WBI Africa Cluster Case Study

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Knowledge, Technology and Growth: The Case Study of Lake Naivasha Cut flower Cluster in Kenya

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April 2006

Knowledge for Development (K4D) Program

World Bank Institute

World Bank

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1.0 Introduction

Kenya's cut flower industry has witnessed a steady upward growth, in terms of acreage, volume and value over the last 10 years as shown in tables 1a and 1b. The exports from the industry grew from 29, 373 tonnes (fetching Kshs. 3.6 billion) in 1995 to 60, 982 tonnes (accounting for Kshs. 16.5 billion) in 2003. The industry has been expanding at the rate of 200 hectares annually making it one of the greatest expansions in any country in the world[1]. The industry constitutes more than 60 per cent of the country's horticultural sub-sector contributing about 1.5[2] per cent of the national GDP and up to 8 per cent of the country's total export revenues. The Kenya Flower Council (KFC) estimates that the flower industry contributes US$ 200 million annually to Kenya's economy and employs nearly 2 million people both directly and indirectly.

Table 1a: Growth in Value of Floricultural Exports (1995 - 2004)

Year	Value in Kshs. Billion
1995	3.643
1996	4.366
1997	4.9
1998	5.913
1999	7.234
2000	7.27
2001	10.624
2002	14.792
2003	16.495
2004	18.719

Source: HCDA

Table 1b: Growth in Volume of Floricultural Exports (1995 - 2003)

Year	tonnes
1995	29,373
1996	35,212
1997	35,850
1998	30,220
1999	36,992
2000	38,756
2001	41,396
2002	52,106
2003	60,982

source: HCDA

1 See the East African May 2-8, 2005 (http://www.nationmedia.com/eastafrican/current/index.html)

2 Horticulture contributes 2.5 % of Kenya's GDP according to HCDA figures. Floriculture constitutes 60 % of this total.

The Kenya's cut flower industry is the largest single source of flower imports into the European Union (EU) commanding up to 25 per cent of the total imports ahead of Colombia (17 per cent) and Israel (16 Per cent). Kenya exports 60,000 tonnes of flowers into the EU annually with the floral varieties dominated by roses (more than 70 per cent), Carnations, Hypericum, Alstoremeria and Eryngium amongst others. Apart from Holland where the bulk of Kenya's flowers are exported (more than 65 percent), other export destinations include UK, Germany, France and Switzerland as shown in table 2 below.

Table 2: Major export destinations for Kenya's floral exports (2003)

Country	Quantity exported	% of total floricultural exports
Holland	40,077	65.7
UK	12,087	19.8
Germany	4,267	7
France	1,574	2.6
Switzerland	1,061	1.7

Source: HCDA export statistics

The success of the cut flower industry in Kenya has been attributed to a combination of factors including Kenya's natural advantages (agro-climatic conditions), active participation of a robust private sector and favourable government policies.[3] Kenya, owing to its location at the equator, has ideal agro-climatic conditions favouring all year round production of flowers. The temperatures range from 22-30 degrees Celsius during the day to 6-12 degrees at night. The government has limited involvement in the flower industry focusing mainly on licensing and regulation thereby giving room for active private sector participation in the industry. The general policy environment is favourable with adequate institutions that support the development of the industry.

[3] See Bolo (2005)

2.0 Profile and Organization of the Cut Flower Industry in Kenya

The Horticultural Crops Development Authority (HCDA) approximates that there are over 160 cut flower growers in Kenya, categorized as small scale (under 4 hectares), medium scale (between 10-20 hectares) and large scale (more than 50 hectares). In terms of employment[4], there are no standard figures but it is estimated that small scale farms (as per this categorization) will employ up to 350 workers, medium scale (between 500 – 1000) while large scale farms employ between 1000 – 2000 workers.

The industry is dominated large scale companies who make up to 97 per cent of total flower exports and owned mostly by foreigners or Kenyans of foreign descent. The small scale growers contribute a mere 3 percent of the total flower exports. This imbalance is explained by the high capital and knowledge intensive nature of the flower business and the strict regulatory market requirements which has locked out most of the small scale growers. According to HCDA, production by the small scale growers has been on the decline over the last 5 years as a result of competition from other areas as well as limited access to improved varieties. It is estimated that capital investment in flower production requires about US$ 50,000 per hectare besides a vigorous marketing network. These requirements have confined most of the small scale growers to summer flowers that can be grown outdoors and do not require heavy investment in green houses and other sophisticated technologies.

