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CASE STUDIES OF CONTRACT FARMING
IN THE HORTICULTURAL SECTOR OF KENYA

by
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PREFACE

This Working Paper is part of a larger research project on Contract Farming in sub-Saharan Africa conducted by the Clark University/Institute for Development Anthropology Cooperative Agreement on Settlement and Resource Systems Analysis (SARSA) for the Africa Bureau of the US Agency for International Development (AID).

For purposes of this study, contract farming is defined by three fundamental characteristics: (i) a futures or forward market in which a buyer or processor commits in advance to purchase a crop acreage or volume; (ii) the linkage of product and factor markets insofar as purchase rests on specific grower practices or production routines and input and/or service provision by buyer-processors; and (iii) the differential allocation of production and marketing risk embodied in the contract itself. Contract farming includes, therefore, the large-scale nucleus-estate/outgrower schemes associated with, for example, palm oil in West Africa and sugar production in Kenya; the parastatal, export-oriented smallholder schemes associated with tea, tobacco, and coffee in Central and East Africa; and a multitude of private schemes producing fresh fruits and vegetables for canning, drying, and direct export to international markets.

Contract farming in a variety of institutional forms has been present in North America since the 1930s, but it has more recently become of increasing importance in Third World states, particularly throughout much of Africa. The objective of this study is to assess the form, organization, and impact of a diversity of contracting arrangements in sub-Saharan Africa, based on both secondary literature and field research in seven countries (Gambia, Nigeria, Ivory Coast, Ghana, Kenya, Malawi, and Senegal). The case studies have been carefully selected to represent the primary commodities and diversity of institutional forms of contract farming. A final report, based in part on the representative case studies, will indicate the conditions under which contract farming emerges; assess the distribution of costs and benefits to the principal actors, including growers; and evaluate the role of contract farming with respect to donor and host-government policies, technology transfer, and institutional development.

Michael Watts and Peter Little

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INTRODUCTION

The Study of Contract Farming: A Note of Caution

Contract farming is an institutional form whereby agricultural production is carried out according to an agreement between farmers and a buyer which specifies certain production and marketing arrangements. For many years contract farming has played a prominent role in certain agricultural sub-sectors in North America and Western Europe. Production contracts are the dominant form of farmer-buyer coordination in these regions for such commodities as poultry, seed crops, processing vegetables, sugarbeets, and fluid-grade milk. In recent decades, contract farming has become a more prominent feature of African agriculture. Crop-specific contractual schemes have been developed by both private firms and specialized government agencies, sometimes with concessional funding provided by international development agencies.

Contract farming in developing countries has been viewed from two distinct perspectives. One perspective sees contract farming as an institutional innovation developed to increase agricultural productivity and specialization and to improve coordination between production and marketing. It views the development of specialized contractual schemes as a compensating response to imperfections in factor and product markets and as an attempt to fill an organizational vacuum left by a poorly functioning public agricultural administration. These contractual arrangements are seen as offering a series of potential advantages to both farmers and buyers, relative to either dealing strictly in spot markets or developing integrated production/marketing operations. Contract farming is viewed as a potentially useful vehicle for improving small farmer productivity and increasing rural incomes.

Critics of contract farming tend to view it as an institutional innovation developed by powerful economic and political groups to increase agricultural productivity and specialization, to appropriate the gains from these improvements, and to pass on the relevant costs and risks to farmers or third parties. This perspective sees contractual arrangements being designed to create or strengthen market imperfections so that private interests gain at the expense of social misallocations of resources. This perspective posits a zero-sum process of the following nature. The contracting firm benefits by gaining greater control over a crop than possible under spot market conditions, yet without incurring most of the costs and risks of actual investment in production. These buyers are placed in a monopsonistic position, able not only to dictate prices, but also to manipulate quality standards to make adjustments for raw

material and market imbalances. Farmers, on the other hand, are seen as getting locked into a dependent relationship with the buyer, made more vulnerable by their increased crop specialization and use of material inputs. Farmers may begin losing their autonomy as the contractor begins controlling many agronomic decisions. Writers representing this position reject the possibility of small-scale farmers benefiting from contract farming.

Contract farming is a highly complex subject requiring analysis of a range of technical, economic, and sociopolitical factors. The institution exhibits wide variations in structure, participants, operating arrangements, and impacts. For this reason caution is necessary in making general comments about the past record of contract farming, let alone about its wider potential and limitations as a vehicle for development of agriculture and agro-based industries. Making generalizations from individual case studies may thus be hazardous. One's insights into a particular form of organization and contracting procedures and into a particular commodity sector of one country may be quite powerful, but the strength of one's arguments dissipates as one moves across organizational, commodity, country, and temporal space. This is frequently not acknowledged by either the outspoken proponents or critics of contract farming.

Contract Farming in Kenya

Within Africa, contract farming has been most extensively developed in Kenya. Production contracts have been extended to both small-scale and large-scale farmers. Contract farming plays an important role in the Kenyan tea, sugar, tobacco, oilseed, horticulture, poultry, and beer-making industries. Raw materials produced under contract are thus used in both export and import-substitution industries.

Within Kenya, interest in contract farming as an institution of development has appropriately focused on schemes incorporating primarily small-scale farmers. Since colonial times, the administration of agricultural support and marketing in Kenya has had a large-farmer bias. Large-scale farmers in Kenya have typically had greater access to inputs, credit, extension and research advice, market information, and alternative distribution channels than has been the case for smallholders. Given constraints in land availability, prevailing demographic patterns, and the political risks associated with highly unequal distributions of wealth and income, agricultural development in Kenya must be oriented toward greater intensification of production and improvements in the productivity and incomes of

small-scale farmers. In certain circumstances, these goals may be approached through the mechanism of contract farming.

Within Kenya, there are a number of crops for which smallholder contracting has been fairly significant. These crops include: tea, sugar, tobacco, sesame seed, sunflower seed, French beans and other vegetables, and horticultural seed. The extent of smallholder participation in contractual schemes is estimated in the chart below:

 Smallholder Contract Farming in Kenya

Crop(s)	Firm(s)	Farmers
Tea	KTDA	150,500(a)
Sugar	MSC; others(b)	35,000(c)
Oilseeds	OCD(d); Ufuta(e)	34,000(f)
Horticulture (g)	Njoro Cannery; others(h)	21,500(i)
Tobacco	BAT	10,000
Total		251,000

 (a) The number of licensed growers under KTDA in 1986 was 150,414. However, there is evidence that additional farmers are growing tea without a license.

(b) Includes Associated Sugar Company, Muhoroni, and others.

(c) This is an estimate. During 1985-86 MSC and ASC contracted a combined total of 29,000 smallholders. We do not have data for the other firms.

(d) Oil Crops Development Ltd.. East African Industries holds 45%, CDC holds 35%, and the IFC holds 20%. The project was initiated in 1984 for sunflower and rape seed production under contract.

(e) Ufuta Ltd. is a subsidiary of Kenya National Mills Ltd and a sister company of Elianto Kenya Ltd. The latter had an unsuccessful sunflower contracting project in the late 1970s. This project is oriented toward sesame seed production at the coast.

(f) The OCD project intends to incorporate 20,000 smallholders by 1988 while Ufuta's target is 14,000. We have no data on the number of farmers actually under contract in 1986.

(g) Includes fruits, vegetables, and flowers, although most contracting is for vegetables for processing or export.

(h) Includes seed companies such as Kenya Seed Company, Regina Seed Company, and Hortitech and exporters such as Kenya Horticultural Exporters and Makindu Growers and Packers.

(i) A conservative estimate based on 15,500 farmers for Njoro Cannery, 3500 farmers for the various seed companies, and 2500 farmers with contractual links to other firms.

If the oilseed projects do reach their proposed scale in the late 1980s and if the other schemes simply maintain their participation rates, then up to a quarter million smallholder farmers will be producing under contract in the late 1980s. This represents approximately 16.7% of the 1.5 million smallholder families in Kenya. The proportion of contracted households is probably somewhat less than this figure as some farmers may grow more than one crop under contract. For example, several contracted horticultural farmers also grow tobacco or tea.

Numerous large-scale farmers also operate under production contract in Kenya. BAT Kenya Developments Ltd. has contractual arrangements with a limited number of poultry growers. Several hundred medium- to large-scale fruit and vegetable growers produce under contracts with processors and fresh produce exporters. Kenya Breweries Ltd. has a total of 17,500 ha of malting barley being grown for it under contract with large farmers. Oil Crops Development Ltd. intends to have 5000 largeholders producing sunflower and rape seed on 60,000 acres by 1988.

Looking across the different agricultural sub-sectors, one finds that the majority of existing contract farming schemes are linked to a processing operation. Many schemes also feature the participation of a European company, either as owner/managers of a scheme or through management and/or marketing contracts with locally owned firms. Many schemes are joint venture investments involving private management and Kenyan Government equity participation.

Literature Review

There is a sizeable literature on contract farming in Kenya. (See page 11.) This literature provides insight into a range of issues, including: the problem of incentives and controls for

staff and farmers, the participation of the contractor in the production process, the transfer of technology, the generation and uses of income, the impact on labor and land markets, and the potentially central role of the State. However, this literature deals almost exclusively with three schemes: i.e., KTDA's smallholder tea project, Mumias Sugar Company, and the BAT tobacco project. The large schemes of KTDA and Mumias have received by far the most attention.

On the other hand, there has been no in-depth research and little reference to smaller or less formal schemes, to schemes that failed or were associated with unsuccessful companies, or to schemes that did not have considerable government backing. There has also been no research on the considerable number of contract farming schemes developed for horticultural or oilseed crops. Thus, while the volume and quality of research on contract farming in Kenya is arguably the best in Africa (or even amongst developing countries generally), this literature provides extremely few generalizable propositions and little or no insight into several potentially important dimensions of contract farming.

The literature on the KTDA, Mumias, and BAT schemes does feature a consensus on a few issues. First, there is evidence from all three schemes that contract farming leads to an increase in cash incomes. Contract smallholders are economically better off than non-contracted smallholders in their area and the difference can at least be partially attributed to participation in the scheme.

Second, there is evidence that the income stream generated from contract farming is unevenly distributed. This has contributed to increased socioeconomic differentiation in the contracted areas. The differential stream of benefits relates substantially to the prescheme landholdings of participants and nonparticipants as well as to the availability of alternative sources of income and employment for households. As contractors have set minimum landholding and production scale requirements, the very poor have generally been excluded from such schemes other than through wage labor opportunities on contracted farms.

Third, the literature strongly suggests that the impact of contract farming will vary with organizational and production structure as well as with preexisting conditions and simultaneous socioeconomic changes. For example, while active farmer participation in the production processes for tea and tobacco has led to real "learning effects" which have "overspilled" into food production, this has not been the case for sugar where the farmer is more passive in the production process. While landholding sizes and the economies of scale in mechanical plowing and

harvesting have resulted in land competition between sugar and food crops, such competition has not generally been important in the tea and tobacco areas due to previous landholding patterns and the smaller scale of contracted crop plantings. Crop and trade diversification has been common in tea areas, while the sugar zone resembles a monoculture economy.

Fourth, there is fairly wide consensus that smallholder farmers are not adequately represented or protected by intermediary organizations. In the case of tea, the grower committees and the factory boards tend to be controlled by larger and more prosperous farmers. In the case of sugar, the Mumias Outgrower Company has not been an effective intermediary. Local MPs typically emerge as the "voice" of farmers.

Fifth, it is a common finding that in male-dominated societies a contractual scheme may adversely affect the position of women. In both the sugar and tobacco schemes it has been observed that men typically gain control over income while the women are relegated to perform difficult and unpaid routine work, such as weeding.

While the literature on contract farming does provide insight into several important issues, the literature features a sample that is biased in the direction of large, state-supported, formal, and successful schemes. As a result several dimensions of contract farming are given little or no attention.

For example, the existing literature frequently leaves the impression that contract farming arrangements are monolithic structures, stable over time. In fact, contractual arrangements may evolve gradually as managers, staff, and farmers adjust their behavior and formal structures to counter inefficiencies and pursue new opportunities. The exclusive focus on highly formal contract schemes has led to limited analysis of the possible transitions that occur in production/marketing arrangements between contractual and quasi-contractual links. The need for formal contracting may be related partly to the absence or presence of trust between farmers and buyers. Many contract farming schemes are not "greenfield investments" involving new crops, new farmers, and new buyers. Contract farming may involve farmers with prior experience with the crop, entering into a more intensive, multifaceted relationship with an existing or new buyer.

Also, the existing contract-farming literature in Kenya describes contract enforcement problems largely in relation to quality control and to credit recovery by the firm. In each case examined, the contracting firm has had a de facto monopoly over

the purchase of the crop. Alternative market outlets for farmers either do not exist or are not remunerative.

Contract enforcement is a more general problem. It is problematic where one or both contracting parties benefits from acting opportunistically and where such behavior is difficult to detect. Such opportunistic behavior may relate to direction of sales/purchases, quality manipulation, and quantity cheating. In many cases of contract farming the "leakage" of raw material out of the project and into alternative distribution channels may be a major problem. The relative merits of sales through alternative outlets will vary, depending on seasonal market changes, the physical location of farmers vis-à-vis the alternative outlets, and the services provided by competing marketing agents. The development by the contractor of measures to guard against leakage may be a key dimension of a contract scheme. Both farmers and buyers may breach contractual terms related to the quality of the product.

Due to unforeseen circumstances (i.e., weather change), poor production practices (i.e., careless harvesting), and/or deceit (i.e., hiding subquality produce on the bottom of a carton), the quality of a farmer's crop may be below standard. This may or may not be detected by the firm. In some cases the firm will chose to ignore the quality problems. In other cases it will make price deductions or reject the crop entirely. Farmers may be able to connive with contractor staff to allow subquality produce to go unnoticed. On the other hand, the contractor may be able to use quality control procedures to adjust quantity imbalances. Particularly where quality is difficult to measure and grading and sorting are performed by company staff, farmers may be surprised by produce inspection results. Farmers and contractors (or their staffs) may attempt to cheat one another with regard to the quantity of the contracted crop. Farmers may obtain seed or other inputs outside of the contract and then sell the extra crop with the contracted crop. Company staff may be given incentives by farmers to overweigh their crop. Alternatively, staff acting on their own or under company orders, may underweigh farmer deliveries.

Further, the literature on contract farming in Kenya notes that changes in product market conditions affect the profitability of schemes and the level of benefits accruing to farmers, but there may be cases where such market changes may undermine the viability of the contracting scheme itself. Adverse market conditions may undermine the contractor's financial position, preventing it from raising producer prices in line with production costs or reducing the scope of its services. Highly favorable market conditions may lead to the emergence of competing contractors or marketing agents offering farmers terms

that the original contractor is unable or unwilling to match. Some market changes may undermine the comparative advantage of the entire venture and lead to closure even when the contract-farming component was performing adequately.

Contract Farming in Kenyan Horticulture

These three dimensions of contract farming schemes--their evolving organizational structure, their vulnerability to opportunistic behavior by one or both parties, and their critical links to the downstream market--are all readily apparent in several of the contractual schemes which have been attempted in the horticultural sector of Kenya. Horticulture has been one of the most dynamic sectors in the Kenyan economy in recent years. It has been driven by a growing export trade, together with rapid rates of increase in domestic trade and consumption. Horticultural exports, comprising fresh and processed fruit and vegetables as well as flowers, are now the country's third largest source of foreign exchange after coffee and tea. The sector features a wide range of organizational structures and mixtures of private and public investment. Large integrated production/marketing operations have played an important role in the development of the sector and these organizational forms remain dominant for flowers, pineapples, and strawberries.

However, for several horticultural crops and commodities there have been numerous attempts at organizing small- and medium-scale production under contract. For different horticultural crops there have been as many as twenty different contract farming schemes proposed or attempted over the past two decades. In the past decade alone, there have probably been at least ten different schemes developed to have farmers grow French beans under contract for processing or fresh export. Many of these schemes failed or had only short-term success. At present, there are at least four schemes which feature small and medium-scale farmers growing vegetable and flower seed under contract. Since 1980 there have been at least three attempts at having smallholders grow "Asian vegetables" under contract for exporters through the intermediation of cooperatives. Since the late 1970s there have been several attempts to organize smallholder flower production under contract.

In each of the attempts at contract farming in horticulture the relationship between buyer and farmers has gone well beyond a strictly marketing agreement. In some cases the involvement of buyers in the production process has been substantial. In most of the cases farmers had experience growing the crop prior to the development of the contracting scheme. However, inefficiencies in product and input markets made production contracts attractive

to farmers. In many cases the buyer faced competition for the crop and contracting was seen as a method of lowering uncertainties about raw material supplies. Still, leakage of produce and poaching by competing firms have typically been problematic. In contrast to the very large contract farming schemes, several horticultural contractors have lacked substantial staffs or access to seconded governmental staff. They have thus had to rely more substantially on local staff or agents or on existing cooperative societies. Most of these schemes have involved no government funding and limited government involvement.

We have chosen three horticultural contracting schemes for in-depth case study analysis. One case concerns the vegetable dehydrating company, Pan African Vegetable Products Ltd. (PVP). This is the first case of smallholders growing under contract with an agricultural processing firm in Kenya. The project was initiated in 1964 and, with numerous changes in ownership and management, carried on until 1982. The smallholder contracting scheme of PVP was largely successful, yet the project experienced continuous financial losses as a result of processing and marketing problems and the insufficiency of large-farmer supplies of raw materials.

Our second case deals with "Asian vegetable" production and marketing and the contractual scheme attempted by Kenya Horticultural Exporters (KHE). KHE has been Kenya's leading exporter of fresh fruit and vegetables for nearly two decades and has on several occasions entered into production contracts with small and medium-scale farmers. The company's scheme for contracting smallholder "Asian vegetable" producers was successful for a few years, but the project was not sustainable due to the larger competitive environment for "Asian vegetable" production and marketing in Kenya. The scheme contributed to substantial increases in smallholder production which the contracting company was only temporarily able to benefit from.

Our third case is the most formal horticultural contracting scheme. It is that of Njoro Cannery, a processor of French beans which has production contracts with over 15,000 smallholder farmers in western Kenya. The Njoro Cannery project was initiated in 1982 in the wake of numerous unsuccessful prior attempts at contracting western Kenya farmers to grow French beans for processing. Seventy percent of the farmers participating in this scheme are women, growing French beans on only 1/20th of an acre. While experiencing numerous technical, organizational, and political problems, this project has managed to survive, produce a high-quality export product, and provide additional sources of income and employment in an economically deprived area.

A review of the literature on the tea, tobacco, and sugar schemes provides insight into the forms of contract farming and its potential impact. The more "high profile" schemes exhibit substantial variation in the nature of the production process and sales arrangements. For example, tobacco production is carried out under a "supervision-intensive" regime and based solely on outgrowers. BAT's comprehensive extension service is responsible for instructing farmers and monitoring their behavior throughout the growing and curing processes. All necessary inputs are provided on credit. However, the tobacco farmer is responsible for carrying out all tasks. Hired labor is uncommon. Farmers are paid cash on the day of delivery according to quantity and a diverse grading scale.

In contrast, sugar production is done both on estates and on outgrower farms. Even with the outgrowers, the company carries out many production tasks either mechanically or through the use of work gangs. The farmer's main task is weeding and even this may be carried out by hired labor. Farmers have no post-harvest role and payment is based strictly on volume.

Various researchers see three strata of farm households emerging in the contract farming areas. The top stratum is that of the "capitalist farmers" who have relatively high income, derived partly (or largely) from trade and salaries. They rely heavily on hired labor on their farms. These farmers can use the additional income from the contracted crop to invest in shops, taxis or production inputs. The second stratum, the "middle peasants," derive income from contracted as well as other crops. They use both family and hired labor. The income generated by the cash crop is used for school fees, housing improvements, and consumer goods. The third stratum consists of very poor households with small holdings and relying solely on family labor. Casual wage labor may be their sole source of cash income. They may have to reduce their holdings to obtain required cash. These farmers can produce cash crops under contract only at the expense of food production, thus increasing their vulnerability. As minimum landholdings and/or production scales are set by the contractors, these poor farmers may be excluded from the projects even if they wished to participate.

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THE FRENCH BEAN CONNECTION:
FRAGILE SUCCESS OF A SMALLHOLDER CONTRACT FARMING PROJECT
IN WESTERN KENYA

Contract Farming in Africa-----Kenya Case Study #1

Introduction

This report examines several features of a privately managed production and marketing operation that has linked up to 15,000 smallholder farmers of a relatively deprived and very densely populated area of Kenya into an international market for a specialized high-quality agricultural product. Njoro Cannery, Ltd., is a locally owned firm acting through a marketing, management, and technical assistance contract with the French company Saupiquet and producing a top-grade canned French-bean product. The study most closely examines the raw-material-procurement dimension of the project. This is a contract-farming scheme with smallholder farmers. We explain the rationale for this contract-farming scheme and trace its historical background and organizational features. We also examine various aspects of the project's performance and impact. The analysis of the Njoro Cannery project is set within the context of the West European market for French beans and the wider development of French bean production and marketing in Kenya.

The case of Njoro Cannery is one of fragile success. The project followed upon several relatively unsuccessful attempts in Kenya to have farmers produce French beans under contract for processing. In the first year and a half of the project it appeared that low farmer productivity and weak capacity to enforce contracts would doom it. Several important technical and institutional adjustments saved it, enabled it to expand, and put the contract-farming element on a sounder economic footing. At this juncture the project was shaken by internal and external efforts (both legal and illegal) to redistribute project earnings. Adjustments were made to reduce further risks of this nature and the project has continued to expand its sales, employment, income generation, and farmer participation. The future of the project is uncertain, not only due to the fragility of the company's organizational structure or its potential competition from other Kenyan firms, but also possibly due to technical developments in Europe that could virtually negate part of Kenya's comparative advantage in French-bean production.

The study is organized as follows: We begin by making some general comments about French beans, their European market, and the overall pattern of French-bean production and marketing in Kenya. Moving on to the Njoro Cannery case study, we first examine the French market for canned green beans and provide some background information on Saupiquet. Next we trace the origin of the project by discussing Saupiquet's prior experience with French-bean contracting in Morocco, its trade ties to Kenya prior to the Njoro Cannery project, and its feasibility study for the Kenya project. The next section outlines the physical and

socioeconomic characteristics of the site for the contracting scheme. This is followed by a broader analysis setting out the rationale for this type of organization for raw material production. The project's actual organizational and contractual structure are then discussed. Next comes an overview of project performance according to a range of indicators. This review of basic organizational features and performance reveals that there have been considerable variations over time. One then needs to explain these performance variations and see whether they were linked to structural changes within the scheme. This we do in the next section where we view the processes of project development. We close with some final comments about the future prospects for the project and some lessons that the project suggests.

French Beans

The French bean (Phaseolus vulgaris) is one of the names given to the pods of the plant species Phaseolus. Other names commonly given to these pods are green beans, snap beans, string beans, bobby beans, and haricot beans. There are many hundreds of different varieties of Phaseolus vulgaris. These varieties may have different characteristics with regard to their production and their quality. Important differences may relate to the following:

Production:	Quality:
Color and application rate of seed	Length of pod
Size and shape of plant	Width of pod
Color of leaves and flowers	Curvature of pod
Length of time to maturity	Texture of pod's skin
Tolerancy to bean rust and halo blight	String development in pod
Rate of seed development	Color of pod
Rate and pattern of yield	

The French bean is thus potentially a highly heterogeneous product. Varietal selection may be a complicated process. First, it involves a matching of quality characteristics with consumer preferences, or the requirements for processing or effective distribution. French beans are consumed in various forms, including fresh, canned, frozen, or dehydrated. Certain

varieties have characteristics entirely unsuitable for some forms of consumption or processing. Even within categories for consumption, there are grading schedules outlining quality specifications for individual pods as well as acceptable quality tolerances (i.e., variances in quality).

Varietal selection will also need to relate varietal production characteristics with the ecological conditions, agronomic practices, and even the socioeconomic features of the area where the crop will be grown. For example, in recent years varietal development in Western Europe has concentrated on cultivars that are amenable to mechanical harvesting. Many of the older French-bean varieties have a yielding pattern consisting of several dispersed flushes over a period of three to six weeks. For these varieties mechanical harvesting is not economical. The harvesting machine acts as a comb, pulling the plant completely from the ground. Using a mechanical harvester for the multiple-flush varieties would result in very low yields. Harvesting of these older varieties must be done by hand, and labor requirements per acre of beans are very high. European producers, faced with rising labor costs, required single-flush bean varieties that could be mechanically harvested.

Fortunately for countries with relatively low labor costs, the single flush mechanically harvested French beans are typically larger in length and width than the pods of the "old" varieties, and frequently have a rougher skin surface. While these characteristics may be suitable for some forms of processing or meet the preferences of certain consumers, they may not be suitable for other uses or market segments. Certain consumers or institutional users of French beans have retained a preference for small and smoothly textured varieties. For this market segment there exists premium demand for particular varieties and certain quality characteristics. Probably the most important specification by these consumers relates to the width of the bean pods. Certain groups offer premium prices for "extra-fine" beans, i.e., those with a width of 6.5 mm or less. Other groups may have preference for "fine" beans, i.e., those with a width less than 9 mm but more than 6.5 mm. Beans of this size cannot be mechanically harvested.

French-Bean Production and Marketing in Kenya

Over the past two decades the French bean has become an important crop in Kenya. While grown for both fresh sale and processing, the main impetus for production has been an expanding export market. Since the early 1960s, Kenya has exported "fine" and "extra-fine" French beans to Western Europe. While this trade was initially targeted toward high-class caterers and department stores, over the years the air-freighted Kenyan beans

have become an item distributed by supermarket chains and purchased by middle class consumers. Kenyan exports are concentrated in the October-May period when European production of French beans is limited by adverse weather conditions. Market prices for French beans during this period are substantially higher than during the European summer when local supplies are plentiful. Still, a certain level of demand for the Kenyan product is retained during the summer months by caterers and "up-market" greengrocers.

Kenyan French-bean exports have been aimed largely for sale to France, Belgium, and the United Kingdom. Consumers in the first two countries have a preference for "extra-fine" beans while U.K. consumers prefer "fine" beans. Consumers in the Netherlands and West Germany prefer the larger bobby beans, which can be widely and cheaply procured from Spain or Egypt. Kenya's main competition for the "off-season" markets for "fine" and "extra-fine" beans comes from several West African countries that have long-standing trade ties with France.

