540	96		14%	464	82
6	100 Eintal micro-jet sprinklers	2 600	460		14%	2 236	396
6	Fertigation system	80 000	22 193		14%	68 800	19 086
6	1000L A-B-C tanks	3 000	531		14%	2 580	457
7	Spray equipment	7 500	1 327		14%	6 450	1 142
8	Air-con packing shed and offic	70 000	9 372		14%	60 200	8 060
5	Coldroom 5 sq. m installed	16 051	2 841		14%	13 804	2 443
9	Electricity connections	14 000	2 478		14%	12 040	2 131
10	Rose plants	720 000	175 123		14%	619 200	150 605
	Extra equipment	10 000	1 770		14%	8 600	1 522
	Bakkie	60 000	19 754		14%	51 600	16 988
	Total	**2 832 932**	**596 168**			**2 434 314**	**512 613**

2. OPERATING COST

	Item	Private Costs (R/ha/an)	Distortions (Ref No. 19) Import tariff	VAT	Social Costs (R/ha/an)
11	Permanent wages	104 000			104 000
11	Overtime (only from year 2+)	498			498
11	Salary (administrative person)	25 000			25 000
12	Fertiliser	30 000	14%	14%	21 600
13	Chemicals (Spray)	48 000	14%	14%	34 560
14	Water	458			458
	Maintenance	24 000		14%	20 640
	Insurance	60 000		14%	51 600
	Electricity	36 000		14%	30 960
	Research	13 856		14%	11 916
	Total	**341 812**			**301 232**

3. MARKETING COST

		Domestic Year 1	Domestic Year 2	Export Year 1	Export Year 2
15	Packaging	4 000	5 600	34 002	49 998
15	Transport to Market	12 480	20 800		
15	Transport to Airport			18 720	31 200
15	Cargo cost			342 300	570 490
	Gross marketing costs	**16 480**	**26 400**	**395 022**	**651 688**
15	Agent fees			7% on total revenue	
15	Auction fees	9% on total revenue		7.45% on total revenue	

B: REVENUE

		Avg. market price/stem	Stems year 1 (Ref. 17)	Revenue year 1	Stems year 2+ (Ref. 17)	Revenue year 2
15	Market mix					
15	60% Export	1.72	969 000	1 666 680	1 425 000	2 451 000
15	40% Domestic	0.56	666 400	373 184	980 000	548 800

	Exports	Year1 (1020000 stems - 10%) Private	Year1 (1020000 stems - 10%) Social	Year2 (1500000 stems - 10%) Private	Year2 (1500000 stems - 10%) Social
18	Export Revenue (172c /stem)	1 666 680	1 666 680	2 451 000	2 451 000
15	minus Auction fees 14.45%	240 835	240 835	354 170	354 170
15	minus Import Tariff 14.31%	204 038	0	300 056	0

Reference numbers in margin refers to budget constructed in Annex 2

Table 4: PROTEA / WESTERN CAPE PROVINCE / 1995

Assumptions	
Plant life	15 years
No. plants /ha	2500
Return/stem	R 0.18
Stems/ha	7500
Stems per box	15
Price/box - export	R 52
Price/box-domesti	R 37
% export	80%
% domestic	20%
Labour: % of cost	42%

COSTS	Year 1-3		Year 4		Year 5 and 6		Year 7...14		Year 15	
	Private	Social	Private	Social	Private	Social	Private	Social	Private	Social
Non-tradables										
Water	433	867	433	867	433	867	433	867	433	867
Land	0	16	0	16	0	16	0	16	0	16
Labour	1 277	1 277	3 584	3 584	4 013	4 013	3 767	3 767	3 521	3 521
Subtotal	1 710	2 159	4 017	4 466	4 446	4 896	4 200	4 649	3 954	4 403
Tradables										
Operating cost	1 329	3 920	4 515	12 598	5 108	14 214	4 768	13 287	4 428	12 362
Capital recovery c	4 181	8 363	4 181	8 363	4 181	8 363	4 181	8 363	4 181	8 363
Subtotal	5 511	12 282	8 697	20 961	9 290	22 576	8 949	21 650	8 610	20 724
Total costs	**7 221**	**14 441**	**12 713**	**25 427**	**13 736**	**27 472**	**13 150**	**26 299**	**12 564**	**25 128**
REVENUE										
Gross receipts: Export			24 544	28 225	31 736	36 497	29 873	34 353	23 415	26 927
Domestic			4 329	3 463	5 587	4 470	5 254	4 203	4 126	3 300
Total revenue			28 873	31 689	37 323	40 966	35 127	38 557	27 541	30 228
Gross margin			**16 159**	**6 262**	**23 587**	**13 494**	**21 977**	**12 257**	**14 977**	**5 100**