It is estimated that over 2,000[5] hectares of Kenya’s agricultural land is under cut flowers with the major growing regions concentrated around Lake Naivasha, Thika, Limuru, Nairobi and Athi river plains. Further upcountry the significant growing areas include Nakuru, Nanyuki/Nyahururu, Mt. Kenya region and Eldoret as depicted in table 3. The Lake Naivasha cluster accounts for about 44 per cent of total hectarage under cut flowers. The distribution of varieties is as shown in table 4 with a greater percentage of this hectarage under roses. Kiptum (2005) has noted that “floriculture in Kenya is dominated by 24 large companies who make up over 72 % of total flower exports and own, on average, between 20 – 100 hectares, employing a workforce of 250 – 6000 persons.” The small companies range from 5-20 hectares and are less capital intensive with some growing in open fields and do not export all year round. The small holders grow summer flowers including Eryngium, Ornithogalum, Papyrus,

[4] These are average estimates obtained from discussions with farm managers of some farms. The figures however do fluctuate during peak and off- peak seasons.
[5] This estimate is based on a recent survey by the *Floriculture Magazine* and is due to be published in 2006. It is important to note however that the survey focused more on export companies/ farms and may not have captured the fairly smallholders who either are out growers or deal only in summer flowers and sell locally. In effect, the hectarage under cut flowers is most likely higher than the estimate.

Lillies, Ammi, Molucella, Asclepias (mobydick), Rudbeckia, Euphorbia, Orchids, Scabiosa amongst others.

The large scale farms have their marketing arms, established as sister companies and located in Europe. These help in the sale and distribution as well as gathering market information which is fed back into the operations of the companies. The small growers, however, have difficulty in accessing the export markets as a result of high costs of freight and strict phyto-sanitary requirements.

Table 3: Distribution of flower farms in Kenya by major growing regions (2005)

Region	**Land size (ha)**
Naivasha	872.5
Thika	251.7
Kiambu/Limuru	187.6
Nairobi	221.6
Nakuru	173.6
Nanyuki/Nyahururu	45.5
Mt. Kenya region	118.5
Eldoret	129.5
Total	**2000.5**

[6]Source: Compiled by author from Masila Kanyingi (editor) *Floriculture Magazine*.

Eryngium 201.5

Table 4: Distribution of most important floral varieties grown in Kenya

Variety	Acreage (ha)
Roses	812
Carnations	211
Hypericum	18.4
Alstroemeria	57.6

[6] This is part of on-going work to be published in *"Floriculture Kenya Handbook 2006"* by Scoop Communications Ltd. This publication expected in mid 2006 has compiled all the exporting flower farms/firms, their hectarage (both current and planned expansion), location and contacts in Kenya. Mr. Masila Kanyingi can be reached at masilakanyingi@yahoo.com

Source: HCDA

2.1 The Lake Naivasha cluster

The Lake Naivasha region is the hub of the Kenya's cut flower industry. The region is situated around 100 km northwest of Nairobi in the Great Rift Valley at an altitude of between 1,800 – 2,000m above sea level. The temperature range for the region is between 7.3 – 22.7 degrees Celsius and annual rainfall ranging from 156.0 mm/month to 1134.0 mm/month distributed throughout the year with peaks in April/May for the long rains and October/November for the short rains.

It is estimated that over 50 per cent of the country's total flower production is concentrated around Lake Naivasha. Other than the growers, the Lake Naivasha cluster comprises other key actors in the flower industry including research institutions, breeding farms, quality control and regulatory agencies, input suppliers, credit and finance institutions, trade promotion agencies and other intermediary organizations. The emergence and growth of Lake Naivasha cluster has been attributed to a number of factors. Key amongst these include:

- Availability of fresh water resources for irrigation: Lake Naivasha is the only fresh water lake in the whole of the Rift Valley region. Flower growing requires a lot of water for irrigation and the presence of Lake Naivasha attracted many farmers to this region. Besides the lake, there are lots of underground water resources (aquifers) which the farms drill to use for irrigation
- Large farms for large-scale commercial production: The availability of large, inhabited tracts of land with suitable soils for flower production around Lake Naivasha was another contributory factor to the development of the cluster. Historically these large tracts of land were owned (through leasehold) by white settlers such as Lord Delamere Estates which owns most of the land around Naivasha town. Both the white settlers and the government therefore leased out the fallow land to the large scale commercial flower growers.
- The soils and climate are conducive for horticultural production: Both the soils, temperature and annual rainfall range around Lake Naivasha are favourable for cut flower production
- Proximity to Jomo Kenyatta International Airport (JKIA), Nairobi: By its location along the Nairobi – Nakuru highway, approximately one hour from the city center, the Naivasha cluster has easy access to the airport making transportation easier. Nairobi is considered a major hub in the East African

region and served by major airlines according Kenya an easy access into Europe and other parts of the world.