The growth in Kenya's exports of French beans can be seen in the following figures:

Table 1: Kenyan French-Bean Exports

Year	Tons
1968	109
1972	642
1976	2324
1980	4965
1982	6306
1983	6447
1984	7094
1985	6558

Source: HCDA trade figures

French beans have also been grown in Kenya for processing. For many years several firms have been canning them for sale in both export and local markets. Generally the high levels of protection in the domestic food-processing industry together with high production costs have made the canned products uncompetitive in world markets but highly profitable on the local market. Canning companies have generally purchased beans from wholesalers or directly from farmers in times of market surplus. In addition to canning, French beans have been processed in Kenya through dehydration. During the 1960s and 1970s a dehydration factory at Naivasha processed French beans for export to Western Europe. This firm entered into loose production contracts with farmers.

Both the dehydration factory and each of the canning companies have experienced considerable problems in obtaining sufficient quantities of raw material. The prices and other terms that they have offered French-bean growers have frequently been uncompetitive with those offered by the fresh market. The Njoro Cannery project contrasts with these other processing operations.

Kenya's comparative advantage in French-bean production rests on two main factors: its ecology and its relatively low labor costs. Limited seasonal variations in temperature and day length allow French-bean production to be extended throughout most of the year in Kenya. French beans cannot survive frost and thus can be grown only under controlled-temperature conditions in most parts of Western Europe during the winter. They are grown in areas of Kenya with altitudes ranging from 1000 to 2000 meters, which are only rarely subjected to frost conditions. Various areas of Kenya have soils that are highly suitable for French-bean production. Furthermore, the presence of trees or bushes on many farms provides natural wind-breaks for the French-bean plants.

Production of "fine" and particularly "extra-fine" French beans is not economically viable in most parts of Western Europe, given the high labor costs that would be incurred in harvesting. Harvesting of an acre of French beans may require 15-20 people over a period of three to six weeks. Once pods are formed they grow at a rapid rate. To obtain "extra-fine" beans, picking must be done every day. The result is that harvesting costs will make up a high proportion of overall production costs for French beans. Where labor costs are relatively low, one may still obtain an economic return on a crop even when such labor time is allocated. In Kenya the daily wage for French-bean pickers ranges from Ksh 10 to 22, equivalent at the present rate of exchange to \$0.63-1.38 per day.

French beans are produced in Kenya by both small-scale farmers under rain-fed conditions and larger commercial farmers under irrigation. In recent years 4000-6000 smallholders have been engaged in French-bean production for the fresh export market alone. These farmers typically grow 1/2 to 1 acre of French beans as part of a mixed-farming pattern including maize, dry beans, dairy cows, and other crops. Such smallholders are based in Athi River and in various sites in Central Province. Larger scale producers for the fresh export market may number 100-150. These farmers may have up to 20 acres of beans under production with harvesting being done on 4-5 acres at a single time. These farmers typically grow French beans to supplement incomes from salaried employment or to improve the cash flow position of farms oriented primarily to tea or coffee production. Some larger farmers are specialist horticultural growers. Larger

French-bean farmers are common at Lake Naivasha, Thika, and Athi River.

A wide range of institutional arrangements exists for farmers in the marketing of their output, from essentially market transactions, through quasi-contractual and contractual sales, and on to vertically integrated operations. A full examination of these different marketing arrangements is not possible here. We merely summarize the main features of three alternative channels.

Several thousand smallholders in the Gatundu and Makuyu areas of Central Province are engaged in French-bean production. Some farmers have grown this crop since the early 1970s. More than a dozen exporters are fairly regular bean buyers in the area. Most of these firms recruit local people to act as intermediaries recruiting farmers and organizing collection and farmer payments. Some intermediaries work with more than one exporter. Exporters may send their trucks to the area three or four times per week during the main export season. Prices are set for the season with one price for "extra-fine" beans and another price for "fine" beans. These "fixed" prices may be subject to short-term adjustment as a result of changing market conditions. Exporters provide no seeds or other inputs and are not in a position to provide any technical advice. The intermediaries distribute cartons to farmers and arrange the days for the farmers to deliver filled cartons to a store or stall. For his efforts the intermediary will take a few shillings per carton commission. Payments to farmers are made fortnightly. Farmers may deal with several different intermediaries (and thus exporters), shifting their sales in light of short-term higher price offers being made by competing exporters.

Kenya's largest exporter of fresh fruit and vegetables is a firm called Kenya Horticultural Exporters (KHE). In recent years the company has exported up to 2500 tons of beans annually. The bulk of its supplies are obtained on contract from large and small growers. In 1986 KHE had 150 farmers growing beans under contract. KHE provides seeds and chemicals on credit to be deducted against the delivered crop. The company has two experienced horticulturists who can advise farmers on production problems, and it employs several people who assist farmers with proper grading and packing. Farmers are paid a fixed price for the full export season. Prices are changed only in exceptional circumstances. During the peak export season KHE trucks may collect produce five or six days a week. Farmers are paid whenever they want. Some receive payment weekly, others fortnightly or monthly.

While KHE may directly contract with only 150 bean farmers, operating under its bean procurement "umbrella" are probably 500 or more farmers. Several of KHE's farmers have their own subcontractors. One contract farmer in Mwea has developed a procurement network of over 200 small-scale farmers in the area. The subcontractors, most of whom are women and many of whom grow the beans on plots provided by the National Irrigation Board, typically have 1/4 to 1/2 acre under beans. The KHE contract farmer provides seed, fertilizers, and chemicals on credit to "loyal" subcontractors. He maintains the collection stations where KHE trucks pick up supplies. The contract farmer takes a margin of 5-10 percent of KHE's contract price.

The export company Homegrown presents another method of raw-material procurement. Homegrown actually has two separate systems. With twenty large-scale farmers he maintains seasonal contracts. He pays premium prices over those offered by competitors, but his quality standards are far more rigid. He employs fifty graders who are actually brought to the contracted farms during harvesting. These graders go through the fields advising and monitoring the pickers. They check the quality and weights of cartons before they leave the farm. The contract farmers receive seeds and some chemicals on credit. Homegrown's manager, an engineer by training, has designed small-scale dams for ten of his farmers. Producer payments are made weekly.

Homegrown simultaneously operates a different system for raw material procurement from smallholders. He maintains two collection centers in Mwea. Small-scale farmers bring their crop in bags, grade them, and sell them in bulk form to the company. Depending upon the regularity of a farmer's sales to the company, she may be paid cash on the spot or else paid weekly. No inputs or technical advice are provided. Transporters take these beans to a company packing/cold-storage unit where the beans are rechecked for quality and packed into cartons.

The production and marketing of French beans has had a number of beneficial impacts. One immediate benefit is the generation of foreign-exchange earnings. In the early 1980s the foreign-exchange earnings for fresh French-bean exports have been the following:

Table 2: French-Bean Export Earnings

1981	Ksh 59.8 million
1982	63.1
1983	70.9
1984	78.0
1985	72.1

Source: HCDA Export Data

These figures are actually "minimum" export values, calculated by taking the Government's minimum export prices and multiplying them by the volume of sales. Actual foreign-exchange earnings are probably 10-15 percent above these minimum values.

A second major benefit has been the generation of cash income opportunities for small-scale farmers. French beans are an ideal smallholder crop given their labor intensivity, their short production cycle (i.e., three months from planting until completed harvest), and the small planted acreages needed to obtain a good supplemental cash income. Based on exporter reports about their bean procurement systems, we estimate that 60 percent of the beans that are exported are produced by small-scale farmers. If one assumes for 1987 that Kenya will export 7000 tons of French beans and one takes a rough average producer price of 10.4 shillings/kg and deducts 1 sh./kg for the middlemen, then smallholder gross income for beans this year will be Ksh 37.11 million.

French beans have also been a lucrative source of income for many large-scale farmers and have helped coffee farmers to overcome cash flow problems associated with delayed payments for that crop. Even when using conservative estimates for yields and producer prices, large growers can obtain a gross income of Ksh 19,600 per acre against production costs (not including depreciation on equipment) of about Ksh 10,653. This net income of Ksh 9000 is for only a three month crop. At least three separate crops per year can be grown.

A third major benefit of French-bean production has been its generation of employment opportunities. Bean production on small farms is undertaken by family members, although a few local people may be hired to assist in picking. Bean production on larger farms is carried out almost entirely by hired labor. The picking and grading of beans is performed almost exclusively by women. Some women may reside permanently on the farms, while others come from nearby villages and work on a seasonal basis. A long-distance migrant flow has also been observed with women from Western Province coming to pick beans in areas such as Athi River and Naivasha.

French-bean production is considerably more labor intensive than most crops grown in Kenya. Compare the figures below:

Table 3: Work Days Needed Per Crop Per Ha

French beans	554 days
Coffee	294
Cotton	235
Hybrid Maize	152

Source: Hormann and Thuo (1979)

Having examined some general characteristics of French beans and the production and marketing of French beans in Kenya, we move now to discuss the case of Njoro Cannery.

Njoro Cannery

The Market

Njoro Cannery produces and exports canned French beans of the "extra-fine" quality. Its market orientation is exclusively the French market. The market for canned green beans in France is segmented into three quality levels--"extra fine," "trifine" (or simply "fine"), and bobby bean. Annual French consumption of canned extra-fine beans is 30-35 million cans of A 2 1/2 size (approximately 1 kilo). (1) This level of demand has been stable over several years, and the French market for canned vegetables generally is essentially saturated. Demand for the canned product is seasonal with reductions during the summer months when fresh green beans are available in abundance.

French production of canned French beans has declined since the mid-1970s as seen below:

Table 4: Production of Canned French Beans in France (tons '000)

1975	35.2	1978	41.0	1981	31.7	1984	16.2
1976	34.1	1979	35.1	1982	36.0	1985	21.2
1977	33.9	1980	28.1	1983	22.1		

Sources: Marketing In Europe (April 1981), (April 1986), (October 1986)

High labor costs have rendered French production of this labor-intensive quality product uneconomical. Consumer demand is being met by increasing levels of imports. Examine the following figures for French imports of green beans (including French beans and mange-tout):

Table 5: French Imports of Green Beans (tons; Francs '000)

Year	Volume	Value
1980	9.6	39.7
1983	20.1	101.4
1984	19.9	137.5
1985	25.2	193.1

Source: Marketing in Europe, Oct. 1986, p.52

French imports of canned green beans carry no tariffs for EEC and ACP countries, but carry a 20 percent custom for other countries of origin. The product must be labeled in the French language and conform to specifications related to weight, size, and quality.

Since the mid-1970s, Morocco has been the leading supplier of canned green beans to France. In 1985 it provided 56 percent of France's imports, sending 13,998 tons. The second largest share was taken by Belgium/Luxembourg, sending 4061 tons and accounting for 16 percent of imports. Kenya was the third most important supplier, sending 3714 tons for a 15 percent share. It should be noted that supplies of extra-fine beans are coming almost exclusively from African countries--i.e., Morocco, Kenya, and the Cameroon.

The French vegetable-canning industry comprises 143 enterprises, but sales are concentrated in a few firms. Five manufacturers account for 63 percent of the industry's turnover and three national brands account for over a third of canned vegetable sales through the grocery trade. These three brands are Cassegrain (for Saupiquet), D'Aucy (for Compagnie Générale de Conserve [CGC]), and Bonduelle (for Bonduelle). (2) These are also the three largest firms and brands for the trade in canned French beans. Saupiquet and CGC each supply approximately 8 million cans/year while Bonduelle supplies 3-4 million cans/year. Many smaller firms supply the balance. (3)

While the manufacturers formerly distributed their products to individual supermarket chains, in recent years a half dozen central food-distribution firms have emerged that deliver a large range of foodstuffs to supermarket chains. The major manufacturers now sell through these organizations. While Saupiquet sells its products almost exclusively under its Cassegrain brand, the other leading firms sell under both their own brands and the labels of the retail chain. Heavy competition has sharply reduced margins, and price premiums for prominent brands have been reduced. At the retail level canned fine mange-

tout beans sell for approximately one-half the price of extra-fine beans. (4)

Saupiquet

The company involved in the Kenya project is Saupiquet. It is a public company with shares traded in the Paris stock exchange. There are a few major shareholders, including Compagnie Navigation Mixte who hold 20-25 percent. The firm dates from the late 19th century and has always been a canning company. The present company is a result of a long series of mergers which, beginning in 1955, have incorporated twenty family businesses. The group consists of a parent company, five French subsidiaries, two European subsidiaries, and two African subsidiaries. Unlike its two leading competitors, it has not operated its own farms in France. Also unlike its leading competitors, it supplies canned vegetables only to the household market, not to the institutional sector. (5)

Sixty percent of the firm's turnover derives from fish (mainly tuna) obtained from the Guinea Gulf and the Seychelles with nearly a quarter of fish requirements coming from the firm's own boats. Ten percent of the firm's turnover comes from ready-made meals. For this it imports meat from Argentina, Australia, and New Zealand. The remaining 30 percent of turnover is derived from sales of canned vegetables. It produces in France canned bobby and French beans, carrots, sweet corn, celery, peas, and mixed vegetables, while importing canned red pepper from Eastern Europe, sweet corn from the U.S., Canada, and Israel, and French beans from Morocco and Kenya. In France it ranks #1 in fish and #2 in vegetables and ready-made meals in terms of sales. It is one of Europe's five largest canners. Saupiquet had a 1985 turnover of French francs 1.63 billion and employed 3437 people. (6)

Saupiquet's attraction to Kenya rests on the two aspects of comparative advantage discussed earlier: ecology and low labor costs. Since the early 1970s Kenya had been supplying fresh "extra-fine" beans to the Paris Rungis market and had begun to develop a reputation for quality. The Kenyan product was available all year long, in contrast to local French production which was limited to the summer months. Local production patterns forced canners to process green beans during a short period and to maintain costly stocks for the remainder of the year.

The most important factor, however, was rising agricultural labor costs in France rendering it uneconomical to harvest and process "fine" and "extra-fine" French beans. Still, the French consumer was willing to pay a premium price for supplies of the

high quality product. Saupiquet needed to source this product from areas with relatively low labor costs. Most important is the identification of areas with low cost but productive agricultural labor forces. The cost of harvesting the raw material is the most important cost in the processing of French beans. Even in Kenya where taxes, tariffs, and imperfect competition render the costs of fuel, cans, and equipment considerably higher than in France, the beans themselves have comprised the largest component of total production costs covering an average of 37.7 percent of total costs over the 1983-85 period. (7)

The Origins of the Kenyan Project

In the mid-1970s, witnessing increased competition in the French market and continuously rising agricultural labor costs in Europe, Saupiquet began to examine the possibility of sourcing canned French beans from Africa. Initial efforts were made in Morocco and Kenya. Both of these efforts would contribute to the later development of the Njoro Canning project in the 1980s.

Saupiquet in Morocco(8)

Prior to Moroccan independence, Saupiquet had operated fish canning factories in that country. When these were nationalized with minimal compensation, the firm adopted a policy of not making further capital investments there. However, Morocco had become an important supplier of fresh "off-season" French beans to the French market and one of Saupiquet's leading competitors was obtaining canned beans from that country. Contacts between the Vice President of France and a top official in the Moroccan Ministry of Agriculture led to a fact-finding mission to explore the scope for processing beans for Saupiquet.

An agreement was reached with a Moroccan businessman who owned a small processing factory (producing paprika for export to the United States) whereby the local businessman would provide the finance and Saupiquet would provide technical assistance and management, ensure the marketing of the canned product, and guarantee a minimum profit level. Saupiquet sent Mr. Gilbert Bintein, a manager of one of its European factory operations, to manage the project. The local businessman invested one million French francs to build a new factory site (1.2 tons/hour capacity) and provided 300,000 French francs toward the initial raw material production operations. Production began in 1976.

The project manager knew that they could not base raw material procurement on a large-scale estate. Due to the crop's labor-intensivity and the problem of supervising a large labor force, he figured it unlikely that they could obtain an "extra-

fine" or "fine" product from large-scale production. However, if they could not obtain such a quality level there was no point operating in Morocco. Low cost bobby bean supplies could be obtained in Europe. An experienced production specialist from Saupiquet recommended that the factory obtain raw material by procedures similar to those used in France: i.e., the company should provide production contracts to farmers to grow plots of 2-5 ha of beans. Another adviser, a man who had just completed work on a rice project in Madagascar, suggested that better results could be obtained by focusing on smaller units of production. The latter strategy was eventually adopted.

The production area chosen was a Spanish- and Arabic-speaking area near Tangiers with sandy soils but with good ground-water resources. Local farmers were growing cereals and vegetables for home consumption. Most did not know what a French bean was, as the area was about 250 km from any major bean growing area. The company began with demonstration plots and initially convinced 50 farmers to grow the crop. By 1980 nearly 4000 farmers were participating in the project.

Participating farmers had a minimum holding of 6 ha with some farmers having 15-40 ha. French beans were generally grown on 1/4 to 1/2 ha plots although some farmers had up to 2 ha of beans growing at any one time. Farmers grew French beans under contract throughout the year. Initially the crop was collected and brought to the factory for weighing and sorting. Farmers were suspicious about this quality control and weight reporting system, so a system was developed to purchase the beans at a village-level collection center using a company representative with a scale. The company wanted to reduce the risk of loss due to theft or improprieties surrounding cash payments, so it instituted a system of providing farmers ticket receipts for their deliveries for a lump-sum payment at the end of the crop. Initially this practice was resisted, but as an "ambiance of trust" was built up, the farmers gave their support. Groups of farmers elected leaders to act as intermediaries between them and the company.

Saupiquet's (i.e., Bintein's) experience in Morocco over the 1976-1980 period had an important influence over the design and functioning of the Njoro Cannery project, especially in its early development. The knowledge gained and the lessons learned would have both positive and negative influences on the Kenya project. This issue will be explored below.

Saupiquet Imports from Kenya

Since the early 1970s French companies had been importing Kenyan fresh French beans to supply the local catering and "up-

market" consumer trade. Saupiquet was interested in finding someone to expand Kenyan production and to process extra-fine beans. At the time Kabazi Cannery was the only firm actually processing green beans to supply the small and highly protected Kenyan market. Kabazi was jointly owned by a local businessman and Brooke Bond (K). Kabazi began supplying small quantities to Saupiquet in 1976. Kabazi was not interested in getting involved in supporting French-bean production, but agreed to increase processing output if provided additional raw material. One French importer who was in contact with Saupiquet suggested that the latter contact his fresh French-beans supplier, a firm called Corner Shop Ltd., to see whether that firm would be interested in organizing raw material supplies for Kabazi. Corner Shop's manager, Mr. Wadhwa, was amenable to this arrangement. (9)

Between 1977 and 1981, Mr. Wadhwa, using technical or financial support from the Ministry of Agriculture and from several foreign donor agencies, initiated a number of French-bean production schemes in Western Kenya. Together with an American partner he leased a 1000 acre farm in Nanyuki to grow potatoes and French beans each on 100 acres. The potato seeds that he was given by a government agency proved to be defective and that crop was lost. With the beans they were unable to organize sufficient labor to do the weeding and harvesting of such a large planted area. That effort was also written off. (10)

In areas such as Kitale, Eldoret, and Bungoma, Wadhwa attempted to encourage large scale farmers to grow a few acres of French beans. Rather than deal directly with the farmers, Wadhwa provided inputs and crop payments through local cooperative societies that had been handling other crops. By 1979 Corner Shop had 1500-2000 farmers growing beans under this system. The firm was not sufficiently able to supervise input distribution, production, and collection, given the scattered pattern of the farms, and was dependent on the effective functioning of the local cooperatives. Cooperative mismanagement and entrepreneurial pursuits on the part of managers undermined the system. Many participating farmers became disillusioned with growing French beans for processing, given the heavy labor demands and the low price offered them relative to what was being offered by exporters of the fresh product. The seeds provided by Wadhwa were of the Monel variety, the same variety preferred on the fresh market.

Wadhwa continued to search for new areas. A staff member of the Bungoma Horticultural Cooperative recommended that Wadhwa try his home area, Vihiga Division of Kakamega District, because of its suitable ecological conditions and the absence of satisfactory cash crop options in the area. In 1979 Wadhwa started operating in Vihiga. Corner Shop operated through the

Manyatibu Cooperative Union, which had previously dealt with locally produced dry beans, honey, tomatoes, and poultry. Corner Shop would provide inputs to the Union on credit to be deducted against the future crop. The Union in turn was to deal with three primary societies. These societies would issue seed, collect the crop at collection stations, and serve as bases for local staff appointed by Corner Shop who would do chemical spraying of fields and supervise grading at the collection stations. Corner Shop appointed two field supervisors to go on motor bikes to advise farmers.(11)

While the effort was based on good intentions and there was initial enthusiasm about the project, the operation was neither technically nor organizationally sound and eventually brought financial loss and farmer disappointment.(12) Neither Corner Shop nor the cooperative leaders knew what inputs and cultural practices would be necessary to grow French beans successfully under Vihiga conditions. Field research was not undertaken locally. Rather, technical advice was based on field research conducted at government research stations in Thika and Nakuru, each under significantly different ecological conditions. "Advice" provided by chemical company salesmen proved to be misguided. Farmers were encouraged to grow continuously, even though rainfall was insufficient over 4-6 months to get a profitable crop.

The performance, both of the cooperatives and of the farmers, proved to be disappointing. Cooperative staff frequently sold chemicals and fertilizers, and some farmer receipts went "missing." The cooperative union delayed its payments to project workers and farmers, sometimes over three months after the time when Corner Shop paid the union. The deductions taken by the cooperatives were excessive given the level of services provided. In 1980 Corner Shop paid sh.2.50/kg but farmers were paid only sh.1.75, the cooperatives having taken 30 percent.

Farmer yields were very low, averaging 30-40 kgs per kilo of seed provided. This would be the equivalent of 600-800 kilos/acre, which is one-third to one-half the norm in Kenya for French beans. Thirty percent of the value of the input loans was not recovered by Corner Shop. Lacking adequate advice and supervision, farmers preferred to keep pods on the plants for additional time to get a heavier crop. The weight difference between an "extra-fine" and "fine" bean is approximately 40 percent. Farmers could thus considerably increase the weight of their crop by picking every other day rather than every day. The company had thus to take and process fine as well as extra-fine beans, selling the canned fine bean product on the local market.

Operating at a loss, Corner Shop's operations in Vihiga drew to a virtual halt in 1981.

Project Establishment

In the fall of 1981 Gilbert Bintein came to Kenya to examine the potential for expanding processed French-bean exports to France. Bintein's attention was focused on identifying a suitable location for establishing a contract-farming scheme. He looked for an area with 1) high population (and farm) density, 2) temperatures in the range of 20-25 degrees celsius, 3) relatively high and evenly spaced rainfall patterns, and 4) natural wind breaks. Visits were made to Kitale, Kisii, Kericho, Njoro, Thika, the Coast, Eldoret, and Vihiga. He examined existing French-bean production for processing or export, noting the insufficient collaboration between farmers and buyers and inadequate use of fertilizers and chemicals. (13)

Bintein gave little consideration to the prospect of establishing a large estate to grow French beans. Labor recruitment and supervision problems ruled out this option. On larger horticultural farms in Kenya nearly all harvesters of French beans are migrant women, many of whom are single. The social problems accompanying large-scale deployment of such a labor force have proven to be large. (14)

There was hope, however, that medium-scale farmers would provide the factory part of their output. The prospect of getting such farmers to grow exclusively for the factory was rather grim as many such farmers were being sought after by exporters of fresh French beans who offered 2 1/2 to 3 times the price that the factory would offer. Past efforts by Wadhwa to recruit medium-scale farmers to grow beans for processing had proven unsuccessful.

The only group of farmers for whom growing beans for processing would appear highly attractive would be smallholders with limited cash crop options and with sufficient family labor to carry out the necessary husbandry-intensive techniques for high quality French beans on a very small scale. This issue is further discussed in the section below entitled "smallholder participation."

Indeed, Bintein decided that the most appropriate area for production would be Vihiga in Kakamega District, Western Province. This area not only possessed the physical and socioeconomic characteristics noted above, but it also lay a considerable distance from any important French-bean market, thus reducing the risk of "leakage" of beans onto alternative markets. Approval to operate in the area was sought from the District

Permanant Commissioner, the District Agricultural Officer, and the local government chiefs and subchiefs.

One of the few individuals to assist Bintein during his fact-finding trip was Wadhwa, and this led Bintein to incorporate Wadhwa into the project being developed. Wadhwa would be responsible for financing a Vihiga-based production control unit called Hortiequip Ltd. and would share in the profits of the overall Kenyan operation. Kabazi Cannery showed little interest in working further with Wadhwa or in expanding their capacity to process French-beans. An alternative partner was identified. A prominent Nakuru-based businessman (dealing in building supplies), T. K. Patel, had acquired a small canning factory in Njoro in 1978. It was operating periodically employing 20-40 people, canning peas and beans in tomato sauce for the local market.

In December 1981 an agreement was signed between Saupiquet and Patel whereby Patel would finance capital investment in an expanded factory and cover the operating costs of the factory. Saupiquet would provide technical assistance in remodeling the factory, manage the factory and the raw material production operation, market all factory output, and guarantee Patel a minimum return on his investment. (15)

Project Location

Kakamega District is divided into ten administrative divisions. The French-bean project has operated in three of these--Vihiga, Hamisi, and Ikolomani. The District (and the divisions where the project operates) is characterized by three main features: 1) high agricultural potential, 2) high population density, and 3) high rate of labor out-migration.

Kakamega District lies in a zone of high agricultural potential. Of its total 3520 sq km, about 3250 sq km are arable. Rainfall varies between 1250 and 2000 mm with a less than 10 percent probability of obtaining less than 750 mm of rain in a year. Rainfall is generally adequately distributed with no major dry season. Rainfall maxima come in April/May and August/September. (16) The area's geography and climate are thus highly suitable for growing vegetables. (17) A Ministry of Agriculture report warns, however, that the high rainfall pattern provides a breeding ground for pests and diseases and that hail is a hazard in the area. (18)

The population density of the District was 295 per sq km in 1979 and estimated at 349 per sq km in 1983. The divisions with the three highest population densities are those where the project is based. In 1979 the population densities were 692 per

sq km in Vihiga, 612 per sq km in Hamisi, and 402 per sq km in Ikolomani. (19) Martin (1985) notes that according to colonial officials, the Vihiga area already had a population density of 450 per sq mile in 1919. One group of researchers claims that the population density of Vihiga is probably as high as any rural location in eastern and southern Africa. (20)

From the early part of the colonial period this region has served as a labor reserve. Martin argues that this pattern arose from a combination of the following factors:

- 1) the colonial ban on African export crop production;
- 2) increasing land pressure;
- 3) neglect of agriculture by the colonial government during the 1930s and 1940s; and
- 4) an anti-capitalist ethic engineered by Quaker missionaries based in the area.