(Source: Wessels, 1998)

ANNEX 5

(A) PRODUCER QUESTIONNAIRE

1. GENERAL

1.1 Business name _____

1.2 Address _____

1.3 Specify the product that you produce and the	% of total production
a.	
b.	
c.	
d.	

1.4 When did you start cultivating flowers? 19..

1.5 What is the size of the cultivating area on the farm? ……ha

1.6 Number of permanent labourers per hectare? ……/ha

1.7 Number of part time labourers per hectare? ……/ha

1.8 How will you describe the cultivating structure on your farm, indicate the hectares where appropriate?

Cultivating structure	Hectare
Unprotected	
Shade netting	
Greenhouse – natural ventilation	
Green house – fan ventilation	
Greenhouse – heating or cooling	
Other?	
Other?	

1.9 Classify yourself under one or more of the following groups? (Please indicate the proportion of the total sales and identify the buyers)

Classification	Proportion %	Buyer
Export via export agent		
Exporting by yourself		
Sell on Multiflora		
Sell in formal flower shop		
Sell in supermarkets		
Sell to street sellers, informal sector		
Sell directly to the consumer		
Other?		
Other?		

1.10 Which of the following equipment and facilities do you make use of?

Cold storage room	1
Insecticide fumigation unit	2
Packing shed	3
Cold transport	4
Boiler heating	5
CO^2 Burners	6
Other heating systems?.....	7
Computer	8
Internet	9
Flower arranging apparatus	10
OG Meter	11
EC Meter	12
PH Meter	13
Magnifying glass	14
Sticky traps	15
A&B tank system (fertigation)	16
Water purifying apparatus (e.g. UV-light, filter, chlorinator)	17
Other?.....	18
Other?.....	19

1.11 Which activities do you perform to add value to your products?

Activity	✔	Description
Nursery name on the packaging material	1	
Dry flowers	2	
Flower arrangements	3	
Mixed	4	
Preservatives	5	
Other?.....	6	
Other?.....	7	

2. RESEARCH AND INFORMATION SERVICES

	Y	N
2.1 Do you make use of research and information services		

If your answer on Question 2.1 was "yes", answer questions A; B, C, D and E below.

A. Do you only make use of domestic services	Y	N
Do you only make use of foreign services	Y	N
Do you make use of domestic and foreign services	Y	N

B. Identify the services and institutions that provides the services. Also award a mark out of ten

Classify	Mark out of 10	Identify the institution
Services provided by the sellers of inputs	/10	
Information services provided by the export agents	/10	
Private consultants that provide information	/10	
Other?	/10	
Other?	/10	

C. What is the effect of your services on your profitability (Indicate the % increase in profitability

	% Increase in profitability		
	5% - 10%	10% - 20%	20%+
Soil and water research			
Fertilisation			
Leaf examination			
Insect identification			
Aalworm identification			
Disease identification			
Disease control			
After-harvest handling			
Cultivating methods			
Other?.....			

D. How much do you spend annually on research and information services? R.....

E. Please specify any problems you have experianced with information services

_____

_____

_____

_____

_____

If your answer on Question 2.1 was "No", answer questions A below.

A. Why don't you make use of research and information services? (Check the appropriate box)

- You have sufficient knowledge ☐
- Services are insufficient ☐
- Services are to expensive ☐
- You don't trust the available services ☐
- Have not had of the opportunity yet ☐
- It is not easy to gain access to the services. ☐
- Other? ..... ☐
- ..... ☐

3 PRODUCTION RESEARCH

3.1 Would you say there is a need for formal production research? Y | N

3.2 Do you conduct research on your own? Y | N

If your answer on Question 3.2 was yes, answer questions A; B and C below.

A. On which of the following aspects do you conduct research?

Aspects	Check Box	Discuss
- Fertilisation		.....
- Pruning		.....
- Cultivar/variety evaluation		.....
- Irrigation		.....
- Protection (Green house / shade netting		.....
- Weed control		.....
- Insect and disease control		.....
- Post harvest handling		.....
- Other?		.....