3.0 Knowledge, Technology and Networking in the Lake Naivasha Cluster

Clusters are defined by two key attributes namely geographical/spatial distribution and sectoral dimension. Porter (1990) defines clusters as a group of firms engaged in a similar or related economic activity in national economy. In most cases these firms are geographical close while in others, they may be more dispersed. Schmitz (1992) defines clusters as a geographic and sectoral agglomeration of enterprises. While both definitions are relevant, Schmitz captures more precisely the cut flower cluster around Lake Naivasha giving more attention to the geographical proximity as well as sectoral specialization. The collective efficiency model (Nadvi, 1996) has identified at least four variables[7] that determine competitiveness in enterprise clusters. These include: market access, labour market pooling, intermediate input effects and technological spillovers. The other variable in the collective efficiency model is what Nadvi (1996) has called joint action. This occurs when firms take deliberate efforts to cooperate and collaborate. The geographical proximity afforded to them by clustering is assumed to facilitate any joint activities initiated by the enterprises. In terms of learning and information flows, Oyeyinka (2004) has identified two types of knowledge namely formal and informal (experiential learning) and states, “non-formal learning which often takes the form learning-by-doing, is an important component of human capital particularly in economic contexts where traditional craftsmanship, often acquired through apprenticeship, predominates.” Oyeyinka (2004) has further noted that knowledge of production, which is largely tacit, relies largely on the skills (know-how) of workers although skill itself draws on know-why to find reasons for particular procedures or routines. Mytelka (2004) has emphasized the role of clusters in promoting the kind of interactivity that is an important stimulus for innovation to occur, but cautions that co-location of actors in a geographically proximate space, does not automatically lead to interaction, learning and innovation.

The attributes identified above form the conceptual foundation against which the Lake Naivasha cluster is analyzed. This analysis focuses on how knowledge and technology are acquired and disseminated within the cluster and how different actors interact with and learn from each other.

[7] These have also been referred to as “external economy factors.” McCommick (2004) has defined external economy as the unintended or incidental by-product of an economic action. In the sense used in this case, the unintended actions of some farms have beneficial economic effects on the activities of other farms.

3.1 Knowledge Acquisition and Dissemination

Most of the key actors in the cut flower industry concur that Kenya has adequate human and technical competence and skills that are required to ensure competitiveness in the industry (Bolo, 2005). This human capital base is buttressed by research, educational and training institutes such as the National Horticultural Research Centre (NHRC) and several universities that offer training programmes in horticulture. However, the industry has not fully utilized this existing research capacity in solving most of the problems facing the industry and has instead relied heavily on the expatriates for technical advice and assistance. Most of the flower farms owners (directors) are businessmen who have acquired their knowledge in floriculture through their long experience in flower business hence they have a very good understanding of the industry. Some of them are graduates of horticulture but most of them inherited the businesses from their parents and family ties and as such have been in the business all their lives. In most cases, they employ horticulture graduates as farm managers dealing with the technical details of production while the farm owners are directors dealing with administration and marketing of products.

The flower industry has often operated as ‘closed systems’ with little formal interaction between the farms and other actors. This has been attributed to lack of trust between the farms and the need to guard trade secrets. However, resulting from the pressure from environmental and human rights groups as well as consumer demands on the working conditions of flower farm workers and the negative publicity it generated, the flower farms have began opening up to the public in efforts to counter negative press. Regular (and often unannounced) environmental as well as social audits are conducted to ensure that the farms not only conform to the good agricultural practices (GAPs) but also maintain environmental standards and favourable working conditions for their work force. Compliance is enforced through codes of practice (CoPs) and certification by industry associations such as Kenya Flower Council (KFC), Fresh Produce Exporters Association of Kenya (FPEAK), Horticultural Ethical Business Initiative (HEBI), the Lake Naivasha Growers Group (LNGG), Lake Naivasha Riparian Association (LNRA) and Kenya Bureau of Standards (KEBS). Horizontal flow of information is predominant amongst flower farms and occurs through a combination of the following:

- Farms learn from their neighbours through exchange of notes on such issues as market information, new technologies by way of farm visits and excursions organized by industry organizations
- Farms also learn from each other through seminars organized by other support institutions, the government and even donors

- Poaching and labour mobility also contributes to learning in farms with the most skilled workers always head-hunted. They often transfer the knowledge and skills to the new farms and their continued informal interactions with former colleagues ensures that they compare notes between operations in the farms
- Learning also occurs when farm owners hire expatriates/ technical experts from abroad to train employees on various techniques. The lower cadres of employees mainly learn through observation and on the job training.