Referring in 1960 to the area where Vihiga lies, Elspeth Huxley stated that "Maragoli has become a sort of dormitory area for places as distant as Mombassa and its communities return for a month or two every year after harvest to drink millet beer and produce a new crop of babies." (21)

The high rate of out-migration has created anomalies in the local labor market. In the 1984-88 Kakamega District Plan it was estimated that out of a workforce of 482,484 in 1983, 276,293 or 57.2 percent were outmigrants. A large proportion of migrants are male, leaving the majority of productive labor in the District to be provided by women, children, and older people. While for Kenya generally the sex ratio for the population 15-49 years of age is 105 females per 100 males, for Kakamega it was 134-100 in 1979 and 126-100 in 1983.

Martin argues that "agriculture has ceased to be a sufficient source of income and households have become more and more dependent upon income from wage labor." While agriculture has been poorly developed it has "been a cushion against the vagaries of labor demands" and thus prevented the marginalization of the population. (22) Martin presents survey results showing that the proportion of household income in Maragoli deriving from off-farm activities rose from 77.5 percent in 1969 to 84.5 percent in 1977.

The survey results did show considerable differences among sub-groups, with those households with more than 7 acres getting 91 percent of income from off-farm activities compared to 78 percent for those with less than 3 acres and 58 percent for those with 3 to 7 acres. While larger landholders tend to find off-farm employment in teaching or the civil service or else operate their own small business, off-farm income for smaller farmers

tends to come from employment in the Mumias Sugar scheme, the Webuya Paper Mills, the Nandi Hills tea estates, or work in Nairobi or Nakuru. (23)

Smallholder Participation

The number of farmers participating in the project has expanded significantly since its initiation, as seen in Table 6 below. The company has sought to control farmer participation, firstly through the specific sublocations where it establishes collection centers, and secondly through endeavoring to achieve maximum control over the distribution of production inputs. The locating of collection centers is critical as the cost and availability of motor transport limits farmers to delivery points only within close proximity to their farms. Control of inputs begins with the distribution of seed with exact seed allocations made to individual collection centers based on the number of farmers whom the center's extension agent (i.e., the "control clerk") has registered. When seeds are distributed the farmer signs a contract with the company, her name and ID number is recorded, and a "farmer card" is issued on which subsequent input and crop transactions are recorded. The French-bean variety used is Vernandon. This variety is not commonly used in Kenya and thus there are few alternative sources of seed. Farmers need not show a land title when obtaining a contract. (24)

Table 6: Farmer Participation

Year/Season	Number of Farmers
1982	1,000-1500
1983 (first season)	3,290
(second season)	3,397
1984 (first season)	10,359
(second season)	12,686
1985 (first season)	13,526
(second season)	15,765
1986 (first season)	12,078
Kisii area	3,466

Source: Hortiequip Ltd.

Approximately 70 percent of the farmers participating in the project are women. This is perhaps not surprising given the incidence of male out-migration and the significant number of farms that are managed by women. While in the early years of the project many of the farmer contracts were signed by the husbands, more recently women themselves have signed for the contract and their ID number is noted on the farmer card. (25) This change is

significant since payment is made to the person whose ID number is on the contract.

The widespread participation of women in a production system involving extension and credit is significant and a departure from past patterns in the Vihiga area. Staudt (1977) found that there was a severe bias against women in Vihiga in the delivery of government agricultural services. This bias held even when controlling for economic standing, size of landholding, and demonstrated interest in adopting agricultural innovations. She found that 98 percent of government agricultural field staff were men and that communications between women farmers and male extension staff who are not related by kinship frequently aroused suspicion, especially when the husbands were absent. She found that 49 percent of female-managed farms were never visited by extension staff while 28 percent of jointly-managed farms were not visited. Attendance by women at demonstration sessions and training courses was also considerably lower than for men. She found that 99 percent of women on female-managed farms knew nothing about the procedures for a loan application even though an Agricultural Finance Corporation program had been active in the area for three years prior to the time of her survey. Women felt that since they lacked a regular salary and since they themselves did not hold the land-title deed, agricultural credit was not open to them. Staudt summarizes that "a large part of the bureaucracy's clientele, who are women, are in effect ignored." (p. 2)

To establish a brief profile of the Vihiga-area farmer participating in the project we have drawn from results of surveys carried out by Mook (1971) and Staudt (1977), and we carried out a survey of 21 participating farmers. The farmers interviewed in our survey were drawn from five different sublocations that vary in 1) their length of time in the project, 2) their level of farmer yields, 3) their location, and 4) their proximity to major roads. Farmers selected for interview also represent a cross sample based on relative yields for the in-progress 1986 second season. Farmers were drawn from categories of "high," "medium," and "low" performance for the season.

Both Mook and Staudt found median landholdings per household to be 2.5 acres. Mook found that 39 percent of households had 2 acres or less and 44 percent had between 2 and 5 acres. The farmers in our survey had the following landholdings:

Table 7: Landholdings in Vihiga Survey

Area	Number of Farmers
1 acre or less	8
Between 1 and 2 acres	8
Between 2 and 4 acres	3
More than 4 acres	2

Multiple fragmented holdings have been common in this area. In Mook's survey 38 percent of farms consisted of more than one piece. In our survey only 2 of 21 households had more than one plot, but several farmers did report having sold plots in the past five years. Most Vihiga farms have a considerable number of people living on them. Mook found that 56 percent of farms had 7 or more people. This actually may be difficult to access as one commonly finds holdings where parents and the families of their sons are resident with the land being divided up amongst the "households" but with children and family labor "migrating" throughout the holding.

A common finding of investigators of the Vihiga scene is the paradoxical condition that in an area with extreme population density, there remains considerable uncleared arable land. Mook estimated that 12 percent of Vihiga farmland was uncleared, 80 percent of which was arable. It is generally argued that labor, not land availability is the prime determinant of cropping acreage. (26)

Maize and local dry beans are the most important crops, with subsistence requirements taken first and surpluses sold in local markets. Hybrid maize has been widely adopted. Cash crops generally consist of small plantings of coffee, tea, sunflower, cotton, cooking bananas, and vegetables. In our survey 8 of the 21 farmers also grew vegetables (cabbages, onions, kale) for sale, followed in incidence by coffee (7 farmers), bananas (5), and tea (3). Five of the farmers grew no other cash crops than French beans. These farmers had an average holding of only 1.1 acres. Those with some coffee and/or tea tended to have slightly larger holdings than the average, with coffee growers having an average of 2.86 acres and tea growers 4 acres. Until the mid-1960s, farmers with less than 7 acres of land were not permitted to grow coffee. (27) Fluctuating prices and delays in payment have restricted smallholder interest in coffee with 1982 Kakamega District production of the crop being less than two-thirds of its level for 1969.

Small acreages and the considerable extent of hilliness and rockiness limit the scope for mechanizing farm practices. All activities from land preparation through planting, weeding, and

harvesting are done by hand. Small acreages, cash constraints, and the availability of family labor (generally women, children, and older people) limit the incidence of hiring agricultural labor. Mook found that only 18 percent of households have paid part-time labor and only 8 percent have paid full-time labor. In our survey 8 of the farmers hire workers part-time with work focusing on the picking of French beans, coffee, and tea. Most of the women interviewed said that their husbands were working on tea estates in Nandi Hills or Kericho or that they were resident in Nairobi. Casual empiricism suggests that many of the men participating in the project are either not in the general labor force (i.e., over 60 years or less than 18) or are in the process of making a transition between obtaining income through seasonal work elsewhere and settling on the farm and perhaps using some savings to establish a local business.

Past efforts to organize vegetable production under contract for processing proved unsuccessful in Vihiga. Kabazi Cannery attempted to obtain tomatoes from Vihiga smallholders in the mid-60s, but local market prices sometimes reached 5 times that offered by Kabazi, and these opportunities outweighed the consideration of a guaranteed market outlet. (28) A local factory that extracts papain from papaya has been unable to organize consistent supplies of raw materials and has relied primarily on seasonal surpluses that then render the factory's price competitive with the local fresh market for papaya. (29)

Experience prior to and after the initiation of the project suggests that only farmers with extremely small landholdings, with available family labor, and with limited cash-crop and wage-labor options would find the growing of French beans for processing economically interesting. The income earned would barely cover the labor costs of a commercial or smallholder farmer using hired labor. Only where farmers do not value family labor at the market rate does the production prove economically interesting. This can be seen below where we calculate the implicit labor cost for growing 1 kilo of French-bean seed during a season and then compare this with average net earnings from the project. Estimations for labor input, length of work day, and the cost of hired labor are drawn from farmer survey responses. This estimation is rather crude, as considerable variations in effort (particularly in harvesting) are observed.

Table 8: Estimated Labor Input and Implicit Labor Costs for French Beans in Vihiga

Activity	Quantity	Cost (10 sh per 7-hour work day)
Land Clearing	1 day	Ksh 10
Ridging	1 day	10
Cleaning/Planting	4 hours	5.71
Weeding	12 hours (3 by 4 hours)	17.14
Fertilizer Application	4 1/2 hours (3 by 1 1/2)	6.43
Stick Support	1 day	10
Bean Picking	72 hours (36 days by 2 hours)	102.86
Transporting/Sorting	18 hours (36 days by 30 min.)	25.71
Total		Ksh 187.85

Thus, we find that the implicit labor cost for growing French beans over a three month season is Ksh 187.85. It is important to note, however, that a majority of farmers do not yet perform the practice of setting up a stick support system for the beans. When comparing net earnings with labor costs we shall deduct the Ksh 10 for this activity. Picking is by far the most important item in the above costing. Two hours per day was the most commonly reported level of effort, although picking time may vary between 1 hour and 3 hours per day depending on the development of the crop. The time spent carrying beans to collection stations, sorting the beans, and having them weighed and receipted is again an average figure with actual timing depending on distance travelled, the number of farmers at the collection station, and even the degree of trust between a particular farmer and the center's quality inspector. The intensity of quality inspection varies from farmer to farmer.

Let us now compare this implicit cost of labor (or cost for having hired labor work on the beans) with the average income for farmers participating in the project. To obtain average income we made the following calculation:

(Price x Average Yield Per Kilo of Seed) - Value of Inputs Loan

For 1985 and 1986 we use a rate of 10sh/day for the cost of labor while for the three preceeding years we use 7.5sh/day. For

labor costs we have deducted the cost of constructing stick supports. Labor cost totals are thus Ksh 133.4 for years 1982-84 and Ksh 177.9 for 1985-86.

Table 9: Average Income Versus Implicit Labor Costs

Year	Average Income	Implicit Labor Cost
1982	-0.23	133.4
1983(1st season)	17.96	133.4
(2nd season)	106.17	133.4
1984(1st season)	155.1	133.4
(2nd season)	235.7	133.4
1985(1st season)	137.3	177.9
(2nd season)	190.5	177.9
1986(1st season)	162.8	177.9

Of course, labor costs will vary with harvesting effort that in turn will influence yields. Thus, implicit labor costs may be lower than average for those getting poor yields and higher for those with superior yields. However, taking our crude estimation for illustrative purposes we find that farmers obtained a cash income exceeding the implicit cost of their labor only in three of the eight seasons or years in which the project has operated. This suggests the economic infeasibility of hiring labor solely for work on the French beans for processing. When calculating for the different seasons the yield required for a farmer to cover not only the value of the inputs loan but also her implicit labor cost, we find a range of 71.3 to 88.2 kilos per kilo of seed. On an acreage basis this would be 1426 to 1764 kilos. The latter figures are not far below the average yields for French beans in Kenya and generally higher if one deducts the output of fine beans and takes only the output of extra-fine beans from a plot of French beans. Thus, larger farmers who will generally have higher labor costs than the 10 sh./day rate in Vihiga and will have labor supervision costs are unlikely to find growing French beans for processing economically interesting.

Basic Organizational Structure and Components

Here we discuss the basic structure of Hortiequip's contract farming system. Its organizational structure considerably matches that which was developed at Saupiquet's operation in Morocco. In the early stages of the project many of the company's policies also matched those adopted in Morocco. Certain cultural practices, the terms of company-farmer contracts, and the technical package comprising seeds, fertilizers, and chemicals were all transferred largely intact. Even today the overall organizational structure remains virtually

the same. However the operation of the system has undergone considerable change since the project was initiated with the company adjusting its package of incentives and its control mechanisms for farmers and for staff. These adjustments were necessary as the company found that it was not adequately in control of its organization and not generating the expected farmer-productivity results. The company also found that it was unable to enforce the terms of its contracts and unable to prevent costly "leakages" out of the system. While the transaction costs inherent in an organization incorporating large numbers of smallholder farmers are necessarily high, unexpected transaction costs arose that necessitated a company response. In this section we outline the basic components of Hortiequip's system. In the subsequent section, where we discuss the performance of the project, we will identify institutional changes made by the company.

a) Function---

The prime function of Hortiequip is to meet the raw material requirements of the Njoro factory both in terms of quantity and quality and to minimize the costs of raw material procurement. Hortiequip is not expected to earn a profit on its own operations. The strategy adopted by Hortiequip is to disperse supply risks and spread project benefits by incorporating large numbers of smallholder farmers.

b) Form of Transactions---

Hortiequip's prime mode of transaction is contractual relations based on a season or year. The company enters into a contract with each farmer, staff member, and transporter individually. Formal contracts are supposed not only to assign rights and responsibilities, but to engender a perception of continuity and common interest and effort. Rather than seen as an alternative to trust, contracts are viewed by the company as the frameworks in which to develop relationships based on trust.

c) Method of Organization---

The basic structure of the Hortiequip operation is that of a pyramid with information, inputs, and harvested product flowing through a hierarchical system, with quality-control points being located at several levels in the hierarchy. The structure of the pyramid is as follows:

General Manager (1)

Field Manager (1)

Supervisors (4)

Control Clerk (60-80)
Farmers (12,000-16,000)

Farmers receive general information about the project in barazas called by their local Chief. All subsequent information will be provided by a control clerk who acts as technical adviser, inputs supplier, and general on-farm production overseer for the farmer and company. Each control clerk recruits and is responsible for approximately 200 farmers (plus or minus 50). Each control clerk operates out of a specific collection center to which all their farmers come for inputs and French-bean deliveries. At each collection center there are individual staff members responsible for a) sorting inspection, b) weighing beans, and c) issuing ticketed receipts to farmers.

Control clerks are to instruct farmers how to prepare their land for the planting of French beans. Company specifications are particular, i.e.:

170 sq meters of land well dug and properly cleaned with a fence of 5 rows of maize around it. The plot should have ridges 20 cms. high, 30 cms. wide and 80 cms. apart. There should be no rocks, trees or any other crop or plants in the plot.

The control clerk is to inspect the farm before issuing seed and having the farmer sign the contract. Farmers are told when to plant. Control clerks are issued a top dressing fertilizer (C.A.N.), and they must instruct farmers in its application. Urea is supplied to the control clerks in three installments and this must be distributed to farmers and its use explained. Four chemical sprayings are undertaken during each crop by hired workers under the supervision of the control clerks. When the beans are ready for harvesting the control clerk is responsible for ensuring that harvesting is done every day and that pods of the proper size and quality are picked. Thus, the control clerks play a vital role in the Hortiequip system, not only filtering

inputs and information down to the farmers, but also feeding information upward in the hierarchy. The proper execution of the control clerk's job is thus vital to individual farmer productivity and the overall performance of the project. (30)

Initially Hortiequip trained 60 local people to be control clerks. Many of these were people recommended by chiefs and subchiefs. Most had some secondary school education and had no past record of crime. Most were 18-20 years of age. Trainees were taught the basic stages in the production of French beans, warning signals for plant disease, and the standard operating procedures of Hortiequip. In subsequent years new control clerks generally have worked in some other capacity for the company (i.e., as chemical sprayers) for perhaps two seasons and have been recommended by a local authority figure. These are the methods of "screening" potential staff for responsible positions. An important unresolved issue within the project concerns who is actually responsible for the behavior of control clerks. Is Hortiequip responsible as the clerks are its employees, or are the local political officials who recommended them responsible? Where a control clerk has committed a crime (i.e., sold spraying equipment belonging to the company) can the company fire the individual and take them to the police or is the political official's consent required? A difficulty arises in that when a local staff person commits some crime or fraudulent act and a local political authority is considering taking disciplinary action, typically strong local and family pressures are applied to the official not to take action. This type of case reduces the overall deterrent value of company policies to minimize staff abuses of the Hortiequip system.

The ratio of farmers to control clerks has increased during the course of the project, but appears now to be near the level of 200 farmers per control clerk, which the company considers optimal. Changes in this ratio can be seen below:

Table 10: Farmers per Control Clerk

1982	56-83
1983 (first season)	110
(second season)	92
1984 (first season)	148
(second season)	249
1985 (first season)	218
(second season)	188
1986 (first season)	183 (193 at Kisii)

Source: Calculated from Hortiequip Records

Supervisors are responsible for an area that will incorporate 20-30 collection centers. Based on the number of farmers each control clerk has, the supervisor will request the necessary quantity of seed and other inputs, and this is delivered to the collection centers. Supervisors visit each of their control clerks each day and issue daily reports to the field manager indicating problems, actions taken on prior problems, and various indicators of farmer and staff performance. The field manager assesses general patterns and problems in production and may target additional supervision or other remedies to areas experiencing problems. The field manager together with the general manager carefully monitor the quality of the delivered beans and act on quality-related problems as identified at collection stations, at the Hortiequip main center, or at the factory. The general manager oversees the activities of the Hortiequip farmer-accounts unit, the inputs-supply unit, the local transport arrangements for beans collection, and the dispatch of beans from the Hortiequip to the factory. The general manager is in steady contact with the overall project manager, Mr. Bintein.

Absence of Intermediaries

No intermediary organizations are involved between the farmer and the company. Neither cooperatives nor traders come between the farmers and the company for input supply or product marketing. The company has sought to minimize the extent of government involvement in the project, fearing that such involvement would reduce the flexibility of decision-making and the performance-based orientation of the company. The company has required the support and sometimes the assistance of the district agricultural officer and the local chiefs. Assistance from chiefs has been needed in disciplining negligent farmers, fraud-committing staff, and various opportunists trying to undermine the project. While initially official extension officers were used to assist, inaccuracies in advice and requests for remuneration led the company to decide to utilize strictly its own hired staff.

The absence of any intermediary organization between company and farmers has several implications. Farmers have no institutionalized channel to render their grievances other than through their control clerk. Within the confines of the project, farmers have no capacity to influence company decision-making; individual farmers have no bargaining power. The information that they pass on to control clerks is likely to have a high dissipation rate before reaching senior staff members. This is especially the case if the information relates to the behavior of the control clerk. (31) Control clerks are not supposed to represent the farmers in the sense of presenting farmer positions and bargain-

ing with the company over the issues. Control clerks acting in such a way are in danger of being perceived by the company as being "trouble-makers."

Lack of institutionalized representation has led farmers to make greater use of political channels to voice their complaints. At barazas called by local government authorities and KANU party officials, farmers will discuss problems they have related to the project. In this manner one event or one problem that a few farmers have faced may become blown up into a larger issue between the politicians and the company.

The absence of a farmer representative body is also likely to reduce the company's capacity to enforce its contracts with farmers and staff. For the company to sanction negligent farmers or negligent or fraudulent staff it generally must go through political and then police channels. There is no institutional mechanism to bring social pressure on the offending party from within the project. While the company has been able to instill in participants some feeling of joint effort and cooperation, this attitude has not been nurtured in the direction of mutual self-government of the project.

Planting Seasons and Input Loans

Over the past four years the production of French beans has taken place over two distinct seasons per year. With the short rains in March comes the first planting for harvesting from May to early July. The second planting is to accompany the long rains in September for harvesting in October and November. Both the cost of inputs and the producer price are set at the beginning of the year and carry through for both seasons. An input package accompanies each one kilo of seed and is costed on such a basis. While the company does maintain stocks of certain inputs (largely due to uncertainty of their timely availability), the company still must bear the risk of changes in the procurement cost of fertilizers and chemicals throughout the year. Table 11 breaks down the inputs loan for 1985.

General Performance Indicators

In this section we present data depicting various dimensions of project performance. The data relate to such results as company sales and earnings, employment, farmer yields and income, producer prices, and loan recovery. The prime causes of variations in performance by year or season are discussed in the subsequent section where we examine changes in the project chronologically.

Table 11: Input Loan (1985)

Input	Quantity	Cost
Seed	1 kg	Ksh 51.00
N. P. K.	5 kgs	27.65
D. A. P.	1.2 kgs	8.06
Furadan	330 gms	11.40
C. A. N.	1.2 kgs	4.99
UREA	2.4 kgs	13.80
Chemicals	4 sprays	36.15
Total for 1 kilo seed		153.05
Rounded off to		153.0

Sales and Earnings

One indicator of performance is the growth in company sales. For Njoro Cannery all sales are exports to Saupiquet. In the table below we give both the Kenyan Shilling value and the US\$ equivalent of export sales. The dollar value is given so that the effects of the Kenyan Shilling devaluation since 1982 are not hidden.

Table 12: Company Sales

Year	Sales (Ksh mills.)	US\$ Equiv. (Mills.)
1982	6.1	0.56
1983	14.0	1.05
1984	27.0	1.87
1985	40.3	2.45

Source: Njoro Cannery

From this table one can see the steady expansion in sales recorded by the project, which provided added foreign-exchange earnings for the country. On the other hand, on account of capital investments of nearly Ksh 31.8 million over the 1982-85 period and subsequent deductions for depreciation, the company has registered operating losses in each year. Thus corporate tax was not paid over the 1982-85 period. However, these "accounting" losses do not threaten the financial viability of Njoro Cannery. The company's owner is guaranteed by Saupiquet an income equivalent to a certain percentage of f.o.b. sales volume. This sum more than adequately covers the company's "accounting" losses.

Employment

Another indicator of company performance concerns employment. The data available do not provide a breakdown between

full- and part-time staff. Most of the field staff work between 6 and 8 months/year. The data do indicate considerable growth in employment. The location of employment in Njoro and Vihiga is of major importance given the relative absence of salaried employment in both of these areas.

Table 13: Company Employment

Year	Factory Staff	Field Staff
1982	100	50
1983	250	100
1984	800	300
1985	850	350

Source: Njoro Cannery

Farmer Productivity

A third set of indicators of project performance concerns trends in farmer productivity and the level of productivity of participating farmers relative to French-bean growers elsewhere in Kenya. Data for average farmer yields are presented in the table below:

Table 14: Project Farmer Yields

Year/Season	Yield (per kilo of seed)	Yield (on acre basis)
1982	28.17 Kgs	563 Kgs
1983 (1st season)	42.64	853
(2nd season)	69.37	1387
1984 (1st season)	83.43	1669
(2nd season)	106.46	2129
1985 (1st season)	77.4	1548
(2nd season)	91.6	1832
1986 (1st season)	79.44	1589
Kisii	61.0*	1220

Source: Calculated from Hortiequip records.

*Kisii yields are per farmer, not per kilo of seed.

We should note here that the output of both small-scale (less than 1 acre) and medium-scale (2 to 10 acres) growers of French beans for fresh export has been largely within the range of 1620 to 2160 kgs per acre in recent years. This, however, is

the yield of fine and extra-fine beans combined. A harvest of beans from one acre may consist of 60 percent extra-fine beans and 40 percent fine beans. If we ignore the considerable weight difference between fine and extra fine (i.e., 1 fine bean = 1.67 extra-fine beans) and simply take 60 percent of this yield range for extra-fine French beans by the leading exporter, we find an increase over this period of nearly 78 percent, with actual prices as follows:

Table 16: Producer Prices for Bean Exports

1982	Ksh 6.7/kg
1983	8.1
1984	8.9
1985	10.4
1986	11.9

Source: KHE Ltd. farmer vouchers

It is important to point out that Vihiga farmers are well beyond the range of fresh French-bean procurement systems, which are generally within a 150 km radius of Nairobi's international airport.

While we have already presented data showing the average income earned by participating farmers, we have yet to provide an indication of the total cash earnings of Vihiga farmers from the project. This is shown in the table below:

Table 17: Cash Income to Farmers in Vihiga

Year	Amount(Ksh)
1982	400,000
1983	800,000
1984	4,700,000
1985	5,750,000

Source: Njoro Cannery

The table shows that it was really not until three years into the project that a substantial amount of additional income was injected into the Vihiga economy. As we showed earlier, this is due to the low yields obtained in 1982 and 1983.

Inputs Loan Recovery

During both 1982 and 1983 a high proportion of farmers had output levels inadequate even to cover the input loan value. While we do not have the exact data, it is very likely that more

than 50 percent of participating farmers had an outstanding inputs balance during the first two years of the project. What data we do have for these years looks at the total outstanding inputs balance as a proportion of the value of inputs loaned for different seasons. This can be seen in Table 18.

Table 18: Outstanding Inputs Balance Data

Year	Outstanding Balance Total Inputs (percent)	Number of Farmers with outstanding balance	Percent of Farmers with outstanding balance
1982	25.4		
1983 (1st)	32.9		
(2nd)	18.1		
1984 (1st)	11.7	2173	20.9
(2nd)	3.5	1041	8.2
1985 (1st)	6.0	2127	15.7
(2nd)	9.5	2787	17.7
1986 (1st)	10.6	2263	18.7
Kisii	21.4		

Source: Calculated from Hortiequip Data

The table shows that during 1982 and 1983 approximately one-fourth of the value of inputs loaned was not recovered by the company. Only for those farmers shown to have misused their inputs (i.e., sold them) would the company have attempted to enforce loan repayment. The actual number of these cases was small. Results for 1984-86 show that while there was a considerable decline in the proportion of total loan value left outstanding, performance has been somewhat unsteady.

More interesting is the sustained (or even rising) proportion of farmers who do not produce enough to earn any cash income. This is seen in the last column. This represents a measure of risk for participating farmers. While farmers new to the project have a higher rate of failure in meeting the break-even production point, other factors are also important. While variations in yield generally will arise from such factors as ecology, labor availability, farmer attention to the crop, and the effectiveness of control clerks, the experience of a crop failure or harvest of a very low yield are usually a result of climatic factors. During several planting seasons hailstorms have badly affected some production areas with the impact depending on the stage in the crop cycle. Hail that hits before actual picking begins may wipe out the entire crop. Lack or abundance of rainfall has also played an important contributing

role in some crop failures. The company staggers planting times to expand the length of the processing season. This necessarily puts some farmers at greater risk as, rather than planting exactly with the onset of rain, their planting time may be scheduled too early or late to take advantage of the rains.

