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Lydia Neema Kimenye

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Carl K. Eicher
Major professor

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THE ECONOMICS OF SMALLHOLDER FLOWER AND FRENCH BEAN PRODUCTION AND MARKETING IN KENYA

By

Lydia Neema Kimenye

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ABSTRACT

THE ECONOMICS OF SMALLHOLDER FLOWER AND FRENCH BEAN PRODUCTION AND MARKETING IN KENYA

By

Lydia Neema Kimenye

Kenya has been praised for its success in smallholder production of traditional exports such as coffee and tea. However, because of the declining world prices of these commodities in the 1980s, Kenya and other African countries are diversifying their agricultural export base. Kenya is giving priority to the development of nontraditional exports, such as horticultural commodities. Currently, flowers and beans account for 70 percent of the value of horticultural exports. However, there is little available information on the economics of smallholder production and marketing of nontraditional exports.

A farm survey was carried out in 1992 to study the economics of flower production in Nyandarua and Kiambu districts and french beans in Kirinyaga district. The information was used to develop farm budgets, identify production and marketing constraints, and suggest strategies for expanding smallholder production. The farm budgets revealed that flowers were capital intensive, risky but more profitable than beans. However, because of the lack of credit and

market information, small growers in Nyandarua district produce low value flowers that are often left unharvested because of the failure to match local supply with European demand. In 1991, half of the flowers produced in Nyandarua were unharvested. The large growers earn higher returns and lower losses because they developed effective market arrangements with European buyers.

Forward marketing contracts used in the bean industry helped match local production with exporters' demand and reduced the losses from unharvested beans. However, contracts were primarily used by the larger and older growers because small growers had a reputation of breaking oral contracts.

In order to expand smallholder flower production for export, the government should encourage flower growers' associations to coordinate local production with the changing European demand. Growers should be required to supply flowers on contract to the associations in exchange for access to credit and planting materials. The government should encourage bean growers and exporters to adopt written contracts. Market news coverage should be expanded to include weekly information on local and international prices, quality, and supply of flowers and beans.

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ABBREVIATIONS

ACP = Africa, Caribbean, and Pacific states

DCK = Dansk Chrysanthemum Kurtur

EEC = European Economic Community

FAO = Food and Agricultural Organization of the United Nations

GGFGA = Githunguri, Gitiha, Flower Growers Association

HCDA = Horticultural Crops Development Authority

HCU = Horticultural Cooperative Union

ITC = International Trade Ceter

JKIA = Jommo Kenyatta International Airport

KARI = Kenya Agricultural Research Institute

KETA = Kenya External Trade Authority

KHE = Kenya Horticultural Exporters

KFGA = Kinangop Flower Growers Association

MOA = Ministry of Agriculture

NAL = National Agricultural Laboratories

CHAPTER ONE

INTRODUCTION

1.1. The Background

The primary goal of Kenya's economic policy is to achieve a 5.6 percent annual growth of Gross Domestic Product (GDP) between 1989 and the turn of the century through job creation, increased productivity and higher foreign exchange earnings (Kenya, 1986; Kenya, 1989). Agriculture is the largest sector in the nation's economy providing for slightly over 30 percent of the country's gross domestic product (GDP), 75 percent of the total employment, and nearly all the country's food needs (Kenya, 1988; 1990). Agriculture accounts for about 70 percent of net foreign exchange earnings, mainly through coffee, and tea exports (Schulter, 1984; Kenya, 1986). In recent years, horticultural exports have emerged as an important nontraditional agricultural export, representing 12 to 15 percent of the total domestic exports (MIAC/KARI, 1991). Therefore, because of agriculture's dominant role in the national economy, higher productivity within agriculture remains the key factor in achieving rapid economic growth and higher incomes for the majority of the people who live in rural areas.

Seven commodities--maize, wheat, milk, coffee, tea, meat, and horticultural crops--are critical to Kenya's agricultural development strategy (Kenya, 1986). Coffee and tea, the traditional export crops, are important sources

of smallholder income. Maize, wheat, and milk production contribute to food security, while horticultural crops are multi-purpose, providing family nutrition, employment, income and foreign exchange earnings. Of the seven commodities, horticulture has increased the fastest over the last decade, averaging 20 percent per year. Horticultural exports have expanded ten-fold, thus making Kenya one of a very few countries in sub-Saharan Africa to emerge as a major participant in international horticultural trade. By 1991, Kenya was exporting almost 50,000 metric tons of fresh horticultural produce to various West European markets, which was valued at over 2 billion shillings (approximately US$ 71 million) (Horticultural Crops Development Authority, Annual Statistics). Nationally, horticulture has emerged as the fourth largest foreign exchange earner after tourism, coffee and tea. Given the continued adverse conditions in the international markets for tea and coffee, horticulture may become the major foreign exchange earner in Kenya.

Floriculture is Kenya's most dynamic horticultural export. Between 1990 and 1991, the volume of flower exports increased by more than 19 percent from 14,442 to 16,405 metric tons. By 1991, flower exports accounted for over half of the value of all fresh horticultural exports. The bulk of the flower exports are accounted for by foreign owned companies or firms owned and managed by Europeans who have secured Kenyan citizenship. However, several successful medium scale farmers have emerged and there is a growing number of smallholders engaged in flower production. While large firms with vertically

coordinated production-marketing programs play an important role in introducing technological and management innovations, it is essential to understand the role of smallholders in the horticultural industry and how their position can be enhanced. Because of the potential employment and income benefits of expanded smallholder production, the government is eager to find ways of promoting greater smallholder participation in the industry (MIAC/KARI, 1991).

French beans constitute the dominant non-flower export, accounting for one third of the total volume of nontraditional exports. In 1991, Kenya exported over 14,000 metric tons of beans valued at 0.5 billion shillings. Like flowers, beans have a large potential for on-farm job creation and for smallholder income generation, both consistent with Kenya's agricultural development policy.

Improving food security is a primary goal set for the agricultural sector. Since many rural households in Africa are net food buyers, it is important to analyze what can be done to increase smallholder flower cultivation and food buying power for net food buyers (Weber et al, 1988; Eicher, 1991).

1.2. Problem Statement

Kenya's favorable climatic conditions facilitate year-round production of high value products, such as flowers and beans. However, because flowers and beans are more fragile and perishable than coffee and tea, they require greater technical and managerial skills in production, handling, and marketing. Until

recently, research in the flower industry was carried out exclusively by the private sector. Public research and extension for flowers is young and deficient in both technology and technical assistance (Schapiro, and Wainaina, 1989; MIAC/KARI, 1991). The large firms obtain the technology and management skills through their foreign links. Small-scale farms without a foreign connection are excluded from this source of information and technology. Yet for smallholders to compete with large growers in international flower markets it is imperative that they have access to technology and information.

An efficient marketing system is required to guarantee both an outlet for the new products and prompt payment to farmers at competitive prices. The marketing system should also be efficient in the collection, storage, and distribution of commodities in order to reduce losses and preserve the quality of the products. High marketing costs and uncertain transaction channels can quickly erode the incentives of farmers to produce nontraditional export crops. As more small-scale growers produce flowers for export, new institutions and institutional arrangements may be needed to assist them to become more efficient suppliers in the global trade.[1]

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[1] North (1990), distinguishes between institutions and organizations. He defines institutions as formal and informal "rules of the game", and organizations as social, political, educational, and economic bodies such as churches, government's agencies, and firms. Like the rules of the game, organizations also shape the structure of human interactions and influence the economic performance of a system. in this study, institutions are used to refer to both rules of the game and organizations.

Kenya has developed a wide range of mechanisms and institutions for the marketing and distribution of agricultural produce. Many of these institutions existed prior to independence in 1963. The majority of these institutions are involved in the marketing of food crops, traditional cash crops, and livestock. The horticultural marketing institutions mainly market fresh and processed fruits and vegetable products. Moreover, the majority of horticultural institutions involved in export marketing, are components of large private firms.

Whereas the large-scale firms use their own export networks to coordinate the sale of flowers, smallholders must rely on other ways of selling their produce. Given their small scale of production and their geographic dispersion, the marketing arrangements between the smallholders and the market intermediaries can be inherently unreliable, especially where there is no binding contract between the two. In such situations, export agents have no obligation to collect all the produce from the farmers. The lack of a reliable market outlet can increase marketing costs for small growers and substantially reduce their returns to their investment in flower or bean cultivation.

The highly perishable nature of flowers demands tight coordination of production, harvesting, post-harvest handling and shipment. Coordination is also critical in ensuring that supply matches demand, in a timely way and in terms of product characteristics that consumers want (Harrison et al, 1974). Such tight coordination can be achieved by the large-scale firms, given their vertically

integrated networks. But individual small-scale growers may find it difficult to achieve the desired coordination of their production and marketing activities.

Studies of production and marketing of horticultural products reveal that vertical coordination arrangements such as contract farming, cooperatives, and vertical integration among others, can successfully overcome the constraints mentioned above. Nearly all vegetable used in the processing industries in the U.S. are produced under contracts (Kauffman and Shaffer, 1983). In Honduras and Guatemala, for example, forward marketing contracts and cooperatives were used to enhance the access of small-scale farms to technology, information, market outlets, and other specialized services in banana and nontraditional vegetable export production (Glover, 1983; Von Braun et al, 1989).

In Kenya, contract farming and cooperatives have been instrumental in facilitating smallholder production and marketing of highly perishable products such as beans for the processing industry and tea (Jaffee, 1987; Glover and Kusterer, 1990). Over 4000 small-scale farmers cultivate beans for both the fresh export market and the processing industry under various forms of marketing arrangements with exporters and processors. Over the last two years, there has been a dramatic increase in the number of farmers producing nontraditional exports. especially, flowers.

Jaffee (1991) describes the evolution of marketing institutions for the horticultural industry and uses transaction cost analysis to explain their emergence. He does not, however, examine how well the institutions coordinate

the production and sale of horticultural products and the farm level institutional arrangements for the smallholder flower subsector. Given the difficulty many small-scale growers have experienced over the past two years in flower marketing, an investigation of smallholder flower marketing is needed

Given the government's objective of promoting smallholder flowers for export, several critical questions arise. How effectively do the present organizational forms address smallholder production and marketing constraints? How effective are the various organizational models in the bean industry relative to those in the flower subsector? What types of organizational arrangements would both increase smallholder production and export?

This study utilized a subsector approach to determine the major production and marketing constraints facing smallholder flower and bean growers and assess the effectiveness of market coordination in the two subsectors. A diagnostic survey was carried out to identify the organizational structure at the grower and exporter levels in the smallholder flower subsector. The survey also identified the major sources of both technical and market information available to smallholders. Information from the survey was used to construct enterprise budgets for small, medium and large sized farms and farms producing under contract and other market coordination arrangements. A comparative assessment of production and marketing of beans and flowers was carried out to indicate how market coordination is achieved in the two industries. The results of the analysis were used to draw insights for expanding smallholder flower and bean production.

1.3. Research Questions

Three strategic research questions guide this study: a) What are the major constraints on smallholder flower and bean production? b) How do forward marketing contracts affect the performance of the bean industry and c) what needs to be done to increase smallholder flower and bean production?

1.4. Objectives

The general objective of this study is to analyze the economics of the production and marketing of flowers and beans in Kenya and suggest strategies for expanding smallholder production and exports in the 1990s.

The specific objectives are to

1) Describe the evolution of the Kenyan flower subsector, including the changes that have occurred in production, marketing and institutional innovations such as vertical integration and forward marketing contracts.

2) Carry out a diagnostic survey of the flower subsector, identify the market coordination mechanisms used in flower and bean production, and identify the major constraints facing growers.

3) Assess the relative profitability of smallholder flower and bean production.

4) Determine the impact of forward market contracts on the income earned by smallholder bean growers.

5) Compare the production-marketing arrangements and the performance of flower and bean growers.

6) Discuss the policy implications to guide the expansion of smallholder flower and bean production and exports in the 1990s.

1.5. Data Sources

The data for the descriptive profiles and empirical analysis were obtained from unpublished and published government statistics and records, publications from local and international institutions, discussions with government officers, and a field survey of growers and exporters in 1992. Secondary data, from publications and records provide the basis for much of the descriptive profiles of the two subsectors.

1.5.1. The field Survey

A diagnostic survey of the flower and the bean sectors was carried out from May to December 1992. The survey consist of two farm surveys and two

trade surveys. The farm surveys were used to conduct interviews with small-to-medium scale flower growers and small-to-medium scale bean growers, respectively. The trade surveys focused on flower and bean exporters. Information from the trade survey supplements the farm level data.

1.5.1.1. Survey of Flower Growers

Two districts, Kiambu and Nyandarua, were the focus of the flower survey. Kiambu district was selected because it has a concentration of both small and medium scale flower producers. Besides its proximity to the city of Nairobi (approximately 45 km) and the Nairobi international airport, Kiambu is also the origin of commercial flower production for export. Currently, many of the indigenous medium-scale producers are located in this area.

Kiambu district has a total land area of 2448 square kilometers, 78 % of which is high potential agricultural land[2]. It is the most densely populated area of the five districts in the Province, having an average population density of over 400 persons per square kilometer in 1989. Horticultural production is an important cash enterprise along with coffee and tea. Within horticulture, flower cultivation has become a highly rewarding enterprise for many small-scale farmers

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[2] Three categories of agricultural land are defined as follows.
High potential: annual rainfall of 857.5mm or more (over 980mm in coast province); Medium potential: annual rainfall of 735-857.5mm (735-980mm in Coast Province and 612.5-857.5mm in Eastern Province); Low potential: annual rainfall of 612.5 mm or less. Source: Central Bureau of Statistics, Statistical Abstract 1985)

who supply high quality flowers to the nearby Nairobi market and to various flower exporters. Today, many farmers in Kabete, Tigoni and Limuru divisions in the district have shifted from maize and beans to flower production.

Nyandarua district, situated approximately 160 Km northwest of Nairobi, was also selected as one of the study areas for flower production for several reason. First, starting in the mid-1980s smallholder flower production expanded rapidly because it was viewed as a promising alternative cash crop. Moreover, endowed with abundant rainfall and cool climate, the Kinangop division of Nyandarua district is one of the few places in Kenya where flowers for export can be grown profitably without investment in irrigation and shade houses. By the beginning of 1991, officials of the Kinangop Flower Growers Association (KFGA) reported that there were one hundred growers, most of whom were members of the association.

Second, Nyandarua was selected for the study because many growers have become disillusioned with flower production because of difficulties in marketing their crop. In 1991 for example, flower growers were featured in the national agricultural news because some of their crop was going to waste due to a lack of a market outlet.[3] As result, several community leaders and pioneer growers in the area, appealed to the Horticultural Crops Development Authority (HCDA), the

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[3] By the end of 1991, about 200 acres under flowers in the Nyandarua district, capable of producing up to 32 million stems of flowers per season, were left unharvested (Daily Nation, 1992a).

Kenya External Trade Authority (KETA) and the Ministry of Agriculture (MOA) to assist farmers in marketing their flowers.

Nyandarua is one of the five districts in Central Province. With a favorable climate and fertile soils, the district is one of the high potential agricultural areas in Kenya. Compared to other districts in the province, Nyandarua has a fairly low population density, which averages 102 persons per square kilometer. Horticulture is the most important agricultural cash enterprise in the district, followed by dairy. Commercial horticultural production is carried out in an area covering approximately two-thirds of the district and supports over 70 percent of Nyandarua's rural residents. In 1990 horticultural production accounted for over 50 percent of the net farm income (Dijkstra and Magori, 1991).

1.5.1.2. Sampling of Flower Growers

A basic problem encountered in selecting the sampling frame for the flower survey was the absence of a comprehensive list of flower growers. The available information was insufficient to select a representative sample of smallholders producing flowers for several reasons. First the HCDA list included some exporting firms who were also growers. Second, the available record of growers included primarily large and technologically-advanced and medium-scale growers who responded to HCDA's annual production mail survey. The

Kinangop Flower Growers Association (KFGA) prepared a list of small-scale growers in the Kinangop area who were members of the association. There was no record of small-scale growers in the Kiambu district or any other flower growing area in the country. Given the lack of a comprehensive record of smallholders, the survey did not rely on random sampling techniques. Target sampling procedure was used to locate flower growers in both Nyandarua and Kiambu district for the farmer interviews. For this reason, it is not known how many and what type of smallholders were excluded from the sample. Therefore, the results drawn from the data, especially on the Kiambu area may not be generalized without reservations.

A total of 37 flower growers were interviewed. Of these, 17 growers were from Kiambu district and the remaining 20 were located in Nyandarua district. Of the 17 growers from Kiambu, 10 were from the Limuru division and the remaining 7 from the Githunguri division. All growers sampled from Githunguri were members of a now defunct Githunguri/Gitiha Flower Growers Association (GGFGA). Flower cultivation in the Githunguri division started about three years ago.

All the 20 growers from Nyandarua were located in the South Kinangop division. Five growers were interviewed from each of four sub-locations: Karuanga, Sasimua dam ridge, Kinamba and Kiamweri. One of the respondents from Sasimua dam ridge was dropped from the analysis because of incomplete information.

1.5.1.3. Survey of Bean Growers

Because smallholder bean production is not carried out in the major small-scale flower growing area (Nyandarua, and Limuru division of Kiambu district), the bean survey was conducted in Kirinyaga district which is located approximately 170 kilometers north-east of Nairobi. Kirinyaga occupies a total area of 1437 square kilometers (approximately 355,945 acres), of which 72 percent can be used for agricultural purposes. In 1991, Kirinyaga had a population density of 313 persons per square kilometer. There were 81,950 farms, each with an average farm size of 3.15 acres. Approximately 43 percent of the district can be classified as high potential. Kirinyaga district is one of the major smallholder bean producing regions in the country. Irrigation is the main mode of production. During the 1991-92 export season, the district had 2,477 acres (1,000 ha.) under bean cultivation.

1.5.1.4. Sampling of Bean Growers

The Ministry of Agriculture did not have a comprehensive and up to date list of all the bean growers in the area because farmers frequently drop in and out of bean cultivation. They can switch between bean and other horticultural crops such as tomatoes even within the export season because of the short growing

period. In the absence of a list of bean growers, 60 farms were randomly selected from the Mwea division and, 34 who cultivated beans in the 1991-92 season were interviewed. However, information from four growers was not used in the analysis because three of these growers cultivated beans exclusively for the processing industry and the one had incomplete data.

1.5.1.5. Questionnaire Design

The questionnaires was designed largely for the purpose of carrying out a diagnostic survey of the smallholder flower and bean subsectors. Information was collected on grower characteristics, production technology, the kinds of flowers grown, the sources of technical and marketing information, and the nature of horizontal and vertical coordination mechanisms.[4] Public and private supporting institutions were also investigated. The questionnaires are attached in appendix A and B.

1.5.1.6. The Survey of Exporters

Two surveys of flower and bean exporters were carried out to collect additional information on the marketing arrangements at the grower-exporter

[4] Grower characteristics in both the flower and bean farm survey focused on education level and age of farmer, how many years the farmer has been producing flowers or beans, and off-farm income.

levels. To obtain the samples for flower and bean exporters, a list of all licensed exporters of fresh fruits, vegetables and flowers was compiled from the HCDA's list of all licensed horticultural exporters. However, because the industry is new, there was a general unwillingness among exporters to disclose information about their business. Only 12 of the 30 registered flower exporters for the 1991-92 export year, agreed to be interviewed.

From a list of 135 registered exporters of fresh and processed fruit and vegetables for the 1991-92 export year, only 21 bean exporters agreed to be interviewed. Also it was especially difficult to locate the small-scale and part-time exporters who did not have fixed business premises. The majority of the small and part-time exporters were found at the produce inspection unit at the Nairobi International Airport, where because of time pressure they were unwilling to answer questions. The questionnaires for flower and bean exporters are attached in Appendix C.

CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1. Agricultural Diversification

2.1.1. The Role of Nontraditional Exports in Agricultural Diversification

Over the past decades, policymakers, analysts, and development specialists have expressed a strong interest in agricultural diversification as a strategy to promote agricultural development. Agricultural diversification, incorporating new products and markets, offers a broad range of opportunities for reducing risks, increasing flexibility, employment, export earnings, and growth. As a development strategy, diversification does not advocate the abandonment of traditional crops. Rather, diversification is demand-driven, and it encourages countries to produce a broader array of products and find new markets for these products (Petit and Barghouti, 1992).

Diversification is influenced by numerous factors including the availability and accessibility of technology, information, and capital, and agricultural support systems. Also important is the adequacy and flexibility of basic infrastructural facilities such as irrigation systems and market opportunities. A review of diversification efforts across many developing countries indicates that major

constraints often include limited technologies for the new crops, poorly developed agricultural marketing systems to handle nontraditional crops and weak research and extension support systems (Timmer, 1992).

2.1.2. Agricultural Export Performance of sub-Saharan African Countries

Total export earnings of sub-Saharan Africa fell by 35 percent from 1980 to 1990.[5] Table 2.1. shows decline in Africa's exports relative to other developing countries.

Table 2.1. Comparative Export Earnings: Africa Versus Developing Countries, 1980-90.

Regions	1980	1982	1985	1988	1990
	(in billion U.S.dollars)				
Africa	49	32	33	33	40
Developing countries	568	499	482	634	793
	(in percent)				
Africa's exports as a share of Developing countries	8.5	6.4	6.9	4.8	5.0

Notes:
a: Excludes Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia, and the former USSR.

Source: IMF, 1992.

[5] Africa will be used to mean the 47 countries in sub-Saharan Africa.

Three main factors contribute to Africa's weak export performance. These include poor performance of the region's traditional non-fuel primary exports, limited success in developing major nontraditional exports and an inability to penetrate new export markets. Unlike other developing countries in Asia, African countries have continued to depend heavily on coffee, tea, cocoa, cotton, and tobacco as sources of export earnings (Svedberg, 1991). Unfortunately, the bulk of the primary commodities have experienced very slow demand growth, reflecting low income and price elasticities.[6] The world demand for coffee, which accounts for a quarter of all Africa's non-fuel exports, grew by only 1 percent in the 1970s and by only 2 percent in the 1980s. Similarly, the total consumption of cocoa in industrial countries, which comprises 70 percent of world demand, declined in the 1970s and grew by only 4 percent in the 1980s (Duncan, 1993).

Further, world market prices for Africa's commodity exports have declined since the late 1970s. Both cereal and beverage prices have been declining since the mid-1980s in both nominal and real terms (Duncan, 1992). Also, no significant long-term improvement in prices is expected because of the potential for a large increase in world supply from current stocks. For these reasons, Africa's best chance for export growth lies in its nontraditional exports such as flowers and off-season fruits and vegetables.

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[6] Income elasticities in major European and North American markets range from -0.2 to -0.4 and are expected to rise only marginally in the future.

Market studies in the 1980s indicate considerable untapped demand for flowers, off-season fruits and vegetables, tropical and sub-tropical fruits, in the region's traditional Western European markets, North America, and Japan. Given the rising living standards in Europe and North America, consumers in these countries tend to demand high quality fresh fruits and vegetables even during periods when these are not available from domestic production. This trend has opened doors for off-season suppliers. For example, FAO (1988), reports that off-season imports of green beans in the European Community increased by 40 percent between 1982-85. In Japan, the fifth largest importer of fruits and vegetables in the world, imports from developing countries currently stand at 39 percent of all Japanese horticultural imports (Honma, 1991).

Despite such exciting market opportunities, however, Africa has lagged behind other developing regions in nontraditional exports. Since the 1970s, only a few countries of the region have been successful in nontraditional export products. Fruit juice concentrate and light manufactures have surpassed sugar as the major export in Swaziland and Mauritius, respectively. In Kenya, where the most significant efforts to develop nontraditional exports have been made, the scale of the success falls far short of what is needed to counter both the effects of declining export revenues from coffee and tea. Market analyses indicate that the African, Caribbean, and Pacific states' (ACP) share of exports of fresh horticultural products to the EEC has declined in recent years. Only 10 percent of the fresh fruit and vegetable imported by the EEC in 1990 came from the ACP

states (Courier, 1992). The success of diversification for the ACP states and African countries in general will to a large extent depend on the ability of producers to penetrate existing export markets and become reliable suppliers of high quality competitively priced products (Stevens, 1990).

2.1.3. Experiences in Agricultural Diversification

Recent developments in South East Asia and Latin America, support the argument that demand-driven diversification can play a crucial role in promoting agricultural growth in developing countries. The ASEAN-4 countries--Indonesia, Thailand, Malaysia, and the Philippines--achieved remarkable growth in export earnings over a period characterized by adverse market conditions for primary commodities. For many years, the ASEAN-4 countries pursued a policy of food-self sufficiency based on rice production and a heavy emphasis on tree crops such as rubber and sugar cane for earning foreign exchange. But, from the late 1970s through the mid-1980s, large and mounting grain stocks and declining world market prices led policymakers to diversify their agricultural sectors. Diversifying agriculture meant developing a farming system that was more flexible and responsive to changes in market conditions. As a result, previously unknown or less important crops such as fruits and vegetables have gained significant shares of the agricultural export earnings in these countries.

Thailand's and Malaysia's success in diversifying agricultural exports illustrates the potential contribution of nontraditional commodities. In 1970, 85 percent of Thailand's agricultural exports came from four crops: rice, rubber, corn, and cassava. By 1985, the share of these crops had declined to 65 percent as producers had diversified into production of a wide variety of newer export products such as natural orchids, canned pineapples, canned fish and dried cuttlefish (Timmer, 1992). Until the early 1970s, Malaysian agriculture was entirely based on production of rubber, paddy rice, and coconuts, with palm oil and cocoa virtually unknown. As the decline in world market price for rubber and rubber exports continued into the 1970s, Malaysian producers substituted palm oil for rubber. This substitution resulted in high productivity, rising export earnings and per capita farm incomes, despite continued decline in the rubber export industry. Malaysia has now become the largest producer and exporter of palm oil and accounts for about 70 percent of the world supply (World Bank, 1988).

Guatemala, Costa Rica, Honduras, and Chile have made remarkable progress in promoting smallholder cultivation of nontraditional export crops. Guatemala presents one of the most successful cases where smallholders have made substantial progress in crop diversification. From the late 1970s, Guatemala's agriculture has continuously and significantly shifted from a predominance of food crops to an expansion of agro-industrial crops, especially export vegetables. The motivating factor for the shift was a growing concern to

alleviate poverty and improve living standards in rural areas, and to reduce instability in foreign exchange earnings due to price fluctuations for major crops such as coffee. As a result, the share of traditional agricultural exports dropped from 92 percent in 1975 to 76 percent in 1984 (Von Braun, et al., 1989).

At the farm level, export vegetable production proved to be more profitable to Guatemalan farmers than traditional crops. The gross margins per unit of land on snow peas, for example, were, on average 15 times higher than maize--the main traditional crop (Von Braun, et al., 1989). Returns per unit of family labor were twice as high as for maize and about 60 percent higher than for traditional vegetables produced for the local market during 1985. Production of the new crops also resulted in employment generation, directly on farms, and indirectly through forward and backward linkages and multiplier effects due to the increased income spent locally. In aggregate, introduction of export vegetable production resulted in a 21 percent increase in agricultural employment within the area.

Generally, the agrarian structure in many developing countries dictates that crop diversification be carried out by millions of smallholders. Given their limited resources, especially capital, smallholders are usually keenly aware of the risks they take in producing a nontraditional crop for which market demand is uncertain. Therefore, for smallholders to successfully diversify into nontraditional crops, access to a reliable market for the new products is a critical element of a diversification process.

In many developing countries, government support of marketing and infrastructure has historically concentrated on primary export commodities and food grains designed specifically to ensure domestic food-self-sufficiency. In Asia, for example, rice is the dominant food crop with a well established market network. In Africa, similar market networks are available for coffee, tea, cocoa, and tobacco. Well-organized marketing channels for nontraditional exports must be developed to encourage smallholders' to add nontraditional exports to their portfolio of production choices.

A fundamental principal of all diversification programs is that they are driven by market demand. The European importer of fruit, off-season vegetables, and flowers, for example, needs a regular supply of pre-determined quantities of consistently high quality produce at reasonable and stable prices. Consumers are becoming increasingly concerned about quality and the levels of pesticide residues. Extreme care is critical to avoid any contamination of the produce, even in transit, because the presence of an unfamiliar insect, even a dead one, in the package, for example, is likely to dismay the consumer and damage the reputation of the country of origin. Where production is carried out by many and dispersed smallholders, coordination of production and marketing activities is critical to ensuring quality.

Export markets have been lost for lack of an effective mechanism of transmitting quality-based price differentials all the way down the marketing

chain--from the exporter and processor to the growers.[7] For that reason, the producer must keep abreast of the quality standards dictated by the market in order to maintain credibility as reliable suppliers of high quality products. Information flow is a crucial part of the establishment of an efficient private marketing system, because it ensures that growers are constantly aware of movements in the market (Stiglitz, 1989; Klitgaard, 1991). Because markets for nontraditional products are usually thin, significant and sudden increases in supply are heavily discounted by traders. Strong coordination of production and marketing is therefore critical. An efficient marketing system ensures low average marketing costs. If marketing costs can be reduced, the average return to farmers can be increased.

Various institutional arrangements have been used to promote production and marketing of nontraditional exports. Vertical integration has been found most effective in coordinating the production and marketing of highly perishable nontraditional exports such as horticultural products. The advantage of a vertically integrated arrangement is that all the activities of production and marketing are carried out in one firm or very closely related firms which enhances coordination. In some countries, notably, Columbia, Guatemala, Israel, and to

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[7] Before the Israeli government and the country's orange growers together established an effective quality control system, each grower received the average price obtained by fruit of that size irrespective of the differences in quality between growers. To the growers, bad oranges were as profitable as good, and as a result, the quality of Israel's oranges in the export market declined and threatened the country's export market (Klitgaard, 1991).

some extent Kenya, this system has proved essential in achieving the high standards required in international export markets (Courier, 1992; International Floricultural Seminar, 1992). Other mechanisms such as contract farming and producer associations have been instrumental in developing smallholder production of nontraditional exports.

In Kenya, both vertical integration and contract farming have been used in the production of vegetables for the European market (Jaffee, 1990). Vertical integration has been the dominant coordination mechanism used in the large scale horticultural enterprises, where exporters and processors have integrated the production of fruits and vegetables into their operations.

In Asia, contract farming has been mutually profitable for farmers and processors in the pineapple industry in Thailand and the Philippines, and oil palm in Malaysia (Timmer, 1992). In Guatemala, vegetable production by small-scale growers is carried out in the context of various institutional arrangements, ranging from contract farming to cooperatives. A substantial part of the export vegetables is from members of the Cuatro Pinos Cooperative, which organizes the production, provides field-level extension, input supply, produce collection, selection and storage. Market stability in the Guatemalan vegetable industry is further enhanced by the existence of numerous market middlemen called Coyote, to whom growers can independently sell their produce (Von Braun, et al., 1989).

In Mauritius, an integrated system was established to coordinate the production and marketing of vegetables by many small-scale growers. However,

the growers could not, by themselves, establish the infrastructure necessary to achieve consistently high quality export produce. Therefore, individual growers, even those whose fruits and vegetables were destined for the local market, organized themselves into produce groups. Together they decide who will produce what, and in what quantities. The agricultural marketing board then organizes distribution of seed, offers a guaranteed market at a floor price, and provides cold storage facilities. Produce destined for the export market is moved in a completely cold chain from the exporters' cold rooms at the packing houses in temperature-controlled trucks to the cold storage facilities at the international airport (Spore, 1992a). In this way, fruits and vegetables from various small-scale growers reaches export markets in a fresh condition.

2.1.4. The Role of the Government in Diversification

Structural adjustment policies advocate less government, freer trade, and more private sector involvement. However, given the imperfections of both the market and the state in many developing countries, development analysists are realizing the need to go beyond the state versus market debate and determine why governments or markets are inefficient and seek the appropriate balance of public and private involvement in economic development (Klitgaard, 1991). For example, Klitgaard shows that a lack of information and institutional development are key factors to the poor performance of the markets in developing countries.

Given the nonexcludability and cost of information, the public sector has, in many cases, a major role to play in the generation and dissemination of information.

The review of agricultural diversification indicates that success is contingent upon an effective institutional support. The support services are needed to improve the responsiveness of the private sector--farmers and traders--to changing market conditions and technologies (Petit and barghouti, 1992). Thus, diversification requires the government to expand its scope of research, extension, marketing and credit to provide adequate assistance to both farmers and traders. For example, governments could encourage investment in the modernization of marketing facilities: they can improve agricultural marketing in general by investing in improved rural roads, communication systems, and storage. More specifically,

> " ..Market information services and access to international markets should be expanded. Governments should aim at improving the quality and availability of market information for export crops; radio broadcasts, for example, can provide market information on traditional and nontraditional commodities. ..[they] should fiance market research and information dissemination, especially for small-scale farmers, and also encourage the establishment of growers' organizations.." (Petit and Barghouti, 1992:10).

2.2. Conceptual Framework

2.2.1. Subsector Analysis

The subsector approach of marketing analysis differs from the standard industrial organization (I/O) framework in both scope and emphasis. The I/O

studies focus on one stage of the production-marketing process, such as wholesaling or retailing. They measure the degree of concentration and its relationship to indicators of conduct such as pricing policy, and industry performance in terms of efficiency, progressiveness, employment and profitability (Scherer, 1980). But, the I/O approach has several shortcomings. First, although the performance of any particular industry depends on the vertical linkages between firms at different levels in the production-marketing chain, standard I/O models do not address these interrelationships. Second, it does not address how firms handle uncertainty. Shaffer observes that, "...the pervading problem of coordinating economic activity, investing, and producing in one period to meet demand in the future periods, is generally external to the model" (Shaffer, 1980 (62):311).