3.2 Human Capital and the Role of Higher Education

The majority of entrepreneurs in the flower industry (especially large scale) are holders of a first degree (and some have postgraduate qualifications) either in horticulture or business administration and management. Most of those with university education are holding management positions while the majority of casual labourers have not gone beyond secondary school training. Among the small scale growers (mainly locals dealing in summer flowers), the majority of entrepreneurs have formal education up to secondary school level and no specialized training either in horticulture or business management. This low level of education amongst the small scale farmers has compounded the problems they face in the industry given that they also lack the financial resources to hire experts to manage their farms. In large farms however, if there's a deficiency of particular skills, the farms can hire expatriates from abroad. Most farms do not have formal training programmes for their employees and where employees have been sponsored for any specialized training; this has been on ad hoc basis and dictated by the urgent skills required either for expansion or upgrading of the farm's activities. The high staff turn – over as a result of 'poaching' by other farms has been seen as disincentive to the farms who fear investing heavily on training only to lose these highly-trained employees to their competitors.

The universities in Kenya have continued to train highly skilled manpower for the industry and almost all the public universities have programmes in horticulture. Some of the universities have introduced floriculture as an independent course to address the specific needs of the flower sector. For example, [8]Jomo Kenyatta University of Agriculture and Technology (JKUAT) offers degree programmes in Ornamental Science and Landscaping where 3rd year students take cut flower and cut foliage production as a unit course. Floriculture is offered as an area of specialization at Master's level. [9]Maseno University offers floriculture both at Masters and Doctoral

[8] See www.jkuat.ac.ke
[9] See www.maseno.ac.ke

levels focusing on flower production in Kenya while floriculture is offered as a unit course in degree programmes in horticulture.
Besides, Universities have tried to forge closer linkages with the industry and some have instituted joint programmes in research and training especially for postragduate students. Undergraduate horticulture students also spend some time during their training as interns in these farms. However, there's need to continuously update curricula to reflect industry's needs as well as train more technical staff at diploma levels to work with the farmers.

3.3 Technology Spillovers and Transfer

The markets have become very competitive and using outdated technology can easily push a company out of business, as such farms tend to keep track of the latest technological developments in flower production. The flower industry has kept on adapting to the changing technological environment as witnessed in the phasing out of outdoor growing, through wooden greenhouses to the latest technologies in steel greenhouses. There has also been a shift from using soil media to hydroponics in some varieties such as carnations. In irrigation, there has been a shift over the years from surface irrigation to drip irrigation and currently fertigation techniques are being employed in the industry. Due to interactions between farms, clustering influences the method, material and markets for flowers as well as the varieties that are grown. Other equally important factors in the choice of technology include the cost, reliability of technical support, availability and the farmer's previous experience. The marketing companies and distributors of farm input suppliers also influence the choice of technology and since the farms are clustered in one geographical area, it is not unusual to find several farms using similar technologies and their choice influenced more by the marketing companies.

3.4 Market Access and Technical Assistance

Out grower schemes are common between large and small farms. These are often necessitated by the need to penetrate export markets by small scale farmers who have difficulty accessing the export (mainly European) markets as a result of phyto-sanitary standards and market requirements. The small farms fail to get accreditation/certification to sell directly hence they sell through the large farms that act as middlemen. Another reason for sub-contracting is the high costs associated with the flower business mainly for freight and marketing. Sub-contracting also becomes necessary where the large farms are unable to grow certain varieties which are in demand either due to unfavourable climatic conditions in their locations or when the demand is short-term and does not justify investment in extra operation costs.

The large farms sub-contract the smaller farms to grow and supply flowers. Large farms market on behalf of the small farms and in return provide pre-harvest and post-harvest technical advice/expertise to ensure supplies of high quality flowers that meet market standards. In addition to these contractual arrangements between small and large farms, there are companies that are specialized in flower export business but do not produce their own flowers. Such companies contract farmers to grow certain varieties of flowers depending on the prevailing market demands. The companies in return offer agronomic advice, sources seeds and other inputs, offers informal training for farmers. Usually such companies employ technical experts who visit farmers on a regular basis during the growing periods to ensure the good quality of supplies. These sub-contracting arrangements are usually cemented by elaborate contracts between the out grower (usually the small farms) and the large farms.

3.5 Collaboration and Joint Action

The Lake Naivasha cluster demonstrates several examples of cooperation and collaboration arising out of deliberate conscious efforts of the different actors. The flower farms have formed various industrial associations with different objectives ranging from lobbying for policy support, environmental conservation, maintaining standards to facilitating corporate social responsibility programmes. The Kenya Flower Council (KFC) and the Fresh Produce Exporters Association (FPEAK) are the key industrial associations whose objectives include maintaining standards, facilitating market access as well as gathering market intelligence for their members. These associations have increased the bargaining power of the growers in such issues as freight charges, taxation, prices of inputs and even against unfavourable policies. The Horticultural Ethical Business Initiative (HEBI) conducts regular social audits to ensure that workers welfare is maintained. In all these cases, members are graded depending on their level of performance and adherence to the codes of practice agreed by the various associations.