One farm visited clearly illustrated this weather-linked risk. The family has several members with their own plots of French beans, although for a variety of reasons (e.g., illness, absence of family member, etc.) their timing of planting differed. Those who planted when first provided seed were obtaining good results with yields well above 80 kgs, but two family members who delayed planting for 7-14 days had virtually no yield. The two unfortunate members planted their seeds in soil dry from an absence of rain for over a week, and the plants were more affected by a hail storm that hit the area just before picking was to begin.

Impact of the Project

Certainly the most important impacts of the project are its injection of additional cash income into the Vihiga economy and its creation of several hundred full-time jobs both in Vihiga and at the factory. The project has also had secondary impacts in a number of areas. It has generated some technical overspill from the cultivation of French beans to the cultivation of maize, local beans, and vegetables. Participating farmers have increased their awareness of the positive impact of fertilizer and chemical use for crop yields, particularly for maize. They learned this through direct application of urea (the company's) on maize as well as through their rotation of the French beans with maize. More farmers are now applying manure or compost to their food crops.

Success in growing French beans in rows with ridges and with proper spacing has led many farmers to experiment growing the local dry beans as well as several vegetable crops with such methods. Results have generally been positive. An interesting side effect noted by several farmers is that while they may have had only limited contact with the official extension service in the past, their participation in the project has taught them "how to ask for advice" from extension workers.

The project has had some social impacts as well. By providing women with their own source of income, the project has increased the influence of many women over the handling and allocation of family financial resources. Increased sums have gone toward children's clothes and school fees. Several successful primary school building drives have been based on earnings from French-bean production. Some people argue that household

conflicts over the use of income have been reduced because of the women's direct access to cash. Another impact of the project is that it has kept a number of people in the area who might otherwise had gone off to find temporary work elsewhere. Several chiefs report that the project has contributed to greater peace in their areas as people are kept busier and have less time to get into trouble.

The project's impacts have been broader than changes within its own confines. Njoro Cannery has obtained permission from a European seed breeder for a local firm to multiply Vernandon bean seed in Kenya. This local firm has contracts with several dozen small- and medium- scale farmers in the Lotokitok area to multiply French-bean seed. In 1985 that firm had contracted for nearly 500 acres of French-bean seed. Although the production process for seed is not as labor intensive as that for fresh beans, this scheme certainly generated at least temporary employment for several thousand local people.

Income and employment spin-offs from the Njoro Cannery operation also derive from the factory's purchase of French beans from both exporters and Lake Naivasha medium-scale growers. When the European market for fresh beans is oversupplied or when air cargo space limitations create an excess supply condition, both exporters and larger farmers can sell beans to the factory at prices that can off-set the labor and overhead costs for these farmers and part of the procurement costs of exporters. This reduces the heavy risk of producing or exporting during the European summer as the farmers or firms will generally have a buyer of last resort. The maintenance of some level of "off-season" production has generated additional employment during this period.

Evolution of Performance and Institutional Arrangements

In this section we retrace the development of the contract farming scheme through a series of formative stages. This enables us to provide explanations for some of the variations in project performance over time and to discuss how the project's institutional arrangements have evolved.

Establishment

Hortiequip's contract farming scheme began in 1982. Results in that year would be nothing less than disastrous. Hortiequip faced unexpected weather and crop disease problems, lacked effective supervision over a staff and a group of farmers familiar with neither French beans nor contract farming, and struggled to implement a technical and organizational package borrowed from Saupiquet's Moroccan project but not fully appro-

priate in Vihiga. Borrowed from Morocco was a particular fertilizer and chemical "package" to be provided with each kilo of seed distributed. Also borrowed was the policy that farmers would be loaned as many kilos of seed as they thought they could manage. Plantings would take place at approximately fortnightly intervals in order to obtain a crop continuously over the year. For the first planting some farmers took as many as 15 kilos of seed, enough for about three-quarters of an acre of production.

Early plantings, involving several hundred farmers, were hit by a leaf rust disease that spread rapidly in some of the growing areas. Hortiequip was late in gauging the extent of the rust disease outbreak. The official agricultural establishment could not provide advice on how to control the spread of the disease. Dutch agronomists working on a legume research project at Thika helped diagnose the problem but advised Hortiequip to have farmers uproot the entire first two French-bean plantings. The company feared that this would cause farmers to lose interest in the project as it would leave them with no income at all from their cultivating efforts. The crop was left in and a minimal yield was recorded. (32)

Throughout much of 1982 Hortiequip was focusing on organizing its physical facilities, its system of record-keeping and contracts, and its arrangements with local and other transporters to collect and then deliver beans to the factory. Production supervision and information feed-back were not yet sufficiently developed to enable the company to know the causes and extent of the disease problem. The activities of control clerks and chemical sprayers were not closely monitored. Area supervisors were acting on their own initiative and were not yet following any standard operating procedures for problem evaluation and reporting. Staff were being paid standard salaries without any built-in incentive system based on measurable performance.

The outbreak of disease and the occurrence of certain pests suggested to the company that either the chemical spraying staff were not performing their job or that the chemicals (or their particular strengths) were not appropriate for growing conditions in Vihiga. Questions also began to be raised about the appropriateness of the fertilizer regime that was based on the Moroccan experience. It was becoming clear that the company would need to initiate its own local-level research program in order to establish the soundness of its inputs package and to distinguish a technical problem from a problem of human negligence.

Not only was there an outbreak in disease, but it was slowly becoming apparent that farmers did not understand the heavy labor demands of growing French beans and that Saupiquet's experience with farmers in Morocco led it to misjudge the appropriate scale

of production in Vihiga. Hortiequip was providing farmers with quantities of seed far in excess of what they could possibly manage. Some farmers began selling excess seed to others. As Hortiequip identified this problem it began to limit the quantity of seed to be loaned to each farmer for each planting. The first limit set was 6 kilos. This was later reduced to 3 kilos.

Farmers were provided with an input package of seeds, fertilizers, and chemical spraying. At the then prevailing inputs cost and producer price the farmers needed to produce 28.24 kgs of beans per kilo of seed simply in order to cover their loan. They would receive cash for yields over and above this level. What transpired was that many farmers did not deliver enough to cover the first input loan. Still they expected some payment, either as an advance for the second planting or to cover their labor input. Many farmers did not really understand the nature of the contract. The contract was explained to farmers at barazas and then by the control clerk in their area, but uncertainty remained. The contract was written only in English and some farmers flatly refused to sign it. They feared that the paper they were signing would lead to the loss of their land. This had happened to several local farmers who had obtained loans from the Agricultural Finance Corporation but were unable to repay.

Farmers who had taken more seed than they could manage themselves had hired laborers to harvest the crop. These farmers thus had a cash deficit from their early bean crop. In order to prevent farmer disillusionment the company adopted a policy to have half the value of the farmer's delivered crop go toward recovery of the loan while the other half would be paid to the farmer in cash. Many farmers had their crop badly affected by the rust disease and then later in 1982 by a fungus arising from rapid bacteria growth during heavy rains. The level of rejected beans at the collection centers was thus high. In order to provide some incomes to farmers Hortiequip sometimes accepted non-processable beans and then provided these free to Kisumu area institutions (i.e., schools and hospitals). Actual enforcement of the contract's quality-related provisions was impossible for the company if it wanted to remain in operation. Debt collection would have been difficult and would certainly have led to farmer withdrawal.

For the year of 1982 (which included at least nine plantings) overall performance was poor. The average yield per kilo of seed supplied was only 28.17 kgs of beans, slightly below the figure needed merely to recover the input loan. Had the company not adopted the policy of paying the farmer for half of her deliveries, the average net income per kilo of seed would have been a credit note of Ksh 0.23. During the year Hortiequip

provided inputs costed at Ksh 1,226,700 and at the end of the year the outstanding inputs balance was Ksh 311,195, amounting to 25.4 percent. During the year 12.3 tons of seed had been distributed with the company estimating that virtually no yield was obtained from 8 tons from this total. (33)

Reconstruction

1983 was a year of adjustments for Hortiequip. Several major policies were altered. Incentives and controls for staff were changed. Farmers with low productivity were either dropped by Hortiequip or exited on their own accord. One important decision that was made was that the project would operate only during two distinct seasons accompanying the short and long rains. Rainfall between these two seasons was not reliable enough to expect income-generating yields for farmers, while attempts at encouraging small-scale irrigation activities were still in their infancy. To provide some dispersion of raw material supplies to the factory, each season would consist of two plantings staggered according to sub-area.

A second policy change related to an attempt to gain increased control over the distribution and application of inputs. Farmers would be restricted to a maximum of two kilos of seed per season, and most farmers would be given only one kilo of seed. During the first season of 1983 the average quantity of seed taken by farmers was 1.51 kilos. For the second season this dropped to 1.09 kilos. Control clerks would be provided only the quantity of seed needed for the farmers, which they had registered before the start of the season. Rather than provide farmers the total allocation of urea at one time, it was decided to subdivide the provision into three smaller lots so as to increase the proportion of urea actually going to the French beans rather than to the farmers' maize or vegetables crops. Staged urea distribution would also prevent the practice of applying urea all at one time rather than spaced over various points in the bean growth cycle.

Uncertainty over the actual performance of chemical spraying led the firm to adopt a practice whereby both the control clerk and the farmer had to sign the farmer's card at the time of each of the four chemical sprayings. An incident arose where the company was accused of using dangerous chemicals after a sprayer had apparently sold some insecticide that was subsequently sprayed on cows. The cows died.

Getting the technical package right was also a focus in 1983. Trials with different seed varieties and different chemical and fertilizer applications were developed on farmer and demonstration plots. Assistance was sought from the Dutch

advisors at the National Horticultural Research station as well as technical advisors from Saupiquet. It was not until the end of the year that the company had become confident in its inputs package. (34)

Efforts were also made to improve quality monitoring throughout the system and to more firmly base staff salaries on performance. Delivered beans were to be examined for quality throughout the chain to the factory on the basis of collection center code number. In this way quality problems could be countered by location-specific remedies. Remuneration of control clerks was changed from a basic guaranteed salary to a system with a basic salary together with flexible (and rather significant) bonuses and deductions according to individual behavior and farmer performance.

For the first season of 1983 15 new sub-areas were added, and three low-performance areas from 1982 were dropped. The number of participating farmers more than doubled over the 1982 levels. Farmer performance during the season was generally poor. In fact 18 of the 30 centers had average yields below the 37.2 kilos needed merely to cover the loan. The overall seasonal average yield was 42.64 kilos, bringing an average net income of a paltry Ksh 17.96. At the end of the season the outstanding input loan balance was 32.9 percent of the total loan value. Unexpectedly, new entrants into the project performed better than those who had participated during 1982. Each of the four highest yielding stations were new for 1983.

There is some evidence that the staggered planting system adversely affected certain areas. Collection centers were divided into two regions with each region planting at slightly different times. Region "A" recorded an average yield of 61 kgs while region "B" recorded an average yield of only 25.4 kgs. Since new and old collection stations were included in both regions and since there is no clear geographical or ecological divide between the two regions, one can only conclude that rainfall patterns were such that the scheduled planting time for region "B" was either too early or too late.

Between planting seasons of 1983 a considerable "shaking out" occurred in the participants in the project. Six collection centers were dropped and thirteen new centers added. Several of the dropped centers had actually performed rather well in terms of factor yields. Problems of an "attitudinal" nature were encountered either in the form of control clerk drunkenness or fraud, or disagreements between the company and local authorities. Examining the 18 collection centers that had average yields below the figure necessary to cover the loan, one finds a drastic reduction in farmer participation during the second

season. Three of these centers were dropped completely while in some centers there were as little as 1/10 the participants in the second as in the first season. Farmer participation in these 18 sub-areas dropped from 1514 farmers to 510 farmers during 1983. From this information, one might estimate that 1/3 of the project's participants exited during 1983. The vast majority of these farmers were those who received no income during the first season and may have held an outstanding loan balance.

Performance during the second season of 1983 improved considerably and provided the first sign that the organizational structure of Hortiequip could generate results with smallholder farmers. Average yields per kilo of seed were 69.37 kilos, and four of 37 collection centers had total averages exceeding 100 kgs per kilo of seed. The magnitude of outstanding loans showed a major decline and represented 18.1 percent of the total value of loans.

Expansion and "Migration"

Having built confidence both in the functioning of its organization and the technical package it was offering farmers, Hortiequip moved over the 1984-1986 period to expand the size of the project considerably, to diversify its operating areas and to raise overall productivity. It obtained at least qualified success in each of these objectives. Through additional investment, the processing capacity of Njoro Cannery was expanded. Greater effort was thus put into expanding the period of raw-material supply and maximizing the actual quantity of raw material that would be processed and canned.

During the first season of 1984, 33 new collection centers were added and the level of farmer participation was tripled to over 10,000. By the end of 1985 a further 50 percent rise in the number of farmers had taken place to reach a level of nearly 16,000. In addition to new collection centers in Vihiga and Hamisi Divisions, operations began in Ikolomani Division of Kakamega District. An effort was made in late 1985 to expand the project to the Bahati area in Rift Valley Province, but this proved unsuccessful and was subsequently dropped. In 1986 the project initiated an operation in the Kisii area, contracting over 3000 farmers there; however, a consolidation of the Vihiga operations of Hortiequip reduced farmer participation numbers there and left total participating farmers at slightly below the 1985 maximum.

The first season of 1984 featured a tremendous productivity improvement over the prior season. Average farmer yields were 83.43 kilos and 21 of 70 collection centers registered average yields in excess of 100 kgs per kilo of seed. The outstanding

input balance fell to 11.69 percent of the total loan value. The vast majority of participating farmers earned a reasonable income. Officials from several locations requested that the company establish a collection center in their area.

Despite the improved performance, the company was becoming worried by a pattern of deviations between the weight of beans as recorded and receipted at the collection centers and the weight of the beans as recorded at the Hortiequip central office. As the company is responsible for paying farmers according to the receipted weights, this leakage would be a cost borne directly by the company. The scale of the problem would take on greater magnitude during the second season.

The second season of 1984 brought the appearance of the highest level of productivity yet recorded for the project. Between seasons the company had dropped centers that were performing poorly for either ecological or "attitudinal" reasons. The number of farmers linked to control clerks with superior performance was increased. During the second season average yields at several centers exceeded 150 kgs. Nearly half the control clerks had groups of farmers without a single shilling of outstanding inputs balance. Over Ksh 3 million was paid out to farmers during this season.

While farmer productivity had undoubtedly improved significantly during the season, this result was perhaps overshadowed by the tremendous discrepancy found between farmer-receipted yield and actual deliveries of beans. The receipts farmers were obtaining from collection center staff were showing a higher number of kilos than the farmer was actually bringing to the center. Sometimes the total discrepancy between the weight as recorded at the centers and as checked at the Hortiequip base office would be 5 percent while at other times it might be as high as 10 percent. For 1984 as a whole more than 120 tons of produce was overrecorded by collection center staff. This equalled 5.4 percent of total deliveries and cost the company Ksh 420,000 or over 1 percent of its total operating costs for that year. (36) This large payment for beans never delivered led Hortiequip again to operate at a loss despite substantial farmer productivity gains.

Naturally this issue is highly sensitive, and participants are not prepared to discuss it, but it is necessary to speculate on the factors that led many farmers and staff to collude in an effort to extract additional income from the company. One fairly weak hypothesis is linked to the 1984 drought which affected several major agricultural areas in Kenya. The suggestion is that numerous farmers in the project had family members who experienced a decline in their migrant wage earnings, and this

created an increased demand for cash-crop income within Vihiga. "Beating" the Hortiequip system appeared to be the easiest method.

A more plausible hypothesis relates the fraud to the changing of local attitudes toward the project. The considerable expansion and improved performance of the project in 1984 was providing participants and other local people with the perception that the company was earning substantial profits. Several local individuals including people in "high places" were voicing the opinion that the company was "exploiting" participating farmers, paying them an inadequate price for their beans. As some of Hortiequip's senior management staff were Asians, Hortiequip was increasingly being described as a typical "middleman" operation profiting "on the backs" of farmers. Most people did not understand that Hortiequip staff are merely employees of Njoro Cannery.

An attitude of suspicion was adopted by an increasing number of farmers. Farmers complained that Hortiequip was taking their rejected beans and then selling them at high prices in Kisumu. As a result, the company had to stop its practice of distributing beans free to local institutions. Some farmers and staff must have decided that they could effectively redistribute company earnings through their own initiative. This form of income redistribution may not have appeared too devious as, after all, the company was being approached by many officials to donate sums of money to social and political causes (or provide jobs to certain people), and why shouldn't those actually generating the wealth be better remunerated. Rather than acting on behalf of Hortiequip, some staff formed a quasi-alliance with farmers in order to extract additional income.

The weight overrecording was the most graphic although certainly not the sole method by which farmers sought to beat Hortiequip's system. Farmer attempts to add rocks or weeds to their bags of beans to increase weight were certainly not rare. A less devious and more common practice has been for farmers to retain a certain proportion of bean pods on the plants in order to produce their own seed for use in subsequent seasons. Whether planting additional seed actually brings the farmer higher yields is uncertain. The company's chemical sprays and fertilizers are calculated on the basis of one kilo of seed, so these inputs will be required to do "extra work" on a field larger than 170 sq meters. The risk of pest or disease attack probably increases. Farmer seed multiplication may be one of the most important factors contributing to the greater incidence of seed-borne diseases in the project over the past several seasons.

Despite the losses incurred by Hortiequip and recorded in the annual financial statement of Njoro Cannery, the expanded volume of production during 1984 increased the turnover and profits of the overall production and marketing operation (including distribution in France).

Several changes in the scope of the project occurred in 1985. Capital investment of over Ksh 14 million was made in expanding the capacity of the factory and in putting in a canning line for celery hearts. This celery line would later be dropped due to its unprofitability. Late in the year an attempt was made to encourage medium-scale growers at Bahati to grow French beans so as to obtain a crop for the factory for several weeks after the end of the Vihiga second season. Over 2000 farmers were contracted, some with up to 4 acres under French beans. While the ecological conditions proved appropriate, inadequate labor was available for picking. As a result farmer yields and income from French beans could not compete with alternative crops.

During 1985 Njoro added a product line for fine beans because at the beginning and end of each planting season the company was getting a significant proportion of beans that were not extra fine. Over the course of an entire season perhaps 15 to 20 percent of beans delivered to the factory from Hortiequip are not extra fine. This raw material has to be utilized to lower wastage costs, hence the development of the fine bean line.

In 1985 the company announced a policy that if there were further discrepancies between receipted produce weights and actual deliveries, then the company would deduct an equivalent amount the following day from the offending collection center. The company repeatedly warned that the practice of overrecording deliveries could undermine the existence of the project. While this policy was never actually implemented, it did serve its deterrent role. Weight differentials totaled only approximately 10 tons in 1985. The cost of this level of discrepancy was less than the level of company donations to local political functions that year.

During 1986 a number of initiatives were made. In an effort to improve management supervision and lower transport costs, the Vihiga operation was consolidated by dropping 18 control-clerk/farmer groups and by increasing the number of farmers reporting to each collection center. Various experiments were carried out in an effort to increase productivity and lower costs. Experiments were conducted with a climbing variety of French beans whose yield (but also production cost) per area was expected to be considerably higher. Experiments were also conducted using compost (made up of rejected French beans and

sawdust) instead of urea in an attempt to save the farmer the cost of the latter.

The factory began a more systematic analysis of bean deliveries in an effort to even out the peaks and troughs of raw material supplies and to carefully monitor the quality of beans on a sub-area basis. While control clerk remuneration was based in part on the quantity of beans that their farmers delivered, a refinement of the incentive system to link pay with various quality characteristics was beginning to be developed.

Probably the most important initiative of 1986 was the start-up (and then termination) of a new Hortiequip operation in Kisii, contracting 3466 farmers at 18 collection centers. Since 1982, Kisii had been viewed as a potentially suitable locale for the project; its ecology and high population density were seen as suitable. It was felt, however, that area diversification could not take place until the company had confidence in its organizational system and technical package. Another reason for moving into Kisii in 1986 was to reduce political activism in Vihiga by sending the people there a message that they are not the only people who can grow French beans. A third reason for area diversification had to do with staff considerations. The production manager at Vihiga had been working in that position since 1982 and decided that without a new challenge she would probably quit. She was made general manager of the new Kisii scheme.

Along with a few senior staff members, a group of the local staff members of the Vihiga operation were brought to Kisii to train local people and to serve as supervisors. Farmers in the Kisii area generally have 2-3 acres of land and more significant cash-crop earnings than Vihiga farmers. Tea is widely adopted here, and there are 5 local tea factories. Banana production for sale is widespread. Many local farmers decided to try French beans, however, because of the shorter production cycle and to spread overall risk.

Engendering farmer interest had not been the most important problem of the new project in Kisii. The Kisii Hortiequip management reported that the main problems stemmed from staff dishonesty and the uncertainty of local political support. During the first season the company received a large number of fake receipts from its collection-center staff. Even where the cases of fraud could be proved, local pressure on the political authorities prevented sanctions being applied against the offender. As a response to this situation, the company adopted a new system whereby receipt books would no longer be held at the collection centers. Instead, collection center staff merely recorded the names and weight deliveries of farmers each day and

submitted summary papers to the local Hortiequip office. At the office the beans were weighed and receipts were written out. When a farmer had made 10 deliveries he would receive that number of receipts from the office. In this way the company was responsible for payment only for the quantity of beans actually delivered to its office. (37)

The Kisii project seemed to be encountering more problems of a political nature than were faced in the establishment of the Vihiga operation. In late August a speech was made by a leading government official claiming that a "businessman ... has introduced a new crop to Kisii farmers and is failing to pay for the product delivered to him... Nobody should be left to feed on others' sweat without working for it." The official's description of the offending "businessman's" operation suggested that he was referring to the Hortiequip project. Neither the owner of Njoro Cannery nor the Hortiequip staff were contacted, however, and when an inquiry was made, it was neither confirmed nor disclaimed that the official's comments were directed at the French-beans project.

During the 1986 2nd season conflicts between Hortiequip management, staff, and local politicians increased. At one point the staff actually went on strike to protest against their treatment by management. Complaints were being made against Hortiequip by both the Kisii District Commissioner and individual chiefs. An investigation by the Njoro Cannery's project manager revealed that the Hortiequip management in Kisii had been acting in a dictatorial fashion, delegating little authority to staff, limiting information flows to downward orders and upward reports, and generally rejecting a priori potentially legitimate complaints by staff and farmers. The tension that was building up between the company and the local people was making productive results impossible. The Kisii project was closed at the end of 1986, although local officials, staff, and farmers were told that it was possible that Hortiequip would return to the area at some future date under different management.

The Uncertain Future

As Njoro Cannery looks to the future, it appears that effective continued operations will depend on the sustained involvement of a few individual senior staff members who have nurtured the project from the beginning. Several of these people are expatriates. Efforts to train local staff for senior management positions in the factory have thus far not been successful. It also appears that the project will remain politically vulnerable. The project's growth has led it to become an important force in the regional economy where it operates. Such an important presence has made the company

vulnerable to individuals seeking political gains either by drawing on company resources or by criticizing the company. The company has periodically been labeled an "exploiting middleman." It operates within a larger political environment where farmers are always "right" and companies (particularly foreign and Kenyan Asian owned) are always "wrong" when any dispute arises.

The relative success of Njoro Cannery has led many Kenyan entrepreneurs to consider establishing competing French-bean canneries. Projects have been proposed for Kakamega and for sites in Rift Valley and Central Provinces. In one case a major Belgian canning firm was considering a joint venture. Whether any significant investment will be made is not certain. The country's existing processing plants generally operate at well under capacity. Improved coordination between producers and processors is needed. Additional processing capacity is probably not required.

Even if technical, organizational, competitive, and political problems can be solved, the long-term prospect for the project hangs in the uncertain shadow of particular technical developments in Europe that could virtually negate Kenya's present comparative advantage. There is some danger that Njoro Cannery will lose its cost advantage for supplying French beans to the French market. Several European seed breeders have developed a hybrid variety of green bean containing many of the quality features of the French bean but the one-flush yield feature of the bobby bean. Having one flush permits mechanical harvesting. While this mixed variety has a slightly different taste from the pure French bean and while mechanical harvesting does lead to more damage and the presence of foreign matter, the new variety can generate a canned product at 15-20 percent below the cost of the Kenyan product. This lower-cost mixed-variety product could well draw away a considerable part of the luxury extra-fine market demand. The latter would remain, but as a more narrow market segment.

The time frame for such developments is uncertain. There is presently inadequate quantities of the hybrid seed to meet existing demand. Commercial production using the new variety was unsuccessful in 1986, largely as a result of a drought in the south of France. Njoro Cannery may be "safe" until perhaps 1990. Saupiquet and Njoro Cannery management have decided to reduce the risk associated with these technical developments. Njoro Cannery product line will be expanded, and Vihiga farmers will be contracted in 1987 to grow both French beans and gherkins.

Concluding Remarks

This case study of Njoro Cannery/Hortiequip highlights the following points about contract farming and research on this form of organizational arrangement:

1) The contracting company must seek to develop an organizational framework that improves farmer productivity and then strive to progressively reduce the transaction costs arising from this arrangement.

2) A system of smallholder contracting will generally involve high transaction costs and "leakages" (whether of money, inputs, or product), but the basic economics of crop production may limit the company to this high cost option.

3) In smallholder contracting systems the effectiveness of extension staff is of critical importance. Analysis must go beyond company-farmer relations and examine company-staff and staff-farmer relations.

4) Contract farming systems go through potentially significant structural and/or policy transformations in response to or in anticipation of internal project developments or external events. Examining the rationale and impact of these adjustments is crucial in understanding the "life cycle" of a contract-farming project.

5) Under circumstances where contracts with neither farmers nor staff are truly enforceable, the contracting company must develop the capacity to "migrate" locationally.

6) Even where a company adopts an apolitical line, political considerations necessarily intervene in smallholder projects. Local political support proves essential for success, yet company success tends to breed political opportunism.