In dealing with highly perishable commodities such as horticultural products, firms have great difficulty in coordinating the production and the sale of such commodities under conditions of uncertainty. The subsector approach integrates all the stages in the production-marketing channel, including input distribution, the relevant factors and systemic interaction that influence the subsector performance (Shaffer, 1973). A commodity subsector is conceptualized as a "vertical cut of the food system organized around the production and marketing of a commodity or group of commodities (e.g., grains, horticultural products)" (Holtzman, 1990:71). A key issue in subsector analysis is how are various activities such as production, assembly, transportation, etc., organized and

coordinated temporally and spatially (Harrison et al, 1974). A well-coordinated subsector also stimulates production and ensures a reliable supply which is necessary for maintaining access to international markets.

2.2.2. Marketing Coordination: Definition and How it is Achieved.

Marketing coordination refers to the matching of a commodity with the demand for it at every step of the vertical production-distribution sequence and at prices consistent with the opportunity cost of resources (Marion et al, 1986). By assuming perfect competition, economic theory tell us that when the supply of the commodity is matched with its demand at prices equal to the marginal cost of production, then resources are efficiently allocated. But in reality perfect competition does not exist because uncertainty is pervasive in many commodity subsectors. Also, the perishability of a commodity adds to the complexity of market coordination. Both vertical and horizontal coordination are critical to the overall process of coordination in a subsector. Prices perform only a part of the process of coordination. The matching of supply with the demand of a commodity depends heavily on the extent to which the two are controllable and on the decisions made by economic agents concerning supply or demand. Horizontal coordination at one or more stages in the subsector ensures the control over aggregate supply, whereas effective means of vertical coordination will minimize the effects of the dispersion of decision control.

Horizontal coordination is concerned with the control of economic functions at one stage in the production-distribution channel, such as at the primary production level. The aggregate supply control of a commodity depends more heavily on horizontal coordination than vertical. Well organized and managed farmer cooperatives furnish a good example of a mechanism for horizontal control.

2.2.3. Vertical Coordination Mechanisms

Marion et al (1986), define vertical coordination as alternative mechanisms for coordinating supply and demand, both spatially and temporally. It includes the set of institutions and arrangements that are used to harmonize the functions of adjacent stages of a commodity system. A given subsector may employ one or several coordination mechanisms. Vertical coordination mechanisms span a continuum ranging from the spot market where coordination relies on separate decisions by firms to integration where coordination is internalized by the firm. Other forms of coordination include the following: contracts, bargaining, cooperative integration, government marketing boards and marketing orders, market information, and formal and informal "rules of the game".

A. Contract Coordination.

Contract coordination between independent firms in the subsector covers a variety of arrangements involving commitments to deliver or receive commodities at a certain time, such as producer first handler contracts that are common in the food system. Marketing contracts can help small-scale growers capture some of the benefits of integration while retaining the advantages of separate entities (Kauffman and Shaffer, 1983). Well formulated and appropriately used contracts can reduce risks associated with availability of markets or supplies and those involving quality variation. The existence of a contract may also contribute to the stability of the subsector involved. However, contracts may restrict short-run access to market opportunities. In agriculture, contracts include forward market specification contracts, production management contracts, and resource-providing contracts.

Forward market contracts generally include the quantity, time and place for future delivery of a product, and often with a predetermined price. While the producers absorbs all the production risk, the major advantage of forward contracts over the spot market coordination is that the seller is assured of an outlet and the buyer of a supply. Moreover, if the price is negotiated before hand, the price risk may be reduced. For example, appropriately-applied forward market contracts between small-scale flower or bean growers and exporters would assure the growers of an outlet for their produce and a reliable supply for the exporters.

Under production management contracts, the contractor accepts part of the production risk. Resource-providing contracts are similar to vertical integration in that much of the production, price risk, and the coordination control is assumed by the buyer.

B. Vertical Integration

Under vertical integration, all the stages along the production-marketing channel are managed by a single firm. Williamson (1975) argues that, in a competitive market, the desire to minimize transaction costs provides the rationale behind vertical integration. Uncertainty is a major cause of transaction costs. In the highly perishable flower and bean export subsectors there is uncertainty over whether the growers will supply the desired type, quality, and quantity of the product and at the right time. On the other hand, growers who do not sell directly to the auction markets are concerned about whether buyers will be available exactly when needed. Under these conditions, vertical integration represents another approach to market coordination.

C. Cooperatives

Cooperative coordination in agriculture is common at the farm and first-handler levels. Bargaining in cooperative coordination is used to establish the

terms of trade where there is an unequal number of buyers and sellers. Coordination under bargaining cooperatives is similar in process to contracting. The common goals pursued in bargaining associations include higher and stable incomes for members, assured markets, higher and stable prices, and reliable market information (Marion et al., 1986).

2.2.4. Market Coordination in Horticultural Industries

There is a growing body of literature discussing the array of institutional arrangements that have been used to coordinate the production and marketing of agricultural products. Because of uncertainty, complexity, and perishability associated with most horticultural commodities, many of the studies have focused on the horticultural industry.

The most commonly cited example where perishability has played an important role in the evolution of organizational arrangements is the U.S.-Caribbean banana trade. According to Glover (1983), contract farming has played a crucial role in the industry since the nineteenth century, and in recent years, the "associate producers"[8] have contributed an increasing share of world exports. Once cut, bananas have to be delivered to port, loaded, transported (often great distances), and distributed promptly. To mitigate problems of

[8] "Associate producers" consist of either individual farmers or grower cooperatives who supply bananas under contract to the multinational exporting firms.

uncertainty about the availability of produce at a given port or of buyers for the product, forward contracts evolved between growers and the highly integrated multinational firms.

In Guatemala, Von Braun et al (1989) found that a substantial part of vegetable production for export came from small scale farmers who were members of a cooperative. The study team found that growth of vegetable exports by small scale farmers was facilitated by the institutional support and technical knowledge provided by cooperatives. A regression model found that probability of a subsistence farmer adopting vegetable production increased with farm size. They also found that exporting firms first negotiated contracts with medium-sized farms and, after a time lag, with small-scale farms. A major conclusion drawn from the study was that forward contracts played a crucial role in improving the coordination of both production and marketing activities. Reliable market outlets were found to be crucial in sustaining export crop production by subsistence farmers.

Most recent studies of Kenya's horticultural export industry have focused on its historical evolution and factors responsible for its rapid growth. In a study on fruits and vegetable exports from Kenya, Jaffee (1986) hypothesized that transaction costs will increase with the degree of uncertainty about demand at each level in the marketing chain, complexity, and lack of familiarity about foreign market conditions. In a follow-up study on bean exports, Jaffee (1987), found

high levels of smallholder participation in bean production when farmers had explicit contracts with exporters.

Jaffee (1990), traced the origins and structural characteristics of the existing array of institutional arrangements in horticulture and observed that new institutional forms evolved primarily to mitigate against uncertainty and asset specificity. Although Jaffee verified the dominance of vertically integrated large firms in flower exports, he found a growing number of small- to- medium scale farmers in export flower production. But it is unclear how these smallholders dealt with the pervasive problems of uncertainty and access to technology and to the highly oligopolistic export market.

This study extends Jaffee's analysis by using a diagnostic approach to determine whether the existing institutional arrangements address the production and marketing problems of flower and bean growers. Farm level enterprise budgets were constructed to estimate the returns to smallholders producing flowers and beans. The results were used to carry out a comparative assessment of the income earned by small, medium, and large-sized growers and between contract and non-contract growers.[9] A regression analysis was carried out to assess the impact of forward marketing contracts on smallholder production and marketing of beans.

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[9] The analysis between contract and non-contract growers will be carried out for the bean industry only because none of the smallholder flower growers interviewed produced flowers under contract.

2.2.5. The Regression Model

A stepwise regression equation was estimated to analyze the impact of forward marketing contracts on the performance of smallholders in the bean subsector where these arrangements exist. In a general form, the regression equation can be expressed as:

$$PRFV = \alpha + \beta_1 YSTG + \beta_2 FSZ + \beta_3 HED + \beta_4 CTR$$

Where,

PRFV = gross margin per acre

FSZ = proportion of bean area on the farm

HED = household head's education (years of schooling)

YSTG = Years bean growing beans

CTR = forward contract between grower and immediate buyer(=1, 0 otherwise)

The hypothesis to be tested is that forward marketing contract increases the income earned by smallholder bean growers and the estimated coefficient for forward market contract be positive and significant.

CHAPTER THREE

AN OVERVIEW OF THE FLOWER AND BEAN SUBSECTORS

3. Horticulture in Kenya

Kenya's climate and soils are ideally suited for the cultivation of temperate and tropical fruits, vegetables, and flowers. The common temperate fruits include strawberries, apples, and pears. Avocadoes, pineapples, mangoes, and passion fruit are the major fruits grown for export. Vegetables for export include French and bobby beans, and a variety of Asian vegetables: okra, chilies, and karela. Roses, carnations, alstroemeria, arabicum, tuberose and solidaster are important export flowers. Flowers and beans are the two largest fresh horticultural export products.

3.1. Public Sector Support

Although horticultural production for started in the 1950s, the government became actively engaged in the development of the industry in 1967, when the Horticultural Crops Development Authority (HCDA) was established by parliamentary legislation. The HCDA was given the authority to control and regulate the cultivation, picking, transportation, and marketing of horticultural

crops. All horticultural exporters were required to obtain export licenses from the HCDA and report the type and quantity of produce exported on an official form.

Besides the regulatory functions, the HCDA was given the authority to engage in direct marketing and export of certain products in order to generate funds for promoting the industry. For example, the Authority was the main distributor of onions in the country and it exported small quantities of pineapples, avocados and passion fruits. Through its production and technical services division, the HCDA has helped many smallholders produce and market crops such as macadamia nuts, avocadoes, vegetables and flowers. In the early 1970s, the HCDA established packing stations in different areas of the country to help smallholders assemble and market their produce. In 1975, the HCDA, in collaboration with the Ministry of Agriculture, FAO and a Danish flower-exporting firm (DCK), launched a project to help smallholders produce flowers for export. Although the project collapsed after a short period of time because of a lack of funds for marketing the flowers, this effort served as a learning experience for many growers who latter continued to produce flowers for both the local and export market.

The HCDA is also an important source of both technical and market information on horticultural products. In 1992, the technical services division of the HCDA had three technical staff at its headquarters in Nairobi who visit and advice flower growers on a regular basis. A few small- and medium-scale growers visit the HCDA and obtain some technical advice. The Authority has developed a

market information service in cooperation with the International Trade Center (ITC). The HCDA receives weekly market information on various fresh horticultural produce from European markets by telex. However, growers and exporters have to visit the HCDA's offices to gain access to this information.

Other government agencies such as the Ministry of Agriculture (MOA), and the Kenya Agricultural Research Institute (KARI) have promoted the development of the sub-sector[10]. The MOA also provides technical advice to farmers through the ministry's field staff, and inspects all fresh horticultural exports at the Nairobi international airport. Once the produce has been inspected and certified, the exporter is issued with phytosanitary certificates and documentation for the produce to gain entry into the EEC.

However, unlike traditional exports such as tea and coffee, horticultural crops have received only limited public research attention.[11] KARI's national horticultural research station at Thika, is the main public horticultural research center. Scientists at Thika are carrying out breeding research on vegetables, citrus, avocados and other important fruits. Researchers at Thika are also assessing the potential for new improved fruit tree varieties and new strawberry cultivars in order to meet expanding domestic and export demand. But public

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[10] The Kenya External Trade Authority (KETA), and the National Chamber of Commerce participate in trade fairs and other promotional activities for non traditional exports.

[11] Most of the limited research on horticultural crops was in cultivar evaluations, spacing, fertilizer, and management studies for the purpose of expanding the area under cultivation.

research programs in floriculture have not kept pace with the demands of a rapidly expanding subsector and dynamic industry. As a result, many of the successful growers rely on information from other countries or conduct their own trials on the new crops, fertilizers and chemicals. Small growers and the newcomers to the industry, look to the government for technical information. Public research on floriculture was initiated in 1981 when the government, in collaboration with FAO, launched flower cultivation trials at KARI's potato research station at Tigoni in Kiambu district. However, this work was terminated upon the expiration of the FAO project in the mid-1980s. In 1991, the project was jointly revived by both KARI and the FAO. Today there is one research specialist with a doctorate degree in plant breeding, a research assistant with a bachelor's degree in agriculture, and two technical assistants assigned to the work on flowers. The researchers also conduct farm trials in collaboration with small-to-medium-scale growers in the area. The flowers on trial at the research station include alstroemeria, ornithogalum, gladiolus, tuberose, arabicum, enthurium, dendrobium and carnations. KARI also does tissue culture and soil analyses at the National Agricultural Laboratories (NAL) for several large-scale growers. The faculty of Agriculture at the University of Nairobi also does tissue culture and field trials for a limited number of flowers.

Without question, the government has played a strategic role in creating an environment that has induced massive private sector investment in the horticultural industry. Rather than control or interfere with marketing as is often

the case with public institutions, the HCDA functioned more as a facilitator of the private sector. Two observers report that:

> "--it is what the government did not do--create a large bureaucratic structure and interfere to a significant extent with the market mechanism--that is the most impressive. Without this combination of government assistance and government restraint, it is highly unlikely that the expansion in horticultural exports would have been rapid or as large" (Schapiro and Wainaina, 1989).

However, despite this unusual public-private sector cooperation, the industry faces a number of problems including a shortage of air cargo space and escalating freight charges. As the main public institution responsible for the development of the industry, the HCDA is a member of the committee responsible for the allocation of cargo space when there is a severe shortage. The HCDA has been instrumental in the standardization of containers for sea freight. Shipping produce by sea is an attractive mode of transport, especially for the bulky and less perishable products such as mangoes, pineapples, and avocadoes.

3.2. Private Sector Activities

Despite broad government's support for the subsector, the production and export of horticultural products has, to a large extent, remained a private enterprise. Many private firms, both local and foreign, have invested heavily in the subsector. The private sector has been the main source of technology and information for many growers. However, it was not possible during the field work

in 1992 to gain access to information from the wide range of private firms engaged in the horticultural industry.[12]

Joint ventures, involving local and foreign entrepreneurs, were the main sources of the capital, technology, and managerial skills for the development of the flower subsector. Sulmac Co. Ltd., the oldest and largest flower grower and exporter in Kenya was established through a joint venture between a foreign firm and several high profile people in the country.[13] This relationship had the advantages of attracting financial resources, imported technology and skills, and the support and goodwill from the government. For example, Sulmac Co. Ltd. has at least 300 or more new varieties from Europe on trial at any one time. All the field managers, breeders, and quality controllers undergo training and mangers keep up-to-date through overseas travel. Sulmac's training program has trained most of the managers of the flower enterprises in the Lake Naivasha area.

Investments by multinational foreign firms and local exporters also contributed to the development of the fruit and vegetable export subsectors. For example, the growth of fresh pineapple exports from Kenya is closely connected to the establishment of the Kenya Canners Ltd., a subsidiary of the Del Monte group. The Kenya Horticultural Exporters (KHE Ltd.), one of the pioneer fresh

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[12] The limited information on the role of the private sector in the horticultural industry draws heavily on informal interviews with managers of Sulmac Ltd. about the development of its flower farm, the Kenya Horticultural Exporters (KHE) Ltd., and secondary information sources.

[13] The current shareholders of Sulmac Co. Ltd., are Unilever and local share holders (12 percent).

fruit and vegetable exporters helped train many smallholders how to grow high quality beans and Asian vegetables. For many years, fruits and vegetable exporters, the majority of whom were of Asian origin, were the main source of planting material and technical information for the Asian vegetables.

3.3. The Position of Flowers and Beans in Horticultural Exports

Both flower and bean production contribute substantially to national economic development through rural income and employment generation and foreign exchange earnings. Flowers and beans account for three-fourths of the value of horticultural exports in 1991. Table 3.1 shows the composition of fresh horticultural exports in 1990 and 1991.

Both flowers and beans are alternatives to the traditional smallholder cash crops--tea and coffee. Bean production is a major source of income for smallholders in the Machakos, Kiambu, and Kirinyaga districts (Ministry of Agriculture, 1992). Hormann (1981) reports that bean cultivation contributes about half of the average farm income of smallholders in both the Machakos and Kiambu areas.

Flower and bean production are labor intensive activities. For example, one of the large scale flower farms employs 3,500 people. Hormann found that half the bean growers employed between five and 20 seasonal workers.

Table 3.1: Kenya: Composition of Fresh Horticultural Exports: 1990 and 1991

Product	1990				1991			
	Volume		Value		Volume		Value	
	(MT)	(%)	(mil.Ksh)	(%)	(MT)	(%)	(mil.Ksh)	(%)
Flowers	14,423	29.4	865.36	51.6	16,405	32.9	1,033.52	51.3
French beans	16,329	33.2	424.57	25.3	14,855	29.8	516.95	25.7
Bobby beans	298	0.6	5.96	0.4	451	0.9	11.74	0.6
Avocadoes	3,311	6.7	49.66	3.0	4,193	8.4	62.90	3.1
Mangoes	2,612	5.3	65.31	3.9	1,745	3.5	56.37	2.8
Other Fruits	2,364	4.8	69.39	4.1	2,429	4.9	82.61	4.2
Chilies	2,119	4.3	46.63	2.8	2,905	5.8	83.08	4.1
Okra	1,842	3.8	42.37	2.5	1,688	3.4	43.90	2.2
Other Vegetables	5,849	11.9	109.22	6.5	5176	10.4	120.18	6.0
Total	49,147	100.0	1,678.48	100.0	49,848	100.0	2,011.24	100.0

Source: Horticultural Crops Development Authority, Export Statistics.

3.4. Major Horticultural Producing Areas

The production of horticultural commodities is spread throughout the country except in the arid northern region (see Figure 3.1). The cultivation tends to be concentrated in areas of high rainfall or where there is ample water for irrigation. Flowers, however, require access to a good road network and the international airport because of their perishability. Many of the fruits and vegetables destined for the local market are grown under rainfed conditions, whereas flowers and most vegetables for export, require supplemental irrigation.

The structure of horticultural production in Kenya is dualistic. Eighty percent of the production is by medium- and large-scale growers who produce mainly for the processing and export markets. The remaining 20 percent is produced by smallholders. Irrigation is used by medium- and large-scale growers in areas such as around lake Naivasha and along the Athi river and the Yatta Furrow. Many small-scale farms producing flowers, beans, and Asian vegetables use irrigation. Table 3.2 presents the geographic distribution of the major horticultural crops grown for export.

Approximately 250,000 hectares of fruits and vegetables are currently under cultivation (Dijkstra, and Magori, 1991). It is estimated that about 650 hectares were devoted to flowers and 10,000 hectares to bean production in 1990 (HCDA Statistics, Ministry of Agriculture, Annual Reports, 1991).

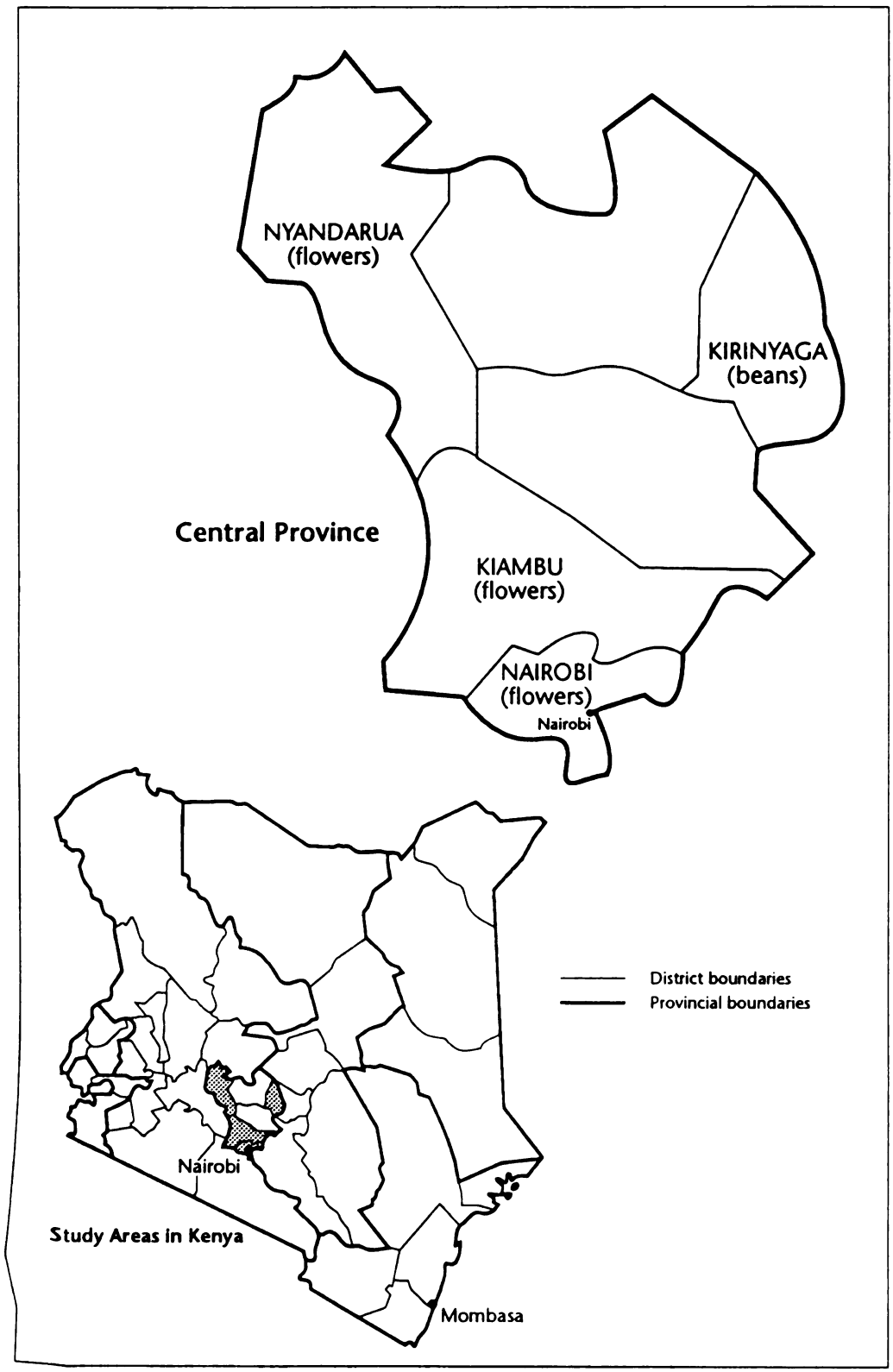

Figure 3.1. Kenya: Smallholder Flower and Bean Producing Areas

Table 3.2. Kenya: Production Location for the Major Horticultural Crops Grown for Export

Crops	Production Area	Rainfall (mm p.a.) or irrigation
Flowers	Lake Naivasha	400-600; Irrigated
	Nyandarua	1200-1800
	Kiambu, Nairobi	600-1000; Irrigated
	Embu	1200-2500; irrigated
	Nyeri	1000-2000; irrigated
French Beans	Lake Naivasha	400-600; irrigated
	Muranga	1000-2000; irrigated
	Embu, Meru	1200-2500 and irrigated
	Kirinyaga	400-800; irrigated
	Machakos	600-1000; irrigated
	Kiambu	1500-2000
Canned beans	Lake Naivasha	400-600; irrigated
	Kakamega	1100-2000
Asian Vegetables	Machakos	600-1000; irrigated
Other vegetables	Machakos	600-1000; irrigated
	Kiambu	1500-2000
	Baringo	400-600; irrigated
	Embu/Meru	1200-2500 and irrigated
	Nyeri	1000-2000; irrigated
Avocado	Trans Nzoia	900-1400 and irrigated
	Kiambu	1500-2000
	Machakos	600-1000; irrigated
Pineapple	Muranga	1000-2000; irrigated
	Thika/Kiambu	1500-2000
Passion Fruit	Machakos	600-1000; irrigated
	Kisii	1200-2100
	Kiambu	1500-2000
	Kakamega	1100-2000
Mango	Kilifi, Kwale	400-1400
	Kiambu	1500-2000

Source: Dijkstra and Magori, 1991.

The total output of flowers in 1990 was about 700 million stems. Table 3.3 shows the estimated acreage and productionof flowers from 1988 to 1990. Although the total flower area has averaged around 645 hectares per year, total production has more than doubled in the last three years. However, the actual flower area and production may be significantly larger since these estimates do not include smallholder production. Table 3.4. shows the total bean area, yield and

Table 3.3. Kenya: Area and Production of Flowers, 1988-90/[a]

Crop	1988		1989		1990	
	Area (ha)	Production (mil. stems)	Area (ha)	Production (mil. stems)	Area (ha)	Production (mil. stems)
Flowers	642	486	658	579	363	749

Notes: a/: An aggregate estimate of yield per ha would be misleading because yield markedly varies with the type of flower.

Source:1992 Farm Survey

Table 3.4. Kenya: Area, Yield and Production of Beans, 1988-89/[b]

Crop	1988			1989		
	Area (Ha)	Yield (metric tons/ha)	Production (metric tons)	Area (Ha)	Yield (metric tons/ha)	Production (metric tons)
Beans	6,530	3.5	22,853	9,330	4.5	41,984

Notes: b/: The 1990 estimated bean area was 10,000 hectares. However, yield and output data are not available.

Source: Ministry of Agriculture, Annual Reports

production. The area under bean cultivation increased by 7 percent from 9,330 in 1988 to 10,000 hectares in 1990.

3.4.1. Flower Producing Areas

There are five main commercial flower producing locations: Nairobi, Kibwezi, Naivasha and Nakuru area, and parts of the Coast Province. The Naivasha and Nakuru zone is the largest flower producing area in the country. It is located approximately 100 kilometers north-west of Nairobi and it contains many large scale flower firms. Naivasha has ideal conditions for the cultivation of spray carnation in the open.[14] Other flowers grown in this area include statices, solidaster, roses, delphiniums, gypsophilla and alstroemeria.

An area about 30 kilometers north of Nairobi is the second largest commercial flower producing region. Cultivation is concentrated in Kiambu district on a ridge of approximately 2000 to 2300 meters covering Tigoni, Limuru and Ngecha locations. Most of the smallholders supplying the Nairobi flower market, as well as a large number of small-to-medium-scale export growers are

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[14] The combination of altitude which is approximately 1800 meters, moderate temperatures, access to irrigation water from lake Naivasha, and the good road to Nairobi, make Naivasha an ideal area for flower production. Sulmac's 1782 hectare farm at Naivasha is reputed to be the world's largest producer of carnations in the open.

located on this ridge. It is ideal for the cultivation of a wide range of flowers such as alstroemeria, asters, solidaster, statices, carnations, gladiolus, arabicum, tuberose, and ornithagolum. A sample of the smallholder flower growers for the study came from this area.[15]

South Kinangop is the largest smallholder flower growing area in the country. It is located about 160 kilometers north-west of Nairobi and because of almost temperate climatic conditions, it is an ideal area for the cultivation of carnations and alstroemeria in the open. HCDA estimates that there are about 300 smallholders in South Kinangop with a total of approximately 100 acres under alstroemeria cultivation[16].

3.4.2. Type of Flowers.

Kenya produces a wide variety of flowers and ornamental plants ranging from highland flowers favoring cooler temperatures to those suited to lowland warmer climatic conditions. Statice, carnations, roses and alstroemeria are the most popular flowers grown for export. The first three are predominantly grown by large-scale farms. Table 3.5 presents a list of the most important flowers, their acreage and production for 1988 and 1990.

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[15] Kibwezi is the third most important flower growing area, specializing in chrysanthemum cuttings, and asparagus plumosis. Embu district grows similar flowers as those in the Kibwezi area. In 1990/91 Embu produced 143 million chrysanthemum cuttings from 8.7 hectares.

[16] A few large-scale exporters have established carnation farms in this region which in 1990/91 produced 20 million stems from approximately 50 hectares.

Table 3.5. Kenya: Type of Flowers: Location, Acreage, and Total Production, 1988 and 1990

Type of Flower	Main Location.	Area in 1988 (Ha)	Output in 1988 (Mill. stems)	Area in 1990 (Ha)	Output in 1990 (Mill. stems)
Statice	Kiambu, Naivasha.	197.0	120.00	100.5	89.00
Carnations[a/]	Naivasha, Athi River, Ruiru	145.0	200.00	182.0	395.00
Carnations[b/]	Kinangop, Limuru	50.0	25.00	53.0	27.00
Alstroemeria	Kiambu, Naivasha, Kinangop, Nyeri.	48.0	24.00	82.0	32.00
Roses	Naivasha, Nyeri, Thika, Kiambu.	25.0	20.00	27.0	29.00
Arabicum	Kiambu, Nyeri.	25.0	0.50	10.8	2.50
Solidaster	Naivasha, Kiambu	15.0	2.50	11.6	8.00
Ornithogalum	Kiambu, Molo, Naivasha.	15.0	15.00	15.0	9.00
Others[c/]	Kiambu, Naivasha Embu.	24.0	110.02	118.2	165.00
Total		549.0	430.02	605.9	760.03

Notes: The estimates based on HCDA's annual mail survey of growers.
a/:Spray carnations, has several blooms (more than 5) per stem.

b/:Standard carnations, one large bloom per stem.

c/:Others include:lilies, orchids, chrysanthemums, strelitzia, asters, gladiolus etc.

Source: HCDA Production and Technical Division.

The total area under flowers, especially alstroemeria has grown rapidly as small-, medium-, and large-scale growers have joined the industry. Alstroemeria was introduced in the early 1970s and is currently the most popular flower among smallholders mainly because it requires little capital to produce. The area under alstroemeria nearly doubled from 48 to 82 hectares and output increased from 24 to 32 million stems. The focus of this study is on alstroemeria production by small-scale growers.

Roses are the most common flower grown by medium-scale farmers with an average of one to two hectares of roses grown in green houses. The majority of the well-to-do African medium-scale flower growers cultivate roses.[17] Rose production has expanded rapidly, especially over the last five years when the total area under cultivation rose from about 16 hectares in 1987 to 27 in 1990. Smallholders generally do not cultivate roses for export because it costs approximately Ksh.4.5 million, (US$ 150,000) to establish one hectare. Over 70 percent of the cost, approximately U.S. $116,129) is for planting material.

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[17] Flower marketing specialists in a recent seminar in floriculture in Harare, Zimbabwe, contended that there is an oversupply of roses grown in Africa. For example, Zimbabwe has about 100 growers of between two to four hectares under rose cultivation. Alternatives recommended include "summer flowers"-statice perez, Ammi majus, and delphiniums-which are relatively newer and have not reached market saturation (International Floricultural Seminar, 1992).

3.4.3. Bean Producing Areas

Bean production for export is concentrated in Central and Eastern provinces, Nairobi, and around lake Naivasha. The major bean areas in Central province are located in Muranga, Kirinyaga, and Kiambu districts. Muranga and Kirinyaga districts are located approximately 150 kilometers to the north-west and 170 kilometers to the north-east of Nairobi, respectively. Both small-scale and large-scale production systems are common. The majority of the growers in Muranga tend to be large-scale, while growers in Kiambu are both large- and small-scale. By contrast, bean production in Kirinyaga district is predominantly carried out by small-scale growers who sell beans to exporters. Many smallholders use canals of the Mwea Rice Irrigation Scheme to irrigated their bean crop. In 1991, smallholders in the Kirinyaga district produced 3000 tones of beans on approximately 1000 hectares.

The area around lake Naivasha represents the largest cluster of large-scale bean production. Virtually all the beans from this area are produced under irrigation. While most of the beans are produced for the export market, a significant proportion also goes to the canning industry. Kakamega, located about 300 kilometers from Nairobi, produces beans for the canning industry.[18]

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[18] Other important bean growing areas include Machakos district in Eastern province, and the Nairobi area. Embu and Meru districts, located about 200 kilometers from Nairobi are emerging sources of high quality beans.

3.5. Evolution of the Flower Export Industry

Flower production for export began as early as the late 1940s when a retired British Army Officer started growing flowers for export on a small scale in Limuru, a few kilometers north of Nairobi. Soon thereafter, several European settlers began to send small shipments to Europe by air during the European winter months. MAC Ltd., one of the prominent flower exporting firms in Kenya, began exporting flowers in 1964 but export sales remained relatively small and fairly constant in volume until the early 1970s. Kenya's flower exports was sparked off by a large foreign investment in flower production in 1971 by the Dansk Chrysanthemum Kurtur Ltd. (DCK) from Denmark. The Kenya government agreed to provide a favorable investment climate for the foreign firm and the DCK subsequently established two large scale flower farms at Naivasha and Masongalemi, and a nursery/trial station at Updown in Limuru.[19] Within a period of five years, the company had over 50 hectares under carnation cultivation and employed about 3,000 people at the Naivasha farm. By 1975, the farm at Masongalemi had about 45 hectares under asparagus plumosis and 18 hectares of chrysanthemum. The Updown nursery remained an experimental station for the cultivation of carnations, alstroemeria and other flowers until 1975 when it

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[19] The DCK Ltd. secured a 25-year contract with the Kenyan government which exempted the company from effects of any changes in laws with regard to transfer of profits and taxation of foreign investments during that period. The DCK was also granted exclusive export production rights for eight years (Hormann, 1981).

became the nucleus for training smallholders in flower production. With the impetus of the DCK investment, other foreign investors started export flower production either singly or jointly with prominent Kenyans. By 1983, flowers accounted for 41 percent of the value of all fresh horticultural export (Table 3.6).