In the field of environmental conservation and sustainable use of the natural resources around Lake Naivasha two key associations stand out: The Lake Naivasha Growers Group (LNGG) and the Lake Naivasha Riparian Association (LNRA). LNGG was formed 8 years ago in response to complaints that the flower farms and other horticultural farms around the lake were not environmentally and socially responsible. It derives its membership from all the stakeholders involved in intensive agricultural activities around Lake Naivasha. The members benefit from regular environmental and social auditing, training and provision of relevant information. LNRA has a diverse membership including small holders, ranchers, flower growers, tour operators, the Kenya Wildlife Service, the Kenya Power and Lighting Company and the Naivasha municipal council. The Association has developed a comprehensive management plan to control human activities in the area and protect the lake from extinction.

There has also been an increase in the provision of social amenities to the communities such as health services and schools which are provided by the farms as part of their social responsibility programmes. Flower farms around lake Naivasha have come together to support social programmes as well as pool together their resources for infrastructure development. For example, the flower farms have invested up to Kshs. 25 million in the repair and construction of parts of the Moi South Lake road which serves most of the farms around the lake.

3.6 Foreign Co-operation in the Flower Industry

There's a strong collaboration between the local flower industry and other international companies and organizations. This collaboration takes several forms and covers a diversity of areas such as training, laboratory analysis and diagnosis, technology acquisition and marketing amongst others. This section considers research, training and capacity building, laboratory analysis and diagnosis and technology acquisition:

Training and capacity building: Most of the foreign supported training and capacity building in the industry are geared towards achieving standards and maintaining high quality of products into the export markets. A few examples help to illustrate this:

- The Royal Netherlands Embassy in Nairobi has initiated a training programme to enhance access of local horticultural products into markets in the industrialized countries[10]. This training programme targets middle-level managers and smallholder farmers. The programme has begun with vocational training for managers in the sector and training is conducted by registered local NGOs who receive basic training from the embassy. In case certain skills are not available in-country, the embassy helps source it.

- The Flower Labour Program (FLP) of Germany has collaborated with the International Center for Insect Physiology and Ecology (ICIPE) in Kenya to develop a flower scout training program. This training which targeted supervisors and management staff was conducted in the production units of flower farms and its main objective was to help the trained scouts detect problems and diseases early enough and avoid extensive damage.

[10] For more on this programme, see *Floriculture magazine* March/April issue 2006

- Following complaints on the inhuman conditions of workers in the flower farms, the Ethical Trading Initiative (ETI) funded a training program for the flower industry in 2003. This training emphasized the role of participatory social auditing to ensure human and environment health requirements are adhered to. This training raised awareness in the industry and resulted in the formation of Horticultural Ethical Business Initiative (HEBI) which is a local Kenyan version of ETI.

Laboratory analysis and diagnosis: the Kenyan flower industry works very closely with laboratories and research institutes based in the developed countries. This is partly motivated by the fact that the consumers tend to trust more the analysis and tests conducted by these laboratories and as such clearance from these laboratories boosts export sales for the farms. Moreover, these laboratories are less bureaucratic and give timely responses to the farmers, sometimes via email in three days. There are examples of this collaboration with the Societe Generale de Surveillance (SGS), Relab de Haan laboratories (Holland), Bureau Veritas, Milieu Programa Sieerteelt (MPS) amongst others.

Technology acquisition: Most of the technologies in the flower industry are sourced from abroad necessitating cooperation between Kenyan farms and the foreign companies supplying these technologies. For example, most of the green houses are either imported from Israel or Spain and the Israeli or Spanish companies have local representatives in Kenya. Equally, most of the export varieties are imported and the breeding companies have local representatives/branches in Kenya. The Kenyan companies are mostly involved in propagation and distribution of these varieties.

Research: In research, there are a number of collaborative programmes involving Kenyan companies/farms and research institutes based in the developed countries. One such example involves Dudutech (K) Ltd which is an Integrated Pest Management (IPM) company based in Kenya and providing crop protection solutions to the Kenyan horticultural industry. The parent company, Flamingo Holdings is registered in the UK. Dudutech (K) Ltd in collaboration with sister companies in the UK such as Flamingo UK Ltd and Flower Plus (UK) both of which are leading suppliers of fresh produce and flowers to supermarkets and retailers have been involved in research into IPM systems and was recently awarded the prestigious Environmental Award for Crop Protection for its achievements in Kenya. Dudutech has developed a range of natural enemies and are now mass-producing Amblyseius, Phytoseiulus, Encarsia, Aphidius amongst others.