B. How much money do you spend on "own" research annually? R.....-....

C. The results from research done by yourself are...

Exclusively for private use
Only available to good friends
Available for publication

3.3 Is there a need for more research directed at problems Experienced by SA flower growers? Y | N

If your answer on Question 3.3 was yes, answer questions A below.

A. What are you willing to pay for research done annually? R.....-....

3.4 Do you make use of foreign research and information services? Y | N

If your answer on Question 3.4 was yes, answer questions A and B below.

A. How do you acquire foreign research and information?

- Direct links to researchers abroad
- Via consultant
- Via growers and friend overseas
- Via magazines and journals
- Other? .....
- Other? .....

B. How applicable would you say is foreign research and information services to the South Africa flower grower's conditions?

Always applicable	☐
Sometimes applicable	☐
Not applicable at all	☐
It is applicable if the information is adjusted	☐
Other?	

3.5 Specify any problems or needs regarding production research.

4 MARKETING

4.1 Do you make use of market research information? Y | N

If your answer on Question 4.1 was yes, answer question A below.

A. How do you conduct market research?

If your answer on Question 4.1 was No, answer question A below.

A. Do you have a need for formal market research? Y | N

4.2 Will you be willing to give information to market researchers? Y | N

4.3 Identify any problems that can be addressed through market research

4.4 Do you experience any problems with the marketing channels?

_____

_____

_____

_____

_____

5 The competitiveness of the South African flower industry

5.1 To what extent will the following factors decrease your competitiveness? (Compare your situation to that of growers in competitor countries such as, Zimbabwe, Kenya, Australia, etc.)

Factors	**0 = no negative influence; 3 = strong negative influence**			
Affordable credit	0	1	2	3
Wages	0	1	2	3
Labour productivity	0	1	2	3
Climate	0	1	2	3
Affordability of information services	0	1	2	3
Affordability of a large variety of plant material	0	1	2	3
Timely delivery of inputs	0	1	2	3
Limited research support	0	1	2	3
Limiting local demand	0	1	2	3
Transport costs	0	1	2	3
The availability of new and unique varieties	0	1	2	3

THANK YOU FOR YOUR HELP AND PATIENCE IN ANSWERING THE QUESTIONNAIRE

(B) SUPPLIER QUESTIONNAIRE

This questionnaire was used in telephone interviews with various suppliers

Name of Supplier _____

Address _____

Telephone number _____

If your business sell any of the items listed below, it will be appreciated if you can complete the table where applicable.

Items	Units	Brand	Price / unit	Comments
Greenhouse structure				
Plastic covers				
Heating system				
Cooling system: Fan Pad				
Irrigation system Pipes Pumps Sprinklers				
Fertigation system Tanks Controller				
Spraying system Pump Pipes				
Chemicals				
Fertiliser				
Reservoir (140 000 litre)				
Water tank (1000 litre)				
Cold storage room (5 m^2)				
Other				

REFERENCES

ABOS, (1996). *Handboek voor de toepassing van de Doelgerichte Interventieplanning (DIP) op het ABOS*. Algemene Bestuur voor Ontwikkelingssamewerking, Ministerie van Buitelandse Zaken, Brussels, Belgium, 2nd edition.

ABSTRACT OF AGRICULTURAL STATISTICS (AAS) (1998). National Department of Agriculture. The Directorate: Agricultural Statistics and Management Information.

AGB (1995). Altwood household survey.

APEC, (1998). APEC Tariff Database. Developed with assistance of FedEx. Available: www.apectariff.org.

AIPH (International Association of Horticultural Producers), (1995), *Yearbook of the International Horticultureal Statistics*, Institut fur Gartenbauokonomie der Universitat Hannover (Germany). Published annually, available through national member associations.

AUSTRALIAN CENTER FOR INTERNATIONAL AGRICULTURAL RESEARCH (ACIAR) (1996). *The cut flower industry: R & D issues*. Centre for International Economics, Canberra.

ANSEEW, W. (1997). Research project: Informal Marketing of Flowers in Pretoria. University of Ghent, Belgium.

BALASSA, B. (1989). *Comparative advantage, trade policy and economic development*. London: Harvester/Wheatsheaf. p. 187.