The flower subsector is still dominated by a few large firms with holdings ranging from 10 to 100 acres or more. DCK, the largest flower export producer, dominated flower production from the mid-1970s to the mid-1980s. In 1975, DCK exported 90 million carnations and 2.2 million bunches of asparagus plumosis from its 50 ha Naivasha farm and 45 ha Masongalemi farm, respectively. In 1978/79 the DCK ran into liquidity problems and was bought by Brooke Bond Kenya Ltd., a subsidiary of the multinational Unilever Plantation Group. Throughout the 1980s, Brooke Bond Ltd. expanded and diversified into other flowers in its production at the Naivasha farm currently known as Sulmac Co. Ltd.[20] By 1991, Sulmac Co. Ltd. was the oldest and the largest flower producer in Kenya and one of the largest worldwide with a turnover in excess of 20 million pound sterling. The other major growers (over 10 hectares) in order of size include Oserian Development Company and Shalimar at Naivasha, Tropiflora at Kiambu, Bobs Harries at Thika, and GK Brothers at Naivasha.[21] Cut flower

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[20] The company closed its Chrysanthemum and plumosis projects at Masongalemi in 1980/81 and 1984, respectively. In 1982, Sulmac Ltd. started standard carnation and alstroemeria production in South Kinangop. In 1990, rose and standard carnation cultivation was started at Kibubuti in the Kiambu district.

[21] There are seven growers who have over 10 hectares under flower cultivation. Three of the large growers have insulated trucks, and their own handling facilities

production on small holdings for export remained insignificant for many years. Most small-scale commercial firms produced for the local market supplying their flowers to street vendors and florists in urban centers such as Nairobi.

Table 3.6. Kenya: Flowers Exports by Volume and Value, 1981-91

YEAR	VOLUME OF EXPORTS (kg)	F.O.B.VALUE OF EXPORTS (current Ksh.)
1981	3,981,166	103,506,000
1982	4,319,162	112,294,000
1983	5,208,956	145,852,000
1984	6,960,460	174,025,000
1985	7,473,999	209,271,972
1986	8,264,912	247,947,366
1987	8,612,948	502,379,287
1988	10,946,051	634,870,958
1989	13,245,204	728,486,220
1990	14,430,691	865,360,000
1991	16,405,012	984,300,720

Source: Horticultural Crops Development Authority, Export Statistics (1981-1991)

In 1975, the FAO/HCDA/DCK launched a project in the Limuru-Njecha area to help smallholders grow cut flowers. Under this scheme, a group of 19 farmers were selected and taught how to grow high quality carnations for export.

(cold store, etc.,) at the Jomo Kenyatta International (JKI) Airport in Nairobi.

This project provided an excellent training ground for many of the future small-scale and medium-scale flower growers. By 1976, the scheme had over 400 smallholder out-growers in the Limuru area supplying carnations and statices to DCK. However, when DCK run into a liquidity crisis in 1978, the project collapsed and many of the out-growers shifted to producing flowers for the Nairobi market.

3.6. Evolution of the Bean Export Industry

Two main types of phaseolus vulgaris L are grown in Kenya: French and bobby beans. French beans are also known as filet beans, needle beans, and kidney beans (FAO, 1988). These are fine, tender, and usually seedless and turgescent. Bobby beans are stringless. French and bobby beans are very susceptible to bruising and withering and, hence, are highly perishable. As soon as they loose their freshness, the market value falls sharply. This explains why generally a large part of the crop is preserved through canning or freezing. The beans are grown extensively in all temperate zone countries during the summer months. But the major source of fresh beans in Europe during the winter is from nontemperate zone countries such as Kenya. Also, because of high wage rates in Europe, many major canning companies have re-located their operations to third world countries to take advantage of low labor costs.

The cultivation and export of beans began in the late 1950s when a small number of European and Asian entrepreneurs started to export both fresh and processed fruits and vegetables, mainly to the U.K. and some gulf countries. However, because of a shortage of both air-freight to Europe and a ready supply of high quality produce, the export trade remained fairly small through the 1960s. For example, in 1963 only 389 tons of beans were produced, and by 1970 the total production was about 800 tons. In fact, it was not until the mid-1970s that Kenya emerged as one of the leading suppliers high quality fresh beans to Europe.

Several factors contributed to the expansion of the industry during the mid seventies. First, rising incomes in Europe generated a demand for fresh beans. Second, the addition of wide-bodied aircraft on the Kenyan-European route stimulated the expansion of the industry. Finally, the bean production capacity in Kenya was enhanced by large capital investments by private firms. Joint ventures, involving local entrepreneurs especially those of Asian ethnicity, and foreign investors, were instrumental in raising the large capital investment and developing access to global markets. As a result of these interlocking activities, fresh bean production and export expanded in the late 1970s and throughout the 1980s. Today, beans are the most important non-flower fresh horticultural export. Foreign exchange earnings from bean exports jumped from 60 million shillings in 1981 to over 500 million shillings in 1991.[22]

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[22] Kenya has also exported canned French beans to Europe from local canning factories at Kabazi Canners, Corner Shop, and Njoro Canners. These firms use marketing contracts with out-growers who supply raw material for processing. Some

3.7. The Structure of Flower and Bean Marketing

Internationally, Kenya has succeeded in marketing itself as a producer of high quality products. The success is attributed to both the private nature of horticultural marketing and the government managed quality control measures that ensure that produce exported meets the international standards for packaging, quality, and grading.

3.7.1. Flower marketing

The local flower market absorbs a small proportion of the total crop produced in the country. The local flower market is concentrated in urban centers such Nairobi and luxury hotels. Various species of flowers purchased from small-scale growers and large-scale growers are sold by florists and street vendors in Nairobi.

In 1991 there were over 30 licensed flower exporters in the country. The majority export flowers exclusively from their farms. A small number of exporters trade in flowers procured solely from small-scale growers. The large growers usually make advance market contracts with overseas clients. For example, over 70 percent of the Sulmac's production is under contract. While this ensures

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local firms are involved in joint ventures with foreign firms to process and export beans.

stability, it also makes the company less flexible in taking advantage of changing market opportunities.

3.7.2. Bean Marketing

There are three market outlets for beans--the local fresh market, the canning industry, and the fresh export market. The fresh export market absorbs around 60 percent of the total production. In 1992, there were 135 fruit and vegetable exporters some of whom traded in fresh beans. Unlike flower exporters, only a few of the bean exporters are also growers. There are about eight large-scale bean exporters who are also growers.[23] There is also a growing number of small and part-time exporters who do not have fixed business premises. Part-time exporters buy beans from smallholders when they have an order for a shipment.[24]

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[23] Among the largest bean grower/exporters include KHE Ltd. located near Thika, Indu Farm, Vegpro in Naivasha, East African Growers, and East African Gardens. The first four have their own handling facilities including a cold store near the JKI Airport in Nairobi.

[24] Part-time exporters have minimum overhead costs. The beans are picked from the farms and transported in a small truck to the JKI Airport for shipment. When necessary, they use the Kenya Airways rental cold storage facility at the airport. Because they rarely have business premises, they communicate with clients using the telex services at the Kenya Posts and Telecommunication building in Nairobi.

3.8. The European Flower Market

Europe is the largest flower market in the world with a total import value of approximately US $ 1.7 billion in 1987. During the late 1980s, Europe's flower imports grew about 3 percent annually. Germany is the largest importer of flowers in the world and in 1987, it accounted for 47 percent of all the flower imports into Europe, followed by France and the U.K. with 12 and 10 percent, respectively.

Europe imports a large array of flowers from many counties. Carnations, statices, alstroemeria, and roses are the most important flowers in this market. Although the market is becoming more competitive, seven countries have remained the major suppliers over the years, accounting for about 94 percent of the market (World Bank, 1989). Netherlands and Israel are the largest suppliers, controlling almost 80 percent of the market. Table 3.7. shows the market shares of Europe's major flower suppliers. Kenya, the sixth largest supplier has increased the value of its exports to Europe from US$ 500,000 in 1977 to about US$ 30 million in 1987, and doubled its market share from 1 to 2 percent over the same period. The value of Kenya's flower exports to Europe was approximately US$ 37 million in 1991 (HCDA Export Statistics).

Table 3.7. Europe: Flower Imports from Major Suppliers

Supplier	1981	1982	1983	1984	1985	1986	1987
Netherlands	67	68	68	68	71	72	72
Israel	10	9	8	9	8	8	7
Italy	7	8	8	8	5	5	5
Spain	2	2	2	3	3	4	4
Columbia	5	4	4	4	4	3	3
Kenya	1	1	1	2	2	2	2
Thailand	2	2	2	2	2	1	1
Other	6	6	6	6	6	6	6
Total	100	100	100	100	100	100	100

Source: World Bank, 1989.

3.8.1. Flower Exports to European Markets

Europe is the largest export market for Kenyan flowers partly because of Kenya's proximity to Europe which has permitted rapid shipment of the highly perishable products. The major European markets for Kenyan flowers are the Netherlands,[25] followed by West Germany, the U.K., and Switzerland. Table 3.8. shows the volume and percent of the flower exports to these markets. Over half of all the flower exports go to the Netherlands followed by Germany with 28 percent.

[25] The Netherlands appeals to many suppliers because of its excellent facilities for receiving flowers from all over the world. The Netherlands re-exports most of the flowers it imports.

Table 3.8. Kenya: Flower Exports to Major European Markets: Volume and Percent of the Total exports, 1990 and 1991:

Country	1990		1991	
	(million Kg)	(percent)	(million Kg)	(percent)
Netherlands	8.59	59.00	9.46	58.00
Germany	3.99	28.00	4.68	28.00
U.K.	1.06	7.00	1.22	7.00
Switzerland	0.39	3.00	0.41	3.00
Other countries	0.40	3.00	0.62	4.00
Total	14.43	100.00	16.40	100.00

Source: Horticultural Crops Development Authority, Export Statistics.

Among developing countries, Kenya is the most important exporter of flowers to the Netherlands. As the third largest supplier of flowers to the Netherlands after Israel and Spain, Kenya commanded close to 10 percent of the Dutch flower market by the end of the 1980s.[26] In 1991, Kenya exported 280.7 million stems of flowers to the Netherlands.

Kenya controls approximately 2 percent of the flower import market in Germany where it is the 4th largest supplier after the Netherlands, Italy, and Israel. Roses, carnations, and chrysanthemums are the most popular Kenyan

[26] Important African suppliers include Zimbabwe, Ethiopia, and Morocco which supplied 7, 1.3, and o.4 percent, of the total imports, respectively in 1991.

flowers in this market. In recent years, Alstroemeria has grown in importance in Germany, exceeding roses.

3.8.2. The Geographic Destination of Bean Exports

Kenya exports fresh beans to more than 30 countries in the world (Schapiro and Wainaina, 1989; HCDA, Export Statistics). Western Europe is the major importer of Kenya's produce. Most of the beans shipped to Europe are targeted to the "off-season" months from October to June. The major suppliers of fresh beans to the EEC "off-season" market include Egypt, Kenya, Burkina Faso, Senegal, Cameroon, Mali, Niger, and Morocco among others. Volume-wise, Egypt is the most important supplier, exporting mainly bobby beans to Dutch market. Senegal is the most important West African exporter of beans to the EEC. Kenya ships beans throughout the year, mainly to the high class restaurant trade and specialty shops, especially in France and the U.K. The Canary Islands are also regular "off-season" suppliers to the Dutch and the U.K. markets.

Until the first half of the 1970s, Kenya exported beans primarily to the U.K. During the 1980s and the early 1990s, France increased in importance as an importer of Kenya's beans. Currently, France purchases over 45 percent of Kenya's fresh beans exports. In 1991, Kenya exported 6.7 thousand tons of beans to France and earned over 230 million shillings in foreign currency.

3.9. Summary

This chapter has demonstrated the vital importance of flowers and beans to national economic development and to small-scale growers in various parts of the country. Because of declining world prices for Kenya's traditional export crops such as tea and coffee, in the 1980s, many smallholders view flower cultivation as an alternative new income stream for their families.

Commercial bean production began in the 1950s but started to expand rapidly in the late 1960s through the 1980s. The initial seed and technology were provided by foreign investors seeking cheap labor in developing countries. Bean cultivation has spread to both small- and large-scale growers. Small-scale growers depend on exporters and processors to purchase their crop, whereas the large growers are often exporters themselves.

The flower export subsector was started in the early 1970s as a result of a joint venture between a Danish flower firm and the government. Since then several foreign and local private companies have invested heavily in terms of capital, infrastructure, and technology in the development of a highly successful industry. Because of the lack of adequate public technical and market information in floriculture, private firms have served as the main source of both the technology and the technical manpower for many years. However, the subsector is still dominated by a few large growers.

Although Kenya has emerged as the largest supplier of flowers from the third world, smallholder flower production has lagged behind smallholder tea and vegetable production. Virtually all the small-scale growers and some of the medium-scale growers depend on the government for both technical and market information. Yet the public floricultural research has not kept pace with the rapid developments in the industry. The large amount of capital used by the private firms, was to a large extent, drawn from foreign sources through vertical integrated arrangements.

CHAPTER FOUR

THE ECONOMICS OF FLOWER AND BEAN PRODUCTION

This chapter will analyze the economics of smallholder flower and bean production. The first part will discuss the economics of smallholder flower production followed by a similar analysis of smallholder bean production.

4.1. The Economics of Flower Production

This section is based on data collected from 36 growers in a field survey carried out between June and October 1992. Production and marketing information for the 1991-92 export season were collected from growers in the Kiambu and Nyandarua districts where flower cultivation by small-scale growers is concentrated.[27] On average, 25 percent of the land in each of the surveyed farms was dedicated to flower production in 1991. The major alternative commercial enterprises include dairying and potatoes in Nyandarua, and coffee and tea in Kiambu. Four types of flowers are included in the survey: Alstroemeria, arabicum, tuberose, and solidaster.

[27] Technologically advanced rose growers and the large-scale firms in the Nairobi and the Lake Naivasha areas are beyond the scope of this study.

4.1.1. The Structure of Production

Table 4.1 presents information on the structure of smallholder flower cultivation in the two districts surveyed. The growers are classified into--small, medium, and large--on the basis of the total area of flower cultivation.[28] Because of the variation among growers, this classification will be useful in the diagnosis and discussion of production and marketing constraints. The small farms have less than one acre under flowers, the medium cultivate between one and seven acres, and the large have eight to twenty acres. Because flower area is a limited indicator of farm size and capitalization on the farm, Table 4.1 also shows the average farm size for each of the three grower categories. In general, it is assumed that large farms would have more resources and enterprises than small. The results in Table 4.1, however, show that the farms with a large flower area also have significantly bigger farms than the other two categories of farms. The large growers are generally more technologically advanced than small and medium growers. These differences have implications for the nature and severity of the production and marketing constraints facing growers.

[28] Experts consider a large-scale grower as one who can supply a pallet (approximately 2000 kg.) of one type of plant. For example, a farmer with about 15 hectares of roses would be considered as a large grower (de Kerpel, 1992).

Table 4.1. Kenya: The Structure of Flower Growers; 1991.

Size of grower	Number of growers	Farm Size		Area Under Flowers		
		(acres)	(cv)[a]	(acres)	(percent of farm size)	(cv)[a]
Small	19	9.09	1.57	0.54	6.00	0.85
Medium	12	10.65	0.87	2.24	21.03	0.85
Large	5	16.24	0.87	11.65	71.80	0.55
All	36	10.61	1.23	2.60	25.00	1.06

Notes: a: cv refers to the coefficient of variation.

Source: 1992 Farm Survey.

Table 4.2. Kenya: Structure of Smallholder Flower Production, 1991-92 Season

District	Size category (acres)[a]	Number of Farms	Percent of all growers	Percent of growers in district	Mean flower area (acres)	Percent of farms growing alstroemeria	Percent of farms using irrigation
KIAMBU	<1.0	9	25	52	0.44	22	8
	1-7	4	11	24	2.31	11	3
	8-20	4	11	24	12.50	11	11
Sub-total		17	47	100	3.67	44	22
NYANDARUA	<1.0	10	28	53	0.63	28	0
	1-7	8	22	42	2.13	22	5
	8-20	1	3	5	8.00	3	3
Sub-total		19	53	100	1.67	53	8
TOTAL		36	100	100	2.60	97	30

Notes:
a: The farms were classified into three categories according to the size of the area on flower cultivation: small, medium, and large. Three of the four farms in Kiambu which have eight to 20 acres under flower cultivation grow flowers on the entire farm.

Source: 1992 Farm Survey

The average flower area of farms in the two districts is 2.6 acres (Table 4.2.) However, 54 percent of the farms are small, with an average of 0.54 acres under flower cultivation. About 30 percent of the farms interviewed are medium size, with an average flower area of 2.2 acres, whereas only 14 percent were large farms growing eight to 20 acres of flowers. The latter had an average of 70 percent of their farm under flower cultivation. The survey also revealed that the average area under flower cultivation in 1991 in Kiambu was 3.67 and 2.67 acres in Nyandarua.

Table 4.3. presents typologies of three sizes of flower growers. The average small growers had 9 acres of land but only 6 percent under flower cultivation. The average farm size for medium and large growers was about 10 and 16 acres, respectively. However, large growers devoted most of their land to flower cultivation (70 percent), while the medium grew flowers on 21 percent of the farm. The results indicate that both small and medium growers are not constrained by land but decide to devote only a small fraction of their farm on flower cultivation.

A good education is vital in flower production for export not only for development technical and managerial skills but also financial management of the business and in communication. Flower growers also vary significantly by their level of education. Sixty percent of the large growers have secondary school education compared to 33 and 15 percent for the medium and small growers.

Table 4.3.Kenya: Typologies of Flower Growers: Farm Size, Percent of Farm Under Flowers, Education Level, and Years Growing Flowers

Type of Growers	Number of growers	Farm size (acres)	Flower area (percent of farm)	Education Level (percent of growers achieved)			Experience (percent of growers who have been growing flowers)		
				Primary	Secondary	beyond secondary	< 5 years	5-9 years	> 10 years
Small	19	9.1	6.0	78.9	15.8	5.3	73.7	10.5	15.8
Medium	12	10.6	21.0	50.0	33.3	16.7	75.0	16.7	8.3
Large	5	16.3	71.0	20.0	60.0	20.0	60.0	20.0	20.0
All	36	10.6	25.0	61.0	27.8	11.1	72.2	13.9	13.9

Source: 1992 Farm Survey

A majority of the flower growers started flower production only recently and have yet to build up experience in the industry. Seventy percent of the smallholder began to grow flowers less than five years ago. A comparison among the three category of growers reveals that 60 percent of the large growers, 75 percent of the medium and 73 percent of the small growers have grown flowers for less than five years.

Table 4.4. shows the distribution of the most important flowers and the mean acreage of flowers on the surveyed farms during the 1992 survey.[29] None of the surveyed farms in Nyandarua grew molucella, tuberose, ornithogalum, and solidaster in 1991. Production and marketing data were collected during the 1991/92 season for alstroemeria, arabicum, tuberose, and solidaster and for the gross margin analysis. Approximately 97 percent of all smallholders surveyed cultivate alstroemeria, with a mean of 1.6 acres.

The results in Table's 4.2. and 4.4. together indicate that most growers in Nyandarua specialize in alstroemeria and grow a few carnations for the local market.[30]

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[29] Capital intensive growers around Nairobi and Lake Naivasha specialize in roses. Approximately Ksh.4.5 million (U.S.$ 150,000 in 1992) is required to establish one hectare of roses.(Source: Ministry of Agriculture, Horticulture Division, personal communication).

[30] One of the flower exporters has supplied a few growers in the area with ammi majus seed. Three of the surveyed growers cultivated small plots of molucella in 1992. If these growers succeed and other growers adopt ammi majus, it is reasonable to expect more diversity in flowers produced by Nyandarua smallholder in the future.

Table 4.4 Kenya: Distribution of the Types of Flowers Grown by Smallholders, 1991-92 Season

Type of flower	Number of farms	Percent of surveyed farms	Mean area (acres)	Percent of farms in Kiambu	Percent of farms in Nyandarua	Total surveyed farms (percent)
Alstroemeria	35	97	1.60	46	54	100
Arabicum	16	44	0.53	75	25	100
Carnation[a/]	14	39	0.11	7	93	100
Molucella	10	28	0.63	70	30	100
Tuberose	5	14	0.97	100	0	100
Ornithogalum	5	14	1.67	100	0	100
Solidaster[b/]	3	8	1.53	100	0	100

Notes:

n = 36 growers

a/ Carnations are produced by smallholder for the local market.

b/: Solidaster and asters require artificial light. Large growers in Kiambu cultivate these flowers.

Source: 1992 Farm Survey

Ample rainfall and cool temperatures allow Nyandarua growers to cultivate alstroemeria without the capital investment needed for irrigation or shade houses. Also, many smallholder specialize in alstroemeria because planting materials, especially for the older varieties, are available from local growers. The planting material for new varieties is both imported and costly. Few growers have access to imported plating material.[31] The limited product mix of small growers in general and those in Nyandarua in particular undermines their marketing efforts. Chapter five addresses the problems that growers face in finding new niches locally and in global markets for flowers.

Arabicum is the second most widely cultivated flower. About 44 percent of the growers cultivate arabicum, with an average of 0.53 acres. Seventy-five percent of the surveyed growers who cultivate arabicum are found in the Kiambu area. Only 25 percent of growers in Nyandarua cultivate arabicum.

Only growers in the Kiambu area cultivate tuberose. Most Nyandarua growers considered the area too cold for the cultivation of tuberose. Unlike those in Nyandarua, Kiambu growers cultivate a wider variety of flowers, a factor that attracts exporters to the area.

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[31] Large growers have organized themselves into positions where they have access to both credit and foreign exchange to import planting materials. Small growers are generally unwilling to apply for credit because of fear of loosing their land--the usual acceptable form of collateral for agricultural credit.

4.1.2. Varieties of Alstroemeria

This study distinguishes new from old varieties of alstroemeria because the average sale price is substantially higher for the new varieties.[32] However, older varieties have been in Kenya for one to two decades and growers generally find it easer to get planting materials for them, usually from neighbors.[33] Most planting material for new varieties is imported and costly. Table 4.5 presents survey data on both old and new varieties. Marina is the most widely planted alstroemeria variety. In Kiambu and Nyandarua, 97 percent of the surveyed growers cultivate marina, with an average of 0.88 acres.

About half of the sample growers are cultivating the new alstroemeria varieties. The mean acreage of new varieties in the study area was about 0.84 acres. However, the area grown by large growers is significantly higher, averaging 2.38 acres. Moreover, all large growers (about 14 percent of the sample) cultivate new varieties. The concentration of new varieties on the larger farms has significant implications for the profitability among growers because new varieties

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[32] In the Nyandarua district, the 1991 average farm gate price (nominal) per stem of a new variety of alstroemeria such as Yellow King was Ksh.2.50, and Ksh.1.5. for Yellow Queen. For an old variety such as Marina, the price was Ksh.1.06.

[33] Marina and Pink Perfection, the most common old varieties, were introduced in the mid-1970s. Most new varieties such as Yellow Queen and Yellow King were introduced in the 1980s. A few smallholder started to grow new varieties such as Apollo, Sangria, and Serena, in the 1990s.

Table 4.5: Kenya: Alstroemeria Varieties by Area of Flowers, 1991.

	Farms with < 1.0 acres of flowers		Farms with 1-7 acres of flowers		Farms with 8-20 acres of flowers		All Sample Growers	
Variety	Area (acres)	Percent growers	Area (acres)	Percent growers	Area (acres)	Percent growers	Area (acres)	Percent growers
Old Varieties	0.50	53.0	1.37	33.0	2.64	13.9	1.10	100.0
Marina[a/]	0.40	50.0	1.01	33.0	2.3	13.9	0.88	97.0
New Varieties	0.27	13.9	0.24	22.0	2.38	13.9	0.84	50.0
Yellow Queen/King[b/]	0.11	8.0	0.27	17.0	1.08	13.9	0.53	39.0

Notes:
a/: Marina is the most common old variety.
b/: Yellow Queen and Yellow King are common new varieties.

Source: 1992 Farm Survey.

yield higher prices than old. The acreage planted to new varieties on flower holdings of less than one acre was 0.27 acres. Yellow Queen and Yellow King are the most common new varieties. Their combined average area on the sample farms was 0.53 acres. The three small growers cultivating these two varieties constitute only eight percent of the sample.

In summary, the data from Table 4.5 reveal that Marina, the old variety of alstroemeria, is the most widely planted flower by small growers in Kenya. Most small and medium growers cultivated marina because they lack the capital necessary to grow the new varieties and the institutional linkages that can ensure access to seeds of the new flower types. Since most exporters prefer to buy more than one type of flower for their shipments, they tend to favor the Kiambu area. Therefore, the excessive dependence of the Nyandarua growers on the Marina type of alstroemeria constitutes an important marketing problem for smallholder in the area.

4.1.3. Sources of Planting Materials

Planting materials usually consist of seeds, root and stem cuttings, young plants, or splits.[34] Large-scale growers and exporters obtain their propagation materials from Europe, usually from the Netherlands. Imported propagation

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[34] Throughout the report, the term "seed" refers to any form of planting material (seeds, roots or rhizomes, young seedlings, or plant splits) unless otherwise stated.

material is often costly because of royalties, freight, and insurance. Royalties must be paid by Kenyan growers on all flower seed for at least three years after purchase. If royalties are not paid, the grower cannot sell flowers at the Dutch auctions--a major outlet for Kenyan flowers. Since Dutch growers also control the flower auctions, they can restrict seed multiplication and area under flowers. Many smallholder, therefore, depend on local sources of seed.

Table 4.6. shows the main sources of seed reported by growers. The most common alternative sources of seed include pioneer growers, supplies retained from a previous crop, and exporters. The survey revealed that fifty-six percent of all growers obtained their seed from other growers in the area. Many purchased seed from pioneer growers in the area. The practice of buying seed from other growers is common among growers of alstroemeria, arabicum, tuberose, and ornithogalum because seed can be easily multiplied on local farms.

About one third of the farmers used seed retained from a previous crop. These have grown flowers for a long period and obtained the initial seed either through import or from pioneer growers. Only 8 percent of the growers imported their seed. The practice whereby exporters supply growers with seed is uncommon.

Table 4.6. Sources of Planting Material

Source of seed	Number of growers in sample	Percent of sample growers
Pioneer grower	20	56
Retained seed	12	33
Imported	3	8
An Exporter[a]	1	3
Total	36	100

Notes:
a: Mac Ltd., a flower exporter sometimes sells seed to smallholder.

Source: 1992 Farm Survey

4.1.4. The Returns to Flower Production

In this section, enterprise budgets are used to evaluate the economics of smallholder flower production. Enterprise budgets are constructed for each of the three size categories of smallholder. Since there is a marked variation in returns to different flower types and old and new varieties of alstroemeria, separate budgets prepared for each of these categories. Since marina is the most widely grown old variety of alstroemeria, it has been selected to represent the old varieties. Because of the small number of sample farms the results cannot be generalized.

The components of enterprise budgets analyzed in this section include a) output, b) production costs, both operating and fixed costs attributable to

equipment and specialized structures used in flower production, c) potential gross and net margins, and d) the realized gross and net margins. Output is defined as the total number of saleable flower stems harvested during the 1991/92 export season[35].

Harvesting coincides with the export season, which begins in early October and ends in March. During this period, flowers are harvested two or three times a week, depending on the demand from exporters. Because they lack cold storage facilities, most smallholder harvest on the day that exporters are expected.[36] The flowers are then sorted into the three recognized grades--white, blue, and yellow--representing 80, 70, and 60 cm of stem length, before they are sold to exporters. The longer the stem length, the higher the grade. Because of a concern to supply high quality flowers to the export market, several exporters regrade flowers that they purchase from smallholder. Flowers which have either crooked stems, or fully opened or immature flowers are unacceptable[37]. Payment is generally made after two weeks. A few exporters remunerate growers on the spot.

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[35] The study has adopted KARI's procedure which assumes that 80 percent of all the harvested flowers are saleable.

[36] Beginning 1991, members of the Kinangop Flower Growers Association (KFGA) in Nyandarua can store their flowers overnight at a cold store constructed with the help of MAC Ltd., one of the flower exporters. Growers in Kiambu currently can rent cold storage space at the Agricultural Development Corporation (ADC) Updown Farm at a rate of 40 cents per kilogram per night.

[37] The desired stage to harvest a flower is called the cut stage. It is defined as the minimum stage of development at which if cut, the flower will be able to survive the physiological shock of harvesting, but be sufficiently mature to open fully once it is in the vase (Ford, 1992).

However, many of the smallholder complained of nonpayment for flowers by some of the exporters. In 1991, many growers, especially those from Nyandarua, incurred substantial losses in revenue due to this problem.

The production costs per acre include both operating and fixed costs involved in growing, harvesting, and preparing flowers for the stage of initial sale. The components of operating costs vary depending on the type of flower. Solidaster and asters require artificial lighting, whereas alstroemeria, ornithogalum, arabicum, and tuberose normally do not. The fixed costs represent annual depreciation of equipment, including irrigation facilities and structures used in flower production.

This study distinguishes potential from realized gross and net margins for two reasons. First, a substantial portion of flowers produced by the relatively smaller growers are often unharvested or unsold. Second, in some cases, unscrupulous exporters do not remunerate growers for their flowers. The realized revenue, from which realized gross and net margins are derived, is the value of the output which the grower sold and received payment. Potential revenue is the value of output. The prices used are weighted average sales prices for the 1991/92 season.

4.1.4.1. Returns to Marina Production

Table 4.7. presents enterprise budgets for Marina for the three farm categories defined in the previous section. The budgets show that the output per acre increases with the size of flower area. The growers with the smallest flower area have an output of 122,035 stems per acre, whereas the largest growers produce almost double that, 225,000 stems. The large growers also produce 85 percent grade one and 15 percent grade two flowers. The small and medium growers tend to produce all three grades.

A comparison of small and medium growers yields some surprising results. The small farms produce a higher percentage of both grade one and two flowers. Seventy-eight percent of the yield from small farms is grade one as compared with 58 percent of medium scale farms. Grade two flowers constitute 18 and 12 percent of the yield from small and medium farms, respectively.

Table 4.7. Kenya: Enterprise Budgets for Marina variety of Alstroemeria, 1991/92.

Item	Small Growers	Medium Growers	Large Growers
Number of farms	19	11	5
Farm Size (acres)	6.00	8.00	8.00
Flower Area (acres)	0.38	1.50	8.00
Area with marina (acres)	0.38	1.50	5.00
Output (number of stems)			
Grade 1	95,850	78,648	191,250
Grade 2	21,820	16,272	33,750
Grade 3	4,365	40,580	0
Yield (stems /acre)	122,035	135,600	225,000
Average prices (Sh/stem)			
Grade 1	0.95	1.00	2.50[c/]
Grade 2	0.75	0.80	2.00[c/]
Grade 3	0.60	0.60	1.50[c/]
Potential revenue (Sh/acre)	110,641	116,072	545,625
Realized revenue (Sh/acre)	33,690	37,944	545,625
Total Operating costs (Sh/acre)[a/]	14,102	12,146	202,906
Total Fixed costs[b/]	1,077	2,630	257,291
Potential Gross Margin (sh/acre)	96,539	103,926	342,719
Realized Gross Margin (Sh/acre)	19,588	25,798	342,719
Potential Net Margin (Sh/acre)	95,462	101,296	85,428
Realized Net Margin (Sh/acre)	18,260	23,168	85,428
Opportunity cost of capital[d/]	1,427	1,389	43,258
Net Income/acre	16,833	21,779	42,170

Notes: a/:Table 4.7a gives a detailed breakdown of the operating costs.

b/:Table 4.7b shows the breakdown of the fixed costs.

c/:These extremely high prices are obtained for flowers exported directly. They represent the minimum export prices reported to the Central Bank for foreign exchange remittance. Auction market prices in Amsterdam for 1991/92 were between 3.60 and 6.80 shillings per stem.

d/: Estimated return on invested capital (operating plus fixed cost) using the 9.4 percent real interest rate charged by commercial banks on loans in 1991 (Kenya Republic of, 1992).

Source: 1992 Farm Survey.

Table 4.7a: Operating Costs.

Operating Costs (Sh/acre)	Size of Grower		
	Small	Medium	Large
Preparation/planting	4,60	680	1,250
Weeding	2,620	4,480	3,125
Fertilizer/manure	4,08	628	6,250
Chemicals	770	113	3,125
Irrigation	150	400	15,125
Harvesting	1,398	5,760	9,375
Pre-treatment chemical	0	32	6,250
Packaging:			
Cartons	0	0	54,000
Rubber bands	0	52	4,800
Sleeves	0	0	57,600
Pre-cooling	0	0	1,500
Local Transport	480	0	1,800
Communication (Fax)	0	0	3,125
Air freight	0	0	35,581
TOTAL	14,102	12,146	202,906

Source: 1992 Farm Survey

Table 4.7b: Fixed Costs.