4.0 Policies and Incentives for the Cut Flower Industry in Kenya

A favourable policy environment has been very instrumental in the success of the cut flower industry in Kenya. The government of Kenya recognized the important role of horticulture in the national economy as early as 1966 and committed itself to promoting its growth. This commitment was first demonstrated in 1967 when horticulture was declared a special crop thereby according it priority in the government's agenda. In a subsidiary legislation to the Agriculture Act (Cap 318), the government created the Horticultural Crops Development Authority (HCDA) to develop, promote, coordinate and facilitate the horticultural industry in Kenya. Since then, the government's direct involvement in the sub-sector has been minimal, limited mainly to issuing export licenses through HCDA and interfering neither in the marketing nor distribution of the crops, leaving these functions to the private sector.

The Agricultural (export) Produce Act (Cap 319) provides for the grading and inspection of agricultural produce meant for export. In a subsidiary legislation to this Act, there are a set of rules called "the agricultural produce (export) horticultural produce inspection rules" which deal directly with the horticultural produce to be exported from Kenya. Besides, the Standards Act (Cap 496) promotes the standardization of the specification of commodities from Kenya and ensures the implementation of a code of practice. This Act provides for the establishment of Kenya Bureau of Standards (KEBS) and the National Standards Council (NSC) which in conjunction with the Kenya Plant Health Inspectorate Service ensure that phyto-sanitary matters are adhered to by the industry players. This helps in protecting the growers from diseases as well as low quality products from the industry.

In terms of protection of Intellectual Property Rights (IPRs), the Seeds and Plant Varieties Act (Cap 326) provides for plant breeders rights (PBRs) to be conferred upon breeders for a period not exceeding 25 years. The Plant Variety Protection office was established in Kenya in 1997 following the revision of the act in 1991. Since the operationalization of the plant variety protection office till October 2004, a total of 640 applications were received (*floriculture* Nov/Dec 2004). Of these 45 percent were presented by local breeders (mainly in food and industrial crops) while 55 percent were foreign applications mainly in horticultural crops. In horticultural crops alone, 88 percent were for ornamental crops (floriculture) representing over 52 percent of all applications in Kenya. Besides, Kenya is a member of the International Union for the Protection of New varieties of Plants (UPOV) under the 1978 convention which allows for cooperation amongst member states in sharing of data and information on variety testing and protection.

The setting up of the Kenya Industrial Property Office in February 1990 after the enactment of the Industrial Property Act (Cap 509) has strengthened intellectual property protection in Kenya. These developments have encouraged private research entities and breeders to operate in Kenya as well as facilitated access to patented innovations and other international research outputs by the industry players.

In the area of developmental policies (as captured in sessional papers and five-year development plans), the sessional paper no.1 of 1986 on *economic management for renewed growth* identified horticulture as one of the [11]seven priority commodities that the government was to focus on in order to achieve food security in the country. In this paper, the government identified the key constraints facing horticultural development and committed itself to addressing the challenges by building new marketing centers in major urban areas, according priority to products of high unit value in air shipment, experimenting with sea shipment as well as market diversification. Noteworthy in this policy paper is the strengthening of HCDA and re-defining its roles to include provision of technical advice to growers, collecting and disseminating market information as well as providing specialized inputs such as refrigerated trucks for transportation to farmers.

The sesional no.1 of 1994 on *recovery and sustainable development to the year 2010* suggested steps the government needed to execute including allocating land to private operators near the two international airports, installation of pre-cooling facilities at the international airports and in major growing areas as well as maintaining jet fuel at competitive levels. The government divested its involvement in marketing and distribution of agricultural inputs and commodities. The paper also defined new research priorities and emphasized breeding programmes for increased yield, disease and pest resistance and research in integrated pest management. The need for timely reliable information on available technologies, prices of inputs and overseas markets is underscored and the paper states in part, “that the research system and the extension service will be required to be up-to-date and highly responsive to farmers needs.”

The Poverty Reduction Strategy Paper (PRSP) of 2001 has recognized the private sector as the engine of growth and limits the government’s role to creating an enabling policy environment which encourages investment and job creation. The PRSP has also called for the development of a participatory extension and technology transfer system. This call for pluralism in extension service provision has been further emphasized in the *economic recovery strategy for wealth and employment creation* (ERSWEC, 2003-2007) which seeks to consolidate the different acts of parliament governing agricultural activities into a single legislation

[11] The other commodities were coffee, tea, pyrethrum, maize, wheat, milk and meat products

Besides the enabling policy and legal framework, there are other incentives available for the cut flower industry in Kenya. Data from the Investment Promotion Council of Kenya (IPC) shows that investors in the cut flower industry can obtain allowances on capital investments including:

- *Wear and tear allowances* on such items as lorries, tractors, computer hardware, copiers, motor vehicles, aircrafts and plant machinery
- *Industrial building allowances* covering all industrial buildings
- *Farm works allowances* covering all structures necessary for the proper functioning of a farm

Other than the capital allowances, there are export promotion schemes such as Manufacturing Under Bond (MUB), export compensation schemes and Export Processing Zones (EPZ). The export compensation scheme and MUB target export businesses while EPZs are a much more flexible export support program providing import duty exemptions for imported inputs. The availability of both international and local seed companies ensures timely availability of certified seeds, other planting materials fertilizers and other agro-chemicals. The provision of cold storage, collection centers, pre-cooling facilities and refrigerated trucks in the major potential growing areas is an additional incentive to small-scale investors.