Notes

- 1 Based on interview with Gilbert Bintein, General of Njoro Cannery on September 11 and 12, 1986.
- 2 Marketing in Europe, October 1986. Special article on the vegetable canning industry in France.
- 3 Bintein.
- 4 Marketing in Europe, p. 58.
- 5 Ibid., op. cit.; Bintein.
- 6 Saupiquet Annual Report 1985; Marketing in Europe, p. 60.
- 7 Calculated from confidential Njoro Cannery data.
- 8 Based on information provided by Bintein.
- 9 Ibid.
- 10 Interview with Mr. Wadhwa of Corner Shop Ltd. on September 10, 1986.
- 11 Ibid.
- 12 This and the subsequent two paragraphs are based on the interview with Mr. Wadhwa and interviews with former staff of the Corner Shop and farmers in the Chango area of Vihiga who participated in this scheme. Our rather negative findings contradict the fairly rosy picture of the project presented in a 1982 FAO document entitled "The Private Marketing Entrepreneur."
- 13 Bintein interview.
- 14 The social problems of a large female labor force were emphasized by several Lake Naivasha farmers during interviews held September 13-15, 1986.
- 15 Bintein interview. Mr. Wadhwa was later dropped from the project as he was unable to finance the Hortiequip operation.
- 16 Kakamega District Development Plan 1984-1988.
- 17 Agriculture Development Plan for Vihiga 1968-1972.
- 18 Ministry of Agriculture, "The Marketing of Fruit and Vegetables in Vihiga" 1969, p. 3.

- 19 Kakamega District Development plan, p. 5.
- 20 Development Alternatives Inc. (DAI) "A Strategy for the Development of Four Districts in Western Kenya" 1982.
- 21 Quoted in Martin.
- 22 Martin, p. 164.
- 23 ibid., p. 167.; Also based on our survey in Vihiga, September 19 6.
- 24 As reported by senior staff of Hortiequip (Vihiga) during interviews of September 17 and 18, 1986.
- 25 Based on survey of Vihiga farmers.
- 26 DAI, p. 41; Kakamega District Development Plan.
- 27 Martin, p. 165.
- 28 MOA, Marketing of Fruit and Vegetables in Vihiga, p. 3.
- 29 Interview with production manager of Msambuani Industries on Sept. 23, 1985.
- 30 One factor explaining the relative productivity of farmers in the project is certainly control of clerk effectiveness. This can be illustrated by examining results from two of the sub-areas where we interviewed farmers--Chango and Mbale. Each of these sub-areas has a collection center with more than one control clerk operating out of each. During 1985 Chango actually had four control clerks (each with more than 125 farmers) while Mbale had three control clerks (each with more than 200 farmers). The characteristics of the farmers attached to individual control clerks at these stations are basically the same. Control clerks aren't allocated a particular territory, so geography isn't a factor. All farmers at one center plant and harvest at similar times. Experience in the project should not differ according to which control clerk a farmer is attached to. Thus differences in average yields between farmers at the same locale but with different control clerks can be largely explained by the relative effectiveness of control clerks.

We lack individual farmer data and have only the mean yields for each collection center. While the data shown below do show variations in performance according to control clerk

at the same centers, in the absence of calculations of standard deviations we cannot claim statistical significance.

1985 Yield Variations at Individual Collection Centers

Area/Code	Combined Seasonal Yields	Index
Chango A	188.9 kgs	100
B	188.6	99.8
C	175.3	92.8
D	161.8	85.6
Mbale A	181.9	100
B	158.2	86.9
C	151.7	82.9

While in Chango the aggregate performance difference between the best and the worst control-clerk group was over 14 percent, in Mbale it was over 17 percent.

31 Farmers interviewed in our survey complained of this problem.

32 Staff of Hortiequip (Vihiga).

33 Ibid. In only one of the 18 sub-areas where the project operated did average farmer yields approach those obtained elsewhere in Kenya for French beans. This was the Mbale area, which had an average yield of 76.6 kgs per 1 kg of seed, but this relatively good annual average stems largely from the excellent results of a late year experiment whereby farmers were provided with only 1/2 kilo of seed for a planting. These farmers obtained an average of 80 kgs of beans or 160 kgs per 1 kilo of seed. Prior to this experiment results in Mbale had not been good. Over the entire year Mbale farmers were provided with inputs valued at Ksh 8755 and the areas's input balance for the year was Ksh 4177 or 47.7 percent.

34 Hortiequip staff.

35 The project proposal predicted average yields of 100 kgs per kilo of seed. None of the centers reached this average during the season.

36 Calculated from Hortiequip and Njoro Cannery Records.

37 Interviews with Hortiequip (Kisii) staff, September 21-22, 1986.

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THE DEVELOPMENT OF THE KENYA/UNITED KINGDOM TRADE IN "ASIAN
VEGETABLES" WITH PARTICULAR REFERENCE TO THE PROBLEM OF
COORDINATING PRODUCTION AND EXPORT MARKETING IN KENYA

"Contract Farming in Africa"---Kenya Case Study # 2

Since the late 1950s, Kenyan farmers and exporters have airfreighted fresh fruits and vegetables to Western Europe and the Middle East. Kenya's horticultural exports have included several dozen tropical and temperate fruits and vegetables and at any one time over forty different items may be exported. While becoming increasingly important to the Kenyan economy, the value and volume of Kenya's fruit and vegetable exports has remained relatively small compared to the supplies provided to the EEC by nonmember Mediterranean countries such as Morocco and Israel. Nevertheless, Kenya has held a predominant position for nearly twenty years in one segment of the European market. This is the market for "Asian vegetables," the group of vegetables that form an important part of the traditional diet of several South Asian communities and that are still widely consumed by various South Asian and other immigrant communities in Western Europe, particularly in the United Kingdom.

Kenya exports up to twenty different Asian vegetables. These vegetables fall under various classifications. Some are beans (i.e., valere, gwar, and chola), while others are peas (tuwer and papdi), capsicums (various types of chillies), marrows/gourds (dudhi, gisoda, turia, tindori, and mooli), leaves (chillie leaves and patra), fruits (aubergins and gunda), cucurbits (karela and tindola), or fit into additional categories (i.e., okra, tindo, saragwa, and gingra). Asian vegetables such as chillies and okra have recently become popular among sections of the indigenous West European consumer population, while other Asian vegetables are consumed almost exclusively by immigrant (or second generation) communities. Very few of the Asian vegetables have an "identity" of their own. Instead, they are typically consumed and nearly always distributed in combination with one another. For marketing purposes these vegetables comprise a comprehensive basket.

This study examines the Kenya/U.K. trade in Asian vegetables beginning at the consumption stage in the U.K. and tracing back the marketing chain to smallholder production in Kenya. For the U.K. I examine the source and growth of demand for Asian vegetables and the structure and characteristics of the Asian vegetable marketing system at retail, wholesale, and import levels. For the Kenyan dimension of the trade I begin by examining the structure of the export trade and the political environment in which it operates. I go on to discuss various contributions of the Asian-vegetable trade to the Kenyan economy.

Special attention is then given to the problem of coordinating production and export marketing in Kenya. I examine the inefficiency and instability of the ties between farmers and exporters, which are now beginning to undermine Kenya's competitive position in the U.K. market. This unstable production and marketing system serves as the backdrop to one

company's attempt in the early 1980s to introduce an Asian-vegetable procurement system based on contract farming. I examine the circumstances surrounding this contract farming project, its performance, and its impact.

The Origin of the Trade

The historical origin of Asian-vegetable production in Kenya is unclear but probably dates to the late 1860s or 1870s with the demand and seed coming from Indian merchants based in Zanzibar and along the Kenyan coast. The demand for these vegetables increased significantly by the turn of the century when thousands of people from the Indian subcontinent were brought as indentured labor into the area to work on the Uganda Railroad. Those workers not stricken by smallpox or malaria and not mauled by lions needed to eat. By 1898 the rail line had reached a place called Makindu (210 miles west of Mombassa), where a camping station for the workers was established. By this time 13,000 Asians were working on the rail line, requiring 21 tons of food per day. A major drought necessitated that practically all food rations be brought up from the coast. It is likely that the presence of these workers not only stimulated Asian-vegetable production at the coast but also encouraged some farmers along the Makindu River to grow these vegetables. The total number of Indians brought over to work on the railroad was 32,000. (1)

Only about one-quarter of the railway workers remained in East Africa, but the local Asian population was augmented by other immigrants from India. Most immigrants were from Gujarat with smaller numbers coming from the Punjab. Many of the immigrants were petty traders or children of peasants who were released from the land. Many immigrants set up small "dukawallahs" in the cities along the railway line selling basic goods to Africans, Asians, and Europeans. (2)

With the expanding local Asian population, the market for Asian vegetables was enlarged. Much of the production of these vegetables was by Asian farmers in areas such as Kibwezi and Athi River, who sent the produce by rail or truck to Nairobi and Mombassa. By the 1950s, African farmers at Voi and the coast also supplied the Mombassa market. Asian retailers would then sell the produce to consumers. The local Asian-vegetable marketing system predated the export trade by some forty years.

In the late 1950s and early 1960s there was a considerable increase in migration of young Indian men to the U.K. A small international trade in certain traditional Indian vegetables was initiated at this time. Vegetable traders in India sent small consignments of produce to small-scale Indian companies in the U.K., who then sold to the immigrant community in London. Demand continued to outpace supply. The U.K. Asian population expanded

rapidly in the 1960s as the initial male migrants were joined by their families. Supply was constrained by insufficient air cargo capacity between India and the U.K. (3)

During the 1960s Kenya emerged as an important source of supply for the immigrant market. Actual Kenyan exports of chillies and other Asian vegetables began in the late 1950s, but this was only of tiny quantities. During the mid-1960s a few Kenyan Asian-owned companies entered the export trade and expanded Kenya's supplies of Asian vegetables. By 1969 this export trade had reached over 750 tons/year.

The Kenya/U.K. trade in Asian vegetables has expanded more than ten-fold over the past decade and a half, and this basket of commodities has played an important role in the overall development of Kenya's horticultural export trade. Over the past fifteen years this group of vegetables has comprised over 30 percent of the volume of Kenya's fruit and vegetable exports. For Kenya's most important market, the United Kingdom, Asian vegetables have comprised over 60 percent of the volume of bilateral fruit and vegetable trade during the 1980s. Several Kenyan firms that initially built their operations upon the Asian-vegetable trade have since been able to diversify into other products.

The Market for Asian Vegetables

The demand for Asian vegetables in Western Europe is heavily concentrated in those cities that have sizeable communities of South Asian ethnic origin. Given the strong historical ties between the U.K. and the Indian subcontinent, the vast majority of South Asian immigrants to Europe have settled in the U.K. Smaller South Asian communities also exist in Amsterdam, Berlin, and in each of the national capitals of Scandinavia. As nearly 95 percent of Kenya's Asian-vegetable exports have gone to the U.K., we focus our discussion on that market.

The Asian Population in the U.K.

According to estimates made by the Office of Population Censuses and Surveys (OPCS), there were over one million residents in the U.K. in 1980 whose ethnic origin was in the South Asian subcontinent. No British census has raised questions on ethnicity, so estimates of the size and demographic structure of the various ethnic groups in the U.K. population are based on information about birthplace and parental birthplace taken in the 1971 census, up-dated and supplemented by estimates of births and deaths, migration statistics, and information about ethnicity raised in the 1979 and 1981 Labor Force Surveys. (4) The OPCS provides the following estimates of the size and growth of the local South Asian population during the 1970s:

Population of Asian Communities in the United Kingdom
(Thousands of People)

Group	Mid-1971	Mid-1976	Mid-1980
Indian born	307	390	460
E. African Asian	68	160	
Pakistani/Bangladeshi	171	246	355
Total "Asian" Population	546	796	1007

(Source: OPCS Monitor PP1 81/6)

As can be seen, the local South Asian population nearly doubled during the 1970s. Since data sets are not consistent it is not possible precisely to subdivide this growth according to net migration and net natural increase. Using data provided in the issues of International Migration published by OPSC, however, it is estimated that slightly less than half of this population growth over this period was due to migration. Migration did play a considerably more important role during the 1971-76 period than in the latter half of the decade. This was particularly the case for Asians who emigrated from East Africa.

Even with a decline in immigration levels, the population of South Asian communities should continue to grow rapidly due to their relatively high birthrates. While their numbers constitute about 2 percent of the total U.K. population, over the 1977-83 period they comprised, on average, 4.5 percent of all live births in the country.(5) Based upon prevailing population growth rates, one Government report has estimated that the 1991 population of people of wholly Asian ethnic origin will be between 1.25 and 1.50 million.(6)

The high birth rate of the Asian population combined with the tendency for immigrants to have been concentrated among the young has led to an age structure for the local Asian population that is skewed toward younger ages. While 6.3 percent of the overall U.K. population is between the ages of 0 and 4, a survey among the Pakistani population in a section of Manchester found 20 percent of the population to be in this age category. While 31.2 percent of the U.K. population is 45 years or older, the sample of the Pakistani community found only 6.8 percent of the group in this age category.(7)

The Asian "community" in the U.K. is actually a "proliferation of distinct ethnic groups" with different countries/regions of origin, different languages, and different religions. At least three major religions, four major languages, and four countries of origin can claim large groups among the

U.K. Asian population. The various groups differ in their rural vs. urban origins, their settlement patterns in the U.K., their occupational structures, and their dietary patterns.(8)

Dietary Habits

While the tastes of the younger generation are certainly changing, a high proportion of immigrants of South Asian origin continue to eat traditional foods rather than English foods. This is partly out of sheer preference for certain foods and partly to maintain their religious affiliations and social customs.(9) A 1973 survey found that 79 percent of respondents born in India or Pakistan ate only traditional foods at their evening meals. The survey suggested that this eating pattern would continue into the second generation. It found that most Asian children were eating primarily traditional dishes with only a small percentage preferring English food.(10) Demand remains strong for certain traditional spices and vegetables and for a growing array of Indian convenience foods that a few specialist firms have supplied. A recent study estimates that the 1985 U.K. market for Indian ingredients and processed foods was 40 million pounds.(11)

Some vegetables are regarded as staple items in the South Asian diet, while other vegetables are either delicacies or spices/seasonings for which there are dried alternatives. The staple vegetables include: carrots, okra, spinach, chillies, peas, and potatoes. Other commonly eaten vegetables include aubergines, karela, tomato, dudhi, and cabbage. Thus, one finds some overlap between the traditional vegetable basket consumed by the Asian population and that of the larger English population. For some Asian vegetables there are locally grown substitutes. For example, dudhi can be replaced by marrows and courgettes while mooli can be replaced by radish or cabbage. There are no acceptable substitutes for chillies, okra, or karela.

Vegetable consumption patterns differ for the different subgroups. Gujarati Hindus are primarily vegetarians and thus require greater quantity and more variety of vegetables. They would be the prime consumers of items such as dudhi, gwar, gisoda, papri, patra, tindola, and valore. Even when multiple groups consume certain items their particular tastes may vary. For instance Gujaratis use chillies as a pickle and thus want a mild variety that has a nice dark green color. Punjabi Muslims use chillies as a spice and thus require a pungent light green variety. There are two main types of karela that are preferred by different groups. Together with their different settlement patterns (see below), these taste differences of the various South Asian groups create a segmented market requiring a specialist knowledge for effective distribution.

Concentrated Settlement Pattern

The local population of South Asian origin is concentrated in a few major English cities. Early South Asian migrants settled in areas experiencing labor shortages either due to their rapid rate of economic growth (i.e., Greater London) or due to poor working conditions (i.e., in the Manchester or Leeds textile industries). (12) South Asian communities are concentrated in London, Birmingham, Bradford, Leicester, or Manchester. For example, according to 1981 census data showing the regional distribution of the local population according to country of birth, of those born in India, Bangladesh, or Sri Lanka, over 53 percent reside in the Southeast, with over 38 percent living in London alone. Different subgroups have had different settlement patterns; for example, Pakistani Muslims are most heavily concentrated in Birmingham, Liverpool, and Manchester, while Gujaratis from East Africa are most heavily settled in Leicester and parts of London.

In some cities the Asian population has come to form a significant proportion of the overall population. For example, between 1971 and 1980, the Asian population of Bradford rose 89 percent to reach an estimated 47,000. Its share of the city's population rose from 8.4 percent to 17 percent. (13) For Leicester, the 1981 census found that 19 percent of the local population was born outside the U.K., of whom 80 percent were born in India or East Africa.

The Asian-Vegetable Marketing System

General Features

Before examining the various levels in the Asian-vegetable distribution chain it is appropriate to lay out some general distinguishing features of this trading network. Such features include the following: (14)

1. Dominance of minority-owned firms---

English fruit and vegetable importers and wholesalers have played only a minor role in the servicing of requirements for the country's ethnic minorities. Only recently have these firms entered into the field of "exotics" primarily at the behest of overseas marketing agencies. Conservatism, lack of understanding of a potential opportunity, as well as the preference for dealing on a commission basis limited the participation of English firms in the ethnic foods trade. The particular requirements of the country's Asian and West Indian population have been met largely by small-scale family companies with origins in these areas.

2. Fixed price system---

Unlike the general fruit and vegetable trade that until recently has operated primarily on a commission/consignment basis, the Asian-vegetable trade has always operated with fixed buying and selling prices. While import costs vary from item to item, importers and wholesalers have tended to sell the wide range of Asian vegetables at the same price level. This has served to economize on transaction costs as price information could be consolidated in one figure and the administration of sales made easier. Traders look for an overall margin on their basket of produce, and some items subsidize others. Prices may remain steady for a considerable period. The most significant influence on prices has come from factors out of the control of participants--i.e., air freight rates and currency movements.

3. Quantity rather than price adjustment---

For Asian vegetables sent from Kenya freight, costs are higher than f.o.b. prices and, for a low value item such as aubergine, may be twice as high as the f.o.b. cost. Freight costs account for nearly a third of the retail prices of these vegetables. This, together with a system of minimum export prices set by the Kenyan Government, determines that the trade has minimal latitude for price reductions in the face of surpluses. The limited spending power of most Asian communities and the personal relationships between retailers and consumers limits the scope for price increases in the face of shortages. Demand patterns are consistent and relatively price inelastic. The trade thus utilizes quantity adjustments rather than price adjustments to match supply with demand. Given the relatively small size of the trade, but the vast range of items exchanged, shortages and surpluses of individual items are ever-present.

4. Fragmentation rather than concentration---

Unlike the general fruit and vegetable trade, which is experiencing increased concentration at import, wholesale, and retail levels and greater degrees of vertical integration across stages, the Asian-vegetable (or ethnic) trade has experienced greater fragmentation, particularly at import and retail levels. At the import level a group of medium-scale, well-established firms have faced increased competition from a large fringe of small-scale firms making deliveries direct from the airport to retail shops. The Asian retail sector continues to proliferate, reducing the clientele for each individual shop.

Retail Distribution

The retail sale of Asian vegetables is predominantly from the corner shop located in an inner-city area. Some shops carry

a wide range of spices and other foods and a more limited stock of vegetables, while other shops are fresh produce specialists and carry a bewildering array of fruit and vegetables, many of which are unknown to the average Briton. Many cater to a primarily ethnic-minority clientele. One survey of Asian shopkeepers in three British cities found that, on average, only 30 percent of their customers were white. (15)

Asian retail establishments are a relatively recent phenomenon in the U.K. Few Asian-owned shops existed prior to the 1950s, and it was not until the early 1960s that there was major growth in this type of investment within the Asian communities. Desai (1963) reports that the first Gujarati grocer in Birmingham started business in 1949 and that by 1961 there were still only six Gujarati grocers. The growth of Asian retailing was rapid in the 1960s and on into the 1970s with individuals responding directly to the opportunities created by the growth in the local Asian population to supply food, clothing, and other items unknown to English shopkeepers.

The growth of the Asian retail sector occurred simultaneously with a pattern of economic decay in some inner city areas and with a trend toward increased concentration of retail food sales. Some researchers have accounted for this in terms of a comparative advantage of "ethnic entrepreneurs" in servicing the needs of particular communities. The retailer, dealing in a range of cultural items, goods, and services, can develop a certain niche that shields him from outside competition. (16)

Against this optimistic picture are a number of studies that have argued that the majority of Asian retailers are working extremely long hours and generating relatively low returns. Not only is the level of purchasing power within Asian communities relatively low, but the expansion in the number of retail outlets has spread the Asian consumer pound more thinly. There are now too many businesses chasing the ethnic trade with insufficient wealth in the communities to support the quantity of retailers. Their location in areas of high Asian population density limits their access to the majority population. (17)

Indeed, for the past several years retailers have seen their margins on Asian vegetables squeezed as costs of supplies have risen with increased air freight costs, but heavy competition has prevented them from passing on these cost increases to consumers. Some retailers have encouraged local Asians to grow vegetables in their backyards so as to provide them with a cheaper product and thus some competitive edge. (18)

Many Asian greengrocers have on-going orders from a wholesaler who makes deliveries to the shop several times per week. Generally, preference is given to suppliers who can

provide a full product range plus multiple-week credit. During periods of peak demand or short supplies this retailer may seek additional supplies from wholesale market-based traders or small-scale distributors with lower prices, but limited credit arrangements.

During the 1980s the multiple chain supermarkets have shown some interest in items such as okra and chillies to be included in their overall range of "exotic" fruit and vegetables. The volume of this flow is growing, but remains small.

The Wholesale Trade

Most of the wholesalers of Asian vegetables carry a full line of fruit, vegetables, and spices for a largely ethnic minority clientele. Based on interviews conducted during the 1984/85 winter, I have estimated that twelve firms, based in Birmingham, London, or Bradford, account for three-fourths of primary or secondary wholesale turnover for Asian vegetables. Secondary wholesalers in cities such as Liverpool, Manchester, Coventry, Leeds, and Glasgow will normally obtain their supplies from Birmingham- or Bradford-based importer/wholesalers.

The history of many of these wholesaling firms has followed a similar path. Most started their businesses in the late 1960s or early 1970s importing small quantities of vegetables and spices from contacts they had in India, Pakistan, Kenya, or Cyprus. Initially, they used their own houses for storage and made deliveries door-to-door to shopkeepers. The firms then acquired warehouses and began selling near or in primary wholesale markets. Contacts and business outside one's own community and ethnic group were expanded as were the product ranges of these firms. Even with the expanded clientele and product range, Asian vegetables from Kenya have remained a key component of each firm's business, and the Asian retailer and consumer the prime orientation. Due to the risks of importing produce directly (see below), most of these firms have withdrawn from this activity and now rely on a few importers for their supplies.

Importing Asian Vegetables

The Asian-vegetable import trade began in the 1960s when some Indian merchants began receiving produce from India and then selling it from the parking lot of Heathrow Airport. The distribution of Kenya's Asian-vegetable supplies also focused around the "parking lot merchants" until the early 1970s. At that time several small companies began operating vegetable-delivery services from vans. Distribution was still largely concentrated in the London area, although significant Asian communities were developing in the cities of the Midlands. Eventually, several "van importers" established warehouses in the

vicinity of primary wholesale markets, reduced the extent of their retail shop deliveries, and operated centralized distribution systems. In 1973 a senior partner in Kenya's largest export company emigrated to the U.K. and established an import/distributing company. Until the late 1970s this firm would dominate the Asian-vegetable trade in the U.K. setting the standards for quality, setting price guidelines, and widening the distribution network supplying the ethnic minority population.

In the 1980s the import trade for Asian vegetables has featured a few long-established dominant firms and a large competitive fringe of small-scale or specialist firms. Five firms probably account for 65-75 percent of the U.K. imports of Asian vegetables from Kenya, although no single firm has more than a 20 percent share of the market. For some of the cities in the Midlands, one or a few firms provide the bulk of imported Asian vegetables. These and other firms also obtain Asian vegetables and other "exotic" fruits, vegetables, and spices from India, Pakistan, Cyprus, Zambia, Egypt, and South and Central America. With one exception, each of the leading firms specializes in the importation of tropical fruits and vegetables for distribution through "ethnic channels." Again with one exception, each firm concentrates its activities in a single city or small region. Each firm is Asian-owned and is typically a family enterprise or two-family partnership. Most of these companies have an annual turnover of less than 5 million pounds. These firms are based in either London, Birmingham, or Bradford. Each firm carries up to thirty individual products and deals with perhaps 100-150 secondary wholesalers and retailers. (19)

In addition to these five firms there are a number of smaller importers of Kenyan produce. Some of these firms are primarily wholesaling operations that merely obtain part of their requirements directly from overseas. Others are the modern-day "van importers," who pick up small consignments of produce at Heathrow Airport and make deliveries by van direct to retailers in London and other cities. There may be up to fifty "van importers" operating in the country. These companies generally do not maintain stocks of produce, preferring immediate turnover. Some of these firms are permanently in the trade while others are simply "cowboy outfits" operating part-time or seasonally and commonly stopping and starting up under a range of different names.

The "van importers" have proven to be particularly important in serving the London market. During the winter months they may have a combined 30 percent share of this market. With insignificant overheads and by bypassing the wholesale trade, the van importers have been able not only to undercut in price some of the larger importers, but also to provide the service of delivery to retailers, but the "van importers" are not in a position to offer the extended credit terms that larger

importer/wholesalers may offer. The competitive fringe provided by the "van importers" has reduced the market power of the larger firms. It has also undermined previously stable trading relationships between established importers and their customers, however. Some of these importers have found it to be unprofitable to continue in the Asian-vegetable trade and have diversified their product range into more profitable items.

As is the case for a few of the leading firms, many "van importers" are linked to family or friends in Kenya. While the larger exporters tend to deal with the larger, well established import/wholesaling firms, many of the small-scale, part-time exporters have traded with the small importers willing to handle a consignment of a ton or less. As the small-scale firms on each side of the trade operate with limited overhead costs, they have been able to undercut the more established firms. While on the surface this appears to be a sign of "healthy" competition and the reduction of "inefficient" market power, examined more closely this pattern appears to be reducing the incentives to participate in the trade for those who are most able more fully to develop the market.

Importer Dissatisfaction

U.K. Asian-vegetable importers have relied heavily on supplies from Kenya. Some produce is procured from European or other countries, but their production is either highly seasonal (i.e., Cypriot okra), relatively more expensive (i.e., Dutch aubergine; Indian, Mexican, and Brazilian okra), or not of the varieties preferred by the local Asian consumers (i.e., Indian, Pakistani, and Cypriot chillies). Given their highly specialized product range, these importers are vulnerable to supply disturbances on the Kenya side.