Fixed cost (shillings)	Size of Grower		
	Small	Medium	Large
Planting Material	540	460	17,000
Irrigation system	0	2,000	129,600
Coldstore	0	0	22,500
Grading Shed	57	64	6,429
Net House	0	0	7,000
Support Structures	0	0	32,000
Water Tank	0	0	6,500
Truck	401	0	32,143
Bicycle	49	0	0
Sprayers	29	106	800
Wheelbarrow	0	0	320
Consultancy Fee	0	0	3,000
TOTAL	1,077	2,630	257,291

Source: 1992 Farm Survey

Table 4.7c. Notes on Fixed Costs: Straight-line depreciation schedule for equipment and structures that are used in flower (Marina) production for the three farm categories:

Item	1991 Price (Ksh.)	Approx. Working Life (Yrs)	Salvage Value (Ksh.)	Annual Depreciation (Ksh.)	Annual Depr.[a/] (Ksh.)
	(1)	(2)	(3)	(4)	(5)
Seed (local)	8,700	5	2,500	1,240	_
Seed (imported)	95,000	5	10,000	17,000	_
Irrigation Pump	900,000	7	200,000	100,000	_
Irrig. Pipes	150,000	5	20,000	26,000	_
Accessories	20,000	5	2,000	3,600	_
Hosepipe/pail	2,500	3	500	667	-
Cold store	300,000	10	75,000	22,500	_
Grade Shade (own)	50,000	7	5,000	6,428	_
Grade Shade (group)	425	7	_	61	-
Net House	45,000	5	10,000	7,000	-
Supports	200,000	5	40,000	32,000	_
Water Tank	75,000	10	10,000	6,500	_
Truck (used)	90,000	7	45,000	6,428	402
Truck (new)	300,000	7	75,000	32,143	_
Bicycle	6,000	7	500	786	24
Sprayers	2,000	3	100	633	79
Wheel barrow	1,200	5	50	320	-
Consultancy	3,000	-	-	3,000	-

a/: The annual depreciation estimate in column (4) was further weighted by the proportion of the farm area under flower cultivation and the result is recorded in column (5). This includes situations where flower production utilizes only a fraction of the services from the equipment.

The results are surprising because growers with a larger area under flowers are generally the most technologically advanced. They are also expected to apply better management, and therefore produce higher quality flowers than small-scale growers.[38]

Small growers produce high quality flowers than the medium growers because high quality alstroemeria can be grown in the open in the favorable climate of Nyandarua without shade houses. Majority of the small growers are located in Nyandarua. By contrast, most medium growers are located in the Kiambu area, which has a warmer climate than Nyandarua. As a result, Marina produced in Kiambu without irrigation, or the protection of a net house or support structures are generally of lower quality than flowers grown in Nyandarua.[39]

Also, growers from the Nyandarua area (who constitute the majority of the small growers) apply more manure than farmers in Kiambu.[40] Small-scale growers also generally tend to be more labor intensive than medium growers.

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[38] Whereas the small, medium and large categories were based on the area on flower cultivation, the average farm size was not significantly different between these three groups (see Table 6). However, in terms of the area flowers, the results reveal a marked difference between large and the small medium farms.

[39] Net houses, also called shade houses, protect flowers from direct sunlight and heat, thereby allowing the flowers to have longer and healthier stems. The net houses used in Kenya are made from a fish net type of material and they differ from green houses (which are made of plastic material) commonly used in the production of roses.

[40] Dairying is a major agricultural enterprize in Nyandarua and many of the flower growers obtain manure from their farms.

Table 4.7a. shows that small growers spent more on land preparation, planting and weeding than medium growers. These factors help explain the high percentage of grade one flowers from the smallest holdings even though they do not use specialized structures.

Large growers have highest production costs per acre because they use more inputs--inorganic fertilizers, chemicals, and post-harvest materials--than the small and medium growers. Operating expenses for large growers were 202,906 shillings per acre. Post-harvest expenses--pre-treatment and pre-cooling, packaging materials, and local transport--accounted for 57 percent of the operating costs. The most expensive post-harvest items are sleeves and cartons.[41] The cost of sleeves and cartons per acre of marina was 57,600 shillings and 54,000 shillings, respectively. Because large growers export their own flowers to European markets, they incur air freight expenses of 35,581 shillings.

Small growers do not incur major post-harvest expenses because flowers are generally bought in bulk by the exporter or the marketing intermediary, and later re-graded and packed for export.[42] A few exporters buying small quantities of flowers from these growers provide free rubber bands. Medium class growers

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[41] After grading, the flowers are tied in bundles of ten stems by a rubber band. The cut end of each bundle is wrapped in a sleeve-shaped cellophane sheath for protection. Up to 25 such bundles are arranged in layers in cardboard boxes (carton) ready for shipment and export.

[42] Growers sort the flowers into the three grades and use sisal ropes or plant vines to tie them into bundles.

in the Kiambu area receive packaging materials, usually cartons from the exporters. Neither small nor medium growers use sleeves.

The need for shade houses consisting of plastic or screen nets; drip or sprinkler irrigation systems; cold storage; propagation materials; artificial lighting systems; and intensive fertilization and pest control makes flower cultivation capital intensive. The amount of fixed costs per farm varies depending on the type of flowers grown. For example, on farms where only alstroemeria is produced, artificial lighting systems are not required.The annual fixed costs for small and medium growers are 1,077 and 2,630 shillings, respectively. Half of the fixed costs on small and medium is the cost of seed. Fixed costs on large farms are about 250 thousand shillings.

Because flower cultivation by the large growers is more capital intensive than production by the medium and small growers, the opportunity cost of capital charged on large farm was substantially higher. The opportunity cost of capital was 1,427 shillings per acre of marina for the small farms, 1,389 shillings, and 43,258 shillings per acre for medium and large farms.

Large growers obtained 60 percent higher prices than small and medium growers because they sold their flowers directly on the European markets while small and medium growers sold their flowers to local exporters. Because large growers achieve both higher yields per acre and higher prices, they have a higher potential revenue than small and medium growers.

Figure 4.1 illustrates the difference between potential and realized gross margins in the production of Marina. On average, small growers earned less than 20 thousand shillings gross margin per acre as compared with 26 thousand for medium growers and over 300 thousand shillings for the large growers. Moreover, despite the high capital investment in Marina production by the large growers, the net farm income per acre was about 60 percent higher on the large farms than on the medium and small farms.[43] Large growers achieved their full potential gross margins because their direct links with the export market enables them to ascertain the requirements of the market and plan their production accordingly. Small and medium growers obtained only a fraction of their potential revenue because of their inability to grow high value flower types and gain access to efficient marketing arrangements. Chapter five examines the marketing arrangements used by flower growers.

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[43] Net farm income per acre is net margin per acre less the opportunity cost of capital and it represents the return to the farmer and his or her land (Harsh, et al, 1981).

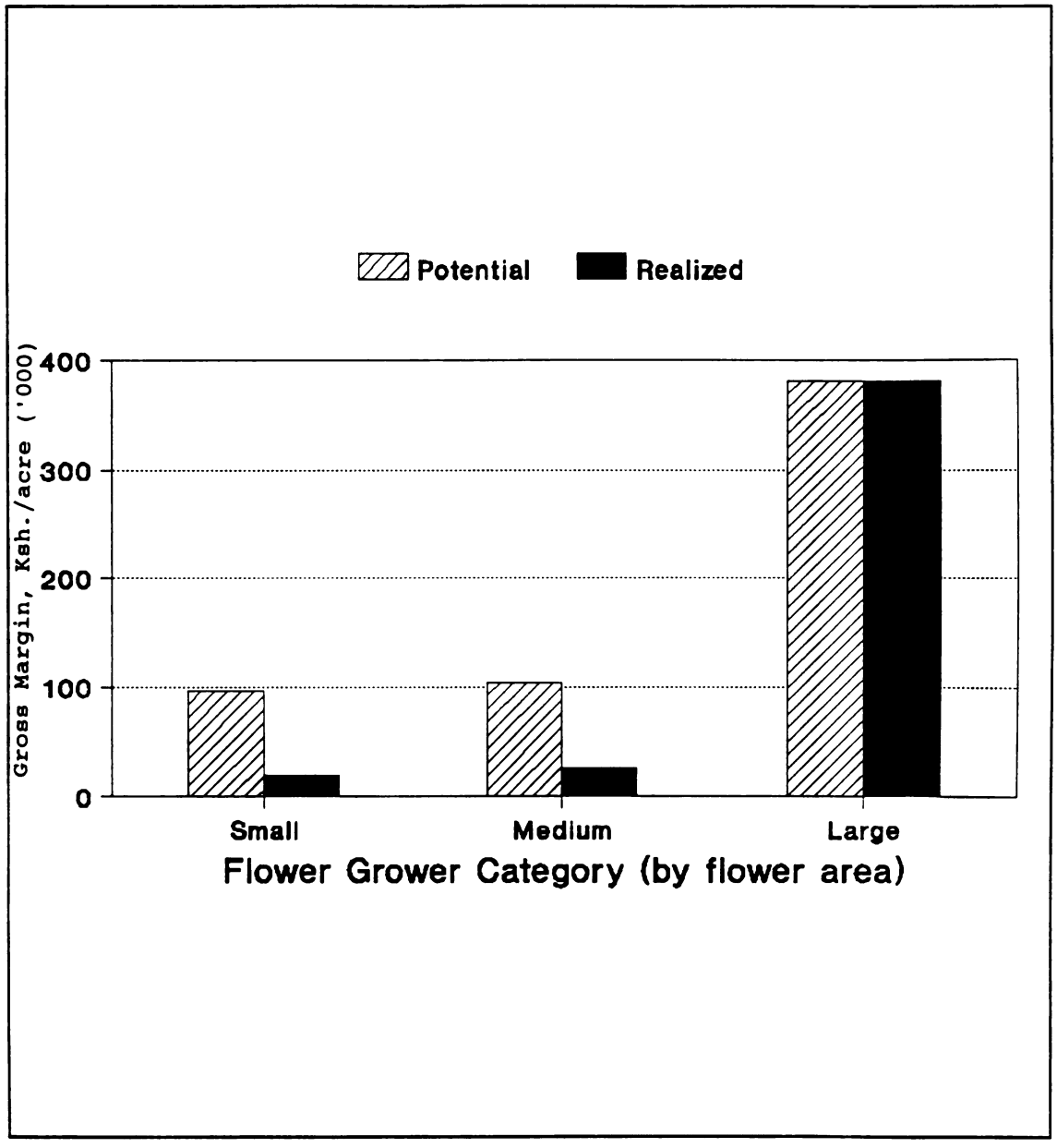

FIGURE 4.1. Kenya: Potential and Realized Gross Margins per Acre of Marina, 1991/92 Season.

Source: 1992 Farm Survey

4.1.4.2. Returns on Other Types of Flowers

With the exception of the information on Yellow Queen and arabicum, the data are derived from case studies of specific survey farms with reliable production data. These case studies identify high value alternative flower types and varieties that smallholder could grow to diversify their production. Table 4.8. presents enterprise budgets for arabicum, tuberose, solidaster, and two new varieties of alstroemeria: The production costs, and gross and net margins, were significantly higher for Apollo than for Yellow Queen because of higher rates of application of production inputs such as inorganic fertilizers, pre-treatment chemicals. Also, because Apollo is a higher value variety than Yellow Queen, growers invest more in its production inputs than for lower value flowers[44]. For example, the operating costs per acre are 80 percent more for Apollo than for Yellow Queen. The expenditure on pre-treatment chemicals is ten times higher for Apollo than Yellow Queen.

Similarly, growers invest heavily in specialized structures in order to produce better quality flowers and gain higher prices. Approximately 28 percent of the fixed costs in the production of Apollo are accounted for by shade houses compared with only 2 percent for Yellow Queen. Also the share of seed in fixed costs is 32 and 10 percent for Apollo and Yellow Queen, respectively.

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[44] Newer flower types and varieties have higher average sales prices than older flowers. In Kenya, the demand for the new varieties among exporters is normally high.

Table 4.8: Kenya: Enterprise Budgets for Four Common Types of Flowers, 1991/92.

Item	Yellow Queen	Apollo	Solidaster	Arabicum	Tuberose
Number of farms	9	1	1	4	1
Farm Size (acres)	12.95	20.00	12.00	5.30	3.00
Flower Area (acres)	5.50	20.00	12.00	3.00	3.00
Acres of flower type	1.75	1.00	4.00	1.00	1.00
Output (in stems):					
Grade 1	225,000	468,000	874,800	81,000	57,375
Grade 2	45,000	87,750	97,200	9,000	19,125
Grade 3	0	29,250	0	0	0
Yield (stems /acre)	270,000	585,000	972,000	90,000	76,500
Prices (Sh/stem):					
Grade 1	1.50	2.50	2.50	3.00	2.50
Grade 2	1.20	2.00	2.00	2.50	1.50
Grade 3	0.90	1.50	1.50	1.50	1.00
Potential revenue (Sh/acre)	391,500	1,389,375	2,381,400	265,500	172,125
Realized revenue (Sh/acre)	172,069	1,314,375	2,256,400	236,000	154,912
Total Operating costs (Sh/acre)[a]	59,800	429,677	516,033	62,550	69,232
Total Fixed costs[b]	67,491	335,605	208,082	12,403	25,869
Potential Gm/acre	331,699	959,698	1,865,367	202,950	102,893
Realized (Gm/acre)	112,268	884,698	1,740,367	173,450	85,680
Potential (Nm/acre)	264,208	624,093	1,657,285	190,547	77,024
Realized (Nm/acre)	44,777	549,093	1,532,285	161,047	59,811
Opportunity cost of capital[c]	12,259	71,936	84,490	7,045	8,939
Net income per acre	32,518	477,157	1,273,075	154,002	50,872

Notes:

a:Table 4.8a. shows the breakdown of the operating costs.

b:Table 4.8b. shows the breakdown of the fixed costs.

c: Estimated return on invested capital (operating plus fixed cost) using the 9.4 percent real interest rate charged by commercial banks on loans in 1991 (Kenya Republic of, 1992).

Source: 1992 Farm Survey

Table 4.8a: Operating Costs.

Op. Costs (Sh/acre)	Yellow Queen	Apollo	Solidaster	Arabicum	Tuberose
Preparation/ planting	3,260	600	3,900	480	2,160
Weeding	9,720	5,400	12,600	1,080	15,768
Fertilizer/ manure	6,750	17,000	14,350	815	600
Chemicals	1,528	2,220	845	165	880
Irrigation	112	30,400	35,833	0	4,944
Light/ season	0	0	25,000	0	0
Harvesting	9,000	43,200	41,400	5,760	5,184
Pre-treatment chemical	3,250	25,920	38,000	0	0
Cartons	21,870	43,200	192,780	54,000	18,360
Rubber bands	250	720	2,400	250	720
Sleeves	2,430	78,000	64,800	0	11,016
Pre-cooling	0	6,240	16,200	0	0
Local Transport	1,630	57,600	64,800	0	9,600
Communication (Fax)	0	3,125	3,125	0	0
Air freight and handling costs	0	116,052	174,720	0	0
TOTAL	59,800	429,677	690,753	62,550	69,232

Source: 1992 Farm Survey.

Table 4.8b:Fixed Costs.

Fixed Costs	Yellow Queen	Apollo	Solidaster	Arabicum	Tuberose
Planting material	6,933	104,952	62,000	8,000	8,000
Irrigation system	2,912	35,999	44,286	0	6,857
Coldstore	0	15,000	0	0	0
Grade shed	6,486	15,000	7,500	3,600	3,600
Net house	7,000	92,857	0	0	0
Supports	35,670	35,670	35,670	0	0
Light System	0	0	16,000	0	0
Water Tank	0	0	6,500	0	0
Truck	7,887	32,143	32,143	0	6,428
Bicycle	0	0	0	445	0
Sprayers	269	633	633	358	633
Wheelbarrow	0	350	350	0	350
Consultancy	333	3,000	3,000	0	0
TOTAL	67,491	335,605	208,082	12,403	25,869

Source: 1992 Farm Survey.

Table 4.8c. Notes on fixed Costs: Depreciation Schedule for equipment and specialized structures used in flower production.

Item	1991 price (Ksh.)	Approx. Working Life (Yrs)	Salvage Value (Ksh.)	Annual Depreciation Estimate (Ksh.)
Seed (local)	48,000	5	8,000	8,000
Seed (Y/queen, imported)	68,500	5	10,000	11,700
Seed (Apollo, imported)	834,667	7	100,000	104,952
Seed (Solidaster, imported)	211,200	3	25,200	62,000
Irrig. (Sprinkler/other),Pump	25,000	7	5,000	2,857
Pipes:sprinkler system	25,000	5	5,000	4,000
Irrig. (Drip/ sprinkler), Pump	900,000	7	200,000	100,000
Pipes (Drip/ sprinkler system)	150,000	5	20,000	26,000
Irrig. accessories	37,500	5	5,000	6,500
Coldstore	300,000	10	75,000	22,500
Grading shed (permanent)	150,000	10	10,000	14,000
Grading shed (semi-permanent)	50,000	5	5,000	6,428
Grading shed (temporary)	20,000	3	2,000	3,600
Net House (local)	45,000	5	10,000	7,000
Net House (imported)	750,000	7	100,000	92,857
Support Structures	258,350	5	50,000	35,670
Lighting System	100,000	5	10,000	16,000
Water Tank	75,000	10	10,500	6,500
Truck (used)	90,000	7	45,000	6,429
Truck (new)	300,000	7	75,000	32,143
Bicycle	6,000	7	500	786
Sprayers	2,000	3	100	633
Wheelbarrow	1,200	5	50	320
Consultancy[a/]	3,000	-	-	3,000

Notes:

Where there are other farm activities which use the equipment, the depreciation rate is weighted by the proportion of flower acreage.

a/:Three medium-scale growers in the Kiambu area jointly hire a consultant to advice them on technical problems.

Source: 1992 Farm Survey.

Among the four types of flowers, solidaster has the highest gross and net margins per acre, followed by Apollo. Solidaster is a high value flower and costly to produce. Solidaster requires approximately half a million shillings in operating costs per acre. Because of the high production cost, many small-scale growers do not have the resources to finance the cost of cultivating Apollo or solidaster, despite the prospects of high returns.

Arabicum and tuberose are the least expensive flowers to produce. They can be grown successfully under warmer climatic conditions without shade houses, which reduces fixed costs. Because planting materials for both flowers are obtainable locally, their seed costs are also low. Although the output per acre of arabicum and tuberose is less than half the yield for other flowers, they are inexpensive to produce and command high prices. This explains why both arabicum and tuberose are widely cultivated by smallholder in the Kiambu area, where the climate is ideal for their cultivation.

The cost of planting material is a significant part of total fixed costs, especially for high value flowers. The annual seed costs for Apollo and solidaster were 104,952 shillings and 62,000 shillings, respectively. Solidaster also requires artificial lighting which has an annual fixed cost of 16,000 shillings.

Despite the capital intensiveness of flower production, none of the small and medium growers reported using credit to finance their production. Large growers generally secured credit from European flower importers to finance the planting material and imported inputs, such as materials for net houses and pre-

treatment chemicals. Another source of financing flower production is off-farm income. About 23 percent of the growers received off-farm income, usually from an off-farm job or business. Large farms are frequently owned by families with high-ranking representatives in the civil service or business.

The farm survey revealed that none of the smallholder achieved the full potential gross and net margins for the four main types of flowers in the 1991-92 season. Figure 4.2 illustrates the difference between potential and realized gross margins. Yellow Queen has the largest disparity between potential and realized gross margins, mainly because of overproduction. Although it is a new variety, Yellow Queen is more widely grown than Apollo. Unlike Apollo and solidaster, Yellow Queen is also grown by a small number of medium and small growers who generally experience serious problems of selling their flowers to local exporters. Therefore Yellow Queen is likely to be more affected by such marketing problems as lack of buyers which was a common problem in the Nyandarua area. During the 1991/92 season, small growers achieved only 34 percent of the potential gross margins per acre of Yellow Queen.

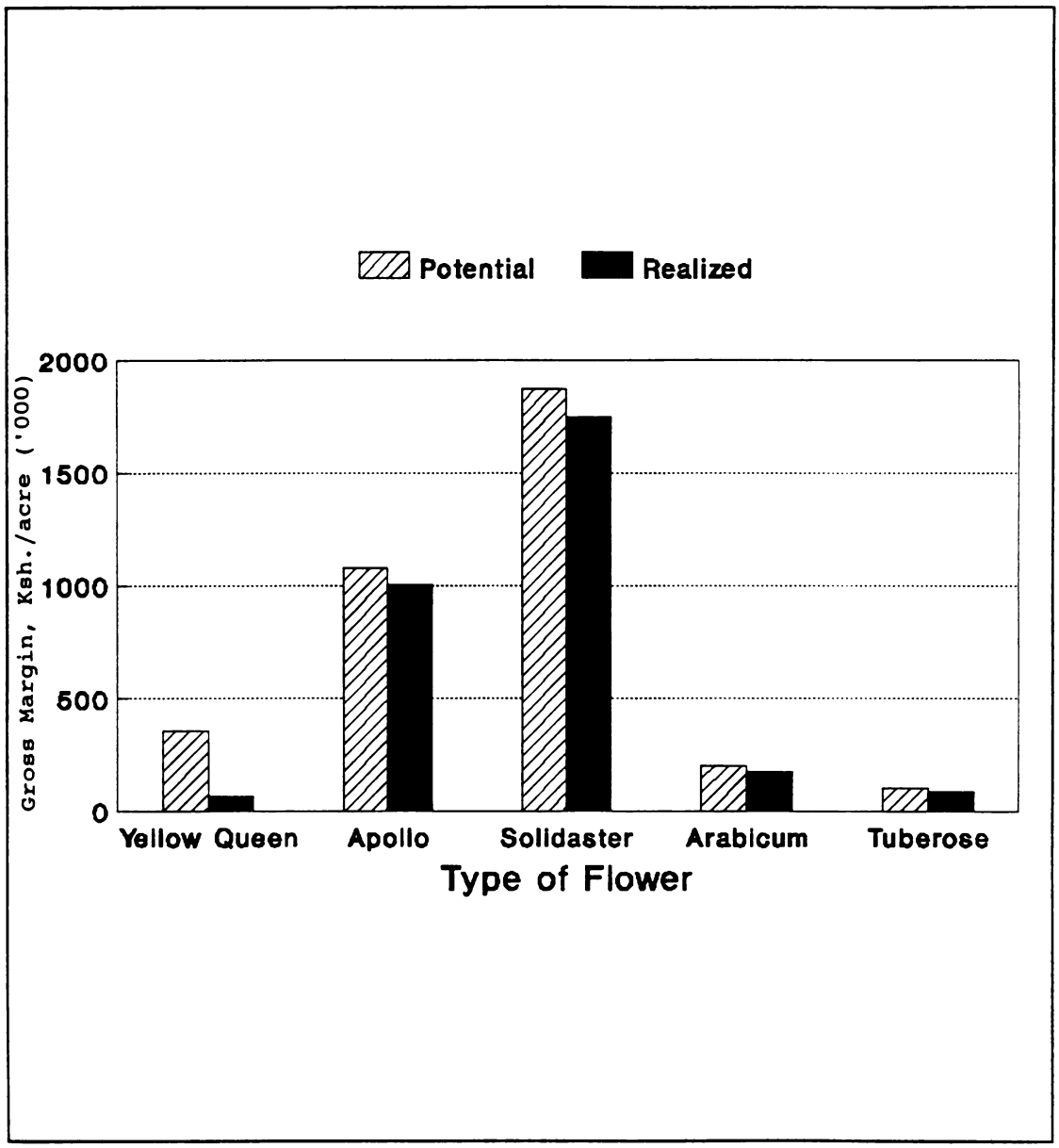

FIGURE 4.2. Kenya: Potential and Realized Gross Margins per Acre, by Type of Flower, 1991/92 Season

Source: 1992 Farm Survey

4.1.5. Major Production Constraints

The farm survey revealed the following three major problems confronting smallholder producing flowers for export:

1. Lack of technical information,

2. Lack of access to appropriate planting materials, and

3. Lack of credit to finance production.

Growers were asked to rank the constraints on a scale of one to three according to the degree of severity, and each score was normalized on a scale of zero, for least severe, to one, for most severe. The normalized scores were averaged across all growers and across those in each of the three farm categories. The results are reported in Table 4.9.

Table 4.9. Production Constraints Facing Smallholders in Flower Production

	Category of Growers			
Production Constraints	Small growers	Medium growers	Large growers	All growers
Lack of production credit	0.87	0.87	1.00	0.89
Lack of access to appropriate planting materials	0.86	1.00	0.60	0.85
Lack of technical information	0.81	0.58	0.80	0.73

Notes: The sample size was 36 growers. The small, medium and large farm categories had 19, 12, and 5 growers each. The figures are mean normalized scores along a zero to one scale, in which scores close to zero are least severe and those close to one are most restricting.

Source: 1992 Farm Survey.

Lack of technical information about the aspects of flower production is a serious problem for many smallholder. In general, the Ministry of Agriculture and other public agricultural related agencies are the main sources of information for farmers. Because the government agencies have not kept pace with the required research in floriculture, they have very limited technical advice to provide to farmers. Thirty-five out of the 36 growers expressed a lack of agronomic information about flower production available to smallholder. About a third of the growers interviewed relied on experienced growers for technical information and about 30 percent consulted the Ministry of Agriculture and HCDA for advice. Three of the large growers jointly hire a consultant from the Netherlands each season to advice them on the types of flowers they should grow.

Lack of access to appropriate planting materials was cited as one of the severe constraints, especially by small and medium growers. However, to be able to purchase the planting materials, access to credit is crucial because of the high cost of seed. Thirty-two of the 36 growers identified the lack of credit as a problem and gave it the highest absolute score (0.89) relative to the other constraints. However, although the large growers obtained credit through their vertical links with the market, they gave a lack of access to credit an absolute score of one, whereas medium and small growers who did not secure credit, gave it a score of 0.87. Because small and medium growers currently cultivate low-cost types of flowers, they do not perceive a lack of access to credit as serious a constraint as do the large growers. However, the results of the enterprise budgets

analysis indicate that for small and medium growers to be able to grow the high value flower types, greater access to credit will be crucial.

4.2. Economics of Bean Production

The economics of smallholder bean production is presented in this section. Enterprise budgets for three farm categories--small, medium, and large--were constructed using farm level survey data from 30 growers for the 1991-92 export season[45]. The results will be compared with those for flower production. The 30 growers in the sample were located in the Mwea division of the Kirinyaga district, where smallholder bean production for export is prevalent. This area is 170 kilometers to the north-east of Nairobi. The average farm size in the sample was 7.4 acres, of which approximately 49 percent was under bean production (Table 4.10). The large, medium, and small growers cultivate 48 percent, 51 and 48 percent of their farm with beans. Growers with less than one acre of beans also have small farms. The mean farm size for medium growers is six acres and they cultivate about 1.8 acres of beans. Large growers have over 15 acres of farm land and they grow about seven acres of beans. The principal alternative cash crops in the area include tomatoes, onions, and maize. Tenants cultivating rice, under the

[45] The three categories of farms are defined according to the area under bean cultivation by the farm: small, refers to holdings with less than one acre of beans; medium, 1.0 to 3.5 acres; and large, over 3.5 acres.

auspices of the National Irrigation Board (NIB), are not permitted to grow any other crop.

Table 4.10. Kenya: Structure of Smallholder Bean Growers: Farm Size and Area of Farm Under Bean Cultivation, 1991/92

Grower sizea[a/]	Number of farms	Farm Size		Bean Area		Bean Area as percent of farm	
		(acres)	(CV)[b/]	(acres)	(CV)[b/]	(percent)	(Cv)[b/]
Small	9	1.69	0.81	0.52	0.31	48.00	0.69
Mediu m	13	6.12	1.25	1.81	0.50	51.00	0.63
Large	8	15.94	0.21	7.25	0.33	48.00	0.44
TOTAL	30	7.41	1.03	2.87	1.06	49.00	0.59

Notes: a/: Small Farms cultivate less than one acre of beans, medium farms between 1.0 and 3.5 acres, and large growers grow over 3.5 acres of beans.

b/: CV is the coefficient of variation.

Source: 1992 Farm Survey

Table 4.11 presents the typologies of bean growers. Eleven of the 30 growers interviewed produced beans under forward marketing contracts with bean exporters. Fourty-six percent of all contract growers had grown beans for more than 10 years, compared with only five percent of the noncontract growers.

Table 4.11. Kenya:Typologies of Bean Growers: Education Level and Number of Years Growing Beans

Type of grower	Number of Growers	Education Level (percent of growers attained level of education)			Number of Years Been Growing Beans (percent of growers been growing beans for the number of years)		
		(primary)	(secondary)	(beyond secondary)	(less than 5 years)	(between 5 to 9 years)	(more than 10 years)
Small	9	11	66	22	78	22	0
Medium	13	23	54	23	61	39	0
Large	8	100	0	0	0	25	75
Contract	11	73	27	0	27	27	46
Noncontract	19	21	53	26	63	32	5
All growers	30	40	43	17	50	30	20

Source: 1992 Farm Survey

Also, 75 percent of the large growers have grown beans for more than 10 years. A large proportion of the small and medium growers have cultivated beans for less than five years and none of them has grown beans for over 10 years.

Although beans are grown throughout the year, smallholder production is between October and June, during the winter months in Europe. Because beans take a shorter period of time to mature than flowers, two crops are generally produced, one from October to December and the other between January and May. Beans have two market outlets: local canning industry, and the fresh export market.Most smallholder in the surveyed area, however, cultivate beans primarily for the fresh export market and only a few have contracts with the canning industry.[46]

4.2.1. Enterprise Budgets

Table 4.12. presents enterprise budgets for beans on small, medium, and large growers. The average area under beans is 0.5, 1.8, and 7.25 acres for the small, medium, and large growers, respectively. The components of the budgets include a) output, from which revenue is derived, b) operating and fixed costs, and c) gross and net margins.

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[46] Highland Canners (HCL, ltd.), a bean processing factory based at Thika near Nairobi, has recruited small-scale bean growers from Kirinyaga and supplied them with seed for a new type of bean suitable for canning. The new type of bean differs from Monel, the variety grown for the fresh market, in both color and texture.

Table 4.12 Kenya: Enterprise Budgets for Bean Growers, Mwea Division, 1991-92 Season.

Farm Category	Small	Medium	Large
Number of Farms	9	13	8
Farm Size (acres)	1.69	6.12	15.94
Bean Area (acres)	0.50	1.81	7.25
Output (cartons/ac)			
Extra fine	315	386	522
Fine	420	382	511
Yield (cartons/ac)	735	768	1,033
Av. Price (sh./ctn)			
Extra Fine	35.58	41.38	47.19
Fine	26.67	31.48	34.37
Revenue (sh./ac.)	23,015	28,994	42,552
Operating cost/ac			
Rental	500	500	500
Land prep.	671	624	735
Planting	287	216	171
Seed	945	956	1,259
Weeding	682	580	1,012
Fertilizer	1,034	1,192	1,151
Manure	111	104	989
Pesticides	2,575	2,588	3,250
Irrigation	1,238	1,700	1,995
Harvesting	5,286	5,441	7,175
Total costs	11,977	13,670	17,927
Fixed Costs			
Irrigation	826	1,607	3,185
Packing shade	0	44	407
Sprayers	262	408	525
Total	1,088	2,059	4,117
Gross margin (sh./ac)	11,938	15,323	24,625
Net margin (sh./ac)	9,949	13,264	20,508
Opportunity cost of capital[a/]	1,228	1,478	2,072
Net income per acre	8,721	11,786	18,436

Notes: a/: Estimated return on invested capital (operating plus fixed cost) using the 9.4 percent real interest rate charged by commercial banks on loans in 1991 (Kenya Republic of, 1992).

Source: 1992 Farm Survey.

In general, beans are sold in extra fine and fine grades which are determined by the maximum width of the pod. Extra fine beans are the thinner of the two and should not exceed nine millimeters in diameter. The preferred length for beans is between eight and 12 centimeters. After grading, beans are packed in fibre board cartons of three kilograms net weight. Both output per acre and ratio of the two grades vary depending on the frequency of harvest. Harvesting more than three times a week yields a higher percentage of the extra fine beans. Most growers pick beans three times a week which normally yields an equal ratio of the fine and extra fine grades[47]. Output per acre is higher for the larger farms than for the smaller. The average was 735, 768, and 1033 cartons per acre for small, medium, and large farms, respectively. The weighted average farm gate prices for the 1991-92 season were used to calculate the revenue per acre for each the three farm categories. Weighted average prices were used because fresh bean prices vary markedly within the season. Only the prices received by growers under forward market contract remain stable throughout the season. For example, the 1991-92 farm gate prices for extra fine beans sold through forward contracts range between 50 and 60 shillings per carton, whereas non-contract prices fluctuated between 40 and 70 shillings. The prices for fine beans fluctuated

[47] Exporters sometimes indicate in advance, especially to contract growers, the proportions of the two grades they want to buy. Exporters shipping beans to the U.K. often prefer the fine beans, whereas, those exporting to France prefer the extra fine grade.

between 35 and 50 shillings per carton of beans sold under contract and 20 to 50 shillings for noncontract beans [48].

The revenue per acre was 23,000 shillings, 29,000, and 42,000 shillings for small, medium, and large growers. The small farms generate lower revenues per acre because they achieve lower yields and average prices than the medium and large growers. The revenue is higher for large growers because a majority of them produce under contract. Contracts enable growers to realize higher and stable prices.