5.0 Key Success Factors for the Cut Flower Industry

The success of Kenya's cut flower industry has been attributed to a number of factors ranging from climatic factors, contextual factors, policies, infrastructural factors as well as international trade arrangements. Each of these is considered briefly in this section.

a) **Climatic factors:** Kenya enjoys a diverse range of climatic conditions from the hot coastal plains to the cool highlands. A temperate climate prevails from 1500m above sea level with a temperature range of between 22-30 degrees Celsius at daytime and between 6-12 degrees Celsius at night. Rainfall is well distributed in the growing areas with two peaks in April/May and September/October covering approximately 60-80 days in a year allowing for ample radiation for most of the year. These factors favour all year-round cultivation and export of high quality flowers. The Lake Naivasha cluster, standing at an average of 1850m above sea level experiences a temperature range of between 7 - 23 degrees Celsius and an annual rainfall range of 156.0 – 1143.0 mm per month

b) **Contextual factors:** The key contextual factors responsible for the success of the Lake Naivasha cut flower cluster include the availability of huge tracts of land and the fresh water resources from the Lake Naivasha as well as underground water resources. The large tracts of land were not only responsible for the initial investments in the area but also allow for expansion of farms as businesses grow. Flower growing is heavily dependent on irrigation hence the ready availability of fresh water afforded by the lake's existence ensures that irrigation can be done all year round.

c) **An enabling policy environment:** government support and non-interference in the industry has been influential in the industry's phenomenal growth. A fairly strong intellectual property protection regime, availability of skilled manpower, a functional quality control and regulatory regime and other government incentives have fostered the rapid growth rate experienced in the industry. Moreover, the government's limited involvement and hands-off approach has created room for a very strong and robust private sector participation in the cut flower industry in Kenya.

d) **Infrastructural factors:** the location of the major growing areas in close proximity to the Jomo Kenyatta International Airport (JKIA) and the capital city of Nairobi, which is a major hub served by major airlines and charter operators has not only minimized transportation costs to the airports but also accorded the industry easy airfreight access into the European markets which accounts for the bulk of Kenya's flower exports.

The major growing areas are also served by the major road networks in the country e.g. Lake Naivasha region is served by Nairobi - Nakuru highway, Thika region is served by Thika Road while the Athi River and Kitengela areas are served by Mombasa Road. The feeder roads into the interiors of growing regions still need upgrading but these major roads provide easy access into the city center and into the airport.

Further, the provision of cooling facilities and refrigerated trucks, building marketing centers in key growing areas, installation of pre-cooling facilities at the airports as well as allocating land to private operators near airports constitute a supportive infrastructural arrangement for the cut flower growers in Kenya.

e) **International trade agreements:** the success of Kenya's cut flower industry has been attributed largely to the easy access into the European market under the non-reciprocal preferential trade arrangements under the Lome IV Convention which allowed Kenya to export preferentially into the EU market. The Lome IV Convention trade arrangement will come to a close at the end of

2007 to be replaced by a new trade arrangement being negotiated under the on-going ACP-EU economic partnership agreements (EPAs). The close of the Lome IV arrangements presents a big challenge to the cut flower industry which is expected to face fierce competition from the neighbouring countries of Ethiopia, Uganda and Tanzania [all of which will still be classified as Least Developed Countries (LDCs)].

6.0 Challenges facing the Cluster

The Lake Naivasha cluster, however, faces certain challenges. These challenges take different forms including:

- Environmental pollution and resource depletion: overdrawing of the Lake's water for irrigation threatens the lakes existence. Munero (2004) quoted in *Moturi et al* (2005) has remarked that the lake region has the largest concentration of horticultural farms which have continued to encroach into the riparian land, leading to pollution and abstraction of the lake waters. *The Daily Nation* (November 1, 2005) reported that the rapid extraction of water from Lake Naivasha for horticulture is likely to kill the lake whose volume is believed to have decreased by up to 800 yards. Moreover, the use of agro-chemicals leads to accumulation of chemical effluents, especially nitrates, threatening aquatic life. Moturi et al (2005) have reported that in recent years flower farms and fishermen around the lake have come into conflict over the diminishing number of fish in the lake, with the fishermen accusing the flower farms of over-using the scarce water resources thus reducing fish stocks.