Importers generally have informal, "gentlemen's" agreements with one or two Kenyan exporters to send a specified quantity of each of 20-30 items, a specified number of times per week. These will be on-going orders that might be subject to adjustment on a weekly or bi-weekly basis via telex communication. The payment schedule for importers is related to their size of purchase, although two weeks credit is the norm. Small importers may have to prepay for their orders a week or consignment in advance. Where transactions are between family companies, the importer may have payment periods of up to three months. While some importers have dealt with the same exporters for a number of years, most importers report that they have shifted among several suppliers in the past few years.

Most U.K. importers are dissatisfied with the ability of their Kenyan suppliers to meet their requirements for quantity, quality, and continuity of supplies. Many firms view Kenya as the least reliable of the main source countries supplying the

overall U.K. fruit and vegetable market. Some firms see this problem stemming primarily from the bottleneck in international transport in Kenya during the peak winter supply months. In recent years during the peak export months of December and January, there has been inadequate air-cargo space for fresh produce leaving Nairobi, particularly that bound for the U.K. market. Significant quantities of produce have been wasted, gone unharvested, or off-loaded from airplanes. (see below)

Other importers see their difficulties stemming from the practices of exporters. They feel that certain exporters have inadequate commitment to their customers and will chase short-term profit-generating opportunities even at the expense of "loyal" customers. In a large number of trading relationships there exists a strong element of distrust. There are certainly exceptions to this state of affairs, but most importers feel that many exporters simply cannot be relied upon. The poor services provided by some exporters has tended to generate external "diseconomies" for the overall reputation of Kenya as a supply source and has undermined the position of the more competent firms.

Importers generally face produce quantity and quality risks rather than price risks. Within an overall climate of distrust importers perceive that the general rules governing the trade include the following:

1. At particular times importers will not receive any produce at all from particular suppliers because a) of a failure on the part of the exporter to secure sufficient airfreight space, and produce that is sent will go to preferred customers; b) cargo is off-loaded at the airport in the last minute scramble for cargo space; and/or c) the exporter has located another buyer who is offering better terms and has thus redirected the consignment. Under this condition importers will need to make purchases from other importers to satisfy at least their most important customers.

2. Importers may not receive produce of marketable quality because a) the consignment has been transshipped and subsequently delayed; b) produce has dehydrated due to heat build-up within the carton during hot periods; and/or c) the supplier has failed to grade and pack the produce properly. There is no standardized Kenyan product; quality levels differ by grower and exporter and quality varies week by week. Under this condition importers can make claims against the exporter for the produce that is unmarketable, and obtain a certificate from the local inspection services to that effect. Most importers must be careful about making "excessive" claims against exporters, however, or the next consignment may "fail" to arrive at all. If quality deterioration was due to transshipment, the importer still must prove that the relevant airline was at fault.

3. Importers will not generally receive what they have ordered because a) within Kenya some items may be in short supply while others have been harvested in surplus. The exporter will seek to meet the quantity of the order by including larger quantities of the surplus item within a consignment; and b) even when communication is made to the exporter that particular items are short or flooded, a lag time of a few days normally follows before a noticeable response is made. Importers are particularly worried about shortages, as these result in dissatisfied customers. Some firms report over-ordering those items that are "traditionally" under-consigned. Normally surplus produce can be sold at cost.

Importers have no legal or other institutional remedy against a supplier who willfully breaches an agreement. One sanction, important in many trading relationships, is the threat of lost future trade. This threat is powerful only for the handful of larger importers. Another possible sanction is the threat of "advertising" the wrongdoing, thereby undermining the reputation of the exporter. This sanction seems to have only limited value as most firms are painfully aware that many trading relations may go sour for a variety of reasons and that the breach of one agreement should not greatly damage the reputation of a firm. Only repeated breaches of agreements should lead to a firm getting a "bad name." Furthermore, some exporters have a very short time horizon with their prime interest being the generation of rapid seasonal profits and perhaps the export of capital to overseas bank accounts.

Importers generally can spread these quantity and quality risks by procuring produce from more than one Kenyan supplier as well as from one or more suppliers in another country. Some importers and wholesalers have encouraged British farmers to grow chillies during the summer months. Still others have invested their own resources in production schemes in such countries as Mauritius and Egypt and even in the black "homelands" in South Africa. Importers do not expect that alternative supply sources will initially be able to match the quality of Kenyan produce. Nor do they expect these sources to compete well initially with the Kenyan supplies on the basis of price. Increased reliability and continuity is the central objective in diversifying away from Kenyan supplies.

The Asian-Vegetable System in Kenya

The Export Trade

Kenyan exports of fresh fruit and vegetables were introduced during World War II with supplies going to Allied troops stationed in East Africa and the Middle East. The export trade to Western Europe began in the mid-1950s with the expansion of

commercial air transport. The European trade was initiated by the European-managed Horticultural Cooperative Union, which sent supplies on consignment to firms operating out of London's Covent Garden market. In the mid-1960s a few Kenyan Asian-owned firms began exporting Asian vegetables and other items to the U.K. These firms either had been local fruit and vegetable wholesalers or had sizeable vegetable farms. The fruit and vegetable export trade can be characterized by four major features: 1) the dominant role of the private sector; 2) the limited role in export marketing of African-owned and managed firms; 3) its fragmented structure; and 4) a major international transport constraint. We touch briefly on each of these characteristics. (20)

1) Private Sector Dominance

For nearly all agricultural crops and products marketed domestically in Kenya or exported, the Kenyan Government has played a substantial role either through price or territorial controls or through direct involvement in physical marketing activities. In contrast, the role of the Government in the development of the fruit and vegetable export trade has been very limited. In 1967 the Horticultural Crops Development Authority (HCDA) was created. Linked to the Ministry of Agriculture, it is a specialized parastatal empowered to regulate, control, or involve itself directly in virtually all aspects of horticultural production, processing, and marketing. While given extensive legal powers, the HCDA has never received sufficient funding or manpower to carry out most planks of its broad mandate. Its prime activities have been a) periodic support for smallholder horticultural production schemes, b) domestic marketing of onions, c) export licensing, and d) monitoring and regulating the export trade.

The Authority entered marketing directly, not in pursuit of an explicit policy objective, but primarily in order to raise revenues to cover its operating costs. This occurred first in the domestic marketing of onions and later in a small-scale export operation. Still, the actual exports of the Authority represent no more than 1 percent of total horticultural exports.

2) Limited Role of African-owned and Managed Firms

Since its initiation, the horticultural export trade has been dominated by firms owned and managed either by Europeans or Kenyan Asians. Kenyan Africans have had a minimal role in export marketing. The HCDA has long maintained a liberal export licensing policy in order to encourage potential exporters, particularly African-owned firms. During the 1970s and 1980s several African firms have entered the export trade. Some of these were owned by civil servants and their wives. Most of the African-owned firms have experienced considerable difficulties

and have withdrawn from the trade. These firms either had difficulty obtaining adequate air cargo space, had insufficient marketing experience and market contacts, or didn't get paid by overseas buyers. The managers of these companies tend to divide their time between this business and several other endeavors, further constraining their ability to establish a stable position in the trade.

In line with a general Government policy for the economy, there have been frequent calls for the "Kenyanization" of the trade, sometimes made from fairly high levels in Government. As all leading firms are already majority-owned by Kenyan (Asian or European) citizens, the term can only be interpreted as a call for "Africanization." The liberal licensing policy introduced in the 1970s was not succeeding in reducing the dominance of firms owned by non-Africans

In the late 1970s, export companies were put under pressure to take on influential African personalities from public life to "participate" in their operations. Failure to do so would have resulted in the termination of one's export license. Generally, such participation did not involve capital investment. Instead, the "personalities" were paid service fees for providing some measure of protection and support in overcoming bureaucratic hurdles. Some of the "personalities" have been provided support from their companies to develop their own farms.

Nine firms continue to account for 85-90 percent of the volume of Kenya's fruit and vegetable exports. With the exception of one European-managed company, each of the other leading fruit and vegetable exporting companies is owned and managed by Kenyan Asians. Only a few of these firms have Africans in senior management positions, although their overall staffs are largely African. African-owned firms have a combined share of less than 7 percent of export volumes. Asian-owned firms conduct nearly the entire trade in Asian vegetables.

Frustration of the official policy has led to recent discussions about "transferring" the trade from established exporters to rising Kenyan African entrepreneurs. This would involve selective licensing, increased scrutiny over various practices of existing exporters, and provision of preferential treatment to a limited number of well-connected African-owned firms. (21)

In recent years there have been numerous official statements deploring the pricing policies of fruit and vegetable exporters as well as their alleged failure to repatriate the "rightful share" of foreign exchange earnings to Kenya. At times, these statements have taken on a strident line with claims made that these exporters were "plundering of the economy." These public attacks have generally questioned the integrity of the entire

industry and have not made distinctions between offending and non-offending firms. At the same time some firms have been accused of "exploiting" farmers. Most export firms see their investments and future livelihood as being vulnerable to politically-inspired interventions.

A few of the export companies have family living in the U.K., which enables these firms to economize on the transaction costs of export marketing. Some exporters deal directly with affiliated family companies while others get assistance from family members through the provision of market information and perhaps through debt collection. Firms with family links are far less vulnerable to various forms of importer opportunism. Many Kenyan exporters have had consignments not paid for or had importers make large claims on the basis of poor quality or noncompliance with their orders in terms of product mix. Those Kenyan firms that deal with family members overseas have not had to "chase" their money or be subject to large claims. They have also been less exposed to exchange-rate risks than other firms. Their U.K. affiliates will generally absorb the deviations between orders and actual deliveries and swallow their normal margins whenever procurement costs have risen temporarily. During periods of financial stress the overseas affiliate can inject capital into the local operation by prepaying for orders.

3) Fragmentation of the Trade

In the 1960s the number of firms exporting fruit and vegetables was probably less than a half dozen. Since the early 1970s the number of licensed exporters has mushroomed to over one hundred. While not all licensed exporters do engage in trade, and while only a limited number of firms contribute a large proportion of overall export volumes, it can still be argued that the Kenyan export trade is too fragmented either to maintain or to expand Kenya's trade position.

The majority of firms holding export licenses have been part-time exporters. They export only during short periods of the year and/or are involved in this trade only as a supplementary activity to selling tea, running a travel agency, or holding a civil service job. Over the years many "cowboy outfits" have sprung up in search of quick profits in this trade. Their scale of operation warrants neither the investment in marketing infrastructure nor the investment in building up stable relationships with growers and overseas buyers. Most firms have neither the capacity nor the inclination to plow back export earnings into the horticultural sector. Most firms have insufficient turnover to obtain an economical return on precooling and cold storage facilities or on the development of their own extension staff.

The fragmentation of the trade results not only in Kenyan firms scrambling for farmer produce and air cargo space, but also competing against one another for the same markets. Fragmentation has also served to undermine the reputation of Kenya as a supplier. The quality of produce and associated services varies by exporter with small-scale, ad hoc exporters not generally being able to satisfy importer requirements. This undermines the overall image of the Kenyan trade and acts as a "drag" on the business of the more competent firms. Regular, long-term marketing relationships have been somewhat undermined by the presence of an array of firms operating with minimal overheads and able to offer produce in the short run at a discount. The fact that the HCDA tends to pass on to new exporters the names and addresses of the overseas buyers of existing exporters does not help preserve these stable trade relations.

4) International Transport Constraint

Throughout most of the history of the horticultural export trade, firms have had to contend with limitations on international cargo facilities out of Kenya. Although it was first mooted as an idea in the early 1960s, has been discussed repeatedly since that time, and has been developed extensively by other horticultural exporting countries, international sea transport of Kenyan produce has never developed. The Kenyan horticultural export trade has been based entirely on air freight.

The seasonal inadequacy of air cargo facilities was felt as early as the 1950s, but the introduction of wide-bodied carriers and a few charter lines in the 1970s was able to handle much of the expanded production and trade. Still, access to air cargo space proved problematic for smaller firms (lacking permanent "relationships" with airline cargo staff), especially during the peak export months. Air cargo space has increased in the 1980s, but not nearly as much as has the demand for it. Air cargo limitations are felt throughout the main October-June export period, but particularly during November to January. Most produce going to the U.K. market must be transhipped via other European countries.

The reasons for the air cargo shortage are many and the problem can not be discussed in detail here, but a short list of causal factors might include:

- 1) the weak direct involvement of Kenya Airways in carrying horticultural cargo and its obstruction of cargo plans proposed by alternative charter and IATA airlines;
- 2) the high customs duties on imports into Kenya that have reduced the south-bound cargo traffic from Europe, and thus cargo space for the return journey;

3) the restrictions on charter licensing and permissible types of cargo on charter flights as laid down by the Kenyan Civil Aerodromes Board;

4) the high fuel charges to airlines relative to those charged in other African countries, with higher fuel taxes being imposed against charter airlines;

5) the Kenyan Government's controlled freight rates for horticultural produce, which are below IATA rates;

6) the growth of the Kenyan flower export trade. As freight charges for flowers are higher than for fruit and vegetables, the airlines prefer to take flowers; and

7) the growth of air cargo requirements out of South Africa as a result of an expanded horticultural trade and increased emigration due to the political situation. Most commercial airlines stopping in Nairobi initiate their flights in Johannesburg.

At any one time thirty or forty exporters may be seeking to get cargo space from the commercial airlines. The airlines may give several firms an indication of available space, but this is subject to change as produce up-take from Nairobi will depend on cargo up-take from previous stops (particularly Johannesburg) and passenger load. The competitive, last-minute scramble for space is accompanied by various malpractices and a high level of uncertainty for those firms that lack a strong personal relationship with the airline cargo staff.

Growth and Contribution of the Asian-Vegetable Trade

The Kenya/U.K. trade in Asian vegetables expanded considerably from the late 1960s until 1983. (22) Since then there has been a decline in the level of trade. The growth of the Kenya/United Kingdom trade in Asian vegetables can be seen in the following table:

Kenya/U.K. Trade in Asian Vegetables (Tons)

Year	Auber- gine	Okra	Chillies	Karela	Mooli	Dudhi	Other Asian Veg.	SubTotal	Total
1968*	30	99	158	-----				289	576
1970*	98	82	274	-----				613	1067
1972*	746	151	471	-----				419	1787
1974	1060	152	688	181	250	98	715		3144
1976	1021	263	882	307	235	201	1184		4893
1977	1260	300	980	215	307	171	1126		4359
1978	1382	361	1209	515	371	257	1223		5318
1979	1622	735	1508	661	365	295	**		**
1980	1618	812	1340	758	241	295	1544		6608
1981	1666	978	1328	840	145	346	1554		6857
1982	1887	1121	1563	962	126	360	1664		7683
1983	2047	1627	1746	980	101	477	1964		8942
1984	1767	1506	1625	914	30	571	2057		8440
1985	1701	1278	1940	979	4	523	1534		7959

(Source: HCDA Trade Statistics)

*Kenyan exports to all destinations. U.K. probably accounted for over 90 percent of these totals.

** Data not available.

As can be seen in the data, there has been fairly continuous growth in the overall trade in Asian vegetables. (23) For some items, trade volumes have stagnated or declined over the past five years. This is most notable for mooli. The market for this product has largely been taken over by cheaper Italian, Dutch, and British supplies. Kenya's market share for aubergine has been substantially reduced as the bulk of increased U.K. imports have been provided by the Netherlands and Spain. (24)

The trade downturn for 1984 and 1985 (and now 1986) reflects changes on both the supply and demand sides. The major decline in 1985 partly reflects the impact of the 1984 drought. The declining Asian-vegetable exports are also a result of the reduced emphasis that a few leading exporters have placed on Asian vegetables as part of their overall export basket. These exporters have placed increased attention on the procurement and sale of higher-value items, particularly french beans. On the demand side Kenya is beginning to face increased competition from European and non-European sources for okra and chillies. While Kenya still retains a competitive advantage due to its ability to provide the full range of Asian vegetables, many alternative sources are beginning to eat away at the virtual monopoly position that Kenya once held in this market. Importer dissatisfaction with the reliability and continuity of supplies as well as the uneven quality of Kenyan produce is pushing this source diversification at a faster pace.

Foreign Exchange Earnings

Using the HCDA's minimum export prices as a guide to actual sales earnings for these crops, one finds that the foreign exchange earnings for this group of vegetables have been the following:

1981	Ksh	47.3 million
1982		54.5 million
1983		67.0 million
1984		76.3 million

The minimum export prices may understate the actual value of sales by 10-20 percent. Even disregarding this fact, in 1984 the export earnings for Asian vegetables were equivalent to 3,763,000 Kenyan pounds, which ranks this commodity group well above the majority of the items listed as "principal" export commodities in the Government's Statistical Abstract. Export earnings from Asian vegetables exceed those for all individual categories of manufactured goods other than chemicals and cement.

Farmer Participation

While the aggregate growth and export earnings of the Asian-vegetable trade are important, the subsector's main impact has been felt through exporter procurement of these vegetables. Initially exporters obtained produce from their own farms or from medium- to large-scale Asian or European farmers. In the late 1960s, in the wake of a series of Kenyan Government measures to Africanize various aspects of the economy, an exodus of Asian farmers from the Kibwezi area began. Africans who had worked on the Asian-owned farms moved on to produce Asian vegetables either on their own farms, on land leased temporarily to them through a government irrigation scheme, or on larger African-owned farms. (25) One Asian farmer whose family had lived in Makindu for many years began in the mid-1960s supplying both his and outgrower-farmer produce to Nairobi-based exporters. He purchased from both small- and large-scale farmers. By 1972 he withdrew from farming and established his own exporting company called Makindu Growers and Packers. By providing technical advice, market access, and (occasionally) production inputs, this firm stimulated Asian-vegetable production for export from Kibwezi farmers.

By the late 1970s small-scale farmers were becoming the most important source of these vegetables. In the early 1980s, small-scale farmers probably accounted for 75-80 percent of the Asian vegetables that are exported. The trend in the mid-1980s has been a move back in the direction of procurement from larger-scale production units. The major involvement of smallholders in the Asian-vegetable sector contrasts, however, with the export

procurement systems for crops such as pineapple, passion fruit, french beans, flowers, and strawberries, where a substantial majority of produce derives from medium- and large-scale farms. (26)

Also important is the location of Asian-vegetable production. The bulk of Asian-vegetable supplies has come from the semi-arid areas of Machokos District such as Matuu, Kibwezi, and Mtito Andei, where over 3000 smallholder farmers are attached to government-supported irrigation schemes. In recent years Asian-vegetable production has also expanded to distant Lotokitok, on the slopes of Mt. Kilimanjaro. Asian vegetables have provided an important source of income and employment for these areas, becoming the most important (and widespread) cash crop in certain locations.

Income Generation

Available data on farmer yields and sales of Asian vegetables are extremely poor, and what data do exist show tremendous yield variations among farmers. Prices paid Asian-vegetable farmers also show considerable variation, yet even when using relatively low yield price estimates, Asian vegetables compare favorably with other cash crops and food crops in terms of gross producer income. The data below for cash and food crops are calculations by USAID/Kenya of the average gross income of crops over the 1979-1983 period.

Average Gross Income Per Production Season (Ksh)

Cash/Food Crops		Asian Vegetables	
Sugar	18,559	Karela	24,000 (a)
Tea	11,227	Chillies	18,000 (b)
Coffee	9418	Okra	16,500 (c)
Pyrethrum Ex.	3736	Aubergine	12,000 (d)
Maize	1584		
Oilseeds	1345		

(a) Yields vary between 2-6 tons/acre and prices between Ksh 5-8/kg. Used here is a yield of 4 tons/acre at Ksh 6 per kilo.

(b) Yields range from 2-6 tons/acre and prices between Ksh 4-9/kg. Used here is a yield of 3 tons/acre at Ksh 6 per kilo. Can get more than one crop per year.

(c) Yields range from 2-6 tons/acre and prices between Ksh 4.75-9/kg. Used here is a yield of 3 tons/acre at Ksh 5.5/kg. Can get up to three crops per year.

(d) Yields range from 5-12 tons/acre and prices between Ksh 1.5-3/kg. Used here is a yield of 6 tons at Ksh 2 per kilo.

This comparison is for illustrative purposes only. The data for the cash and food crops is now slightly outdated. Even though I have used relatively poor average yield estimates and average price estimates toward the bottom of their range, some smallholders may obtain less positive results. The estimates are for gross rather than net income; however, one source has calculated the net income for an acre of thin chillies, okra, and karela to be Ksh 9000, 12,800, and 7000 respectively. (27) These levels are higher than the estimated gross income for many other cash and food crops.

Employment

Most Asian vegetables are labor intensive relative to other crops grown in Kenya. They are grown throughout the year, although the peak production of most items takes place over the October-June period. The employment opportunities created by expanding Asian-vegetable production have led many young people in parts of Machokos District to remain in their home area rather than migrate to Nairobi or other locations in search of work. Compare below estimates of labor intensity for different crops:

Man Days Needed Per One Hectare Crop

Hybrid Maize	152	Aubergine	277
Cotton	235	Okra	304
Coffee	294	Chillies	378
		Karela	510

(Sources: Hormann and Thuo (1979); own calculations)

The Asian-Vegetable Procurement System

While it may be said that the Asian-vegetable trade has made a range of contributions to the Kenyan economy, this does not imply that the production and marketing system for these crops has functioned efficiently. To the contrary, the coordination of production with marketing has been extremely weak, and the overall system seems to operate in a state of perpetual disequilibrium. Subsector participants, especially farmers, operate under considerable uncertainty. In recent years overall production has far outstripped demand, while on a seasonal basis the supply of particular items has been inadequate. Not only has produce wastage been high, but the produce mix of exporters has been thrown into an imbalance. This has undermined the competitive position of Kenya in the U.K. market.

In this section we discuss the general features of the Asian-vegetable procurement system. We note the inefficiencies and uncertainties that the system creates. Together with the

overseas market conditions and the wider political framework, this systemic disequilibrium serves as the backdrop to one export company's attempt to introduce formal contractual arrangements into the procurement system. This case is discussed in the subsequent section.

What we will discuss here is the main features of exporter procurement of Asian vegetables from smallholder farmers. All exporters obtain a share of their supplies from medium- to large-scale growers. This share varies by company. Some companies rely largely on a few larger growers with whom they have dealt for many years. For these firms, smallholders may only be a residual supply source. More commonly, exporters obtain the bulk of their supplies from smallholders and rely on larger farmers primarily for items requiring greater investment (i.e., wires for trellising) or higher technical standards. Those Asian vegetables that require high humidity for growth are contracted to larger farmers at the coast. Chillies grow well at Lake Naivasha and as exporters are already procuring french beans from the large farmers there, this Asian vegetable is added to their order.

The nature of exporter/largeholder relations differs significantly from that of exporter/smallholder relations. The relationship is generally more personal, more intensive, and longer lasting. It sometimes is based on a higher level of trust and loyalty. Bargaining power is not as skewed as in the exporter-smallholder case. The relationship is also not as politicized. Communication flows are better than in the smallholder case. For these reasons the exporter/largeholder links have generally been satisfactory from the perspective of both exporters and farmers. Supplies from large farms are inadequate to meet demand, however. Some large-farm areas are not environmentally suitable for Asian vegetables. In other areas where large farms exist and where some Asian vegetables can be grown, farmers have preferred more familiar crops or crops yielding higher revenue per acre (i.e., french beans). Larger farmers operating with pump irrigation systems have demanded continued price increases to maintain their plantings. Seasonal labor shortages have also constrained large-farmer production in areas such as Kihwezi.

Smallholder producers of Asian vegetables have thus been sought. Even at lower prices and with lower and varying yields, smallholders in parts of Machokos District would find growing Asian vegetables for export an attractive venture. The procurement system for smallholder Asian-vegetable supplies, however, has not functioned efficiently. Let us examine this system.

Demand for Smallholder Supplies

The demand for smallholder supplies of Asian vegetables is a derived demand. It is an aggregation of the requirements of a large number of individual companies, which themselves derive from:

- a) the level and adjustment of on-going orders by U.K. importers;
- b) the quantity of air cargo space allocated and then actually provided to the exporter;
- c) the relative importance of Asian vegetables in an exporter's produce mix; and
- d) the exporter's supplies of produce from larger farmers.

These are variables, not constants, and thus the quantity of Asian vegetables required from smallholders shows continuous variability. When combined with variable production and poor information flows, the seeds of disequilibrium are sown.

Typical Procurement Arrangements(28)

In a production area such as Matuu (Machokos District) the exporter's contact with farmers is through his truck drivers and a few local agents whom he may appoint to represent him. For smallholder supplies most exporters work through agents, usually local shopkeepers or farmers who own or rent a shed in a market area. These agents try to recruit farmers to grow for a particular company. General procedures vary by company. Some provide agents with cartons on a weekly basis and give orders for a week, perhaps scattered over three or four days of pick-up. An agent must distribute cartons and make sure farmers make deliveries to his stall in time for the collections. Other companies bring cartons only on the morning of collections and specify their orders on that day. An agent may have some farmers operating on accounts while other farmers deliver on a strictly cash basis. Those with accounts generally receive a steady price for individual products and may be paid monthly or fortnightly. Those delivering on a cash basis will face widely fluctuating prices. Exporters will inform their truck drivers of the daily prices. The actual prices that "cash farmers" receive and the extent of delay in payment depend upon their relationship with the agent.

The weak coordination of the trade can be illustrated by several features, including:

1. Absence of Production Support--- Most exporters have had no direct involvement in the smallholder production process. They view themselves as trading companies neither capable of nor responsible for providing smallholders with either production inputs or technical advice. These are seen to be the responsibility of other institutions. While the seeds/chemical

trades and various farmer associations are seen to be responsible for the inputs side, the government extension service and the HCDA are seen to be responsible for technical assistance to farmers.

The location of some of the production sites, the specialist nature of these crops, and the prior notion that these crops are not important to Kenyan Africans have resulted in an absence of production services to smallholder Asian-vegetable farmers. This vacuum can most clearly be seen in the area of technical advice to farmers. In the main areas of Asian-vegetable production the numbers of extension staff have been few and their mobility limited by inadequate transport means. Trained as generalists and having only a few of the Asian vegetables described in their Ministry of Agriculture Handbooks, these extension people have not been in a strong position to make recommendations to farmers. What they know about Asian vegetables they have learned from farmers. One extension worker views his activities as being equivalent to "running in the fields."