Harvesting labor and pesticides are the most costly inputs in smallholder bean cultivation. Harvesting labor ranges between five and seven thousand shillings per acre, whereas the expenditure on pesticides is about 2,000 for the small and medium farms and 3,000 shillings for the large. Unlike smallholder flower production, bean cultivation does not involve major post-harvest expenses. After harvest, the beans are graded and packed in cartons provided for free by the buyers. The harvesting expenses also cover the cost of both grading and packing. Overall, operating costs in bean production the small, medium, and large farms are about 11,000, 13,000, 17,000 shillings per acre, respectively.

The major fixed cost item in bean production is the depreciation of the irrigation system. Nearly all beans for export are produced under irrigation. The

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[48] Whenever the price dropped to about five shillings, many growers did not harvest their crop that day. The wage rate for bean pickers ranges between 8.50 and five shillings per carton depending on the farm gate price for the day. A price of five shillings per carton only covers the harvesting cost.

most common irrigation system is the furrow, using water from either canals of the Mwea rice irrigation scheme, or nearby rivers. The average fixed cost for irrigation equipment ranges from 800 to about 3,000 shillings, depending on the area under bean cultivation. Unlike flower production, smallholder bean cultivation does not require investments in specialized structures and equipment. The net income to the farmer and land, after deducting the opportunity cost of capital, was 18,436, 11,786, and 8,721 shillings for the large, medium, and small farms, respectively.

The gross margins per acre of beans in the Kirinyaga district were approximately 24,000 shillings for large growers, 15,000 for medium and 12,000 for small growers.[49] The net margins were 20,000 shillings per acre for large farms, 13,000 for the medium, and 10,000 for small farms. However, growers cultivating beans under forward contracts with exporters realized significantly higher gross and net margins per acre than noncontract growers. Eleven of the 30 growers had contracts with exporters. Table 4.13. illustrates the differences in costs and returns for contract and noncontract growers. The 11 growers under contracts realized 37 percent higher yields and 80 percent higher net margins per acre than the 29 noncontract farmers.

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[49] The Ministry of Agriculture's Farm Management Guidelines estimates of gross margin per hectare for growers in Kirinyaga in 1991-92 were 40,014.20, 31,895.40, and 22,42.90 for the high, medium, and low levels of input use, respectively. The corresponding operating costs per hectare were 34,984.20, 28,104.60, and 7,545.30 (Ministry of Agriculture, 1992).

Table 4.13. Kenya: Enterprize Budgets for Contract and Noncontract Bean Growers, 1991

	Contract Growers	Non-contract Growers
Number of farms	11	29
Bean Area (acres)	4.98	1.53
Output (cartons/acre)		
Extra fine	498	354
Fine	532	393
Yield (cartons/acre)	1,025	
Price (Ksh./carton)		
Extra fine	55.00	47.50
Fine	44.09	35.26
Revenue (Ksh./ acre)	50,5571	30,672
Operating costs (Ksh./ acre)	18,194	12,802
Fixed costs (Ksh./acre)	2,117	1,165
Gross margin (Ksh./acre)	32,377	17,870
Net margin (Ksh./acre)	30,260	16,705
Opportunity cost of capital[a/]	1,909	1,313
Net Income per acre	28,351	15,392

Notes: a/: Estimated return on invested capital (operating plus fixed cost) using the 9.4 percent real interest rate charged by commercial banks on loans in 1991 (Kenya Republic of, 1992).

Source: 1992 Farm Survey

Table 4.14. Kenya: Enterprize Budgets for Small, Medium, and Large Bean Growers, Under Contract and Noncontract, 1991.

	SMALL GROWERS		MEDIUM GROWERS		LARGE GROWERS	
	Contract	Non-contract	Contract	Non-contr	Contract	Non-contract
Number of farms	2	7	2	11	7	1
Bean area (acres)	0.4	0.5	2	2	7.5	4
Yield (cartons/ acre)	903	695	920	760	1103	950
Prices (sh/ctn)						
Extra fine	42.5	37.3	46.3	39.3	55.6	37.5
Fine	30.0	28.3	37.5	28.8	44.2	26.1
Revenue (sh/acre)	31,860	22,972	38,325	27,061	54,962	29,625
Op. costs (sh/acre)	16,216	11,637	15,630	13,287	19,707	14,933
Fixed costs (sh/acre)	366	673	1,271	1,368	2,984	2,095
Gross margin (sh/acre)	15,643	11,334	22,695	13,774	29,291	14,692
Net margin (sh/are)	15,257	8,004	21,424	12,406	26,308	12,694
Opport. cost of capital[a]	1,559	1,157	1,589	1,377	2,133	1,600
Net Income per acre	13,698	6,847	19,835	11,029	24,175	11,094

Notes: a: Estimated return on invested capital (operating plus fixed cost) using the 9.4 percent real interest rate charged by commercial banks on loans in 1991 (Kenya Republic of, 1992).

Source: 1992, Farm Survey

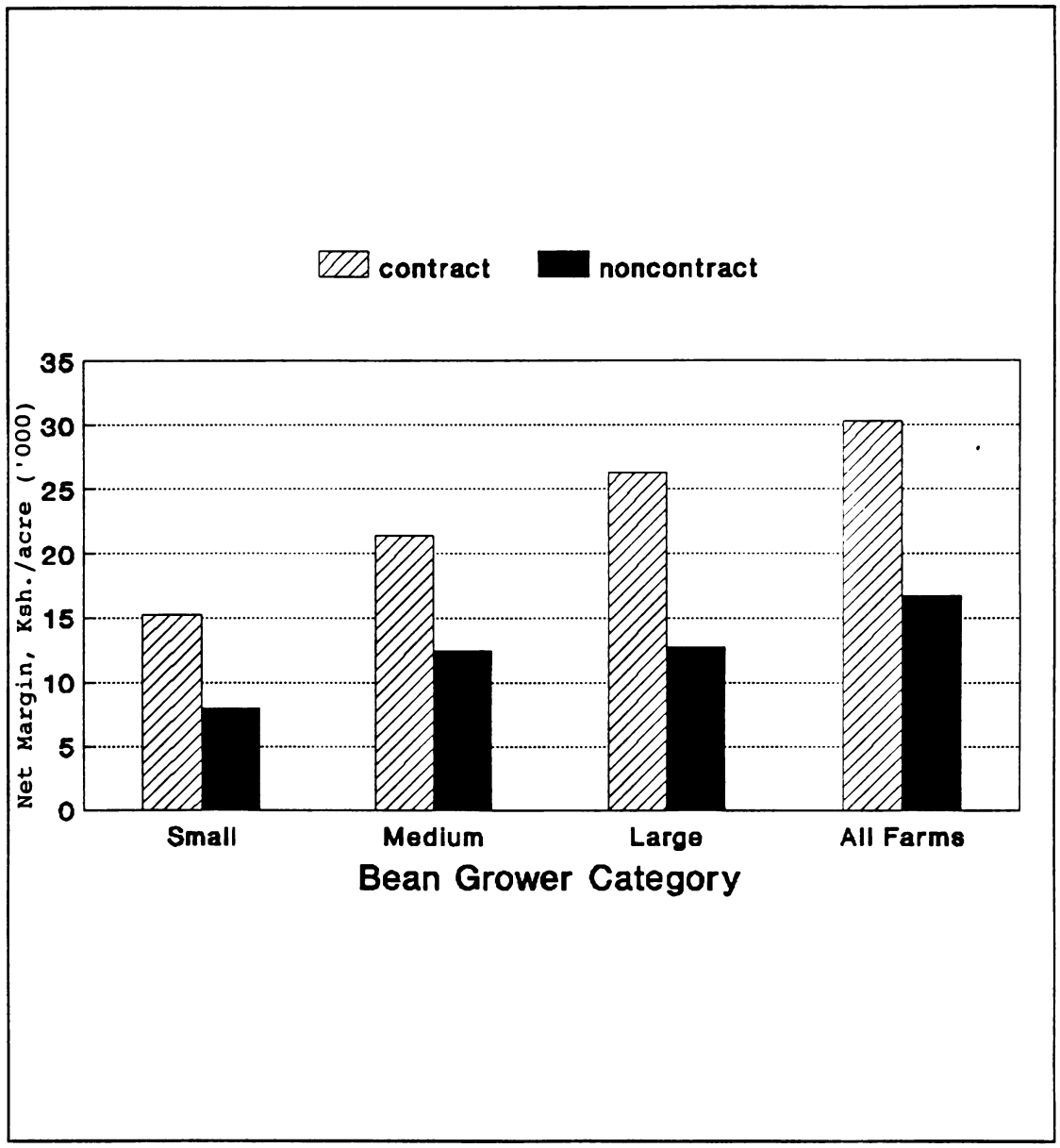

FIGURE 4.3. Kenya: Net Margins for Contract and Noncontract Bean Growers, 1991/92

Source: 1992 Farm Survey

Contract growers are able to obtain higher yields because they use more inputs such as fertilizers, which they receive as credit under the contract agreements.

However, not many small growers can secure contracts with exporters because of a problem of enforcing contracts.[50] The 1992 farm survey included two small and two medium growers producing beans under contracts. Under contract arrangements, small growers can spend 39 percent more on inputs than non-contract growers and earn 90 percent higher net margins per acre.

4.2.2. Production Constraints on Bean Growers

Table 4.15 presents a summary of the constraints identified in bean production. The data shows the normalized scores along a scale of zero for least severe to one for most severe, according to growers perceptions. Overall, bean growers did not perceive lack of technical information, credit, and lack of seed as severe constraints as did flower growers. Among bean growers, contract farmers experience less problems in obtaining technical information, seed, and credit than noncontract farmers because the former have a better access through the contractual arrangements.

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[50] Small-scale bean growers have a bad reputation of violating contracts, especially when market prices are higher than the contract price range. Therefore, exporters are reluctant to enter into contracts with small growers.

Table 4.15. Kenya: Production Constraints on Bean Growers, 1991/92 Season

Constraint	Contract growers	Noncontract growers	All growers
Lack of Agronomic information	0.50	0.59	0.55
Lack of access to seed	0.14	0.37	0.28
Lack os access to credit	0.43	0.54	0.50

Notes: The sample size was 30 growers. The number of growers under contract was 11 and noncontract growers were 19. The figures are mean normalized scores along a zero to one scale, in which scores close to zero are least severe and those close to one are most restricting.

Source: 1992 Farm Survey

4.3. The Returns on Alternative Crops

Table 4.16 reports a summary of the costs and returns for major agricultural enterprises common in the Kirinyaga district of Central Province. Tomatoes appear to be the most profitable of the five alternative crops grown in the area but on average, they are less profitable than beans, particularly beans grown under contract. The gross margin of tomatoes in 1991/92 was 28,962 shillings per acre, whereas the gross margin of beans grown under contract was 32,377 shillings per acre. However, tomato production is less costly than bean production.

Table 4.16. Kenya: Costs and Returns for Competing Crops in Kirinyaga District, 1991/92 Season

Costs/Returns	Beans		Tomato[a/]	Tea[a/]	Coffee[a/]
	Contract	Noncontract			
Revenue (Sh/acre)	50,571	30,672	40,371	27,263	19,330
Operating Costs (Sh/acre)	19,194	12,802	11,409	6,198	6,889
Gross Margin (Sh/acre)	32,377	17,870	28,962	21,065	12,440

Notes: a/: Values shown are based on the medium level of input use and management.

Source: 1992 Farm Survey; Ministry of Agriculture, 1992.

4.4. Summary

This chapter presented the major findings of an analysis of the economics of smallholder flower and bean cultivation in Kenya. Two farm surveys-- covering 36 flower growers and 30 bean growers--were carried out in 1992 in order to determine the principal constraints on flower and bean production and to generate information for the preparation of enterprise budgets. The results show that flower cultivation is more capital intensive and more profitable but more risky than bean production. Larger growers in both subsectors achieved significantly higher gross and net margins per acre than small and medium growers.

Growers cultivating the new and high value flowers earned significantly higher incomes than growers with old varieties. Because new varieties are costly to produce, only large growers who had access to credit and connections with the export markets were able to grow them. Production by small growers, especially growers from Nyandarua, was restricted to the old varieties such as Marina because of a lack of access to credit, planting material, and technical information. Because small and medium growers could not diversify their flower production they faced marketing difficulties and could not harvest and sell all of their crop. It was demonstrated that small and medium flower growers achieved only 20 and 25 percent of their potential gross margin per acre because of large losses from unharvested and unsold flowers. However, small growers, especially in Nyandarua district, produce high quality alstroemeria because of the favorable climatic conditions. For small growers to benefit by participating in flower production for export, it is vital for them to have greater access to credit and technical information.

Bean production is less capital intensive, and less risky but yield lower net margins per acre than flower production. Large bean growers earn higher gross and net margins than small and medium growers, because a majority of the large growers have forward marketing contracts with exporters. Forward contracts enabled large growers to have greater access to agronomic information and to credit and seed in kind. Also, both large and contract growers have grown beans for a longer period than small and noncontract growers. Over 70 percent of the

small bean growers and a third of the medium growers, have grown beans for a period of less than five years. Only 4 of the 22 small and medium growers had contracts with exporters because they have a reputation of breaking contracts. Given the potential benefits for growers under contract arrangements, it is vital that production under contract is expanded to many small growers.

CHAPTER FIVE

MARKETING OF FLOWERS AND BEANS

This chapter will present the results of a diagnostic survey of flower and bean marketing at the farmer and exporter levels. The first part will identify the marketing channels used by flower growers and assess the effectiveness of the information flow and the coordination mechanisms at the grower-exporter level. The section also documents poor coordination in the marketing of flowers from smallholders. The results of similar analysis on smallholder bean marketing are presented in the second part of the chapter. The final section presents a comparative assessment of marketing coordination in the flower and the bean industries.

5.1. Flower Marketing

The major marketing questions facing producers generally include the types of flowers to grow to fill niches in international markets and the choice of distribution channels and overseas markets. Chapter three reported that the Netherlands is the major market for Kenya's flowers, followed by Germany.[51]

[51] About 1 percent of Kenya's flower production is sold locally to street vendors, florists, and hotels. The most common flowers found in the local market include carnation, roses, statice, gladiolus, and lilies. The source of this supply includes small-scale growers and nurseries near Nairobi and large scale farms.

Because the flower industry is dynamic and new flower types are being continuously introduced in the market, growers need reliable information on market opportunities for an array of old and new types of flowers. This requires an efficient flow of information from overseas markets back to the producers. Chapter four reported that most smallholders are producing old flower varieties even though a small number of growers are receiving higher incomes by cultivating new varieties. The analysis will examine the types of marketing channels, the mechanisms used to coordinate smallholder flower marketing and the flow of information.

5.1.2. Marketing Channels for Flowers

The 1992 survey of smallholders revealed that virtually all smallholders are growing flowers specifically for the export market. None of the smallholders reported selling alstroemeria in the local market. Unlike the marketing of traditional export crops such as coffee and tea that are sold through government commodity boards, the marketing of flowers is generally an individualistic affair, with growers selling either to a local exporter or an overseas importer.

Sixty percent of Kenyan flowers are sold through the Dutch flower auctions. Dutch flower auctions are owned and operated by Dutch flower growers' cooperatives. The Verenigde Bloemenveilingen Aalsmeer (VBA), in Amsterdam is the largest flower auction in the world (appendix D provides

information about the flower auctions). Kenyan exporters who sell directly through the Dutch auctions normally ship flowers to a dispatcher (a clearing agent) at the import department of the flower auction. The dispatcher handles all the financial and administrative aspects of the sell on behalf of the grower or exporter, at a fee[52].

In the main flower producing areas of Kenya, there is no organized assembly of flowers before they are sold to exporters. In Kiambu district, growers frequently deliver flowers individually to the exporters' premises. In both the Nyandarua district and the Githunguri division of Kiambu district, exporters travel to some locations where growers gather with their produce. In these areas, the farmers had organized themselves into grower associations--the Kinangop Flower Growers Association (KFGA) in Nyandarua, and the Githunguri Gitiha flower Growers Association (GGFGA) in Githunguri. More than 70 percent of the growers interviewed were members of a grower association and collectively sought exporters to buy their flowers. Grower associations are a relatively new institutional arrangement in export flower production and at the time of the survey none of them were engaged in export. Growers formed associations, to bargain for higher prices and reduce the incidence of nonpayment by exporters for

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[52] At the Verenigde Bloemenveilingen Aalsmeer (VBA) auction, the dispatcher also arranges for transport from Schipol Airport to the VBA and performs other handling activities. In 1992, the fee charged by the VBA for the services to the supplier included an auction commission of approximately 8 %; a lot levy of Dfl.2 per lot; a PVS levy (for promotion) of 0.4 %; and unpacking costs at approximately 2 cents per flower (Interview, 1992).

flowers delivered. However, even members of the associations frequently opted to sell flowers directly to buyers because of a lack of exporters, especially in Nyandarua.

The survey results show that flower marketing channels differ markedly by farmer size. Specifically, larger growers have a higher probability of selling their flowers directly to Europe than the smaller ones. The latter rely predominantly on exporters who are not growers themselves and occasionally on larger growers who want to supplement their own production. Table 5.1. illustrates the three channels used by growers from the Nyandarua and Kiambu districts during the 1991-92 export season.

Table 5.1.Kenya: Flower Marketing Channels, by Category of Growers, 1991-92

	Grower Category by Size of Flower Area							
	< 1.0 Acre		1-7 acres		8-20 acres		All Growers	
Channel	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Sell Directly to Europe	0	0.0	0	0.0	3	8.6	3	8.6
Farmer to Exporter w/o Association	3	8.6	3	8.6	1	2.9	7	20.1
Farmer to Exporter with Association	17	45.5	8	22.9	1	2.9	26	71.3
Total	20	54.1	11	31.5	5	14.4	36	100.0

Source: 1992 Farm Survey.

The data in Table 5.1 shows the percentage of growers using each channel rather than the percentage of flowers passing through them because of the lack of information on the volume of flowers produced and marketed by smallholders in the two districts in 1991. The results, however, show that over 90 percent of growers in Kiambu and Nyandarua rely entirely on market intermediaries, usually exporters, for the sale of their flowers. Seventy percent of these were selling flowers to exporters with assistance of grower associations, and 30 percent sold flowers directly to exporters. None of the two associations identified during the survey exports flowers because they are young and lack capital to finance flower exports. In fact, the associations do not buy flowers from members. Besides assisting growers bargain for higher prices, the associations also look for and encourage exporters to come into the area to buy flowers from members.

Among the possible barriers to entry to direct exporting include high air freight costs, production of the mix of flowers needed in the markets, and managerial skills. Kenya has high freight rates for air cargo mainly because of the high cost of the government regulated jet fuel prices. During the 1991/92 export season, air freight charges ranged from US$ 1.75 to 2.00 per kilogram.[53] The VBA Auction market receives imported flowers only on the basis of pre-paid

[53] At the 28 sh/US$ official exchange rate the freight charges are approximately 49.00 to 56.00 shillings per kilogram of flowers.

freight costs.[54] Access to credit could open the way for grower associations to enter the export market.

The VBA auction accepts imported flowers if they are of high quality and form an "interesting supplement" to what domestic growers supply. Therefore, to gain entry to the auctions, the growers or grower associations should be able to provide the right type of flower needed in the market. However, the associations do not have access to reliable export market information that would enable them to ascertain the array of flowers to provide. Currently, members of the KFGA primarily cultivate, Marina. As the results in Table 5.1. indicate, most growers sell their flowers to exporters. Only 8.6 percent of the growers surveyed export directly to Europe, shipping their flowers to either an importer or an agent at the Dutch auctions.

Table 5.2 shows the farm level marketing channels by district. The important conclusion to be drawn from this information is that none of the producers from the Nyandarua district sells flowers directly to Europe. This finding has important implications for smallholder participation in flower production for export given that the majority of such growers are located in this district which has ideal climatic conditions for low cost flower cultivation. Over 50 percent of the smallholders surveyed come from the Nyandarua district and none of them exports flowers directly. Even in Kiambu district where there is

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[54] Some exporters shipping flowers directly to European importers may have arrangements with the clients to deliver flower on c.i.f. basis.

evidence of growers exporting directly to Europe, a vast majority of smallholders in that area also rely on exporters. Fourteen of the 17 growers surveyed from the Kiambu district sold flowers to exporters.

Table 5.2. Kenya: Flower Marketing Channels by District, 1991-92

	Number and Percent of Smallholders in Each Channel					
	Direct Export		Farmer to Exporters		Total	
District	Number	(%)	Number	(%)	Number	(%)
Kiambu	3	8.6	14	39.3	17	47.9
Nyandarua	0	0.0	19	52.1	19	52.1
Total	3	8.6	33	91.4	36	100.0

Source: 1992 Farm Survey.

Table 5.3 shows the average farm gate sales prices for flowers sold through each marketing channel. The prices shown for growers who sell directly on the European market were not the actual prices received from the export market. Rather, farmers who exported their own flowers, reported prices approximately equal to the official minimum export prices that they are required by the government to declare to the Central Bank. During the 1991-92 export season, the minimum average export price was 60 shilling per kilogram (approximately 2.50 shillings per stem). The average Alstroemeria price at the VBA flower auction near Amsterdam for 1991/92 was 38, 35, and 20 Dutch fl. cents per stem for grade one, two, and three. At the 1992 official exchange rate (18.00 Ksh/Dfl.) the average auction price was 6.80, 6.30, and 3.60 shillings per stem. The relevant

prices for the export grower would depend on the quantities sold and the prices received during the days flowers were supplied to the market. However, based on the data on average export prices, growers who sold flowers directly on the European market obtained higher marketing margins than suggested by the prices they reported.

Table 5.3. Kenya: Average Price of Marina (Quantity Sold) by Market Channel and District[a/], 1991

	Average Price Alstroemeria (Marina) By Grade[b/]		
Channel	Grade 1 (Sh./stem)	Grade 2 (Sh./stem)	Grade 3 (Sh./stem)
Direct Export	2.50	2.00	1.50
Farmer-to-Exporters	1.06	0.81	0.62
District			
Kiambu	1.15	0.85	0.60
Nyandarua	0.99	0.79	0.63

Notes:
a: The results do not include information about statistical significance because the sample of growers who use the direct export channel was too small to allow for statistical inferences.

b: The prices reported for flowers sold through the direct export channel differ from the average auction prices for imported flowers reported by the auction. The average alstroemeria prices for 1991 were 38, 35, 20 Dutch fl. per stem for grade one, two, and three. The growers reported prices (approximately 2.50 Ksh. per stem) in accordance to the official minimum F.O.B. price of 60.00 ksh. per kilogram.
Source: 1992 Farm and Exporter Surveys

Table 5.3 reports prices received by growers for Marina based on the amount of flowers the grower sold, whereas Table 5.4 presents average prices per Marina flowers produced (based upon the revenue received divided by the quantity produced). Although the income earned from the sale of flowers is determined by the price per flower sold, the prices per flowers produced are the most relevant to the growers and are a better indicator for the system's performance than prices per flower sold.

Because some of the flowers harvested are not sold, the prices per flower produced are lower than for those base on flowers sold. A comparison of Table 5.3 and Table 5.4 shows that the latter reports lower prices for all grades and in all the channels. However, the difference is more pronounced for the prices received by growers who sell flowers to exporters than prices obtained by growers who export directly to Europe. The data in Table 5.4 indicates that growers who export directly also obtained prices three times higher than those received by other growers. One of the reasons why the prices per flower produced for growers selling to exporters are substantially lower than for those who sell directly on the European markets was the large quantity of unsold flowers for the former category of growers.

Nyandarua growers on average earned about 40 percent lower prices than Kiambu growers who do not export flowers directly.

Table 5.4.Kenya: Average Price of Marina (Quantity Produced) by Market Channel and District, 1991

	Average Price for Alstroemeria (Marina) By Grade		
Channel	Grade 1 (Sh./stem)	Grade 2 (Sh./stem)	Grade 3 (Sh./stem)
Direct Export	2.00	1.57	1.46
Farmer-to-Exporters	0.60	0.45	0.35
District			
Kiambu	0.82	0.61	0.41
Nyandarua	0.49	0.38	0.32

Source: 1992 Farm and Exporter Survey.

Table 5.5 and Table 5.6 report the prices received for flowers sold and flowers produced, respectively, for a new alstroemeria variety, Yellow Queen. Again, growers who export flowers directly obtained significantly higher average prices than growers selling flowers to local exporters, both per Yellow Queen flowers sold and per total Yellow Queen produced. The average prices for all grades of Yellow Queen sold through the direct export channel were found to be at least 60 percent higher than for those sold through the farmer-to-exporter channel. Since the smaller growers sell all their flowers to exporters, the results further support the conclusion that there is a systematic positive relation between the price received and size of grower.

Given that 90 percent of the growers are small, it means that the vast majority of the smallholders receive lower prices for their flowers compared to what they would earn if they exported directly. However, selling flowers

Table 5.5.Kenya: Average Price Received for Quantity of Yellow Queen Sold, by Market Channel and by District,1991-92

	Average Price for Alstroemeria (Yellow Queen) By Grade		
Channel	Grade 1 (Sh./stem)	Grade 2 (Sh./stem)	Grade 3 (Sh./stem)
Direct Export	2.50	2.00	1.50
Farmer-to-Exporter	1.50	1.20	0.92
District			
Kiambu	1.50	1.30	1.00
Nyandarua	1.50	1.20	0.90

Source: 1992 Farm and Exporter Surveys

Table 5.6. Kenya: Average Price Per Yellow Queen Flower Produced, by Market Channel and by District,1991-92

Channel	Average Price for Alstoemeria (Yellow Queen) by Grade		
	Grade 1 (sh./stem)	Grade 2 (sh./stem)	Grade 3 (sh./stem)
Direct Export	2.25	1.78	1.35
Farmer-Exporter	0.84	0.67	0.51
District			
Kiambu	1.07	0.92	0.65
Nyandarua	0.74	0.59	0.42

Source: 1992 Farm and Exporter Surveys

directly on the European auction markets is risky and individual small growers are unlikely to able to absorb such risks. But, assuming that the minimum export prices reported by the large growers are sufficient to cover their risks and marketing costs, the establishment of an institution, such as a grower association,

to pool the smaller growers, should be encouraged to enable them to export flowers directly. The KFGA is an example of such an institution. However, KFGA would require a more reliable source of market information to minimize the transaction costs associated with uncertainty, and credit to pay for the initial marketing costs. Currently, information about the European flower markets is available at the Horticultural Crops Development Authority office in Nairobi, but only a few smallholder from Nyandarua travel to Nairobi for the information.

The results also suggest a spatial price differential between the two flower producing regions. The difference in the prices for flowers produced was observed for both Marina and Yellow Queen. The observed difference in prices between Kiambu and Nyandarua can be explained neither by transportation costs nor by differences in quality. Although Nyandarua is about 100 kilometers further from the Nairobi airport than Kiambu, the difference in transportation costs is only about 4 cents per stem.[55] Since Nyandarua growers produce high quality flowers, the price differential cannot reflect quality differences.

The price difference between the two districts is partly due to an oversupply of alstroemeria in Nyandarua relative to Kiambu and to larger number of exporters in the Kiambu area. The problem of over production of alstroemeria, especially Marina, in Nyandarua is a result of a sudden increase in

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[55] Nyandarua and Kiambu are approximately 165 and 60 kilometers away from the Nairobi International Airport, respectively. The difference in transportation costs to the airport between the two regions is about sh.10.00 per carton. Since there are 250 stems per carton, this works out to 4 cents per stem.

production by new smallholders in 1990 and 1991. This rapid increase in the number of growers and flower production led to an oversupply of flowers and a large proportion of the 1991-92 crop was left unharvested. There are additional risks to exporters who buy flowers from Nyandarua because of the distance and poor roads in the area. Besides the risk of damage to the flowers due to the distance, the produce might not arrive at the airport on time.

5.1.3. Market Coordination of Flower Production and Marketing

Market coordination mechanisms include the set of institutions and arrangements that are used to harmonize supply and demand at various stages of a commodity subsector. The smallholder flower subsector is characterized by a lack of strong market coordination. With the exception of seven vertically integrated large-scale firms and a few growers and exporters who have established direct links with flower importers in Europe flower importers in Europe, the rest of the participants in the industry rely on the local market for the coordination of their production and marketing activities.

5.1.3.1. Horizontal Coordination

The Horticultural Cooperative Union (H.C.U.) is the only horizontal coordination mechanism that has played an important role in Kenya's fresh

horticultural produce marketing. The H.C.U. was created in 1952 by the colonial government in order to provide marketing services to European horticultural growers. For many years the H.C.U. was the largest wholesaler and exporter of fresh horticultural products. After independence, African producers joined the Union and it emerged as a national broad-based organization of vegetable and fruit growers aimed at creating a more advantageous marketing arrangement with strong bargaining powers for the producers. But the H.C.U. did not fulfill the growers' expectations. Throughout the 1970s, the Union experienced financial and managerial problems and it eventually collapsed (Ministry of Cooperative Development, 1980). Since then, farmers producing products such as beans, and recently flowers, have tried to set up similar coordination arrangements with very limited success. Where this form of coordination exits, it is mostly limited to loose institutionalized groupings of small-scale growers for purposes of reaching collective agreement on prices with exporters or processors and to collect produce.

5.1.3.2. Vertical Coordination

Vertical coordination refers to the coordination of marketing functions between two or more stages in the marketing chain. Again, because of the weak links between the members of informal grower associations and exporters, the coordination of marketing activities for the smallholder flower subsector is left to

highly variable market prices, and unsold flowers. Contracting arrangements between the farmer and the exporter stages might reduce the uncertainty.

One of the two small-scale flower grower associations identified in Kiambu during the survey discontinued its operations at the end of 1991 because its members became disillusioned with export flower cultivation. The Githunguri Gitiha Flower Growers Association (GGFGA) was formed in 1990 by a group of farmers in order to improve the marketing of flowers from the area. Virtually all the flower growers in this area were cultivating Marina and were experiencing difficulties in getting buyers for their crop. By forming an association, the members expected to be in a better position to attract exporters to the area and to seek assistance from the HCDA. Members contributed 450 shillings per season to rent a shed from where they could grade and sell the flowers to exporters. Although the area was frequented by exporters, they could not absorb all the flowers produced. As a result, many growers have uprooted their crop.

At the time of the 1992 survey, all export flower growers in Nyandarua were members of the Kinangop Flower Growers Association (KFGA). The KFGA was established in 1991 by growers to assist members to recover their money from exporters who had taken flowers on credit, and attract reliable buyers to the area. According to the leaders of the group, other goals of the association include assured market, higher prices, and access to market information.

While most of the money owed to growers has yet to be recovered, the KFGA has succeeded in making arrangements with a major flower exporter to

buy flowers from Nyandarua on a regular basis. With the assistance of the exporter, KFGA has also constructed a grading shed and a charcoal-based cooling store for overnight storage. Under this arrangement, the exporter will provide four graders and purchase flowers from the area twice a week at an agreed upon price. At the beginning of the 1992/93 season, the exporter offered to pay 1.40, 1.20, and 1.00 shillings per stem, respectively, for each grade of Marina purchased. From the gross price, the exporter would deduct 40 cents per stem for transport, grading, and other marketing expenses. Remuneration for the flowers purchased would be made every two weeks.

Besides a 100 shillings membership fee, each grower is charged one percent commission on the gross sales of flowers sold through the association. The commission pays for running the association and administrative costs. Each member also contributed 400 shillings to finance the construction of the grading shed and cold storage facility. Members are required to sell flowers to exporters involved with the association. But the association has attracted only one exporter to the area who is unable to absorb all of the flowers. Currently, the association does not have a means of controlling the supply of flowers from the area.

The advantages to growers of selling flowers through the association include a reduction of marketing risks in terms of price, grades and quality of the flowers when they arrive at the market, and an outlet for flowers. Moreover, the prices for flowers sold to the exporter under the arrangement with the association are negotiated prior to the onset of the export season and therefore the growers

know what prices to expect. All flowers sold through this arrangement are graded at the group's grading shed and both the grower and exporter receive a voucher stating the amount and grades of the flowers from the grower. Exporters who buy flowers directly from farmers without involving the association often regrade the flowers in Nairobi and report the grades back to growers at the time of payment. Because growers generally do not trust the exporters local report on grades, by channeling the sale of flowers through the association, this problem is reduced.

At the time of the field research, the arrangement between the association and the exporter had just started and there was not sufficient data for measuring its impact. Further research is needed to examine the effects of the association, on the prices received by growers before and after the formation of the association and the relationship between member prices and non-member prices.

Several weaknesses limit the KFGA's effectiveness in vertically coordinating the production and marketing of flowers. First, KFGA does not engage in the buying or selling of flowers and, unlike members of a cooperative, members of KFGA are not obligated to deliver all their produce to the association. This factor together with poor market information flow from the market to growers in this area, limit the ability of the organization to coordinate the supply with exporters' demand for flowers. Second, the arrangements between KFGA and the exporter are verbal agreements. Because flowers are highly perishable, if the exporter does not collect flowers as agreed, it could result in serious losses for members. Similarly, the exporter runs the risk of growers selling

their flowers elsewhere. Moreover, given the large number of growers in the area, and the fact that a single exporter cannot absorb all the flowers produced, marketing still remains a major problem for farmers in the area.