BARLOW, R., (1978). *Land Resource Economics: the economics of real property*. Second Edition. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

BJARKE, L. (1997). Danish pot plants with South African roots. *FloraCulture International*, February 1997.

BRADFIELD, R.E., (1993). *Skaduprysberekeningsmetodes vir omvattende koste-voordeelanalise*. PhD-tesis, Universiteit van Potchefstroom, Potchefstroom.

CLOVER, V.T., BALSLEY, H.L., (1977). *Business research methods*. Second Edition. Grid Publishing, Columbus, Ohio.

COLLINS, R. (1998). Personal communication. Professor of Agribusiness, School of Natural & Rural Systems Management, University of Queensland.

DAY, G.S. (1984). *Strategic market planning: the pursuit of competitive advantage*, West Publishing Co, St Paul, M.N.

DE BRUIN, D. (1998). Personal interview. Chairperson: South African Flower Growers Association and professional cut flower grower.

DEPARTMENT OF AGRICULTURE – WESTERN CAPE, (1995). *Combud-enterprise budgets*, Volume 5. Directorate Agricultural Economics. Published by Subdirectorate of Agricultural Economics and Financing.

DEPARTMENT OF WATER AFFAIRS AND FORESTRY, (1995). *Bulk water tariffs in South Africa: A possible new application?* Department of Water Affairs and Forestry, South Africa, October 1995.

DEPARTMENT OF WATER AFFAIRS AND FORESTRY, (1995). *Unit cost of water supplied out of Government water schemes*. Department of Water Affairs and Forestry, South Africa, October 1995.

ECKET, J.B., LIEBENBERG, G.F., TROTSKIE, D.P., (1997). The Western Cape Agricultural Social Accounting Matrix (WCAGRSAM): Strategic Micro and Macro Modelling Project (SM^3). A joint project between the Department of Agriculture, Western Cape, and the Development Impact Analysis Unit of the Agricultural Research Council: *Progress Report: Volume 1*. Elsenburg, 1997.

FINANCE AND THE FARMER, (1988). Published under the agricultural department of Standard Bank of South Africa, with J. van Zyl. Second edition. Johannesburg: Standard Bank of South Africa, 1988.

FISKE, S. (1997). The market of flowers. Effektiewe Boerdery, *Landbougids* 1997 p. 66.

FLOWER COUNCIL OF HOLLAND (FCH) (1995), *Facts and figures about the Dutch horticultural industry* - Leyden, the Netherlands.

FLOWER EXPORT COUNCIL OF AUSTRALIA (FECA) (1996). *Export guide for Australian flowers and foliages*. RIRDC Project. September 1996.

FOOD AND AGRICULTURAL ORGANISATION (FAO) Available: http://apps.fao.org

GALINSKY, B. (1996). Country report. Ugandan rose industry predicts major growth. *FloraCulture International*, December 1996.

GITTINGER, J.P., (1982). *Economic analysis of agricultural projects*. John Hopkins University Press, London.

GLEESON, T. AND EVANS, D. (1994). Industry and innovation. Paper presented at the Third National Workshop for Australian Native flowers. University of Queensland, Gatton College, Feb 1994.

HARDY, S. (1993). *Introduction to carnation budgets*. Department of Primary industries, Gosford, Australia.

HAZE, G. (1998). Personal communication. Horticulturist, Department of Primary Industries, Redlands Horticultural Research Centre, Australia.

HOY, A., (1998). *Life is no bed of roses for growers*. FECA–Update,Volume 51, July 1998 Australia.

IDC (INDUSTRIAL DEVELOPMENT CORPORATION), (1996). South African flower industry. Unpublished.

IFTS (INTERNATIONAL FLORICULTURE TRADE STATISTICS), (1996). Pathfast Publishing.

IFTS (INTERNATIONAL FLORICULTURE TRADE STATISTICS), (1997). Pathfast Publishing.

INTERNATIONAL TRADE CENTRE UNCTAD/GATT (1993), *Manual on the packaging of cut flowers and plants*, Geneva, Switzerland: ITC, p.5.

KOHLS, R.L. AND UHL, J.N. (1990). *Marketing of agricultural products*. Seventh Edition. Purdue University. MacMillan Publishing Company, New York.