2. Inappropriate Quantities or Produce Mix--- Each participating exporter is continuously unable to obtain his full vegetable requirements in the appropriate mix to meet overseas orders. Each day he obtains a surplus of some items and insufficient quantities of other items. Being short of certain items is particularly problematic, as it upsets the entire produce basket. Exporters react to this situation of uncertain product mix by a) over-ordering supplies and then rejecting or repacking produce, b) over-ordering supplies and keeping excess items for shipment the next day, c) over-ordering supplies and then selling excess items in their own retail outlet, or d) exchanging items held in excess for short items held by other exporters at the airport. Only a few exporters have their own retail outlets and there is practically no demand for these items by the local processing industry (i.e., processing firms import chillie powder from the Far East) so option "c" is not commonly pursued. Each of the other options are common.

Option "a" shifts quantity risks onto the farmers. Option "a" can be carried out in the field or in Nairobi. Exporters may give their truck drivers target quantity figures for different vegetables. Once these targets are reached in the course of their collection rounds, the collectors may cease further purchase of these items, perhaps on the basis of "poor quality." Another traditional practice has been to match supplies with orders at the last-minute documentation stage at the airport, save some extra supplies, and then return additional surplus on "quality" grounds. Farmers report that sometimes they receive back ca. tons that either are not theirs or are half empty.

2. High Wastage and Speculative Production--- While a few exporters do give an indication to farmers (or farmer groups) of

their expected requirements over the course of an export season, there is no coordinated planning procedure for Asian-vegetable production. While Asian-vegetable production is carried out all year long in the main smallholder producing areas of Matuu and Kibwezi, there are weather-induced production peaks in December-February and April-June. During this first period Asian vegetables must compete with higher value horticultural crops for the available air cargo space. During the latter period there is generally a surplus of many items. Most farmers growing Asian vegetables either must leave a sizeable proportion of their crop unharvested or face considerable wastage due to the lack of a sales outlet. Most farmers obtain seeds and then plant speculatively, hoping that a buyer will be found at harvest time. Wastage of produce may be 30-50 percent at times. Even when farmers do have ongoing relations with exporters, the latter sometimes give short-term notice to stop harvesting particular items. (29) Farmers located in areas with poor access roads may have even higher levels of wastage as some exporters simply do not send their trucks to these areas during periods of heavy rain.

3. Producer Price Variation--- Producer prices exhibit wide variability for the same crops in the same places. These price differences are not generally linked to quality differences. Rather, they are linked to short-term supply and demand conditions, the relative desperation of competing exporters, and price manipulations of the local agents serving the exporters. Most exporters pay different farmers different prices. Sometimes farmers who have accounts with exporters are paid higher prices, while other times farmers selling on a cash basis receive a premium. Even when a company has established a consistent policy, its implementation by staff or local agents may involve considerable discretion. Company staff collecting produce and paying cash are sometimes in a position to pay farmers below the company's stated price. Local agents who may also be farmers are in a position to underpay less-informed farmers;

4. Quality Variation--- Produce quality exhibits wide variation at farm and export level. The industry lacks a consistent set of quality guidelines for many of the Asian vegetables. Different exporters set different quality standards, and produce rejected by one firm may be accepted by another. In addition, quality standards are adjusted by exporters in the context of supply and demand conditions. We noted above the upward shift in "quality standards" when supply exceeds demand. Quality standards are adjusted downward over the July-September period when some crops are in short supply. Quality control is thus a vehicle for quantity control. Not only exporters behave opportunistically in relation to produce quality. A common practice of farmers is to put good quality produce at the top of a carton and bad produce on the bottom, hoping that the carton

will pass through the exporters and government inspectors undetected. Previously it was the exporter who paid for this practice through the quality claims made by overseas buyers. More recently, some exporters have each contributing farmer write a designated code number on the side of the carton so that the culprit can be detected and deductions made on future purchases.

5. Information Problems--- Small-scale, Asian-vegetable farmers are poorly informed about the changes in supply, demand, or the air cargo space situation. With such a large number of exporters and the uneven buying behavior of some, farmers have difficulty gauging demand. Communications are very poor between Nairobi and several growing areas, and information is generally passed to farmers by company collection-truck personnel. Delays in communications may result in farmer losses as produce is harvested without exporter intention to purchase. Exporters tend to pass on only short-term information regarding the quantity of requirements. When local agents are responsible for providing information to farmers, there is scope for distortion. Local government staff do not understand the general patterns and complexity of the trade, and are thus not in a position to advise farmers on a production and sales strategy.

In a contentious trading environment information becomes a perishable commodity. Information is a key element in reducing risks. As long as farmers can be held in the dark, the risks of cargo off-loads and supply/demand imbalances can be shifted to them. Information flows take a "negative" form. Exporters will inform farmers when the overseas market is depressed or when the quality of produce is below some standard set by the exporter. Positive feedback on good produce or good sales results is rare.

6. Weak Intermediation--- The weak bargaining position of farmers, the poor information flows, and the absence of effective production planning would all appear to call for the involvement of farmer cooperatives or associations in the Asian-vegetable system. A large number of such groups have either emerged ostensibly to help vegetable farmers, or have diversified beyond interests in coffee or cotton to include vegetable farmers. Generally, these cooperatives have made only a minimal contribution to the Asian-vegetable sector. Some of these groups are "paper cooperatives" consisting of a list of names and office holders. Other groups have "bodies with no legs" lacking support and legitimacy in the eyes of farmers and being used for political purposes by exporters rather than carrying out actual marketing functions. Cooperative officials have been adept at corresponding with exporters and government officials, laying out terms of trading agreements or asserting the rights of farmers, but vegetable cooperatives have been singularly unsuccessful in coordinating the production and marketing of the farmers on their lists.

While not averse to the idea of cooperation, many farmers have come to associate formal cooperative organizations with the deduction of cesses from farmers in order to pay for the offices, telephones, and trips to Nairobi for a few "big men." Where horticultural cooperatives have operated, internal power struggles have frequently led to the breakaway of splinter groups with both exporters and government officials not being clear about whom to deal with.

7. Widespread Mistrust--- Exporters perceive most farmers as opportunists selling to whoever provides them with the best terms at any one time. Farmers view exporters as unscrupulous and unreliable. Commitments are made to tie down the other party and reduce one's own risks. Under a range of circumstances the commitment will be readily broken. Cooperative officials mistrust exporters and farmers while the latter two mistrust the cooperative officials. Farmers view the HCDA as supporters of exporters while the exporters view the Authority's intentions with suspicion and its direct participation in the trade with alarm.

A Contractual Scheme for Asian Vegetables

Within the context of this rather chaotic trading network an effort was made between 1982 and 1985 to organize exporter/smallholder relations on a contractual basis. The scheme involved approximately 500 smallholders in the Matuu area linked by contract and farmer groups to the company, Kenya Horticultural Exporters Ltd.

Background of Matuu-Yatta (Machokos District)

During the period 1954-59 the 37 mile long Yatta Furrow was constructed by a work force of Mau Mau detainees. The furrow was fed by the Thika River and was initially geared toward supplying water for domestic use and for cattle. Not until the mid-1960s, with the initiation of settlement schemes, was water from the furrow used for irrigation purposes. Throughout the late 1960s and early 1970s small groups of people were settled on one- to three-acre plots near the furrow with feeder channels providing irrigation water. The first plantings on these plots was in the spring of 1967. (30)

From the beginning the Matuu farmers planted vegetables on the irrigated parts of their land, and maize and cowpeas on rain-fed sections. Availability of water permitted the farmers to produce tomatoes, cabbages, and chillies at times when supplies were short from the rain-fed areas in Central Province and in other parts of Machokos District. During these times Nairobi traders would travel over nontarmac roads to reach the scheme. At other times of the year Matuu farmers were heavily constrained by transport, as bus links to Nairobi or Thika were weak and

preference was given to passengers over produce. Insufficient coordination of farmers restricted the hiring of lorries to transport produce to Nairobi. (31)

In the mid-1970s the Horticultural Crops Development Authority attempted to assist Matuu vegetable growers by establishing a few grading, packing, and collection centers and linking local farmers to the nation-wide Horticultural Cooperative Union, to food processors, and to exporters. Various companies made inquiries through the Ministry of Agriculture as to whether the Matuu farmers could increase their production for export. In 1977 Schluter and Co. requested birdseye chillies for local processing. A year later M/S Kenez came forth with a request for 30 tons of Asian vegetables per week to export. In 1979 Al-Khaldiya Trading company inquired about supplies of fruit to export to Saudi Arabia.

As with the efforts of the HCDA, these firms needed to establish a link with a local organization. The only existing farmer's organization was the Masinga Farmers Cooperative Union, which was handling cotton. The HCDA stations were turned over to the Union to administer, and exporter requests were passed on to the cooperative. Few farmers felt that the Union represented their interests, however, after it had generally mismanaged their cotton crop and delayed payments for their vegetables. The HCDA packing stations were closed and the produce inquiries were not followed up. (32)

Still, by the late 1970s a few exporters of Asian vegetables had become aware that good quality vegetables could be obtained from Matuu. They thus employed some local farmers to act as their agents, buying from other farmers and then meeting the exporter's trucks in Thika. It was not until the 1980/81 season when the Thika-Kitui road was tarmacadamed that exporter trucks actually went to the Matuu area. Only two exporters were purchasing on a sustained basis in Matuu. Neither firm was directly involved in supporting production. A few other exporters made purchases on an ad hoc basis.

Farmers growing Asian vegetables for export were not satisfied with the prevailing marketing arrangements. Fluctuating prices, uncertain purchases, unreliable payments, and quality adjustments were seen as common, and farmers had no bargaining power vis-a-vis exporters. A group of farmers contacted the director of the Horticultural Crops Branch of the Ministry of Agriculture asking for his assistance. This director himself had a farm in Matuu. He encouraged the farmers to form an association or "self-help" group and put them in touch with an exporter who might consider a more formal marketing link with the Matuu farmers. This firm was Kenya Horticultural Exporters Ltd.

Kenya Horticultural Exporters Ltd. (KHE)(33)

KHE is a partnership of two families, both with origins in Gujarat, India. The families entered into business together in the mid-1950s to form a fresh-produce retail outlet. The firm imported fresh fruit and expanded into local wholesaling, especially for potatoes, onions, and garlic. In the mid-1960s with the involvement of several European farmers at Naivasha, they initiated an export trade. At that time the only other important exporter was the Horticultural Cooperative Union, although there were a few small-scale competitors.

The company's early exports consisted primarily of french beans, pineapples, and strawberries obtained largely from European farmers and sent on consignment to a broker in London's Covent Garden Market. In the late 1960s the company began exporting Asian vegetables to two Indian firms based in London. Asian vegetables were obtained from a few European and Asian farmers.

During the 1970s KHE emerged as the leading exporter, expanding its volume of trade and significantly diversifying its product mix and market outlets. It was the first company to enter the West German market and played an important role in the opening of the market for Kenyan french beans in France and Belgium. The company handled a quarter to a third of Kenya's fruit and vegetable exports over the decade. Asian vegetable exports to the U.K. remained important, accounting for 30-40 percent of the company's export volume. In 1973 one of the company's founders emigrated to the U.K. and shortly thereafter established his own fruit and vegetable import and distributing company. This U.K. affiliate played a major role in expanding the distribution of Asian vegetables outside of the Greater London area.

The company continued to obtain its supplies from medium- to large-scale farms in areas such as Naivasha, Thika, Embakasi, Kibwezi, and the coast. It was developing a reputation for reliability in its dealings with farmers. For this reliability farmers needed to pay a risk premium--KHE's producer prices were generally 10-20 percent below those of its competitors. Having developed excellent relations with several airlines, having strong overseas marketing links, and purchasing in sizeable volumes, KHE was able to exercise considerable bargaining power in local price negotiations. "Loyal" farmers could obtain inputs and credit from the company. If unforeseen market downturns occurred these "loyalists" would be compensated for part of their production costs. The company was the first to provide written contracts to farmers growing vegetables for export. This was undertaken with several farmers growing french beans and sweet pepper.

KHE has continued to expand its trade in the 1980s. It is one of only a few Kenyan firms that have maintained a reputation in Europe for quality produce and reliable service. At any one time the company is exporting to up to a dozen countries and can send 50 or more different items. While Asian vegetables and french beans have continued to comprise a major part of the company's export volume, the company has been Kenya's leading exporter of avocado, mango, passion fruit, and more exotic produce such as apple bananas. In recent years KHE's exports of fruit and vegetables have reached the following levels:

1982	4315 tons
1983	5170
1984	5881
1985	5423

Over this period, the company has accounted for between 21 and 25 percent of the total volume of Kenyan fruit and vegetable exports.

When KHE was approached in 1982 by the Ministry of Agriculture official on behalf of the Matuu farmers, the company was in a confident mood. By that time it had succeeded in developing strong marketing links to a number of countries. Its U.K. affiliate was diversifying its product range and was becoming actively involved in marketing channels supplying multiple chain supermarkets. KHE was in the process of hiring an experienced horticulturalist who had managed the farm of one of the company's main suppliers. It had just moved into a new Ksh 24 million complex incorporating offices and packing, grading, and cold storage facilities. The company's operations were previously scattered among three Nairobi sites. The cold storage facilities would not only help deliver a higher quality product with a longer shelf life, but would enable the company far greater flexibility in its procurement arrangements. The cold storage facility would enable the firm to carry out more effective grading and quality control and to accommodate surpluses of produce.

Thus, KHE in 1982 was in a confident mood looking to expand. In terms of Asian vegetables the company had been experiencing procurement problems as its policy of low but steady prices was making the firm uncompetitive with other exporters whenever supplies of particular items were short. The other exporters merely increased their prices and made cash purchases. In addition, the company was finding that some of its traditional suppliers were not able to grow okra and chillies in sufficient quantities and at high quality. The company's Asian-vegetable export mix was thus out of balance and was constraining the marketing effort of its U.K. affiliate.

The Matuu situation appeared to provide the company with a tremendous opportunity. The farmers there were looking for a reliable buyer. Several Asian vegetables as well as other items could possibly grow well there under irrigation. The company had never formally contracted smallholder farmers before, but a contractual framework was viewed as the best way to signal the company's long-term intentions both to the farmers of the area and to government officials aware of the marketing problems faced by the Matuu farmers. The company hoped that if indeed Matuu became a major new source of export produce, then its contractual links would enable it to have prime access to the additional supplies.

The Scheme

Over three seasons--1982/83, 1983/84, and 1984/85--KHE operated a contracting scheme for Asian vegetables and selected other items in the Matuu area. At the height of the scheme more than 300 farmers were selling produce to KHE, and this enabled the company considerably to expand its exports of Asian vegetables. In the beginning of 1985 the project virtually collapsed in the face of the drought-induced shortage of produce and severe competition from other exporters for the farmers' output. Since then the company's presence in the area has diminished greatly, and during the 1986/87 export season no more than 30 Matuu farmers sold to the company. Still, Asian-vegetable production has continued to expand in Matuu. It is KHE's competitors who are picking the fruits of this expansion.

1982-83

In June of 1982 a contract was worked out between KHE and a committee representing the Matuu farmers. The program laid out was extremely ambitious, reflecting the newly strengthened confidence of the company. Matuu farmers would grow for KHE not only several Asian vegetables they were familiar with, but also substantial quantities of french beans and smaller quantities of melons and even gooseberries. The company intended to enter with a "blanket," spreading seeds, chemicals, and advice, and generating a major new supply source of export produce. There would be no trial period. Inputs would be distributed and KHE purchases would begin in October. The program specified KHE's weekly requirements over a period from October 1 to May 31 as well as guaranteed prices that would hold over the entire period. Production outside of this period would be at the farmers' risk and would be purchased at negotiated prices.

KHE would not deal directly with each of the individual smallholders. The company had not previously operated in the Matuu area and had no past contact with any of the large- or small-scale farmers in the area. As it wanted to develop a project on a fairly wide scale it required local intermediaries.

The Matuu Horticultural Marketing and Suppliers Committee, comprising some of the area's larger, more influential farmers, was seen as an appropriate intermediary. While initially the Committee was supposed to play the role of communicator, negotiator, and advisor for the farmers, the intention was that the Committee would seek small farmer members and register as a formal cooperative.

Farmers preferred that the Committee remain purely a communicative and advisory body with no decision-making authority. They resisted the Committee's efforts to raise contributions from them to set up an office and cover the petty expenses of the Committee. The farmers preferred that KHE deal either directly with them as individuals or through a number of collection stations. Having individual accounts with several hundred smallholder farmers was viewed by KHE as both expensive and administratively infeasible. KHE's horticulturalist and an agricultural officer in the area established eight collection centers in the area. Twenty to twenty-five farmers were assigned to each center, and they elected a center manager. KHE would hold separate accounts for each collection center and provide inputs and payments through their managers.

The KHE horticulturalist instructed each center on what crops and what acreage to plant and provided the inputs to the centers. At each center he initiated a small nursery to facilitate the transplanting of seedlings. He provided some instruction to center managers and individual farmers on production techniques and grading. Other company staff worked part-time on the project, especially in monitoring farmer grading and packing. The company had insufficient manpower, however, to provide more than a minimalist extension service.

In drawing up the contract, each side acknowledged the prevalence in the trade of sudden quantity adjustments on the part of exporters. Thus, a clause was written into the agreement that "the KHE will undertake to collect all exportable produce at the given collection time. In the event of unavoidable circumstances, the KHE will negotiate with the committee and put in writing a suitable value of compensation for any uncollected produce." This clause would theoretically lower the impact of the major marketing risk facing Matuu farmers--i.e., lack of a market outlet for their crops.

Distribution of inputs began in June 1982, initially on a small scale. For several months the company provided a total of about 20 kilos of seed/month. Nurseries were started at each of the collection centers and on some of the larger farms. Among the Asian vegetables, the company wanted to have Matuu farmers concentrate on only a few items that were upsetting the export basket because of their short supply. Particular attention was given to okra, thin chillies, and fresno chillies. Matuu farmers

were also keen on growing aubergine as they knew it grew well in the area and was far less labor-intensive than some of the other crops. By October, input distribution was at full steam with okra seed alone being supplied at the rate of 60 kgs. per month, enough for 20 acres of planting. Most farmers were planting 1/4 to 1 acre of Asian vegetables. Several larger farmers, who had individual accounts with KHE, planted up to five acres of Asian vegetables.

Matuu experienced adequate rainfall over the 1982-83 season to produce a good crop. Over the October 1982-September 1983 period, KHE purchased 575 tons of Asian vegetables from the Matuu area. This represented more than 30 percent of the company's exports of this group of vegetables for that year. KHE's purchases in the area had a value of Ksh 2.58 million. Four items accounted for 84 percent of KHE's Asian-vegetable purchases in Matuu. These items were okra (195 tons), aubergine (133 tons), thin chillies (99 tons), and fresno chillies (59 tons). The Matuu farmers had prior experience with thin chillies, so the good results for this crop were not surprising. Fresno chillies were introduced by KHE and brought good harvests from November to May. The results for okra were disappointing, although supplies from Matuu did help KHE improve okra's position in its overall export basket. The 60 kilos of okra seed per month that KHE provided from October to June should have generated 40 tons of produce per month, even with a poor yield of 2 tons an acre. Actual okra purchases were the following (in tons):

Oct 1.6	Feb 18.0	Jun 50.9
Nov 6.6	Mar 18.2	Jul 11.8
Dec 11.4	Apr 26.6	Aug, 11.8
Jan 17.9	May 23.3	Sept 3.3

Only in one month, June, did purchases come anywhere close to expected levels. Okra supplies in June were actually in excess of KHE's needs, and it brought that product into surplus at the time when Cypriot okra was coming onto the U.K. market. The subsequent collapse of supplies over the July-September period was weather induced with chilly evenings restricting okra growth. In the course of the season, competing exporters had made cash purchases of some of the produce grown under the KHE contract. Okra was one product where such "leakage" was important. When these other exporters stopped purchasing okra in June, the entire crop was left for KHE. The inadequate supplies at other months cannot be accounted for by leakages alone. Many okra fields were hit by disease, and yields were very low.

Aubergine also proved to be a problematic crop for the season because of extremely uneven deliveries. Farmers utilized the KHE contract as a sort of safety net, planting speculatively outside of the contract, looking for alternative buyers at higher cash prices, but then falling back on the KHE commitment when

market circumstances necessitated. KHE specified in the contract that its requirements were 12 tons/month. Actual KHE aubergine purchases were the following (in tons):

Oct 1.3	Feb 19.8	Jun 10.4
Nov 5.2	Mar 21.9	Jul 6.6
Dec 9.4	Apr 25.1	Aug 4.7
Jan.9.7	May 9.8	Sept 8.7

The figures show that during the main October-May season the company's requirements were not met in five of the eight months, but that in the three other months deliveries were approximately double the company's expected requirements. A surplus of aubergine had emerged by mid-February and the farmers needed the KHE outlet. The company was not sure whether excess supplies were due to better than expected yields or entirely to overplanting, and so continued to buy the produce on offer. By late April the company received a telex from its U.K. buyer noting that the aubergine market was depressed, that KHE was sending too large a volume, and that there were severe quality problems. The company immediately stopped its purchases of aubergine from the Matuu farmers. It informed the Head of the Horticultural Branch of the Ministry of Agriculture that this step was being taken because of the quality problem. The Matuu Committee argued that KHE graders were inspecting the produce and passing it for loading into the collection trucks as before. While acknowledging that heavy rains had affected some of the crop, the Committee argued that some of the crop was still good and that KHE needed to abide by the clause to take "all exportable produce" or else provide due compensation. The dispute ended several weeks later with KHE undertaking limited purchases. No compensation was provided to farmers as the company showed that it was making purchases in excess of the contract.

An effort to have the Matuu farmers grow bobby beans during the 1982-83 season proved to be a disaster. The effort was concentrated on some of the larger farms in the area, rather than the settlement farmers. The beans encountered severe disease problems. Nearly two tons of seed were lost.

1983-84

The 1983-84 season was highly successful for the project. New collection stations were started and additional farmers sought individual accounts with KHE. At its peak perhaps 500 farmers were linked into the KHE system. KHE increased the level of input supply and expanded the range of Asian vegetables that it purchased from Matuu. Several nurseries were operating effectively and helped provide higher quality aubergine and thin chillies. Over the period from October 1983 to September 1984,

KHE purchased nearly 839 tons of vegetables from Matuu at a value of nearly Ksh 4 million. These purchases accounted for about 45 percent of KHE's Asian-vegetable exports that year.

It is possible that a similar volume of purchases was made in the area by competing exporters buying not only from the farmers ostensibly growing under the KHE contract, but additional farmers who were encouraged by the income obtained by the contract farmers. While the other exporters were not providing inputs, the farmers were obtaining seeds outside of the KHE contract from shops in Nairobi. The contractual scheme was thus generating a general production expansion in the area.

KHE's exports of Asian vegetables expanded over the year as its basket was more closely coordinated with the requirements of its U.K. affiliate. Additional supplies of good quality okra and chillies were sent to a buyer in France. The bulk of KHE's requirements for several relatively minor items was obtained from Matuu.

Still, the year was not without problems. While less dramatically than during the first year, supplies continued to be uneven and deliveries rarely reflected the requirements set out in the 1983-84 contract. Aubergine supplies continued acting like a roller coaster, sometimes below orders and sometimes considerably above. The company's monthly order (for October to May) for Asian vegetables was about 93 tons. Actual purchases averaged 85 tons; but two months featured purchases of less than 70 tons, and two months had purchases of over 108 tons. The company provided large quantities of chola seed hoping to increase production of this item. Chola is a type of pigeon pea that the local farmers like to eat. The company was not getting the deliveries of the crop that it had expected and discovered that farmers were eating the leaves of the plant or selling the crop locally.

Some problems were encountered with collection center managers not paying farmers. As there were no banks in the Matuu area, KHE would write a check in the name of the manager who would then be responsible for distributing the money to individual farmers as per the receipts they were given at produce delivery. Several center managers were dishonest, and farmers began losing confidence in the collection center system. Some centers closed with a few farmers obtaining individual accounts with KHE while other farmers decided to sell to other exporters.

1984-85

The KHE-Matuu contracting scheme completely unravelled during the 1984-85 season. The short rains of March-April 1984 were lower than normal and the long rains of September-October 1984 completely failed. Drought conditions had set in in many

parts of the country, adversely affecting agricultural production. Matuu farmers were still able to draw on the irrigation water of the Yatta furrow. The production of Asian vegetables continued to expand up until about February of 1985. KHE's purchases were at levels similar to those of the previous year, but farmers were restricted from irrigating during the day due to the shortage of water and the threat of water supply to Kitui town.

Reduced Asian-vegetable output in Matuu and shortages of supplies from other areas resulted in a chaotic scramble for supplies over the March to June 1985 period. Many exporters were attempting to obtain produce in Matuu and were offering prices well above those offered on the KHE contract. Compare below the prices offered by KHE with the prices reached in the cash spot market:

Prices per Carton (Ksh)

	KHE	Spot Market
Okra (6 kg)	25.5	70
Chillies (5 kg)	20.0	50-55
Aubergine (6 kg)	13.5	25-30
Karela (6 kg)	30.0	70-80

Thus spot market prices reached levels more than double those offered by KHE. KHE did not react to the situation fast enough. It initially maintained a policy of not entering into a cash price war, hoping that it had generated through its efforts sufficient loyalty from its farmers in Matuu. This view proved to be naive. Farmers were being swamped with attention by other exporters. An attitude spread that there was tremendous demand for Asian vegetables, that exporters could earn profits even if paying double the KHE price, and that KHE had actually been cheating them for a long period. KHE contacted the Matuu Committee and asked for their assistance in preventing farmers from selling outside the contract. The Committee responded that the problems were the company's fault since it had been "exploiting" farmers. KHE finally did react to the situation and sent out circulars announcing increased short-term prices. Other exporters merely adjusted their prices upwards to compensate. KHE suffered a costly loss by not recovering a large number of cartons that it had distributed during the season.

1985-86

KHE was not ready to abandon its efforts in Matuu. In May of 1985 it made proposals to the Matuu Committee for the following production season. It was agreed that all farmers growing for KHE must formally register with the Committee and would not be allowed to sell any of his/her produce to any other

buyer" or "be liable to paying damages to both the Group and KHE." They also agreed that "all farmers for KHE will only plant according to the programme as provided...(and) no member of the Group will be allowed to plant outside that programme."

The agreement was actually a last ditch illusion to save the project. Neither members of the Committee nor most farmers perceived that they had an interest in abiding by the terms. Other exporters were now more active in the area, setting up collection stations of their own. The KHE contract would truly be a safety net to fall into when higher price offers were not available. The KHE contract for the 1985-86 season called for 80 tons of vegetables per month. During October and November actual purchases averaged 11.3 tons. The project had indeed collapsed to competition. Only a small number of farmers continued supplying KHE on a continuous basis, and KHE supplies of inputs and technical advice virtually stopped.