The problem of uncertainty about the market outlet is more severe for growers than for exporters, since the latter are usually growers themselves and have direct links to the export market. During the 1991/92 season over 90 percent of the smallholders did not have any prior arrangements for marketing their flowers. Even growers who sell through the KFGA are not guaranteed an outlet for all of their produce. As a result, many growers have been unable to sell significant proportions of their crop over the past two years. Unsold flowers, especially alstroemeria are destroyed since the local market, mainly Nairobi, consumes an insignificant amount of this product. Table 5.7. illustrates the proportion of losses incurred by growers from unsold flowers. The data shows the value of unsold flowers as a percentage of total possible revenue. On average, smallholders incurred a 42 percent loss in potential revenue from unsold flowers in 1991. The 19 growers from Nyandarua district lost 51 percent of their potential revenue from unsold flowers in 1991.

Table 5.7.Kenya: Loss in Potential Revenue from Unsold Flowers, by Market Arrangement; 1990-91 and 1991-92 Export Seasons.

	1990		1991	
Market arrangement	Number of growers	Percent of growers	Number of growers	Percent of growers
Direct Export	4	6.67	4	20.33
Farmer-to-Exporter	32	8.93	32	44.08
All Growers	36	8.68	36	41.78

Notes:

The main cause for losses to the vertically integrated growers who export flowers directly was flower spoilage due to delays on transit and inadequate air cargo space for in time shipment.

Source: 1992 Farm Survey.

A major weakness identified in flower marketing was poor access to market information. Growers who export directly have internalized information systems and receive feed-back from clients and agents about the condition of the flowers reaching the market, current prices and the types of flowers in short supply. The small and medium sized growers who do not export directly can get information about the European markets only if they travel to HCDA's offices in Nairobi. This lack of timely and reliable information leaves them with inadequate knowledge about the demand in both the local and the export markets.

For flowers exported directly by the growers and sold through the Dutch auctions, the terms of sale are specified by the relevant auction market. At the

VBA auction, each grower (or exporter) designated as the seller in the auction is responsible for any apparent quality deterioration in the flowers. The flowers are inspected immediately before the sale and prices are determined through biding.

The terms of sale for flowers sold locally to exporters vary depending on whether a grower association was involved in the arrangements of the sale. Under the KFGA-exporter arrangement, the prices were agreed upon at the time of sale and the exporter assumed the responsibility for the condition of the flowers after the initial exchange. However, payment was effected two weeks after the exchange. In situations where the transaction was between an individual grower and exporter, the price was frequently determined after the exporter sold the flowers in Europe. Under these situations, growers bore the full risk of quality deterioration.

The poorly developed vertical coordination between the smallholders and flower exporters has contributed to a lack of confidence in the market. The lack of confidence arises because of the loose nature of the sales agreements and the absence of predictable standard operating procedures. For example, although most exporters promise to remunerate growers after selling the flowers in Europe, the agreements are seldom in writing. Thirty-one percent of the growers interviewed complained of nonpayment following delays in transit which reduced the quality of the flowers. Overall, 77 percent of all growers expressed dissatisfaction with the existing marketing organization.

Historical evidence reveals that the ability to export directly is critical to maintaining viable flower enterprises. Capitalization and trading arrangements between the large growers or exporters and the destination market in Europe are crucial. Currently the KFGA does not have the capacity to export flowers directly to Europe.

5.1.4. Principal Marketing Constraints

Based on an analysis of flower marketing at the farmer level and informal discussions with growers and exporters, the major marketing constraints facing smallholders are a lack of market information and a lack of reliable marketing arrangements. Table 5.8. reports the mean scores for the marketing constraints as perceived by the interviewed growers. Growers were asked to rank each constraint on a scale of one to three according to the degree of severity. The individual scores for each constraint were normalized along a scale of zero, for least severe, to one, for most severe. The normalized scores were averaged first, across all growers surveyed and across those in each of the three farm categories identified previously. The normalizing and averaging of the scores provided cardinal estimates indicating the severity of each constraint in relation to another, for smallholders in general and between growers in the three farm categories. An average score of zero indicates that the constraint was perceived as least binding, that of one, most binding. For a better understanding of the results, especially in

relation to the role of market coordination mechanisms in harmonizing production and marketing, the table includes scores for the production constraints identified in chapter four. Though based primarily on growers' perceptions, the conclusions drawn from these results are crucial inasmuch as they confirm the production constraints diagnosed in chapter four and the market coordination deficiencies discussed above.

Table 5.8.Kenya: Constraints on Smallholder Participation in Export Flower Production, 1991-92 Season.

Constraints	Category of growers			
	Large growers	Medium growers	Small growers	All growers
Marketing Constraints				
Lack of access to reliable market outlet	0.50	1.00	1.00	0.97
Lack of relevant market information	0.83	0.91	0.83	0.87
Production Constraints				
Lack of access to planting materials	0.60	1.00	0.86	0.85
Lack of access to finance	1.00	0.87	0.87	0.89
Lack of technical information	0.80	0.58	0.81	0.73

Notes:

The sample size was 36 growers. In the large, medium, and small grower categories, the number of respondents was 5, 12, and 19, respectively. The figures are mean normalized scores along a zero to one scale, in which constraints ranked close to zero are least severe and those close to one are most severe.

Source: 1992 Farm Survey.

The results recorded in Table 5.8 reveal that the lack of access to a reliable market outlet was the most important constraint facing smallholder flower growers in 1991. Both the smaller and the medium class of growers have a significantly higher absolute score than do the large, indicating that the constraint was more severe for the former two types of farmers. This finding reinforces the conclusions drawn from the results on marketing channels and vertical coordination mechanisms adopted by flower growers. Lack of access to a reliable market was identified as the most severe constraint by 32 out of all 36 growers interviewed, giving a mean score of 0.97. A comparison of the severity of this problem between the three categories shows all 19 small growers identifying this constraint as the most severe. Eleven out of the 12 medium and two out of the five large identified it as such. Earlier results from the production analysis demonstrated the large losses incurred by growers from unsold flowers. Therefore, these combined findings stress the need for addressing the absence of a reliable market and market information for smallholders and a means to harmonize local production with market opportunities if they are to compete in flower cultivation for export.

Lack of market information is a serious problem, with a mean score of 0.87. Twenty-six out of the 36 growers felt that they had very poor knowledge of what the demand was in the market, and therefore could neither effectively plan their production nor bargain for better prices from the exporters. Lack of access to planting materials was also cited as one of the severe constraints. Again, the

majority of those who perceived this as a serious constraint were the medium and smaller growers. Lack of technical information about the aspects of flower production was also an important problem facing the growers, although it was ranked lowest among the constraints.

5.2. Smallholder Bean Marketing

This section describes the marketing organization of the smallholder bean subsector and contrasts it with the flower subsector. The analysis focuses on the role of forward contracts in affecting the bean growers' incomes. The principal smallholder bean producing areas, such as the Kirinyaga and Kiambu districts in the Central Province and the Machakos district in the Eastern Province, are well served by a good road system which allows exporters easy and timely access to the area and from the production area to the Nairobi airport. This analysis is focused on the Kirinyaga district, where the average farm size for the farmers interviewed was 7.4 acres, approximately 49 percent of which was dedicated to bean production. The principal alternative cash crops in the area are tomatoes, onions, and maize.[56]

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[56] Rice, grown in the Mwea irrigation scheme under the auspices of the National Irrigation Board (NIB) and an important cash crop in the area, is technically not an alternative crop because the tenants cultivating it are not permitted to grow any other crop.

Although beans are grown throughout the year, smallholder production between October and June is targeted to the off-season market in Europe. Two crops of beans are generally produced each year, one from October to December and the other between January and May. Beside producing beans for the fresh export market, smallholders also sell beans to processing factories. Most smallholders in the survey area, however, cultivate beans destined primarily for the fresh export market and only a few have contracts with the canning industry.[57]

5.2.1. Bean Marketing Channels

Smallholders have two alternative marketing channels:

1. Grower to an exporter using forward contracting arrangements,

2. Grower to the exporter through "Brokers"[58],

3. Grower to exporter through an exporter's agent,

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[57] High Land Canners (HCL, ltd.), a French bean processing factory based at Thika near Nairobi, has recruited small-scale bean growers from Kirinyaga and supplied them with seed for a new type of bean suitable for canning. The new type of bean differs from Monel, the variety grown for the fresh market, in both color and texture and is produced specifically for canning.

[58] The term "brokers" as used by bean growers and exporters differs from its normal usage of " one hired for a fee to negotiate purchases, contracts, or sales". Bean brokers buy and deliver beans to the agents and make their margin from the difference between what the agents are willing to pay and the price brokers offer to the growers. According to bean growers, brokers do not negotiate prices with them.

Since no smallholder in the survey was exporting beans directly, the discussion is focused on the first two channels. The third channel, although common in other bean producing ares, is rarely used in the Kirinyaga area. Figure 4. shows the breakdown of the marketing channels used by bean growers. Whereas the volume of beans produced annually by smallholders is known, it was impossible to gain information on the volume of beans moving through each channel.

About one third of the growers interviewed market their beans through forward contracts with exporters and about two thirds sold their beans to exporters through market intermediaries. In channel two, the beans pass through a "broker" before they get to the exporter's agent.[59] The "brokers" are generally from the area, some of whom are growers, who offer to buy and gather beans in a central location on behalf of the agents at a commission. The commission is determined by the "brokers" and it is the discount they place on the price offered to growers. This procedure saves the agents the time and transport necessary to gather beans from small and dispersed growers. A majority of the growers interviewed, although they did not like this arrangement, they have no practical alternatives to this. Growers do not like selling through this channel because they

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[59] Informal discussions with exporters indicates that it is nearly impossible for exporters who do not have forward contracts with growers to purchase beans in the Kirinyaga area without passing through the "brokers." Brokers are surprisingly uncommon in other smallholder bean producing areas.

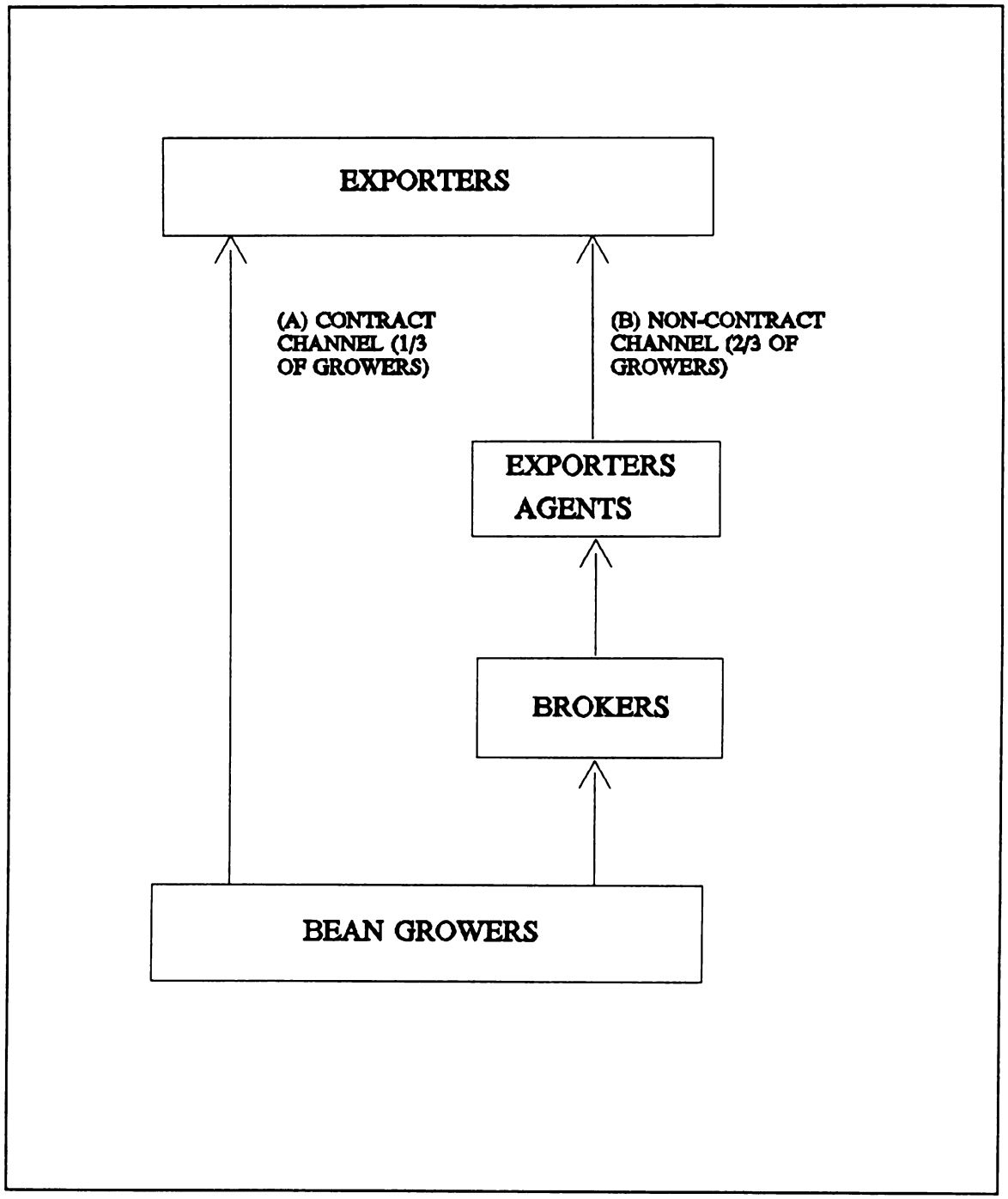

FIGURE 5.1. Kenya: Bean Marketing Channels

Source: 1992 Farm Survey

report receiving lower prices from "brokers." Exporters using this arrangement complain about the commission as an extra cost.

Bean marketing channels differ by farmer size. Larger growers, with an average of 7 acres under bean cultivation have a higher probability of selling through forward contract with an exporter, than do smaller growers. Smaller growers channel their beans mainly through the so-called "brokers." Besides bean acreage, farmers who have cultivated beans for a long period--five years and over--also stand a higher chance to produce beans under contracting arrangements.

Table 5.9 presents information about the distribution of growers according to the type of marketing channels used during the 1991/92 export season.

Table 5.9.Kenya: Bean Marketing Channels, by Farmer Size, 1991.

	Percent of Growers Using Channel					
Bean area (acres)[a]	Growers selling through contracts		Growers selling through Brokers		Total	
	number	percent	number	percent	number	percent
< 1.0 acres	2	6.67	6	20.00	8	26.67
1 -3.5 acres	2	6.67	11	36.66	13	43.33
> 3.5 acres	7	23.33	2	6.67	9	30.00
Total	11	36.67	19	63.33	30	100.00

Notes: a: refers to the bean area categories: < 1.0 acres is small, 1-3.5, medium, and over 3.5 large.

Source: 1992 Farm Survey.

The major conclusion to be drawn from the table is that selling beans through "brokers" is the most common marketing channel used by smallholders in the Kirinyaga area. One of the reasons for the unpopularity of this marketing channel among exporters was the tendency for smaller growers to break the contract when prices were higher outside the contract. For this reason, most exporters were reluctant to make contracts with the smaller growers. As Table 5.9 shows, two thirds of the growers interviewed are small and medium producers. Less than half of those selling under contract belonged to the small and medium category of growers.

5.2.2. Market Coordination for Beans

Market coordination for smallholders in the bean subsector is more effective than in the flower industry because there is a more effective mechanism to match supply with demand in the bean industry. For example, bean growers lost 11 percent of their production from unsold beans compared to a 40 percent for flower growers. Large bean growers have developed vertical integration coordination mechanisms similar to those found for large-scale flower firms. However, unlike smallholder flower growers, bean growers have an option of producing and marketing their crop through forward contracts with exporters. Agricultural economists have identified forward contracts as an effective

mechanism of coordinating production and marketing of highly perishable horticultural products (Kauffman, and Shaffer, 1983; Glover, 1990).

5.2.3.1. Horizontal Coordination

Discussions with officials of the Horticultural Division of the Ministry of Agriculture (MOA) revealed that horizontal coordination of the bean growers was poorly developed. The limited horizontal coordination consists of informal groups of growers for purposes of securing collective agreement on prices with exporters. However, because they lack a means of enforcing such agreements, these organizations are inherently unstable. The survey did not identify any formal or informal organizations of bean growers in Kirinyaga district.

5.2.2.2. Vertical Coordination

Vertical coordination mechanisms span a continuum from spot markets to intermediate forms such as market contracts, grower associations and cooperative, to vertical integration where decisions are internalized in a single firm. The 1992 survey of growers and discussions with exporters revealed that forward marketing contacts and the use of "brokers" were the most common mechanisms used by smallholder bean producers. Vertical integration was predominantly used by large-scale growers. Only a third of the growers interviewed coordinate their

production and sale of beans through the system of forward marketing contracts, whereas two thirds depended on "brokers."

Bean growers who had contracting arrangements with exporters received regular technical advice on bean production, and production credit. Virtually all the exporters who had contracts with growers had field officers who regularly visit farmers to give advice, monitor the growth of the crop, and ascertain the expected output. The majority of exporters are experienced growers who provide advice to the contract growers. Production credit provided by the exporters is given in kind, usually in the form of seed or fertilizers and pesticides, with the agreement that the grower will sell all of the crop to the exporter, who will deduct the value of the credit from the sale of the crop. However, given that these agreements are seldom in writing and difficult to enforce, growers frequently sell part of the crop in the spot market if the price is higher there. This is one of the primary problems cited by exporters regarding the use of forward contracts.

5.2.2.3. Payment Terms and Net Prices Received, by Market Channel

A major concern to the bean growers was the fluctuation in farm gate prices during the season. In general, the prices that growers receive vary according to the period in the export season. Bean prices are generally higher at the beginning of the export season when exporter compete for the early crop and drive up prices. As the season progresses, more beans enter the market, which

forces the price downwards. Towards the end of the off-season, imported beans compete with locally produced beans in Europe, which reduces the export price and, in turn, the price to growers.

However, beside these normal market fluctuations other local factors contribute substantially to price fluctuations. First, the number of bean growers has increased over the years causing an oversupply, especially during the middle of the season. Compounding this is the problem of air freight limitations, which sometimes causes exporters to suspend procurement of beans until sufficient cargo space is available. Second, the absence of active horizontal coordination at the farm level limits the bargaining power of growers. Smallholders interviewed complained that marketing intermediaries, especially the "brokers," capitalize on their weak position and obtain considerable price concessions from them. The survey results showed that although the buying price for beans was determined by "brokers" and exporters' agents, there was no evidence of monopoly power by "brokers". Moreover, the survey did not establish any significant barriers to the brokerage business. The majority of the "brokers" were young men prepared to devote their time and energy to gather beans for exporters. With data available for only one season it was not determine the fluctuation of the brokerage income. It was apparent, however, that "brokers" provided an important service to both exporters and growers.

Table 5.10 presents results from an analysis of variance to determine whether the use of a forward contracting system significantly reduces the

fluctuations in farm gate prices for bean growers. The results show that the system of forward marketing contracts used by bean growers in the Kirinyaga area was not significant at the conventional 95 percent level of statistical significance in minimizing price fluctuation.

Table 5.10. The Mean Deviation of Prices Received, by Sales Channel

	Extra Fine Bean		Fine beans	
Sales Channel	Mean deviation (sh/carton)	Level of Statistical Significance	Mean deviation (sh/carton)	Level of Statistical Significance
Contract	19.32	0.3651	17.72	0.5734
Brokers	23.00		19.83	
All	21.60		19.03	

Notes: The sample size was 30 bean growers of which 10 were under contracts with exporters. The prices used in the analysis were averages for the beans harvested and sold. When bean prices offered fell below 5.00 shillings per carton, growers stopped harvesting the crop.

Source: 1992 Farm Survey

The mean deviation of prices faced by growers who used forward contracts with exporters was 19.32 and 17.72 shillings per carton, respectively for extra fine and fine beans. By contrast, farmers selling through brokers experienced an average fluctuation of 23 and 19.83 shillings per carton for extra fine and fine beans, respectively. Since the difference between the effects of the two sales channels on prices is not statistically significant, the hypothesis that the system of

forward contracting used by bean growers results in stable prices for growers is not confirmed.

Table 5.11 reports the mean and range of prices received by bean growers who produced under forward contracts and noncontract bean growers. These results show that contract bean growers obtained on average higher and less variable prices than noncontract growers. The coefficient of variation for the prices of the two grades indicates less dispersion for the contract prices than noncontract grower prices.

Table 5.11.Kenya: Bean Prices Received by Contract and Noncontract Growers, 1991-92 Season.

Grade of bean	Mean price (Ksh./ carton	Price range (Ksh./ carton	Coefficient of variation	Mean price (Ksh./ carton	Price range (Ksh./ carton	Coefficient of variation Extra fine
Extra fine	55.00	50.00 to 60.00	0.04	47.50	40.00 to 70.00	0.15
Fine	44.09	35.00 to 50.00	0.09	35.26	20.00 to 50.00	0.18

Source: 1992 farm and exporter survey

Table 5.12. provides some information about the proportion of beans that was not harvested for both growers who sell under contract and those who do not. These estimates are based on growers' own approximations and the researchers

impressions during the farm survey. The results indicate that about 11 percent of the 1991/92 bean crop from the study area was not harvested, primarily because the price was too low to cover the harvesting costs. Only about 5 percent of the crop from contract farmers was not sold, whereas approximately 14 percent of the beans from noncontract growers was not harvested. This implies that the overall prices received by noncontract growers for the amount of beans produced was significantly lower than that for contract farmers.

Table 5.12. The Proportion of Beans Not Harvested for Contract and Noncontract Farmers, 1991.

Type of grower	Number of growers	Unharvested beans (percent)
Contract grower	11	5.0
Noncontract Grower	29	14.2
All growers	30	11.1

Source: 1992 Farm Survey

5.2.2.4. The Impact of Contracting on Growers Income

A stepwise multiple regression was estimated and the results were used to test the hypothesis that forward marketing contracts increase the income earned by growers. The dependent variable used in the estimation was the growers' gross margin per acre. The variable of immediate interest in the regression analysis,

contracting, was entered as a dummy variable taking the values zero or one for "brokers" or contract. Only contracting as a variable entered the equation and the results are shown below.

The other independent variables--farm size, number of years in bean production, age of grower--were insignificant and did not enter the estimated equation. The correlation matrix indicated that these variables were highly correlated with one another (over 0.7) suggesting a problem of multicolinearity. Also the correlation coefficient between farm size, age of grower, and years in bean production with contracting was 0.52, 0.64, and 0.50. However, because all of the other independent variables besides contracting were lowly correlated with the dependent variable they were considered insignificant in explaining the variation in gross margin per acre.

Variable	Est. Coefficient	Std.Error	Significant level
Contracting	9223.8397	4410.3169	0.0457
Constant	15542.9421	2670.5795	0.0000

R^2 = 0.13511, Adj. R^2 = 0.10422

The coefficients for the variable in the equation have the expected sign and are both significantly different from zero. The results indicate that the growers who do not use contracting arrangements earn an average of 15543 shillings per acre of beans, whereas the use of contracting increases gross margins per acre by 9224 shillings. However, since the values of R^2 and Adj. R^2 are low, much of the

variation in gross margins cannot be explained exclusively by contracting alone. The main conclusion to be drawn from these results, however, is that forward marketing contracts significantly improve the income earned by smallholder bean growers.

The results from the analysis of the impact of contracting on price variability showed that the variability was not significant by the 95 criterion. The data, however implies that the variability was significant at the 65 percent level. The coefficient of variation observed for contract prices and noncontract prices reveal that prices received by noncontract growers were more variable than contract prices. Besides stability in prices, contracting provides grower with other advantages that can results in higher incomes. Because of the guaranteed market, growers under contract invest more in the care and management of their crop. The results in chapter four reported that yields were significantly higher for larger growers (most of whom had contracts) than was for the small noncontract farmers. The availability of credit for inputs and advice from exporters also contributes to the higher incomes for contract farmers.

5.2.3. Summary

A large percentage of smallholders in both bean and flower industries do not have effective mechanisms to coordinate their production and marketing. The results of the flower and bean marketing analysis revealed that the smaller

growers in the two subsectors rely heavily on the market price to coordinate their activities. However, because of a serious lack of widely distributed marketing information on both the local and export bean and flower markets, virtually all of the small growers operate under great uncertainty. As a result, the small and medium growers earned substantially lower prices and income than the large growers. A majority of the large growers in both flower and beans had more effective coordination arrangements.

However, the results have also revealed that, on average, production and marketing by smallholders is more effectively coordinated in the bean than the flower subsector. Bean growers who are unable to export directly to Europe, have an option of producing under forward contracts with exporters. Eleven of the 30 bean growers interviewed (37 percent of growers), had contracts with exporters and earned higher gross margins per acre than noncontract growers. A comparison of mean prices received by contract and noncontract growers revealed that the former obtained higher and less variable prices than the non-contract growers. Contract growers also received support services from the exporters, including market information, which enhanced their performance. However, because of a problem of enforcing of the contracts, it is not widely used in bean production.

Coordination of production and marketing in the flower subsector is stronger for the larger growers who also export flowers directly to Europe. Small and medium growers who sold their flowers to exporters in the country do not

have an effective mechanism to match their production and market demand and therefore, they incurred large losses in potential revenue from unsold flowers. However, the study identified the KFGA--an association of Nyandarua flower growers--as an institution that could improve the production and marketing of small growers in the area if credit and information constraints were reduced.

CHAPTER SIX

COMPARATIVE ASSESSMENT OF FLOWER AND BEAN SUBSECTORS

6.1. Introduction

This chapter presents a comparative evaluation of the flower and bean subsectors and an analysis of policy and institutional reforms to increase smallholder production of nontraditional exports. This assessment is based on enterprise budgets for flower and bean growers and findings from the marketing analysis. Vertical coordination mechanisms will be highlighted because the nature of these arrangements will determine, to a large extent, both the production and marketing outcomes of a subsector. For example, the way in which flower growers, exporters, and the European markets are coordinated along the vertical production-distribution chain, is a critical determinant of growers' access to agronomic information, inputs, and marketing opportunities. Likewise, the array of flowers produced in a region will influence the number of exporters in the and nature of flower market available to growers.

It is clear from the analysis that good vertical coordination, access to credit and information enabled some farmers to become large and diversified flower growers. What is unclear is how these growers were able to build the vertical integration that leads to their good performance. Further research on the evolution of large growers could provide insights on this. But the focus of this

study is how small growers individually and collectively can establish effective vertical coordination arrangements and attract capital in order to improve their performance.

6.2. Performance Issues

The specific performance issues to be addressed are the vertical coordination of production and marketing in the two subsectors. In terms of coordinating production, the major issues include the effectiveness of vertical coordination in ensuring access to technical information, credit, technology, and reliable market outlets. Vertical coordination is especially critical in the flower subsector because new technologies and flower types are constantly being introduced in the market. The comparison of the coordination of flower and bean marketing will focus on the degree of market uncertainty and the availability of production inputs and market information for different groups of participants. Enterprise budgets will be used to compare the economics of production for small, medium and large growers.

6.3. Flower Production and Marketing

A. Access to Technical Information and Planting Material

Chapter four revealed that vertical integrated producers (about a fifth of those interviewed) cultivated a diverse mix of high value flowers because they have better access to the high value planting materials. On the other hand three-quarters of the smallholders were locked into producing low value marina flowers. However, improving the availability of high value planting materials to non vertically integrated smallholders is insufficient to induce these farmers to adopt new varieties because they lack access to credit. Therefore, a strategy to increases access to new varieties of flowers must also address the credit constraint.

One solution to this problem is for small growers to acquire credit and imported planting materials through the recently formed grower associations. With support from the government, The Kinangop Flower Growers Association (KFGA), for example, could be used to purchase seed and pay a royalty on behalf of small growers.[60] Research trials should be carried out on flowers with less costly planting materials such as arabicum, tuberose, and ornithogalum in the Nyandarua area.

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[60] The grower associations would require access to government credit for the purchase of seed.

Access to technical information was also a primary concern of all interviewed growers. Growers were unable to obtain local agronomic recommendations for plant spacing, type and level of fertilizer, type and level of pesticide and fungicide application for each of the diverse flowers currently in the market.[61] A group of large growers in the Kiambu area paid a consultant US$ 300 per visit (normally lasting three days) for technical advice, but small growers were unable to afford to pay consultancy fees. Finally, growers who have access to technical information often conduct their own on-farm trials in order to develop local agronomic recommendations for each type of flower. Without question, public floricultural research has lagged behind the expansion of the industry. Increased public research and extension are needed on floriculture and extension in order to ensure continued growth of the subsector.

B. Access to Capital

The analysis in chapter four revealed that flower cultivation for export has a large potential for income and employment generation even for small farms with less than one acre of flowers. However, flower production is capital intensive

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[61] Because agronomic information from foreign experts and production manuals is based on overseas production conditions, it requires adaptation to local conditions. Sulmac Co. Ltd. for example, currently has more than 300 flower varieties under trial on a separate section of their Naivasha farm. According to the technical manager of the research trials, the company does not initiate commercial production of any flower variety until it has undergone trials under local growing conditions for at least two years.

and small growers face a serious credit constraint. The survey revealed that only the larger growers cultivating high value flowers obtained credit. None of the small and medium growers applied for credit for flower cultivation. The reasons for this are unclear but two possibilities arise. First, flower cultivation is a risky activity because of both the perishability of the product and market uncertainty. For example, chapters four and five showed that small and medium growers lost between 40 and 50 percent of their potential revenue from unsold and unharvested flowers in 1991. The farmers' level of risk aversion is unknown, but since the majority of them are relative newcomers to flower production, risk aversion is expected to be high. Second, because the title to land is frequently required as a form of collateral for agricultural loans, many farmers are unwilling to risk loosing their land because of unsold flowers or a sharp decline in market prices.

C. Access to Reliable Market Information

The lack of access to reliable market information is undoubtedly a major factor influencing the performance of a subsector. For example, Stiglitz (1989: 209) observes that: "Imperfect information impedes entry into markets...[and] because consumers may be concerned about the quality of the good produced, new entrants may have difficulty in establishing themselves in the new market...". Market institutions, either for products or factors of production, cannot function

efficiently without timely and reliable information about market prices, quantities, quality, and grades. However, the analysis in chapter five revealed that small growers are ignorant about market prices, and quantities and quality of flowers sold in local and European markets. The critical question that emerges is the following: how can Kenyan smallholders compete in global markets when they lack basic information about prices, the kind and quantity of flowers needed, and market opportunities?

The marketing analysis in chapter five revealed that only four large grower exporters were receiving up to date information through telex and fax about the flower markets in Europe. Twenty-six of the 36 surveyed growers (18 of them from Nyandarua) depended on other growers and exporters for market news. Surprisingly, none of the 26 growers were aware that they could obtain information about European flower markets from the Nairobi office of the Horticultural Crops Development Authority (HCDA). The HCDA receives weekly information about major European markets by telex from the International Trade Center (ITC), Geneva, and makes this available to growers and exporters who visit their Nairobi office. While this is an important service to the industry, it is infeasible for hundreds of small growers to travel 100 to 150 kilometers to Nairobi for market information. Therefore, there is an urgent need to disseminate this information to farmers throughout Kenya.

The survey also revealed that small growers were poorly-informed about local market prices for flowers traded and the type , quality and quantities of

flowers demanded by local exporters. Currently there is no market information system reporting on local trade in flowers.[62] This lack of information subjects farmers to possible exploitation by middlemen and exporters. More specifically, "when no widely known market prices exists, each transaction is attended by bargaining, which imposes costs and in general reduces the amount of trade from the economically optimal level" (Klitgaard, 1991: 35). Therefore, a local market information system would also create transparency in the sale of flowers from growers to exporters and improve efficiency in the subsector. Exporters would also be in a better position to make strategic plans in the sale for flowers abroad.

Spatial coordination of the flower market within Kenya at the first handler level was found to be weak. Lack of information about the market for flowers in the two major smallholder producing areas could be one of the reasons for this problem. The prices received for flowers produced in Nyandarua and sold to exporters are about half of those received for the same flower in the Kiambu area. In addition, it was found that around 50 percent of Nyandarua grown flowers were unsold, whereas in Kiambu only 29 percent were unsold. The survey results

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[62] The Marketing Division of the Ministry of Agriculture (MOA) collects and disseminates daily information on prices and quantities of agricultural products sold in local markets. This information does not include nontraditional exports, such as flowers and beans even though there is substantial local exchange at the first handler level.

suggest that improving market information for growers could enhance spatial integration of the two areas.[63]

D. Performance by Size

Larger growers achieved more effective coordination of the production and sale of flowers than the small and medium growers. Vertical integration provided significant benefits for the large growers and accounts for much of their success in flower production. The survey results also reveal that growers with 8 to 20 acres of flowers have better access to technical information, appropriate planting materials, the capital needed to import seed and other production inputs, and have direct access to European markets. Because they have access to the high value flower planting material and are able to sell directly on the European market, they received higher prices than small and medium growers. In fact, the large growers earned about 90 percent higher net margins per acre of flowers than small and medium sized growers. Also because large growers had better

[63] Although the survey did not reveal significant differences in the transportation costs from Kiambu and Nyandarua to the Nairobi Airport, the latter is more physically isolated from Nairobi. Moreover, the roads in Nyandarua are often impassible, especially in the rainy season. Both of these factors discourage exporters from buying flowers in Nyandarua. This is likely to be a problem for the Kinangop Flower Growers Association (KFGA) when it starts to market flowers for members in the near future. A better road network in Nyandarua will improve the evacuation of flowers and other horticultural and dairy products from the area.

knowledge of the types of flowers desired by European firms, they incurred less loss of potential income from unmarketed flowers.[64]

Small growers, especially in the Nyandarua were producing high quality flowers without investing in shade houses because of the favorable climate. The vertical coordination of flower production and marketing by the smaller and non-vertically integrated growers may be improved by grower association. However, because the grower associations are new, it was not possible to ascertain how efficient they will be in the two flower areas. Follow-up research is needed on grower associations.