JAMES, K. (1996). A snapshot of the Australian floricultural production and Exports. International Symposium on new floricultural crops. Abstracts. Perth Western Australia.

LEWIS, J.; WARFIELD, B. AND TOMES, R. (1997). *Rice flower as an export industry: Market opportunities*. Marketing Services – Department of Primary Industries, Queensland. RIRDC.

LOUW, D.B., VAN ZYL, J. (1997). The Western Cape Regional Linear Programming Model. Strategic Micro and Macro Modelling Project (SM^3). A joint project between the Department of Agriculture, Western Cape, and the Development Impact Analysis Unit of the Agricultural Research Council: *Progress Report: Volume 1*. Elsenburg, 1997.

LYNCH, W. (1988). "Marketing of flowers on the domestic market". Proceedings of Australian floriculture conference' Adelaide, 1998. (Eds K.A. Handreck, T.A.M., Reichstein and J.F. Roach). Australian Institute of Horticulture (S.A. Council): Australia.

MAHARAJ, N. AND DORREN, G. (1995). The Game of the Rose, the third world in the global flower trade.

MALTER, A.J., REITENBAGH, A., JAFFEE S. AND LAMBADA, S. (1996). Profits from Petals: The Development of Cut Flower Exports in Southern Africa, the World Bank. August 1996.

MONKE, E.A. AND PEARSON, S.R. (1990). The Policy Analysis Matrix for Agricultural Development. Cornell University Press.

MUSSON, C., (1998). Future Marketing Challenge for Australia with Increasing African Exports. Westralia Flora Exports.

NIEDERWIESER, F., ANANDAJAYASEKERAM, P., COETZEE, M., MARTELLA,D., PIETERSE, B., MARASAS, C., (1997). *Socioeconomic impact of the Lachenalia Research Programme*. ARC Report, Agricultural Research Council, Pretoria, Republic of South Africa.

PORTER, M.E., (1985). Competitive Advantage. New York Free Press 1985.

PORTER, M.E., (1990). The Competitiveness of Nations.

PERTWEE, J., (1992), *The production and Marketing of Roses 1992*, Frinton-on sea, U.K.: Pathfast Publishing, p49.

SALVATORE, D. (1995). *International Economics*. Fifth Edition. Prentice Hall International Editions. P31.

SEMINAR ON MARKETING OF FRUITS AND CUT FLOWERS IN WESTERN EUROPE, (1996). Paper 5, floricultural products. A quick survey of selected markets in the European Community. Kuala Lumpur: 13 January 1996.

TASCHNER, L. (1997a). *Cut Rose News*, March 1997. Association for cut rose growers in South Africa.

TASCHNER, L. (1997b). Floriculture by numbers: South Africa. *FloraCulture International*, August 1997.

THE INTERNATIONAL FLORICULTURE TRADE STATISTICS, (1997). Pathfast Publishing.

TOMEK, W.G. AND ROBINSON, K.L., (1991). *Agricultural product prices*. Cornell University Press, London.

VAN DER MEER, M. (1996). Het andere Afrika, Zuid Afrika profiteer vooral van groeiende thuismarkt. *Vakblad voor de Bloemisterij* 45.

VAN ROOYEN, C.J., (1986). Guidelines for economic analysis of agricultural development projects. *Development Southern Africa*, 3 (4).

VAN ROOYEN, C.J., (1998). Personal interview. Post Graduate School of Agriculture and Rural Development, University of Pretoria.

WESSELS, J.M.C. (1998). *The socio-economic impact of the Proteaecae Research Development and Transfer Programme of the ARC*. Unpublished MSc thesis. University of Pretoria.

WESSELS, J.M.C., ANANDAJAYASEKERAM, P., LITTLEJOHN, G., MARTELLA, D., MARASAS, C. AND COETZEE, C. (1997). *Socio-economic impact of the Proteaceae Development and Transfer Programme*. Agricultural Research Council. October 1997.

WHITE, R. (1996). Economics of Ugandan rose production.

YENCKEN, J. (1997). Trends in cut flower and foliage production, consumption and export: Analysis of the Available Statistical Data. Paper for the Queensland Industry Conference, Brisbane, June 12-14, 1997.

YOUNG, K. (1998). Personal interview. Queensland member; native flowers group Rural Industries Research and Development corporation; grower of wax flowers for export. Gatton, Queensland. September 1998.