- The clustering has also led to increased spread of diseases and pests with the close proximity making it difficult to control the spread of infections across the farms

- There have also been complaints that the former public beaches around the lake have been overtaken and privatized by the flower farms and are no longer accessible to the public thereby denying the residents the use of these recreational facilities. This has led to increased tension between the residents and the flower farms.

7.0 Key Lessons and Policy Implications

The case of Lake Naivasha cluster presents some important policy-relevant lessons critical to the success of the cut flower industry in Kenya. These lessons are useful to other agricultural sectors which have experienced decline in performance both in Kenya as well as other parts of Africa.

i. Clustering accords the farms/enterprises and other actors in the sector an opportunity to interact, network and collaborate with each other. This interaction, as Mytelka (2004) has argued, is an important stimulus for innovation and long-run competitiveness. This co-location of enterprises allows for exchange of information thus contributing to learning and knowledge flows in the sector. In the Lake Naivasha cluster, specifically, farm owners consult each other on technological advancements, new varieties, market information and requirements while employees exchange valuable information on growing techniques, pest and disease management amongst other things. Through poaching/labour mobility, there occurs technology transfer and spillovers within the cluster. This staff mobility within the cluster contributes to the overall functionality of the system by promoting mixing of ideas and allowing organizations to learn from each other.

ii. Clustering also promotes cooperation and joint approach to problems facing the industry thereby increasing the bargaining power of the farmers. The formation of industrial associations which serve to gather and disseminate information and market intelligence to their members, collective bargaining on such matters as input prices, freight charges, lobbying for policy support especially for infrastructure development and self-regulation (both environmental, phyto-sanitary and social auditing) ensure a unified approach to issues affecting the industry

iii. Ease of policy/government support: By locating in the same geographical area, it affords the government the opportunity for well targeted support for the industry. Development of infrastructure e.g. roads, pre-cooling facilities and cold stores, establishing of regulatory offices become easier when dealing with a specific region. Other government services to the industry which are made easier through clustering include pest and disease surveillance

iv. Clustering facilitates sub-contracting, marketing support and technical assistance between the large and small scale farms. The small farms can access export markets by selling through the large farms which in turn provide technical assistance to ensure good quality flowers. These arrangements contribute to learning in the sector and help build the capacity of the small farmers in flower production. Moreover, sub-contracting (out grower schemes) enables the large growers to supply their customers with varieties of flowers which they can not produce on their own, either due to climatic factors or if the demand is only short-term.

v. Clustering also allows input suppliers and service providers easy access to a large number of farms/enterprises within a small geographical area. This reduces operational/transportation costs to the input suppliers and service providers. The benefit of cost reduction to input suppliers is translated to cheaper prices for the farmers. The farmers can also organize themselves and purchase their inputs in bulk further reducing the costs of farm inputs.

Conclusion

Markets, technology, customers and competition are continually changing requiring farms and enterprises to continuously adapt and innovate in order to guarantee their competitiveness and sustainability. The case of Lake Naivasha cut flower cluster demonstrates the usefulness of clustering in promoting technological learning, innovation and competitiveness that result in increased productivity and export growth. It has shown that clustering creates opportunities for interaction and networking that are necessary if farms are to overcome the numerous challenges and constraints facing industries in Africa. Networking within a cluster allows farms and enterprises to join forces around issues of common concern and results in relationships with other independent actors to share knowledge, goods, and experiences, and learn from each other with a common goal in mind (Padron (1991), Engel (1993). Moreover, Pinzas and Ranaboldo (2003) have reinforced the role of networking and argued that such networks only produces development *when* the network transforms itself into a space for innovation, experimentation and learning. This transformation requires strong linkages between the different organizations within the sub-sector which allows for exchange or transfer of information, technology and resources.

Equally important in the overall effectiveness of a cluster is the critical role of policies and incentives. A country's policy and legal framework determines the actor behaviour, attitudes, and corporate culture thus helping to promote the habits and practices that are beneficial to the industry. The availability of additional incentives and a favourable business environment has been significant in attracting private sector involvement and investment in the cut flower industry.

In general, sectoral specialization and geographical proximity results in the creation of a community of practice (Wenger, 1997) within a cluster. These communities of practice comprise practitioners within the sector who are defined by a shared domain of interest, engage in joint activities and share information. Through sustained interaction, these communities develop a shared repertoire of resources including experiences, stories, tools and ways of addressing recurrent problems (Wenger, 1999). In the Lake Naivasha cluster and Kenya's flower industry in general, these communities have taken forms of strong industrial associations such as the Kenya Flower Council (KFC) and the Fresh Produce Exporters Association of Kenya (FPEAK) amongst other such associations which tackle joint problems such as markets, infrastructure, regulation, quality control and policy lobbying on behalf of their members.

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