E. Needed Policy, Technical, and Institutional Innovations

This comparative institutional assessment has pointed out the inability of indigenous flower growers in the Nyandarua area to match their production with the changing European demand for flowers. This failure of individual growers to match supply with demand is dramatically illustrated by the 40 percent average loss of potential income from unharvested flowers relative to the bean sector where the use of forward marketing contracts resulted in an 11 percent loss from unharvested beans. Table 6.1. presents a summary of the major problems identified in the flower industry and the needed policy, technical and institutional innovations.

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[64] In the 1991/92 season, large-sized growers who sold flowers directly on the European market lost approximately 20 percent of potential revenue from unsold flowers. The small and medium growers lost about 44 percent of potential revenue.

Table 6.1. Flower Subsector: A Matrix of the Problems and Needed Policy, Technical, and Institutional Innovations

Problem	What growers can do	What buyers (e.g. exporters) can do	What the government can do
Lack of agronomic information on flowers			Increase applied research on flowers, conduct adaptability trials for each existing and new type of flower.
Lack of appropriate planting materials	Form grower association and purchase material for members.		Assist grower association with credit to finance purchase of planting material royalties;The HCDA in collaboration with (KARI) to import new planting material to develop and sell to grower associations.
Lack of access to credit and need for collateral		Exporters with access to planting material could provide this in kind to growers under contractual arrangements	Agricultural Finance Corporation (AFC) to channel credit to growers through grower association.
Lack of access to market information about European markets	Visit HCDA office for information		The MOA to expand its market information coverage to include weekly information about European flower markets; the government should assist Grower Associations develop informational infrastructure, such as telex/fax to rapidly disseminate market information to growers.
Lack of information about local market prices, quantities and quality of flowers.		Collaborate with the HCDA and MOA by providing information	The MOA's information service should include market information on the local flower market.
Lack of an effective institution to coordinate flower production and marketing by small-scale growers	Form grower association which could give members contracts to grow flowers		The HCDA should recognize and assist flower grower associations by providing technical assistance, grading and standards, and timely market information.

6.4. Bean Production and Marketing

A. Access to Technical Information and Planting Material

Access to planting materials does not appear to be as critical a problem for bean growers as flower growers. The monel bean variety used in bean production is available locally. The 11 growers under contracts received bean seed on credit from exporters. However, agronomic information about types and application rates for fertilizer, insecticides, and fungicides was not readily available. It is not clear why there is a lack of agronomic information on beans. Research on beans has been carried out at KARI's horticultural research center at Thika for a longer period of time than for flowers. A possible explanation for this problem, particularly on the lack of information on the level of application of chemicals, is that most pests have become resistant to the recommended chemicals. As a result, the recommendations from the Ministry of Agriculture field staff are quickly outdated. This problem was found to be more severe for the non-contract growers.

Growers under contracts with exporters generally receive both seed and other inputs (fertilizers and chemicals) on credit along with agronomic advice and supervision from exporters. A majority of the exporters who contract with farmers also grow beans and carry out their own trials on chemical and fertilizer use.

B. Access to Credit

Bean production is less capital intensive than flower production. In fact, the seed requirements for an acre of beans are 60 percent cheaper than for marina flowers.[65] The major production inputs for beans include fertilizer and chemicals. But surprisingly none of the 19 surveyed non-contract bean growers applied for credit in 1991. It appears that credit and capital are not major constraints on bean production because growers with contracts can obtain fertilizer, seed, and chemicals in kind.

C. Access to Reliable Market Information

Access to credible information about market prices, and the quantity and quality desired in the market is vital to both growers and buyers because it enables them to make strategic production and marketing plans. The HCDA receives ITC weekly horticultural market information from the major European markets and makes it available in their Nairobi office to anyone who requests for it. The information includes prices and quantities and quality of beans from all the major suppliers in all the main European markets. However, none of the interviewed growers has ever used this source of information. Currently, there is

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[65] There was a tendency among a few small growers to retain seed from the bean crop. However, after a season the seeds lost their vigor and yield low quality beans.

no system of gathering and reporting market prices, quantities and quality of beans at the first handler level of marketing in Kenya. Instead, bean exporters and brokers are the major source of information about market prices for growers.

Studies have shown that a lack of transparency in markets often exposes one party in the exchange to possible exploitation (Klitgaard, 1991).[66] The present study found that the 19 non-contract growers depended on brokers for information about market prices. However, despite growers complaints about unfair prices offered by brokers, the data did not confirm these complaints or identify significant barriers to participation in the bean trade.

The 11 contract growers depended on exporters for market information. The contract growers were found to be better informed about the market than noncontract growers because they received information about quantities, grades, and prices of beans needed the exporters.

D. Performance by Size of Grower and Use of Forward Contracts

Bean production was found to be profitable for small, medium, and large growers.[67] Infact, a comparison of the results of farm budgets with MOA's farm

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[66] Klitgaard (1991) observed that auctioneers in a mango market in Karachi routinely passed lower prices on to growers than those actually received at the auction because the information about market prices was not available to growers.

[67] Economists have argued that contracts between farmers and exporters or processors improve coordination and reduce uncertainty for the participants

management data revealed that bean production was the most profitable farm enterprise in the Kirinyaga area. In 1991, smallholders in the area earned 160 and 54 percent higher gross margin per acre from beans (grown under contract) than from coffee and tea, respectively. The study revealed that 11 of the 30 interviewed bean growers were using forward market contracts. Contracts in bean production were found to help reduce market uncertainty and increase the income of contract growers relative to noncontract growers. The analyses revealed that growers under contracts had greater access to technical information, received production credit in kind, and earned 93 percent higher gross margins per acre of bean than non-contract growers. Since contract growers know in advance whether the buyer wants fine or extra fine beans, they are able to plan a production and harvesting schedule accordingly.[68] The study revealed that growers under contract on average lost about 5 percent of their crop from unharvested beans compared with over 14 percent for non-contract growers.[69]

The regression results and enterprise budgets revealed that contract growers received significantly higher incomes than non-contract ones. The average gross margin per acre of beans produced by growers under contract was

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(Kauffman and Shaffer, 1983).

[68] Harvesting more than three times a week yields a higher percentage of extra fine beans. Some exporters prefer fine beans (usually destined for the U.K. market) to the tiny extra fine beans (for the French market). Some non-contract growers harvested extra fine beans and then realized that the exporters wanted fine beans on that particular day.

[69] In general, when the price of beans falls below a certain level (5.00 shillings per carton in 1991/92 season), farmers allow the beans to go unharvested.

81 percent higher than that earned by noncontract farmers. The large growers earned higher gross and net margins per acre than the small and medium growers because a majority of large growers had forward contracts. Within the medium class of growers, the two contract growers received approximately 70 percent higher net margins per acre than non-contract growers. The small growers under contract earned about 90 percent higher net margins per acre than non-contract growers.

Finally, discussions with exporters revealed that oral contracts are inherently unstable because of a lack of means to enforce them. The tendency for the smaller growers to break contracts when higher prices can be secured outside the contract has forced exporters to allocate most contracts to larger and more established growers. Because a majority of the bean growers are small and medium in size, a critical policy issue is to find ways to design enforceable contracts for small growers.

E. Needed Policy, Technical and Institutional Innovations

Table 6.2. summarizes the problems facing smallholder bean production and marketing and outlines what each of the major participants can do to improve the performance of the subsector.

Table 6.2. Bean subsector: A Matrix of the Problems and Needed Policy, Technical, and Institutional Innovations

Problem	What growers can do	What buyers (e.g. exporters) can do	What government Agency can do
Lack of up-to-date recommendations regarding chemical and fertilizer application on beans	Form contingent contracts with exporter who can provide such agronomic advice	Continue to provide agronomic advice to contract growers	KARI, the public Universities, input manufacturing expand agronomic research on bean production and disseminate the information to growers.
Lack of awareness to the existing at the HCDA information about the major European bean markets	Visit HCDA office for information		The HCDA and the Ministry of Agriculture to expand market information coverage to include weekly report on European bean markets.
Lack of information about prices, quantities and quality of beans		Be more willing to supply credible information	The MOA's Market Information System to be expanded to include the local bean market. Market information to include type of bean, quality, quantity, and prices offered by exporters for each grade.
Broken contracts	Participate in written contracts with bean exporters	Make written contracts with growers	MOA extension service to educate small growers about adhering to contracts.

6.5. Synthesis

This comparative assessment of the flower and bean subsectors has revealed that although flowers are more profitable, they are more capital intensive and more risky than beans. Small growers in the flower subsector experienced serious constraints because of a lack of agronomic and marketing information and poor coordination of their production and marketing activities. Because small flower growers in Nyandarua produce high value alstroemeria without the use of expensive shade houses, the government should encourage them to develop more effective market coordination arrangements. The flower growers' associations could provide an effective means of alleviating some of the constraints of small growers if the associations receive credit and technical support from government agencies.[70]

Bean production under contracts was more profitable and contract growers had greater access to agronomic and market information than noncontract growers. Contracts helped match the supply of beans with exporters' demand and reduced potential losses from unharvested beans for the contract growers than for noncontract farmers. However, few small bean growers had contracts because of

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[70] Grower Associations are used to coordinate small-scale production and marketing of flowers in Israel and fruits and vegetables in Latin America (Glover and Kusterer, 1990). However, growers' commitment to the association is crucial for the benefit of all members.

their reputation of breaking oral contracts. Because of the potential benefits to growers and exporters, the government should, encourage exporters and growers to examine the potential of written contracts.

CHAPTER SEVEN

CONCLUSIONS, POLICY IMPLICATIONS, AND FURTHER RESEARCH,

7.1. Summary and Conclusions

Kenya has been frequently praised by international observers for its success in articulating and implementing a smallholder model of agricultural development. Kenya's decision to emphasize smallholder development started with the Swynnerton plan that was introduced in 1954, nine years before independence. The Swynnerton plan gave priority to helping smallholders increase the production of traditional exports such as tea and coffee that had been previously grown on plantations and by large scale commercial farmers. The removal of the racial barriers to credit and other inputs and the establishment of smallholder support institutions, such as the Kenya Tea Development Authority (KTDA), led to a surge in smallholder output. However, because of declining world prices of traditional export commodities in the 1980s, many African countries are faced with the need to diversify their agricultural export base and to look for new global market opportunities.

Kenya has taken the lead in the development of nontraditional exports such as flowers and fresh beans. In fact, flower and bean exports account for over 70 percent of the value of all fresh horticultural exports. Horticulture has emerged as the fourth largest foreign exchange earner after tourism, coffee, and

tea. Moreover, since horticultural production is labor intensive, it has excellent potential for rural employment generation. However, although both small and large scale growers are producing flower and beans for export, a few large firms dominate the industry, particularly the flower subsector. For example, seven farms with more than 10 hectares (24.77 acres) under flower cultivation dominate flower production and exports. Given that most Kenyan farmers are smallholders, diversification of agricultural exports cannot be successful unless special attention is given to these firms.

Several studies have been carried out on the production and marketing of traditional agricultural exports. However, there is a lack of solid economic data on smallholders' production and marketing of nontraditional exports. Therefore, a diagnostic farm survey was carried out on flower and bean growers in 1992 to try to close this gap. Since smallholder flower and bean production are carried out in separate ares of Kenya, Kiambu and Nyandarua districts were selected for the flower survey and Kirinyaga for beans. The general objective of the study was to collect information to analyze the economics of the production and marketing of flowers and suggest strategies for expanding smallholder production and exports in the 1990s. Because smallholder bean production has been under way for about two decades longer than flower cultivation, the bean subsector study is designed to provide insights into alternative production, and marketing arrangements for flowers.

The concept of commodity subsector was used to organize the research. A commodity subsector can be viewed as an interdependent array of organizations (e.g. input suppliers, growers, exporters, etc.) involved in the production, processing and distribution of a commodity or group of commodities, such as, horticultural products. In addition to collecting base line farm management data on the cost and returns of flower and bean production, information was also collected on the impact of market coordination mechanisms on the performance of growers in the two subsectors. Special emphasis was given to identifying production and marketing constraints in each subsector and how the various market coordination arrangements affected growers' access to agronomic and marketing information, credit, and production inputs, especially planting materials.

The study found that flower cultivation was more capital intensive and risky but more profitable than bean production. As a result, smallholders experience greater difficulty in producing and marketing flowers than beans. Although small growers in the Nyandarua district produce high quality flowers because of the favorable climate, virtually all of them were locked into the production of low value, old varieties.[71] The inability to add high value flowers to the production portfolio of small farmers was caused by a lack of access to appropriate planting materials, credit, technical information. These problems were compounded by a lack of reliable market information. The survey revealed that a

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[71] The growers were classified into small, medium, and large depending on whether they had less than one acre, one to seven, or eight to 20 acres under flower cultivation. Only five of the 36 growers interviewed were large.

majority of the smallholders were ill-informed about quantity and quality of flowers demanded and about market prices. As a result, small and medium growers incurred losses of between 40 and 50 percent of potential revenue from unsold marina flowers in 1991.

The study also revealed that the large growers who exported flowers directly to Europe had better access than small and medium growers to capital, technical and market information, planting materials. The larger flower growers also earned significantly higher gross margins per acre than the smaller growers. It is clear from the analysis that the high returns achieved by large growers were partially attributed to effective coordination of their production and marketing activities.

The study also found that small growers in the Nyandarua area recently formed a growers' association to deal with the problems of flower marketing. Although the association could help promote smallholder flower production and marketing, it is hampered by a lack of capital, information, and managerial skills. With proper support from the government, the Kinangop Flower Growers' Association (KFGA) in Nyandarua could be used to assist smallholders to produce and market high quality flowers. In the long run, this collective action by smallholders could help small growers become more competitive players in global flower markets.

The survey revealed that bean production was the most profitable farm activity for smallholders in Kirinyaga district. In the 1991-92 season, smallholders

earned 160 and 54 percent higher gross margin per acre from beans than from coffee and tea, respectively. Although beans are profitable for small, medium, and large growers, they earn lower gross and net margins per acre than flowers. However, as noted earlier, beans were found to be less risky and require less capital than flowers. Bean seed was also readily available to all growers. The study revealed that large growers achieved significantly higher gross and net margins than smaller growers because a majority of the large growers produced beans under forward marketing contracts. The study revealed that marketing contracts helped reduce market uncertainty and increased the income for contract growers. However, only an eighth of surveyed bean growers had production contracts with bean exporters. Wider application of contract production is currently hindered by a problem of enforcement of oral contracts, especially among the smaller growers.

Both smallholder production of flowers and beans are constrained by a lack of locally available agronomic information on the production of these commodities. The public research institutions have been unable to keep up with the rapid developments of the horticultural industry, especially, the flower subsector.

7.3. Policy Implications

Both the private sector, consisting of growers, exporters, and other interested parties, as well as the public sector have important complementary roles to play in order to assist in the expansion of flower and bean production and exports. Indeed collaboration between the public and private sectors has been instrumental for the observed rapid growth of the horticultural export industry over the past two decades. The range of policy options for the government include generic issues for the development of the flower and bean, and specific issues for the flower and bean subsectors.

7.3.1. Policy Options for the Flower and Bean subsectors.

The range of direct activities which the government should urgently consider include the following:

1)To ensure effective matching of local supply of flowers and beans with the changing European demand. The failure to match local supply of flowers especially from the Nyandarua area with the changing European demand dictates the need for institutional innovations to improve the coordination of flower production from many small growers. The establishment of grower associations and a requirement that small growers supply flowers to the associations on contract is an alternative institutional arrangement to coordinate production of

flowers by the non vertically integrated growers. The government should consider assisting grower associations established in remote areas such as Nyandarua with the establish more efficient communication infrastructure such as telephones and fax.

2) Expand the market information system. The current practice of assuming that smallholder flower and bean producers can travel hundreds of kilometers to the HCDA's office in Nairobi for market information needs to be reexamined. In order to make the flower and bean subsectors more transparent and competitive, the Ministry of Agriculture (MOA) should expand its current market information system (radio broadcast and daily newspaper reports) to include timely information about flowers and beans. The expanded information system should go beyond market price reports and also include information on the quality and quantities traded in both local and export market. The weekly horticultural information that the HCDA receives from Europe should be summarized and widely distributed through the MOA's market information system in all the major producing areas.

3) Ensure greater access to credit for smallholders and grower associations. Small-scale growers are generally reluctant to surrender their land titles as collateral for credit because of the risk associated with the production and marketing of perishable crops such as flowers and beans. The government should consider making more credit available to individual growers or through grower associations. Credit can be extended by the government in kind and repaid from

the proceeds of flower and bean exports. Because of the transaction costs involved in dealing with many small growers, one approach would be for growers to have contracts with a growers' association and the association to have the responsibility of issuing and recovering the credit.

4) Public research. Increased applied research on both flowers and beans is urgently needed in order to generate effective agronomic recommendations to assist growers keep pace with the rapid changes taking place in these nontraditional export industries. For example, specific adaptive research is required on every type of flower in the country. The public research base is lagging behind the expansion of the flower industry. A special study should be carried out of the R & D requirements of the horticultural industry over the next 10 to 20 years.

5) Contribution from the private sector. Farmers, exporters, and input manufacturing and distribution firms also have important roles to play in furthering the development of the flower and bean industries. Without question, the quality of highly perishable horticultural exports is influenced by what transpires on at each stage in the production-marketing chain. The initial production and handling activities by the growers are crucial in maintaining quality. Small growers need help in learning about the required quality standards and voluntarily adhere to them. The maintenance of acceptable quality standards will help smallholders generate a reputation as reliable suppliers of quality products in international markets.

Continued cooperation between exporters, small-scale growers and the government should be sought. In particular, exporters should cooperate with the government in learning how to design more enforceable contracts. However, exporters should be willing to provide information to aid in research for the development of the industries. Studies have shown that, by providing information, especially about market prices and requirements, traders will also benefit in the long run. They are able to learn more about the market, and their plans and actions could become more efficient.

7.3.2. Policy Issues for the Development of the Flower Subsector

The following policy issue are needed for improving production and marketing of flowers by smallholders.

1) Promotion of farmer associations. The study has shown that small-scale growers are unable individually to compete with large growers in supplying flowers to the international market. However, with government assistance in areas such as access to credit, the recently formed Kinangop Flower Growers Association (KFGA) and other grower associations in other flower producing areas could provide the institutional arrangement and incentives for small

growers. The government has an important role in investigating the feasibility of associations and assisting in their development.

2) Planting materials. To address the problem of inadequate access to planting materials for new types of flowers and payment of royalties by small-scale growers, the HCDA in collaboration with the Kenya Agricultural Research Institute (KARI), should study the feasibility of acquiring these materials, multiplying them, and selling them to small growers.

7.3.3. Policy Issues for the Development of the Bean Sector

The major policy issue urgently needed for promotion of smallholder bean production and marketing relates to the problem of broken contracts. The lack of enforceable oral contracts has emerged from the survey of bean production and marketing as a major problem. Broken contracts have undermined the important role of forward contracts in coordinating small-scale bean production and marketing. The government has an important role to play in facilitating the design and implementation of enforceable contracts either by providing technical assistance in drawing up written contracts and by strengthening the legal system to uphold contracts.

7.4. Further Research

A major contribution of this study has been the generation of baseline information which has identified research gaps on smallholder cultivation of high value nontraditional exports, such as flowers and beans. The following were identified as priority areas for further research:

1) Breeding and applied research on flowers and beans should be given more emphasis by KARI and the public universities. The input processing firms can assist in carrying out some of the agronomic research needed to establish effective recommendations for chemical and fertilizer use for each specific type of flower present and new bean varieties.

2) Research is urgently needed to generate information about the economics of new types of high value flowers that have high potential for income and employment generation on small-scale farms.

3) Follow-up research is needed on the growth pattern of successful large farms. Case studies will reveal whether they were launched as subsidiaries of European firms or whether they started producing flowers as small growers and moved up the size ladder.

4) Research is also required on the effectiveness of the recently formed grower associations in coordinating flower production and marketing by smallholders.

5) Research is needed to determine how to assist smallholders gain access to credit.

APPENDICIES

APPENDIX A

QUESTIONNAIRE FOR CUT FLOWER GROWERS

1. Introduction

1.1.Date:_____

2.Interviewer: _____

3.District:_____

4.Village:_____

2. Grower characteristics

2.1.Farmer's Name:_____

2.2.Age of household head:_____

2.3.Level of formal education: _____

0.Uneducated
1. Primary
2. Secondary
3. Beyond secondary

2.4.Family members: Adults_____; Children under 14_____

2.5.Farm size:_____ Area under flowers:_____

2.6.Would you characterize your farm as Small, Medium, or large scale in relation to other flower growers in your area ?_____

2.7.Nature of ownership of the farm: Fill in the appropriate code number in the space provided .

_____

1. Individually owned
2. Rented
3. Other (specify----------)

2.8.If rented, what is the monthly rent per acre ? _____

3. OFF-FARM INCOME &REMITTANCES

3.1. Do you have a job off- your farm ?_____

No = 1 Yes = 2

3.2. If yes, type of work _____

3.3.Annual income from job _____

3.4.Does anyone else in family living with you have a job off-farm?
No = 1 Yes = 2 _____

3.5. If yes, type of work _____

3.6. Annual income from the off-farm job _____

4. FLOWER PRODUCTION

4.1.In which year did you begin to grow flowers ? _____
4.2.How did you learn about growing flowers ? _____

1.Shown by another farmer
2.Used to work for a flower grower/company
3.Shown by extension officers (HCDA; KARI; MOA)
4.Other (Specify _____)

4.3. What types of flowers do you grow? (insert 1, 2, 3, etc., against each type in order of importance, and the total acreage of each).

	acrages
Alstromeria_____	_____
Ornithogalum ____	_____
Tube rose _____	_____
Statice _____	_____
Solidaster _____	_____
Aster_____	_____
Arabicum_____	_____
Molucella_____	_____
Rose _____	_____

Carnations_____ _____

Other(specify) _____ _____

4.4.If you grow alstromeria, list the varieties you have and their respective acrages below:

Variety	Acreage
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4.5. For you most important type of flower, please give a rough estimate of the establishment cost (Planting to first harvest)

Type of flower:_____

Establishment cost: _____

ON IRRIGATION

4.6. Do you use irrigation? ___; No = 1 Yes = 2

4.7.If yes, what type of irrigation?_____ (Sprinkler, Drip, Flooding, Other(specify)

4.8.What is the cost of your irrigation equipment ? (Indicate the cost and the year of purchase in the respective spaces below):

	purchase price	year of purchase or age
Pump and engine	_____	_____
Pipes	_____	_____
Sprinklers	_____	_____

Other components _____ _____

4.9.How often from planting through the export season(september to may) do you irrigate your flowers ?(e.g. once a week etc.,)

_____

SPECIALIZED STRUCTURES

4.10. Which of the following structures or facilities do you use in the flower operation ? (For each of them indicate the capacity i.e., number of flowers cartons or flowers pails or flower stems it can contain or the area it can cover etc.; the cost and year bought or construction)

	CAPACITY						COST	
YEAR **Structure**	cartons		Pails	Area	Own/ Rented		price	or rental
Cold storage	___		___	____	___	____		
Grading/packing	___		___	____	___	____		
Shade Houses: Polythene	___	___	____	___	____	____		
Net	___	___	____	____	____	____		
Lighting system:	___		___	____	___	____		
Support structures:	___		___	____	___	____		
Water Tank	___	___	____	____	____		____	
Pickup/truck	___		___	____	___	____	____	
Other (specify)	___	___	____	____	____		____	

EQUIPMENT/ OTHER SPECIALIZED INPUTS(e.g. Spray pumps etc)

Type of input	price bought	Rental charges	Year bought/ constructed

_____ _____ _____ _____

_____ _____ _____ _____

5.EMPLOYMENT AND LABOR USE

5.1. How many people are employed on the farm?
Full time (in the year) _____ Wage rate/month _____

5.2. Of these, how many are female ? _____

5.3. How many people are employed during the main export season (Oct. to May)
_____

5.4. Of these, how many female? _____

5.5. What problems if any, do you have, with regard to labor ?

1.Primary problem _____

2.Secondary problem _____

6. PLANTING MATERIALS AVAILABILITY (Seed, Bulbs and Cuttings Etc.)

6.1.For two of your most important types of flower/variety, what was the source of your planting material? Fill in the space provided with the appropriate code number for the response:

1. Imported
2. Got from another farmer
3.Retained from previous crop
4. From other sources (specify ----------)

		If retained from previous crop	
Flower type	**source**	**original source**	**year**
_____	____	_____	____
_____	____	_____	____

6.2.Please give the breakdown of the cost you incurred in obtaining these planting materials:

flower Type &Variety	Price	Royalty		Trans-		other -port	Total expense
_____	____	_____	_____	____	_____		
_____	____	_____	_____	____	_____		

6.3. Do you have any of the following arrangements with the source of your planting materials? _____

1.Sell the flowers to them
2.Provides technical information
3.Provides credit/other inputs
4.Other (specify)

6.4.What are your primary and secondary problems if any, regarding planting materials?

Primary _____

Secondary _____

6.5.How much planting material (seed) do you use per acre?

Quantity	Unit
_____	_____

6.6. If you grow alstromeria, are there any varieties among those on your farm which you feel were not very popular in the export market in the last export season ? _____

No = 1 Yes = 2

6.7.If yes, which are they ?

1._____

2._____

3._____

6.8. Why do you still grow these unpopular varieties?

1.Can not get other varieties to replace these
2.Bound by contract to supply these
3.Price might improve next season
4.Other (specify) _____

6.9. What problems if any, do you have regarding chemicals and fertilizers?
1._____
2._____
3._____
4.None.

8. OTHER MAJOR COMPETING CROPS

Output

			Market Price/unit		
Name of Crop	Acreage	Yield/acre	high	medium	low
_____	_____	_____	____ ____	____	
_____	_____	_____	____ ____	____	

9. Activity Expenditures and output/acre (estimates for enterprise budgets)
9: Type of flower:_____

	Number	Hrs/day	Cost /day	Days Total total
9.1.Land preparation: Labor:	_____	____ ____	____	____
machinery:	_____	____ ____	____	____
Fuel :	_____	____ ____	____	____
9.2.Planting:				
Labor:	_____	____ ____	____	____
Planting material:				
Quantity	_____			
Cost	_____			
9.3.Transplanting:				
Labor:	_____	_____	_____	_____ _____

9.4.Weeding: How many times do you weed the crop ? _____
Labor : _____ _____ _____ _____ ____

9.5.Fert.Application: How many times do you apply fertilizer?
_____
Labor:_____ _____ _____ _____ ____

First application:
Type _____
Amount _____
Cost of fertilizer _____
Second application:
Type _____
Amount _____

Cost of fertilizer _____

9.6.Chemic.Application: how many times do spray ? _____

Labor:_____ _____ _____ _____ ____

First spraying:

Type _____

Amount: _____

Cost of chemical _____

Second spraying:

Type _____

Amount _____

Cost of chemical _____

9.7.Irrigation: On average, how many times do you irrigate ?

_____

Labor:_____ _____ _____ _____ ____

Fuel or electricity:

Amount/day _____

Cost _____

Other irrigation inputs:

Type _____

Quantity/day_____

Cost _____

9.8.Harvesting:

Labor:_____ _____ _____ _____ ____

other:_____ _____ _____ _____ ____

9.9.Post-harvest(i.e grading & packing):

Labor:_____ _____ _____ _____ _____

Chemicals for pre-treatment:

Type _____

Quantity/Day _____

Cost _____

Cartons:

Quantity/day _____

Cost _____

Rubber bands:

Quantity/day _____

Cost _____

Sleaves:

Quantity/day_____

Cost _____

Cooling: _____ _____ _____ _____ _____

other:_____ _____ _____ _____ _____

9.10.Yield/unit of land (e.g.acre)/day of harvest: (indicate unit i.e. if cartons or no. of stems) _____

9.11.Total output (i.e yield times number of days):

_____

9.12.Price for which sold: Indicate the unit of sale, i.e. per carton or per stem etc., and the grade:

Grade 1 Grade 2 Grade 3

_____ _____ _____

9.13.Transport/unit(specify unit)

local :_____

Air freight:_____

9.14.Other expenditures:

Cold room at local airport _____

Handling charges at local airport _____

HCDA charges _____

Other charges(specify ----------) _____

10.CREDIT/LOANS

10.1. If needed, is credit available ?____ No = 1 Yes = 2

10.2.During the last export season, have you taken any credit ?___ No = 1 Yes = 2

11.POST-HARVEST,MARKETING AND INSTITUTIONAL ARRANGEMENTS:

11.1.Do you grow flowers for export or local market ? _____

Local = 1 Export = 2

(If grow for local market, skip to section No.14)

11.2. Have you had any problems from your buyer(s) regarding the quality of any of your flowers you have sold in the past ? ___ No = 1 2 = Yes = 2

11.3.If yes, how often in the current season (1992)? _____

1 = once; 2 = twice; 3 = more than twice

11.4. Approximately what proportion of your total production has been thus affected in: 1991_____; 1992 _____

Special exporting Arrangements:

11.5. Do you belong to any farm organization that is involved in flower production/export such as a coop.?___

No = 1 Yes = 2

11.6.If yes, skip to question no. 12.7; If no, have you ever been a member in the past? _____ No = 1 Yes = 2

11.7.If you have been, why aren't you a member now? _____
_____

11.8. If you're currently a member of a flower organization, What is its name ?____
_____

11.9.What services does this organization provide ?
1.Looks for a buyer on behalf of members
2.provides pool transport for group
3.Assists in obtaining credit
4.provides technical advice
5.Provides cold storage
6.Other(specify) _____

11.10.Are there any charges or fees, or other conditions on the members?
No = 1 Yes = 2

11.11.If yes, Indicate the charges in Ksh_____
and list the conditions of membership.
1._____
2._____
3._____

11.12. Generally how satisfied are you with the services provided by your group ?
1.Very satisfied
2.Somewhat satisfied
3.Neutral
4.Dissatisfied
5.Very dissatisfied.

11.13.If dissatisfied, list the reasons
1.Primary reason _____
2.Secondary reason _____

11.14.Have you had any relationship with such large exporters (e.g., Oserian, ADC,Sulmac, etc.,)in the past?_____;
No = 1 Yes = 2

11.15. If yes, what was the nature of the relationship ?

1.sold them flowers

2.Used their aircraft charters
3. Used to be outgrower
4.Other (specify) _____

11.16.Currently, what relationship if any, do you have with the large flower growers/exporters such as Oserian, ADC, Sulmac, etc.,? _____
_____
_____

11.17. If you do have a relationship with these large firms, generally how satisfied are you with this relationship ? _____
Fill in the above space the appropriate code number suitable for the response:

1. Very satisfied
2. Somewhat satisfied
3. Neutral
4. Dissatisfied
5. Very dissatisfied

11.18. If 4 or 5, what are the reasons?
1.Primary reason: _____
2.Secondary reason _____

11.19.What relationship if any, do you have with any other flower medium-to-small scale(for those in a grower organization, consider others outside the group)?
1.They buy my flowers
2.I buy planting material from them
3. Other (specify)_____

11.20. If you have some relationship with other flower growers (medium-to-small), how satisfied are you with that relationship ?
_____
Choose the appropriate code number for the response.

1. Very satisfied
2. Satisfied
3.Neutral
4.dissatisfied
5. Very dissatisfied

11.21. If 4 or 5, Give reason why _____
_____

11.22. How do you sell your Flowers ? _____
Choose the appropriate code number and fill in the above space.
1.Export directly

2.Through Coop/group
3.Through an exporter on contract
4.Sell to any middleman who comes by
5.Other (specify----------)

11.23. If export through a contract, please state the terms, indicating whether the contract is with a local exporter/middleman or not_____
_____
_____

11.24.If you export directly, to which country(ies) do you send most of your flowers? (List in order of importance and proportions of produce sent to each destination)

Name of flower	Destination	Quantity	% of total (in volume)
_____	_____	_____	_____
_____	_____	_____	_____

11.25. When you export your flowers, do you send them to a specific importer(s)/ commissioned agent(s) ?_____ No =1 Yes = 2

11.26.If yes, what is (are) the name(s) of the importer(s)? **(If no, skip to questions no.12.29-30.)**
_____
_____

11.27.If you always send flowers to a specific buyer, give reasons:
Pick the choices that is closest to your reason and fill its appropriate code number in the space provided: _____
1. Best terms available (state terms----------
----------)
2. Only reliable buyer
3. Have a contract
4. Other (specify----------)

11.28. If you do not sell flowers to a specific/ regular importer, why not? _____
_____
_____

11.29.**(To all growers for export)** Do you have any problems with payment for your flowers? No = 1 Yes = 2

11.30. if yes, explain _____
_____

11.31.What other major problem(s) if any, do you face in dealing with your main buyers ?_____
_____
_____

11.32. Are there any specific periods when you can not sell all of your flowers ? __
_ No = 1 Yes = 2

11.33.If yes, which months? _____
11.34.What do you do with the surplus? _____

12.AIR CARGO SPACE AND FREIGHTS

12.1.How many months in the year do you export flowers ? _____
1.Twelve months
2.Between six and twelve months
3.Six months or less

12.2. How frequent do you ship your flowers ? ____
Fill in the appropriate code number for the response:
1.Once a month
2.Twice a month
3. Once a week
4. twice a week
5. more than twice a week

12.3.What is the average weight of each shipment you make ? ____

12.4. Is there any specific carrier you prefer ? _____

12.5.If yes, give name and reason _____
_____

12.6. What is the freight rate you pay per unit of your shipment ?
_____

12.7.Have you had any problems with getting enough cargo space for your produce ? _____ No = 1 Yes = 2

12.8.If yes, what proportion of your total production was affected by this problem and resulted in either produce deterioration due to delayed shipment and subsequently sold in salvage market, or thrown away ? in:
1992_____; 1991_____

12.9. Pleases give an estimate of the loss in revenue or profits which resulted from this problem ? _____

12.10.Generally, what steps do you normally take to make sure you have secured adequate space for your flowers ? _____
Fill the appropriate number in the above space:

1.Charter special flight
2.Give some "chai" (bribe)
3.Offer to pay higher freight than the official one
4. Other (specify) ----------

13. EXTENSION SERVICE,TECHNICAL & MARKET INFORMATION

13.1. If you have a technical question regarding flower production whom do you ask first? Fill in the space the appropriate code number for the response in the space provided

_____

1.Extension agent (HCDA; KARI; MOA)
2.Contacting firm/agent (i.e.the buyer)
3.Hired expatriate or private consultant
3.Other(specify----------)

13.2.If extension agent, how often are the visits ?_____

13.3. If consultant, what are the charges? _____

13.4. Briefly describe the nature of the technical services you obtain from each of the sources _____

_____

13.5. Do you carry out your own breeding/multiplication of planting materials ?
_____ No = 1 Yes = 2

13.6.Do you get any technical assistance from the government research stations (KARI) ?_____ No = 1 Yes = 2

13.7. If you have a problem regarding marketing of your flowers, whom do you ask first for assistance ? _____

1.Extension agent (HCDA;KARI;MOA)
2.Another grower
3.Hire consultant
4.Other (specify ----------)

13.8. If consultant, give an estimate of the charges _____

13.9. Generally, how satisfied are you with the services that the Ministry of Agriculture extension (MOA) or Horticultural Crops Dev. Authority (HCDA) field staff or other private sources are providing to educate farmers in the production and export of flowers ? Fill in the appropriate code number for the response in the spaces provided:

1.Very satisfied
2.Somewhat satisfied
3.Neutral
4.Dissatisfied.
5.Very dissatisfied

	HCDA	MOA	KARI	Consultant	OTHER (Give names)
On Production:	____	____	____	_____	_____
On Exporting:	____	____	____	_____	_____

13.9.What major deficiencies do you note in the supply of the technical service ? _____
_____

13.10.Do you receive market information? ___
No = 1 Yes = 2

13.11.If yes, what is the nature of this information?
_____
_____

13.12.What is the source of this information ? Fill in the appropriate code number in the space provided:

_____
1.From the auction book
2.From the International Trade Center (ITC)
3.From HCDA
4.Other (specify ----------)

13.13. Generally, how satisfied are you with the access to market information? Tick the appropriate response among the categories provided below:

1.Very satisfied _____
2.Satisfied _____

3.Neutral _____
4.Dissatisfied _____
5.Very dissatisfied _____

13.14.If dissatisfied, what deficiencies or problems do you have regarding market information ? _____

_____

14. CONSTRAINT AND POTENTIAL FOR SMALLHOLDER PARTICIPATION:

14.1. How important are the following factors in reducing the potential for increasing the production and export of flowers from your farm ? Fill in the spaces provided with the appropriate number against the category of responses:

1 = Very important
2 = Somewhat important
3 = Not important
4 = Not applicable

Lack of readily available technical information _____

Unfamiliarity with quality standards _____

Unreliable middleman/exporter _____

Difficult to get reliable contact in foreign market _____

Inadequate airport facilities(for cooling) _____

Lack of information on demand in Europe _____

Foreign exchange shortages/uncertainty to import inputs _____

Cumbersome regulation/procedures at Central Bank _____

Patent rights associated with getting new varieties _____

Shortage of cargo airspace _____

Complicated payment procedures _____

credit availability for the investment _____

High freight rates for flowers _____

15.2.Are there any comments you would like to make?

_____

APPENDIX B

QUESTIONNAIRE FOR FRENCH BEAN GROWERS

1. Introduction

1.1.Date: _____

2.Interviewer: _____

1.3.District: _____

1.4.Village: _____

2. GROWER CHARACTERISTICS

2.1.Farmer's Name: _____

2.2.Age of household head: _____

2.3.Level of formal education: _____

0. Uneducated
1. Primary
2. Secondary
3. Beyond secondary

2.4.Family members: Adults_____; Children under 14_____

2.5.Farm size:All area _____ Under French beans _____

2.6.Would you characterize your farm as small, medium or large scale in relation to other french bean growers in your area ?

_____

2.7.Nature of ownership of the farm: _____

1. Individually owned
2. Rented
3. Other (specify ----------)

3. Off-farm income & Remittances

3.1.Do you have another job off-farm ? _____

No = 1 Yes = 2

3.2. If yes, type of job ? _____

3.3. Annual income from job? _____

3.4. Does anyone else in your family living with you have a job ?

No = 1 Yes = 2

3.5.If yes, type of job? _____

3.6.Annual income from the off-farm job _____

4.FRENCH BEAN PRODUCTION

4.1. When did you begin to grow French beans? _____

4.2. How did you learn about growing French beans _____
1.Shown by another farmer
2.Shown by extension officers
3.Shown by agent of exporter
4.Other (specify ----------)

4.3.Which variety of French bean do you grow ?:_____

4.4.How do you decide when to plant? _____
1.Told by exporter (or buyer)
2.Told by extension officer
3.I know season
4.Other (specify ----------)

4.5. How do you decide how many acres to plant? _____

1.Told by exporter (or buyer)
2.Told by extension officer
3.I Just guess
4.Other (specify----------)

4.6.How many acres of French beans did you plant in:
1991: _____
1992: _____

4.7. Why didn't you plant more? _____

1. Don't have more land
2.Lack of seed
3.No reliable market (difficult to sell)
4.Labor shortage
5.Other crops more profitable (which crops----------)
6.Other (specify----------)

5.IRRIGATION

5.1. Do you irrigate your crop? _____
No = 1 Yes = 2

5.2. If yes, what type of irrigation? _____
1.Sprinkler
2.Drip
3.Flooding
4.Other (specify ----------)

5.3.What is the cost of your irrigation equipment ? (indicate cost or price and year of purchase):

	Purchase price	Year of purchase
Pump &engine	_____	_____
Underground pipes	_____	_____
surface pipes	_____	_____
Sprinklers	_____	_____
Other components	_____	_____

6.POST-HARVEST HANDLING STRUCTURES

6.1.Do you own a packing/grading house ? _____
No = 1 Yes = 2

6.2.If yes, give an estimate of the construction cost and the year constructed:

Construction cost	Year constructed
_____	_____

6.3.If you do not have own packing house, where do you sort and pack your french beans ? _____
1.In a rented packing house
2.Under a tree
3.At collection Center
4.Other (Specify ----------)

6.4. if you grade and pack at collection center, who owns this center ?
1.Belongs to buyer

2.Belongs to growers' group
3.Other (specify ----------)

6.5.If grading and packing is done outside the farm, how far is it from the farm ? _
_____

7.LABOR USE

7.1.How many people are employed on the farm?
Full time(throughout the year) _____ Wage rate/ month ____

7.2.Of these, how many work in the French beans? _____

7.3.Of these how many are female? _____

7.4.How many people are employed during the peak season ? _____
Wage rate/day _____

7.5.What primary and secondary problems if any do you have regarding labor?
1.Primary _____
2.Secondary _____

8. PLANTING MATERIALS AVAILABILITY

8.1. What variety of French bean do you prefer? _____

8.2. Was this variety readily available to you in the immediate past year 1991/92 (season)? _____
1. Readily available locally
2. Somewhat available(Not at nearest shop)
3. Other (specify ----------)

8.3. How far do you have to travel to obtain the seed? _____
8.4. Who is your source of the seed? _____
1.My buyer provides the seed
2.Buy from shop
3.Other (specify ----------)

8.5.Please give a breakdown of the cost you incurred in obtaining your seed ?

Price per unit	Transport	Other cost	Total
_____	_____	_____	_____

8.6. How much seed do you use per acre? _____

8.7. What special arrangement if any do you have with the seed supplier ? _____

1.Sell the produce to him
2.Other (specify ----------)

8.8.What primary and secondary problems do you have regarding seeds for planting?

1.Primary _____

2.Secondary _____

9. Chemicals/Fertilizers

9.1.How far do you have to go to obtain the chemicals you use?

_____

9.2. What types of chemicals do you use and what is the cost ? :

Type total amount source price/unit transport

9.3. What primary and secondary problems do you have if any regarding the chemicals? 1.Primary _____

2.Secondary _____

9.4.How far do you have to go to obtain your fertilizers ?_____

9.5.What types of fertilizers do you use and there costs?

Type Total amount Source Price/unit Transport

9.6.What primary and secondary problems do have regarding fertilizers?

1.Primary _____

2.Secondary _____

9.7.Do you use manure ? ___

No = 1 Yes = 2

9.8.If yes, How much do you use per acre and its cost?

Amount	Unit of land	Price/unit	Total cost
____	_____	_____	_____

10.OTHER INPUTS (e.g.fuel, spray pumps. etc.)

10.1

Type of input		Price	Usage/acre	Other costs	Total cost
_____	___	_____	_____	_____	
_____	___	_____	_____	_____	
_____	___	_____	_____	_____	

11.OTHER MAJOR COMPETING CROPS

Crop	Acreage	Yield/acre	Market Price/unit high	medium	low
___	_____	_____	___	___	___
___	_____	_____	___	___	___

12. ACTIVITY EXPENDITURES/ACRE (costing for enterprise budgets)

	Number	Hrs/day	Cost /day	Days total	Total cost
12.1.Land preparation: Labor:_____	___	___	___	___	
Machinery:_____	___	___	___	___	
Fuel: _____	___	___	___	___	
12.2.Planting:					
Labor: _____	___	___	___	___	
12.3.Seed:					
amount:_____					
cost: _____					
12.4.Weeding:					
Number of weeding:_____					
Labor: _____	___	___	___	___	
12.5.Fertilizer:					
Labor: _____	___	___	___	___	
First application:					
Type: _____					
Amount:_____					
Cost: _____					
Second application:					
Type: _____					
Amount:_____					
cost: _____					
12.6.Chemicals:					
Labor: _____	___	___	___	___	
First spraying:					

Type: _____
amount:_____
cost: _____

Second spraying:
Type: _____
amount:_____
cost: _____

12.7.Irrigation:
Labor: _____ ____ ____ ____ ____
fuel/day: _____
price: _____
Electricity/month:_____

12.8.Harvesting:
How many weeks:____
# of times/week:____
Labor: _____ ____ ____ ____ ____
yield/day:_____
total output (yield * Days): _____

12.9.Grading/Packing:
Labor: _____ ____ ____ ____ ____
Number of cartons obtained for each grade/day:

Extra fine	Fine	Bobby
_____	_____	_____

12.10.Price for which sold:

Extra fine	Fine	Bobby
_____	_____	_____

12.11.Transport to market:
Average distance to buyer:_____
Cost/carton: _____

12.12.Other expenditures:
_____

13.CREDIT AND LOANS

13.1. If needed, is credit available ? ____
No = 1 Yes = 2
13.2.During the past year, have you taken any credit ? ____
No = 1 Yes = 2

13.3. If yes, what is the name of the lender? _____

1.Bank
2.My buyer of the beans
3.Other(specify ----------)

13.4.How satisfied are you with the terms of the credit ? _____

1.Very satisfied
2.Somewhat satisfied
3.Neutral
4.Dissatisfied

14.POST-HARVEST, MARKETING AND INSTITUTIONAL ARRANGEMENTS

14.1. Has any of your french beans ever been returned by the buyer due to poor quality ? ___

No = 1 Yes = 2

14.2.If yes, how often in the 1991/92 season ? _____

Once = 1 ; Twice = 2; More than twice = 3

14.3.Approximately what proportion of your produce has been returned by the buyer due to poor quality in the 1991/92 season ?

_____

14.4. Do you belong to any farm organization that is involved in French beans such as a cooperative or a growers' association? ___

No = 1 Yes = 2

14.5.If no, have you ever been a member in the past? _____

No = 1 Yes = 2

14.6.If yes, why aren't you a member now?_____

_____

14.7.If you are a member of a French bean group., What is its name? _____

_____

14.8.What services does this group provide ? _____

1.Looks for buyer on behalf of members
2.Provides pool transport for group
3.Pool produce to have sufficient quantity to bring buyers
4.Other (specify ----------)

14.9.Are there any charges or fees on members ? _____

No = 1 Yes = 2

14.10.If yes, indicate the charges Ksh:_____

and any conditions on members?
1 _____
2._____

14.11.Generally how satisfied are you with the services provided by your group ? _ _____

1.Very satisfied
2.Somewhat satisfied
3.Neutral
4.Dissatisfied
5.Very dissatisfied

14.12.If dissatisfied list the reasons
1.Primary reason _____
2.Secondary reason _____

14.13.To whom or how do you sell your French beans ? _____
1.Individually on contract to specific buyer on agreed price
2.As a group
3.Sell on spot to middlemen or their agent
4.Sell in local market
5.Export directly
6.Other (specify ----------)

14.14.If you have on contract with an exporter, please state the terms
1. _____
2. _____
3. _____

14.15. If you always sell to a specific buyer, what are the reasons for doing so ? ___ _____

1.Best terms available
2.Best price available
3.Cash on spot
4.Only buyer who comes to the area
5.Provides inputs
6.Other (specify ----------)

14.16. Are there any specific periods when you can not sell all of your French beans ? _____

No = 1 Yes = 2

14.17. If yes, in which months ? _____

14.18.What primary and secondary problems do you have in dealing with your buyers ?

1.Primary problem _____

2.Secondary problem _____

14.19. How far is the market/ collection center from your farm ?

_____

15. EXTENSION SERVICE/TECHNICAL AND MARKET INFORMATION

15.1.If you have a technical question regarding French bean production, whom do you ask first ? _____

1.Extension agent(HCDA;MOA;KARI)
2.The buyer (e.g.,Contacting firm/agent)
3.Other (specify----------)

15.2.If extension agent, how often does he/she visit the farm?

_____

15.3. If contracting firm /agent or the buyer, how often do they visit the farm for this purpose? _____

15.4. Generally, how satisfied are you with the services that the Ministry of Agriculture extension field staff on the one hand and the buyer on the other, are providing to educate farmers in the production of French beans? Fill in the code that closely represents you answer regarding each source of the extension service

1.Very satisfied
2.Somewhat satisfied
3.Neutral
4.Dissatisfied
5.Very dissatisfied

HCDA		MOA	OTHER SOURCE
___	___	_____	

15.5.What primary and secondary deficiencies do you note in the supply of the technical service ?

1.Primary _____

2.Secondary _____

15.6.Do you receive market information? _____

No = 1 Yes = 2

15.7.If yes, what is the *nature of this information* ?
1._____
2._____
15.8.What is the source of this information ? _____
1.From buyer (contractor/agent)
2.HCDA
3.Other (specify ----------)
15.9. Generally, how satisfied are you with the access to market information?

_____ 1.Very satisfied
2..Satisfied
3.Neutral
4.Dissatisfied
5.Very dissatisfied

15.10.If you are dissatisfied with the access to market information, what primary and secondary deficiencies or problems do you see?

1.Primary _____

2.Secondary _____

16. CONSTRAINTS AND POTENTIAL FOR SMALLHOLDER PARTICIPATION IN FRENCH BEAN SECTOR:

16.1.How important are the following factors in reducing the potential for smallholders' participation in the French bean export subsector? Fill in the space provided with the appropriate number against the category of responses:

1.Very important
2.Somewhat important
3.Not important
4.Not applicable

1.Lack of readily available technical information _____

2.Unfamiliarity with quality standards _____

3.Unreliable middleman or exporter _____

4.Lack of information on what the foreign market wants _____

5.Inadequate airport facilities for handling _____

6.Uncertainty foreign exchange/importation of inputs _____

7.Problems of obtaining planting materials _____

8.Shortage of aircargo space for shipping exports _____

9.Credit availability for smallholders _____

10.High freight rates for French beans _____

6.2. Are there any other problems or comments you would like to make? _____

_____

APPENDIX C

QUESTIONNAIRE FOR FLOWER AND BEAN EXPORTERS

QUESTIONNAIRE FOR CUT FLOWER EXPORTERS

1.INTRODUCTION

1.1.Date: _____

1.2.Interviewer: _____

1.3.District: _____

1.4.Village: _____

2.EXPORTER CHARACTERISTICS

2.1.Name of export firm: _____

2.2.Name of Principal owner:_____

2.3.Educational level of principal owner/manager:__
(choose from the responses given bellow)

0.Uneducated
1.Primary
2.Secondary
3.Beyond Secondary

2.4. Nature of ownership of firm:_____
(choose from among the choises given below)

1.Sole Proprietor
2.Partnership
3.Limited company
4.Cooperative
5.Other(specify):_____

2.5.In which year was the firm established? _____

2.6.In which year did the firm begin to export flowers? ___

2.7.How far from the Jomo Kenyatta airport is the business premises located ? _____

2.8.What kind of transportation do you use to get flowers to the airport? **(choose from among the choises given below)**

1.Refrigerated trucks
2.Insulated trucks
3. Other (specify_____)

2.9. If firm owns the trucks, what is the estimated value each?
_____

2.10. What is the running cost per trip ? _____
2.11. If the firm uses rented trucks, what is the rental cost per month ? _____
_____

Cold Storage Facilities

2.12.Do you have cold storage facilities at the airport? ____

Yes = 2 No = 1 **(circle the appropriate answer)**

2.13. What is the estimated cost of the facility?

If owned give estimated value in Ksh. _____

If rented, what is the monthly rent? _____
2.14.Does the firm own cold storage facilities at the firm's premises or central collection point ? _____

Yes = 2 No = 1

2.15. If yes, give estimated value _____

2.16. If firm rents cold storage in the field, what is the rental charges per month ? _____

3.PROCUREMENT OF FLOWERS FOR EXPORT

3.1.What type of flowers do you export ?(insert 1,2, 3, etc.,against each type in the order of importance to the firm)

Alstromeria _____

Arabicum _____

Aster _____

Carnations _____

Mollucella _____

Rose _____

Tube rose _____

Solidaster _____

Statice _____

Ornithogalum_____

Other(specify)_____

_____

3.2.If you export Alstromeria, What proportion of the annual sales came from alstromeria in:

The 1990/1991 export season ? _____

The 1991/1992 export season? _____

3.3.In the current season (1992/1993), is this proportion likely to increase or decrease ? _____ **(choose from the choises below)**

Decrease	=	1
Increase	=	2
Constant	=	0

3.4.If proportion is to decrease, what is the reason ?

_____

3.5.From which of the following areas do you obtain flowers ?{**for each area state the proportion(%)of flowers obtained and average distance from the firms premises or central point**}

Area	**Proportion (%)**	**Average distance(km)**
Njabini	_____	_____
Ngecha	_____	_____
Tigoni	_____	_____
Redhill	_____	_____
Kibubuti	_____	_____
Githunguri	_____	_____
Naivasha	_____	_____
Other(specify)	_____	_____

_____

3.6.What is the source of the flowers you export ?

Source	**proportion of total export**
1.Own farm	_____
2.Outgrowers on contract	_____
3.Buy from farmers w/o contract	_____
4.Other(specify below)	_____

3.7.For each of the above sources of flower procurement that you use, what is the approximate cost of procurement per stem per type of flower ?(estimate includes,purchase price, transport, production cost and other relevant costs).

Type of flower	source of supply	Average cost per stem
_____	_____	_____
_____	_____	_____
_____	_____	_____

_____ _____ _____

3.8. Generally, how satisfied are you with each of the sources of produce supply ? **For each source select the rating that closely describes your satisfaction and insert in the space against each of the sources you use.**

1.Very satisfied
2.Somewhat satisfied
3.dissatisfied

Source of supply Rating

_____ ____

_____ ____

_____ ____

_____ ____

3.9.If some of your flowers come from small scale growers, what primary and secondary problems to face if any in dealing with these farmers ?

1.Primary _____

2.Secondary _____

4.TC ASSOCIATED WITH AIR CARGO SPACE LIMITATIONS

4.1.In the last two export seasons did your firm experience problems with obtaining air cargo space when you needed to ship flowers ? _____

No = 1 Yes = 2

4.2. If yes, has your firm incurred losses from spoilage, delays etc., due to problems of air cargo space availability ? ____ No = 1
Yes = 2

4.3.If yes, in which months has it been most difficult to get adequate space ?

_____ _____ _____ _____

4.4.If you had problems with cargo space, what proportion of your annual produce was thus affected and its estimated value ?

Season **Proportion of the loss** **Approx. value in Ksh.**

	(%)	
1990/91	_____	_____
1991/92	_____	_____

4.5.What steps do you take to ensure you get adequate space to airlift your flowers on schedule ?

Steps Taken	**Approx. cost involved per unit(e.g.carton)**
1.Use own charter flight	_____
2.Other exporter's charter	_____
3.Other arrangements (specify)	_____

_____

5.QUANTITY EXPORTED AND DESTINATIONS

5.1.During the peak of the export season how frequent do you ship flowers ? **Fill in the average weight for the frequency you choose from the choises given below**

	Average weight of shipment (in kg.)
1.Daily	_____
2.Three times a week	_____
3.Twice a week	_____
4.Once a week	_____

5.2.To which countries do you send your flowers ?

Name of flower	**Destination**	**% of total volume of sales**
Alstromeria	_____	_____
Solidaster	_____	_____
Other	_____	_____

5.3.When you export flowers, do you send them to specific importers or sell directly in the auction markets? **give the proportion of sales to each type of buyer in the spaces below**

Destination	Importers customers	Auction market
_____	_____	_____
_____	_____	_____
_____	_____	_____

5.4. Does the firm have representative in the importing country for receiving and handling of the flowers when they arrive ? ____

No = 1 Yes = 2

5.5.If yes, what proportion of the total transportation and handling costs does the foreign handling and marketing costs represent ? _____%, and an estimated average handling cost per shipment

_____

5.6.If the firm has no representative, who receives and handles the flowers ?

_____

5.7.If there is no representative, what is proportion of the foreign cost in the total transport and marketing costs ? ____%

5.8.During the past two export seasons, has any of your shipment of flowers been rejected by buyer due to poor quality ? ____

No = 1 Yes = 2

5.9.If yes, what was the approximate loss in value of sales?

Export season	**Approx.value of the loss**	**% of total sales**
1990/91	_____	____
1991/92	_____	____

5.10.In general, what proportion of the loss associated with poor quality or deterioration during transit is to borne by the grower (where exporter is not the grower) ?

_____

5.11.Generally which period in the main export season do your sales peak in each of the destination countries?

Destination	Peak period
_____	_____
_____	_____
_____	_____

5.12.What are the primary and secondary problems if any does your firm face in the destination markets ?

Primary _____

Secondary _____

6.MARKET INTELLIGENCE

6.1.Do you get up-to-date information about the market for flowers?

___

No = 1 Yes = 2

6.2.If yes, what is the nature of the information ? _____
(choose the appropriate answer from the choises below)

1.Current prices for various flower types
2.Future demand situation
3.Prospective importers
4.Other type of information (specify in space below)

_____

6.3.From where do you obtain the market information ?**(select from the choises below)**

1.Auction book
2.From International Trade Center (ITC)
3.Other (specify) _____

6.9. For each information source, what is an approximate cost of getting the information for your firm annually ?

Information Source	**Estimated cost (Ksh)**
_____	_____

6.10.What primary and secondary problems beside the limitation on air cargo space would you say constrain expansion of your flower exporting business ?**(fill in the spaces below)**

1.Primary _____

2.Secondary_____

7.ANY COMMENTS BY THE EXPORT

7.0.Are there any comments you would like to make?

_____

_____

QUESTIONNAIRE FOR FRENCH BEAN EXPORTERS

1.INTRODUCTION

1.1.Date: _____

1.2.Interviewer: _____

1.3.District: _____

1.4.Village: _____

2.EXPORTER CHARACTERISTICS

2.1.Name of export firm: _____

2.2.Name of Principal owner:_____

2.3.Educational level of principal owner/manager:__

0.Uneducated
1.Primary
2.Secondary
3.Beyond Secondary

2.4. Nature of ownership of firm:_____

1.Sole Proprietor
2.Partnership
3.Limited company
4.Cooperative
5.Other(specify):_____

2.5.In which year was the firm established? _____

2.6.In which year did the firm begin to export French beans?___

Mode of transporting French beans to airport

2.7.How far from the Jomo Kenyatta airport is the business premises located ? _____

2.8.What kind of transportation do you use to get the beans to the airport?

1.Refrigerated trucks
2.Insulated trucks
3. Other (specify_____)

2.9. If firm owns the trucks, what is the estimated value each?
Number _____

Value _____

2.10. What is the running cost per trip ? _____
_____

2.11. If the firm uses rented trucks, what is the rental cost per month ? _____
_____

Cold Storage Facilities

2.12.Do you have cold storage facilities at the airport? ____
Yes = 2 No = 1

2.13. What is the estimated cost of the facility?

If owned give estimated value in Ksh. _____

If rented, what is the monthly rent? _____

2.14.Does the firm own cold storage facilities at the firm's premises or central collection point ? _____

Yes = 2 No = 1

2.15. If yes, give estimated value _____

2.16. If firm rents cold storage in the field, what is the rental charges per month ? _

_____

3.PROCUREMENT OF FRENCH BEANS FOR EXPORT

3.1 What proportion of the firm's annual sales came from French beans in:

The 1990/1991 export season ? _____

The 1991/1992 export season? _____

3.2.In the current season (1992/1993), is this proportion likely to increase or decrease ? _____

Decrease	=	1
Increase	=	2
Constant	=	0

3.3.If proportion is to decrease, what is the reason ?

_____

3.4.From which areas in the country do you obtain your French Beans? **{for each area state the proportion(%)of beans obtained and average distance from the firms premises or central point}**

Area(Division/district)	**Proportion (%)**	**Average distance(km)**
_____	_____	_____
_____	_____	_____
_____	_____	_____

3.5.What is the source of the French beans you export ?

Source	**proportion of total export**
1.Own farm	_____

2.Outgrowers on contract _____

3.Buy from farmers w/o contract _____

4.Other(specify below) _____

_____

3.6.For each of the above sources of bean procurement that you use, what is the approximate cost of procurement carton per grade ? (estimate includes,purchase price, transport, or production cost and other relevant costs).

Grade	source of supply	Average cost per carton
Extra fine	_____	_____
Fine	_____	_____
Extra fine	_____	_____
Fine	_____	_____
Extra Fine	_____	_____
Fine	_____	_____

3.7. Generally, how satisfied are you with each of the sources of produce supply ? For each source select the rating that closely describes your satisfaction.

1.Very satisfied
2.Somewhat satisfied
3.dissatisfied

Source of supply	Rating
_____	____
_____	____

3.8.If some of your French beans come from small scale growers, what primary and secondary problems do you face if any in dealing with these farmers ?

1.Primary _____

2.Secondary _____

3.9.If some of your French beans come from small scale growers, what special arrangements or relationships do you have with them ?

1.Supply them with seed on credit

2.Supply other form of credit (specify ----------)

3.Provide technical information

4. Other (specify ----------)

4.TC ASSOCIATED WITH AIR CARGO SPACE LIMITATIONS

4.1.In the last two export seasons did your firm experience problems with obtaining air cargo space when you needed to ship French beans ? _____

No = 1 Yes = 2

4.2. If yes, has your firm incurred losses from spoilage, delays etc., due to problems of air cargo space availability ? _____

No = 1 Yes = 2

4.3.If yes, in which months has it been most difficult to get adequate space ?

____ _____ _____ _____ _____

4.4.If you have incurred losses due to problems of air cargo space, what proportion of your annual produce was thus affected and its estimated value ?

Season	**Proportion of the loss (%)**	**Approx. value in Ksh.**
1990/91	_____	_____
1991/92	_____	_____

4.5.What steps do you take to ensure that you get adequate space to airlift your beans on schedule ?

Steps Taken	**Approx. cost involved per unit(e.g.carton)**
1.Use own charter flight	_____
2.Other exporter's charter	_____
3.Other arrangements (specify)	_____

5.QUANTITY EXPORTED AND DESTINATIONS

5.1.During the peak of the export season, how frequent do you ship French beans ?

	Average weight of shipment (in kg.)
1.Daily	_____
2.Three times a week	_____
3.Twice a week	_____
4.Once a week	_____

5.2.To which countries do you send your French beans ?

Type of beans	**Destination**	**% of total volume of sales**
Extra fine	_____	_____
Fine	_____	_____
Bobby	_____	_____

5.3. Does the firm have representative in the importing country for receiving and handling of the French beans when they arrive ?____

No = 1 Yes = 2

5.5.If yes, what proportion of the total transportation and handling costs does the foreign handling and marketing costs represent ? _____%, and what is an estimated average handling cost per shipment _____

5.6.If the firm has no representative, who receives and handles the Produce ?

_____

5.7.If there is no representative, what is proportion of the foreign cost in the total transport and marketing costs ? ___%

5.8.During the past two export seasons, has any of your shipment of French beans been rejected by a buyer due to poor quality ? ____

No = 1 Yes = 2

5.9.If yes, what was the approximate loss in value of sales in each season ?

Export season	**Approx.value of the loss**	**% of total sales**
1990/91	_____	____
1991/92	_____	____

5.10.In general, what proportion of the loss due to poor quality or produce deterioration is borne by your firm and by the grower (if any) ?

	Proportion (%) of the loss
Firm (exporter)	_____
Grower(where not exporter)	_____

5.11.Generally which period in the main export season do your sales peak in each of the destination countries?

Destination	Peak period
_____	_____
_____	_____

5.11.What primary and secondary problems if any, does your firm face in the destination markets ?

Primary _____

Secondary _____

6.MARKET INTELLIGENCE

6.1.Do you get up-to-date information about the market for French beans?

No = 1 Yes = 2

6.2.If yes, what is the nature of the information ? _____

1.Current prices for various Grades of French beans

2.Future demand situation
3.Prospective importers
4.Other type of information (specify in space below)

_____

6.3.From where do you obtain the market information ?
1.Colleacap
2.From International Trade Center (ITC)
3.Other (specify) _____

6.9. For each information source, what is an approximate cost of getting the information for your firm annually ?

Information Source	**Estimated cost (Ksh)**
_____	_____
_____	_____

6.10.What primary and secondary problems beside the limitation on air cargo space would you say constrain expansion of your French bean exporting business ?

1.Primary _____

2.Secondary_____

7.ANY COMMENTS BY THE EXPORT

7.0.Are there any comments you would like to make?

_____

_____

APPENDIX D

The VBA Auction Market

Facts and Figures about the Verenigde Bloeme-nveilingen Aalsmeer (VBA), a Cooperative Association.

1.Some 5000 growers and suppliers of flowers are the members and are obligated to sell all their flowers at the auction.

2.Nearly 14 million flowers and 1.5 million plants are sold daily--3.5 billion flowers and 370 million plants per year. Because of compurerization, 50,000 transactions can be handled per day.

4.The most important products at the VBA are:

Roses (in 200 varieties)	1,162 million stems
Tulips	374 million
Carnations	322 million
Chrysanthemums	217 million
Freesians	151 million
Gerberas	150 million

More than 80 percent of the flowers sold at the VBA is exported, mainly to America, other European countries, and the Far East.

AALSMEER
HOLLAND

How to become a supplier of imported cut flowers to the VBA

General information

1. **Apply to the Management for a permit**
   Conditions
   a. The products to be supplied must form an interesting supplement to the VBA package
   b. The supplier must ensure regular supply, so that auction can take place four times a week
   c. The products should be of good quality
   d. The VBA imports on consignment basis only
   e. The VBA imports only on the basis of pre-paid freight costs.

2. An application for the auction of imported flowers should be submitted to:
   The Management of the VBA
   Attn Import Department
   Postbus 1000
   1430 BA AALSMEER
   The Netherlands
   tel.: 02977-34567 telex: 15484 vba nl fax: 02977-32791

3. **Dispatcher** (clearance agent)
   The dispatcher deals with the financial and administrative aspects of import duties and Customs facilities. He also takes care of any transport from Schiphol to the VBA.
   The VBA dispatcher is:
   J. v.d. Put
   Postbus 63
   2370 AB ROELOFARENDSVEEN
   The Netherlands
   Telex 39314 jput nl tel.: 01713-19113 fax 01713-16220

4. **Bank account**
   The supplier will inform the VBA in writing as to his bank (address in full) and his account number.
   The result will automatically be transferred to your account once a week, after the costs have been deducted.

5. **Costs**
   The VBA charges the following costs:
   a) Auction commission of approx. 8%
   b) Lot levy of Dfl. 2 per lot
   c) PVS levy (for promotion), 0.45%
   d) Any unpacking costs, approx. 2 cents per flower
   e) Any other costs

A detailed summary of all costs will be provided on request.

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