Project Impact

Matuu is presently the leading source of Asian vegetables for export with purchases of nearly 100 tons/week being made at the height of the export season. Up to 2000 local farmers may be involved in this activity, with up to a dozen exporters purchasing on a consistent or periodic basis. The most important impact of the KHE project and its wider stimulation of Asian-vegetable production has been its injection of increased income and employment opportunities into a relatively deprived area.

In each of the past few years the Matuu farmers have probably supplied in the area of 4000 tons of Asian vegetables per year. Such a level of sales has a farm-gate value of between Ksh 20 and 25 million. Over the course of its three year project, KHE alone made purchases valued at over Ksh 10 million. Over this same 1982-85 period the Njoro Cannery project in Vihiga made payments to farmers totalling about Ksh 11.7 million, but while the payments of Njoro Cannery were spread across some 15,000 farmers, KHE's payments went to little more than 500 farmers. Sizable income increases have enabled many farmers to start small businesses, build permanent structures on their farms, and pay school fees. The impact of Asian vegetables can be most clearly seen in the development of Matuu town. In 1979 the town was a small site with only two shops. The town has grown at a phenomenal rate and now includes numerous streets filled with shops and various service businesses and cottage industries.

Asian vegetable production has also greatly affected the value of land in the Matuu area. In one settlement scheme area the cost of leasing land has risen from 400 sh/acre in 1983 to 2500 sh/acre in 1986. As for purchasing land, the cost in one area has risen from 1000-2000 sh/acre in 1977 to 6000 sh/acre in

1986. In another area land values have risen from 3000 sh/acre in 1982 to 10,000 sh/acre in 1986. The costs of part-time agricultural labor have also been affected. Wages for agricultural labor have risen from 5 sh/day in the early 1980s to 10-12 sh/day in 1986.

The project also had an impact on KHE. Through its operations in Matuu, KHE was able to build up its level of Asian-vegetable exports over the 1982-85 period. Its U.K. affiliate was able to strengthen its competitive position in this product area. KHE was also able to send high quality okra and chillies to France. The impact of the project on KHE's Asian-vegetable trade can be seen in the following figures:

KHE Asian-Vegetable Exports

1980/81	1220 tons
1981/82	1350
1982/83	1830
1983/84	1850
1984/85	1750
1985/86	1085

(Source: Own approximations using disaggregated KHE export data according to customer)

One can see from the figures that the collapse of the project in the beginning of 1985 adversely affected the company's overall exports of Asian vegetables. While Asian vegetables comprised over 40 percent of the company's export volume during 1982/83, they comprised less than a 20 percent share during 1985/86. Despite the initial success of the project for KHE, most of the lessons that the company has learned from its experience have been negative. In the aftermath of the project, the company has sought to reduce the risks and transaction costs involved in Asian-vegetable procurement by concentrating on large farmer supplies. (see below)

Alternative Non-Market Solutions?

With the collapse of the KHE project in Matuu, the procurement system for Asian vegetables has largely returned to its status quo ante disequilibrium situation. Smallholder Asian-vegetable farmers are faced with a situation of a) weak bargaining power vis-a-vis exporters, b) uncertainty over prices and the proportion of their harvest that will be purchased, c) poor access to information on demand and transport, d) difficult access to production inputs, and e) poor access to useful technical advice.

Difficulties in obtaining reliable and high quality supplies of Asian vegetables from smallholders is leading some firms to consider alternative sources. KHE has decided to concentrate its Asian-vegetable procurement on larger farmers. During the 1986-87 season less than fifty farmers throughout the country supply KHE with Asian vegetables on a regular basis. Four farms supply 60 percent of the company's requirements of thin chillies. Supplies of fresno chillies come from only six farmers. For aubergine, three farms now supply the bulk of the company's supplies with one farm alone providing 50 percent of requirements. Karela supplies are coming largely from one farmer who manages a series of farms at the coast. If the company can interest a few large Kibwezi farmers in growing exclusively for it, then it may withdraw from Matuu altogether.

Simultaneous with KHE's attempt to recruit a few large farmers, the company has begun a process of backward integration via the development of a few farms owned by senior partners in the company. Investments in drip irrigation systems are being made on two farms. Already this year nearly a quarter of the company's thin chillies requirements will be produced on one of these company farms.

Kenya's second largest fruit and vegetable exporter, Makindu Growers and Packers, has also begun to explore non-market solutions to the problems of the Asian-vegetable trade. This firm was mentioned previously. It had actually begun in farming, moving later into strictly export marketing. The firm has relied upon a mix of small- and medium-scale farmers in Matuu, Kibwezi, and Lotokitok for its supplies and has sold to a large number of different importers in the U.K. In 1985 one of the company's senior partners emigrated to the U.K. where he set up an import company. That firm handles distribution of Makindu's products in London. The uncertainties of Asian-vegetable procurement as well as an interest in diversifying into other product lines has led Makindu to begin development of its own farm also.

These patterns of increased vertical integration by two firms, which perhaps have the best reputation in the Asian-vegetable trade, are probably beneficial to the maintenance of Kenya's competitive position in this trade. The present fragmentation of the trade is undermining its long-term viability, but backward integration by exporters into production reduces the scope for smallholder participation in the sector. The rationalization of smallholder Asian-vegetable production does appear necessary. Such a rationalization process should require not only a reduction in the planting of some items, but an improvement in the yields and quality of the planted crop. The fragmentation of the sector virtually assures that output reduction will be achieved only through gradual smallholder disillusionment with an uncertain and unstable marketing system. Neither the private sector nor the official agricultural

establishment is willing or presently able to bring about the necessary yield and quality improvements.

The instability and inefficiency of the smallholder Asian-vegetable component has recently attracted government interest with a wide range of possible interventions muted. A 1984 Ministry of Agriculture study on the problems at Matuu made the inevitable recommendations that HCDA be strengthened and that more extension officers be assigned to the area and provided with more technical information about Asian vegetables. Also recommended was that the Matuu Committee should register as an official cooperative, that all farmers should register with that cooperative, and that all exporters should sign binding agreements with the cooperative. (34) Neither farmers nor exporters have shown much enthusiasm for this arrangement and the idea remains floating

During 1985 and 1986 both the Ministry of Agriculture and the HCDA have made various problem-solving suggestions and proposals for government interventions. Each proposal has sought to introduce controls over one or more dimensions in the trade. For example, one report issued by the Ministry called for the introduction of production quotas for farmers. How such a quota system would be devised, let alone enforced, was not discussed. (35)

HCDA has toyed with a package of policies for implementation in the Asian vegetable sector. Most of its proposals, however, have been targeted on the symptoms of the sector's inefficiencies, rather than the actual causes of these inefficiencies. Little discussion has related to reducing the fragmentation in the export trade, countering the uncontrolled growth and variable quality of production, or improving the provision of technical advice and inputs. The air freight constraint continues. Most proposals have been control-oriented. These policies have been brought up at various meetings between the HCDA, exporters, and farmers, and have generally sailed through as resolutions even though only a minority of participants view them as enforceable (or even desirable).

One issue generally discussed at these meetings is the unscrupulous behavior of "middlemen" acting on behalf of the exporters. Typically, a resolution will be passed stating that there will no longer be middlemen between farmers and exporters. In practice this is impossible as exporters cannot deal directly with each individual smallholder (who may deliver one or a few cartons of produce per day) and even where exporters have set up collection stations, the managers of these stations inevitably take on the characteristics of the dreaded middleman who is able to take advantage of less informed farmers. Most of the "middlemen" are local farmers, not some elusive character lurking in the shadows of night. Without such middlemen, most existing

exporters would be hard put to obtain produce from smallholders on any consistent pattern whatsoever. What weak information flows that do exist between farmers and exporters are largely via the presence of the "middlemen."

A second resolution frequently passed is that each farmer will register with one and only one exporter and each party should sign a written agreement stating terms of exchange. A copy of this agreement should be sent to HCDA. Thus, in the absence of trust, contracts are seen to be an appropriate means of improving production-marketing coordination. Neither most exporters nor many farmers wish to enter into enforceable contracts. Voluntarily drafting such contracts would typically be done in an attempt to "lock-in" the opposite party to future transactions. As both parties are aware that each is likely to default at one time or another, the contract merely represents an illusion of commitment. If exporters were told that they must commit themselves in writing to purchasing specified quantities of produce, then they would simply specify quantities well below their actual requirements and then obtain the balance "unofficially" from noncontracted farmers. A contract-farming system cannot be imposed by government in circumstances where there is a surplus of (uncontrolled) production and where there is a multiplicity of buyers.

The variability of prices among exporters and over time is another issue raised in meetings between the HCDA and farmers. The proposed "solution" is a controlled producer-price system with prices worked out between the HCDA and exporters and then communicated to farmers. Official producer prices would probably be followed initially, but the structures of production and export marketing would soon result in the reintroduction of variations. Otherwise, farmers with top quality produce and consistent supplies would obtain the same prices as farmers producing mixed-quality produce on a sporadic basis. Official producer prices would probably not be flexible enough to enable adjustments to short-term supply and demand changes. The reduction of price uncertainties would probably lead to accentuated seasonal gluts and farmers would welcome access to buyers at below the official price.

Concluding Remarks

This report examined several features of a complex production and marketing system. The analysis began by examining the demand and distribution of Asian vegetables in the U.K. and traced back the marketing channels through to the production stage in Kenya. Particular emphasis was given to the structure and constraints of the export trade and the poor level of coordination between production and export marketing. The report went on to analyze a contract farming scheme implemented by one of Kenya's leading horticultural exporters in the early 1980s.

While the project did contribute to a major expansion in Asian-vegetable production among smallholders, market forces made contractual enforcement impossible and the contracting company progressively lost control over the crop.

Competitive forces abroad and the changing business strategies of several exporters appear to dictate a rationalization of smallholder Asian-vegetable production. Farmers are not in a position to guide this process collectively and are thus vulnerable to both the vagaries of the market and the uncertain effects of piece-meal government interventions. The government has concentrated its attention on monitoring exporter behavior and has not laid down the institutional machinery to support farmers. The export trade is fragmented and largely unprofessional. Greater coordination between production and marketing appears elusive, and the Kenyan export trade in Asian vegetables will decline.

Notes

1. Miller (1971) pp.396-98.; Interview with Mr. Omii Bij of Makindu Growers and Packers, October 10, 1986.
2. Tandon and Raphael (1984), p.4.; Robinson (1986), p.40.
3. This information was provided by several London-based Asian-vegetable importers interviewed December 1984 to February 1985 and November 1986.
4. OPCS, 1982 Population Trends.
5. OPCS, Birth Statistics 1983.
6. The Immigrant Statistics Unit (1979) as reported in Robinson, p.36.
7. Central Statistical Office (1985); Anwar (1979).
8. Aldrich et al. (1984); Robinson (1986).
9. N.O.P. Market Research Ltd. (1974); Hunt (1975); Key Note (1986).
10. As reported in Wilson (1977).
11. Key Note (1986), p.9.
12. Jones (1978), as mentioned in Robinson (1986), p.29.
13. Jones (1983).

14. For a more detailed examination of these features see Jaffee (1986a).
15. Aldrich et al. (1984), p.199.
16. Ward (1983).
17. This is the general argument put forth by Aldrich et al. (1981; 1984).
18. Loughborough (1984); personal communications.
19. Based on interviews with importers.
20. See Jaffee (1986b) for a more detailed discussion.
21. The difficulties of accomplishing this "transfer" and suggestions of potentially more efficient methods of increasing African participation in export marketing are discussed in Jaffee (1986b).
22. A British team advising the Kenyan Government in the late 1960s predicted that the trade in Asian vegetables would level off at around the volume reached in 1969 and would subsequently decline. The prediction was based on the assumption that there would be no major population increase within the U.K. Asian community and that consumption patterns among this community would shift away from traditional foods.
23. Several short periods of rapid growth or decline can be linked to institutional changes. Particularly significant trade growth took place over two subperiods: 1972-74 and 1981-83. It was during the first subperiod when a partner in Kenya's biggest export company emigrated to the U.K. and started an import/distributing company. During the second growth subperiod, a U.K. firm dealing primarily in Kenyan produce embarked on a major expansion program via investments in storage and transport and making deliveries to several cities. The 1984 downturn in the trade may be partly accounted for by the bankruptcy of this latter firm, the resulting increased fragmentation of the trade in the U.K., and the financial losses borne by Kenyan exporters dealing with this firm.
24. It is likely that Kenyan export data for aubergine are inaccurate. In recent years there has been a considerable decline in U.K. importer interest in the Kenyan aubergine with the greater availability of European aubergine supplies. Such a decline in demand is not reflected in the trade data. One explanation may be that some exporters are falsely declaring other produce as "aubergine" since aubergine have a lower f.o.b. value than other vegetables, and making such declarations would

reduce the foreign currency values that would have to be repatriated to the Kenyan Central Bank.

25. Thuo and Horrman (1979), p.8.

26. See the sections on the structure of the horticultural trade in Jaffee (1986b).

27. Crop budgets made by Kenya Horticultural Exporters Ltd., 1986.

28. Based on interviews with exporters, government extension workers, cooperative officials, local agents, and farmers in September 1985 and October 1986.

29. One notice seen in October 1986 read "Kindly stop the harvesting of aubergine. Sorry for any inconvenience."

30. Ministry of Agriculture (1974), p.14.

31. Ibid., op cit.

32. Wekundah (1985), p.2; Farmer interviews.

33. Based primarily on interviews held with Atul Dhanani and other senior staff of KHE.

34. Wekundah (1984).

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CONTRACT FARMING, MARKET CONDITIONS, AND THE VEGETABLE
DEHYDRATION INDUSTRY IN KENYA, 1964-1982

"Contract Farming in Africa"---Case Study #3

Introduction

The vegetable dehydration industry is the first case in Kenya where small-scale African farmers became a party to written production contracts with an agricultural processing firm, but this smallholder contracting component was perhaps the only successful dimension of a project that spanned two decades and featured numerous changes in ownership, management, and operating strategy. Severe problems were faced in largeholder and nucleus-estate raw material procurement, in processing and in marketing. While initiated in 1964 largely for the social benefit of improving the welfare of newly settled African smallholders in the former "White Highlands," the project never succeeded in making a transition into an economically viable venture. Government subsidies, foreign investment, and multinational marketing were all marshalled to put the project on a sound commercial basis but low levels of operational efficiency and adverse changes in market conditions (both local and international) led the project into a financial abyss.

Little has been written on the project and few publically available documents provide any information about the participants, organization, or performance of the project. (1) The information presented in this study has been drawn primarily from a selected number of government documents and from sections of company records. I have also relied on information provided by the former agricultural manager of the project. Information about the world market for dehydrated vegetables was obtained from secondary sources.

This study provides only an initial overview of the project's development, market environment, internal structure, and performance. Many important dimensions of the project warrant further study. A fuller understanding of the microeconomics of the project as well as the institutional linkages among participants would require a more thorough review of company records and a wider range of interviews with project participants than was possible in the course of this research.

We begin by discussing general features of dehydrated vegetables and their international market. We then provide an overview of the foundation and the early performance of the Kenyan dehydration industry. This covers the period from 1964 to 1972 when the industry was oriented primarily toward providing a market outlet for small-scale farmers, but was not economically sustainable because of its limited operating scale as well as its management and marketing problems. In the early 1970s a plan was developed to expand the industry and to link it to an international expert in the field. We examine the new project concept and its main participants. We then move on to the core

of the study: an examination of the organization and performance of the industry over the 1975 to 1982 period. We discuss the international market environment in which the new project was set and explore the marketing, processing, and raw material procurement problems that were faced by the new project. In discussing the raw material supply problem, we contrast the relatively successful smallholder-farmer contract farming scheme with the problematic sourcing of supplies from large-scale farms and company estates. We then provide a few concluding comments and raise a series of questions for further research.

Dehydrated Vegetables

Dehydrated vegetables have been produced in small quantities since the 19th century. The product was used by British naval expeditions in the mid-19th century and by both soldiers and civilian populations during subsequent wars. Advances in processing technologies after World War II brought significant improvements in the quality of dehydrated vegetables.(2) The demand for convenience foods began to grow in the 1950s and accelerated in the following two decades. The dehydrated vegetable industry would benefit from this growing demand for convenience foods.

Dehydrated vegetables are less bulky and lighter in weight than fresh or other processed vegetables. They are cheaper to pack than canned vegetables and do not require refrigeration as do frozen vegetables. Dehydrated vegetables have a long shelf life, extending several years for some items.(3)

The major use for dehydrated vegetables is in the manufacture of dried (or packet) soups. The demand for dehydrated vegetables is thus a derived demand, based on production and consumption of (primarily packaged) soups. Secondary uses of dehydrated vegetables are in baby food, canned soups and stews, and a variety of ready-made meals. Seventy-five percent of West European imports of dehydrated vegetables are supplied to soup manufacturers. A further 20 percent is supplied to the catering sector and to institutions (i.e., hospitals and schools). The remainder is used by general food manufacturers or sold directly to consumers as dehydrated vegetables.(4)

In most Western European countries the domestic production of dehydrated vegetables reached a peak sometime in the 1960s or early 1970s and declined thereafter as a consequence of rising raw material and labor costs. In some countries a small number of large and diversified firms have continued to produce smaller quantities of high-value, high-quality dehydrated vegetable items. Consumer and manufacturer demand has been met largely by increased imports from Eastern Europe, the Mediterranean, and

Asia. A large number of countries, both industrialized and developing, now supply the West European market, and competition is heavy both in terms of quality and price. Price fluctuations are common owing to changes in supply and/or demand conditions. (5) Transport costs play a relatively insignificant role in the relative competitiveness of different countries. Dehydrated vegetables are sent by sea freight, and transport costs tend to be 10-15 percent of import costs.

In most supplying countries vegetables for dehydration are grown almost exclusively on contract for processors with contracts stipulating acreage, planting periods, varieties, stage of maturity at harvest, delivery dates, grading, and prices. It is generally considered that required continuity as well as varietal specificity of raw material cannot be assured by buying on the fresh market. (6)

The world dried-soup industry is dominated by three firms-- Unilever, Nestle, and Knorr (CPC Intl). These firms hold a preponderant market share in nearly all Western European countries. As the main users of dehydrated vegetables these firms have strongly influenced the standard trading practices in the industry. These firms have set high quality standards for their suppliers in terms of cut, color, moisture content, bacteria level, flavor, and rehydration time. Historically, price has been a secondary factor after quality in supplying raw materials to this market sector. The soup manufacturers have generally preferred not to purchase directly from overseas producers, but instead buy from well recognized importers who have the capacity to test, reprocess, regrade, and repack supplies. Developing-country exporters thus tend to deal with brokers or importer/packers rather than directly with soup manufacturers.

In contrast to the soup sector, for buyers serving the catering/institutional sector, price is a major consideration and quality standards are set lower. Standards set by baby food manufacturers are the highest, but supplies fetch a considerable price premium. This sector is small in volume relative to the former two. (7)

Vegetable Dehydration in Kenya

1964-1972 Subsidized Trial and Error

Foundation

In 1964, less than a year after an initial investment proposal was submitted, Pan African Produce and Development Company started dehydrating vegetables at a small Naivasha

factory. The factory had a capacity of producing 450 tons of finished product annually. The company's main sponsor and shareholder was Biddle and Sawyer Company, a London-based firm that had been prominent in the marketing of Kenyan pyrethrum. With Kenyan Government approval, also investing in the project was the Development Finance Company of Kenya (DFC). Minor shares were held by a few other private parties.

The main reason for the Government's interest in the project was the creation of an outlet for the vegetables produced by the small-scale farmers who were settling near Lake Naivasha and in Nyandarua District (i.e., the Kinangop Plateau) under the One Million Acre settlement scheme. At Kenyan independence large European farms in the highlands were purchased by the Government with British financing. Settlement schemes were developed to allocate land to smallholders and landless Africans. Seventeen settlement schemes, each with a size varying from 10,000 to 18,000 acres, were established. African settler families were provided with plots of 20 to 60 acres, although generally only 5-10 acres of each plot were arable. With the backing of the Ministry of Lands and Settlement, each settlement scheme was to develop its own cooperative with its own administration, technical equipment, workshop, and agricultural advisor. Farmer membership in these cooperatives would be mandatory.(8)

As originally conceived, the project would combine private and public interests in a production scheme that theoretically would not only generate export earnings and improve the welfare of newly settled smallholder farmers, but would also assist in developing the country's cooperative movement. In theory the DFC shareholding was being held in trust for the grower cooperatives, which after accumulating a sufficient surplus, would purchase these shares on behalf of their farmers.

Outgrower Contracts

As noted above, Kenyan Government support for the project rested largely on the expected benefits that would accrue to the settlement farmers. Most of the land held by these farmers was kept under permanent pasture to support their livestock. Milk, sold through the settlement cooperatives, would become these farmer's main source of income. Arable land was used to produce maize, potatoes, and other vegetables. Carrots grew particularly well in the Kinangop area. The farmers faced problems marketing their produce as the road network in the Kinangop was poor and Nairobi traders had easier access to vegetable-growing areas nearer to the capital.

The dehydration company decided to base its raw-material procurement system on production contracts with farmers. Since

it was felt that contracting directly with newly settled farmers would be administratively difficult and financially risky, the company decided to enter into written contracts with the settlement cooperatives. The cooperatives would act as "channeling funnels" for inputs and technical assistance and as units for production planning. It was further felt that the cooperatives would be well placed to assist in contract enforcement and debt collection, since they would also be marketing the farmers' milk and, if necessary, deductions could be taken from payments for this commodity.(9) We examine these production contracts in a later section.

The company's procurement of raw material incorporated two other groups of farmers. One group consisted of people working in the afforestation schemes of the Ministry of Natural Resources. Workers employed on these schemes to clear bush were permitted to utilize space between tree rows for agricultural purposes. Each worker had access up to 7.5 acres. Four forest stations would serve as the intermediary between these farmers and the company.(10) Both the settlement farmers and the forest station workers were initially contracted to grow primarily carrots for the factory.

Large-scale European farmers operating around Lake Naivasha comprised the third group to benefit from the project. Some of these farmers had begun growing vegetables in the 1940s, initially growing potatoes and onions for local sale and later starting to grow capsicums and French beans under irrigation for fresh export to Europe.(11) Growing vegetables for the factory was a useful supplement to these other activities and helped defray the high initial investment that these farmers were then making in infrastructure and irrigation systems. Farmers were particularly interested in growing for the factory during the export off-season. With these larger farmers written contracts were rare. The provision of seed by the company, and the farmer's commitment to provide his output to the factory, were based on trust. These farmers would concentrate on specialist crops such as French beans and capsicums. Producer prices would be collectively negotiated based on agreed estimates of production costs.(12)

Erratic Performance

The project was supported largely on social and political grounds, rather than on commercial grounds. The private investors viewed the investment as a pilot project to examine the technical and market prospects for a larger venture. They had no technical expertise in the field and the managers appointed to run the factory had no experience with dehydrating vegetables. Machinery and equipment were purchased from several sources, some

local and some foreign. Some machinery was badly designed or not in full working order. As an assessment of raw-material procurement potential had not been made, it is not surprising that some of the equipment purchased was for use in processing vegetables that could not be procured economically in the Kinangop area. (13)

The project sputtered along for four years making continuous losses. A management overhaul in 1966 had only a minor effect on performance. It was becoming obvious that the factory's very small capacity made the entire operation uneconomical. Overheads were swallowing sales earnings. The factory was only operating at less than 50 percent of its small capacity in several years. The company was exporting small quantities of low quality carrot powder to the United Kingdom. Exports marketing was ad hoc, involving little preplanning or long-term contracting. European manufacturers would not enter into longer-term trade arrangements because of the uncertainty of supply and quality associated with the Kenyan product. The annual export levels were the following: 1965--102 tons; 1966--117 tons, and 1967--217 tons. These export volumes, combined with the low prices that the Kenyan product could fetch, led to continued financial losses. In March of 1968 the company went into receivership. Later that year the factory was purchased by the Kenyan Government and renamed Pan African Foods (1968). The government wished to prevent the closure of the factory with its subsequent adverse effects on the contracted farmers.

Following the government's purchase of the factory several adjustments were made that improved some aspects of the company's performance. Additional machinery was added to the factory to bring its capacity up to 600 tons of finished product per year. It was also decided that the factory's raw material intake required greater diversification. Smallholder production had concentrated on carrots, and this item formed most of the factory's supplies. This contributed to financial problems as carrots generate a lower profit margin and lower unit sales earnings than vegetables such as green beans, capsicums, and onions. To increase commercial viability the company would have to put greater emphasis on procuring the higher-value vegetables. This raw material diversification would require greater reliance on the Naivasha farmers. The Kinangop area features low temperatures at night plus clouds and high humidity in the early morning. Thus, crops such as onions or beans which have high photoperiod sensitivity do not grow well there. (14) Smallholders would be encouraged to grow more leeks and cabbages.

Some success was made in diversifying raw material supplies. While in 1970 eighty-two percent of the weight of raw materials processed consisted of carrots, by 1972 the share of carrots was

down to sixty-seven percent. The company had succeeded in increasing smallholder supplies of leeks and cabbages and large-farm supplies of capsicum, beetroot, and French beans. (15) Total raw material supplies by the Naivasha growers were, however, showing signs of instability by the early 1970s. Large-farmer supplies to the factory fell from 4306 tons in 1970 to 2971 tons in 1971 and down to 1960 tons in 1972. Many large farmers were becoming more actively involved in the fresh export trade, adding crops such as courgette to the initial basket of French beans and capsicum. Exports of fresh capsicums to Europe increased four-fold between 1969 and 1972. Another outlet, that of the Nairobi greengrocer serving a higher income clientele, also grew in size and paid prices above those of the factory. (16)

Performance in the smallholder component was more favorable. Cooperative vegetable supplies to the factory more than doubled from 2304 tons in 1970 to 5234 tons in 1972. This occurred despite the fact that by 1970 the Ministry of Lands and Settlement had lost interest in the project and no longer wanted the project justified on the basis of the social benefits accruing to newly settled farmers. Initially the settlement schemes had been underfinanced and lacked effective institutional structures to channel the needed finance, equipment, and technical assistance to the farmers. The Pan African Foods project thus required the support of the local Ministry of Lands and Settlement officials to get the cooperatives sufficiently organized to perform project-related functions. Cooperative staff had been both meagre and unqualified. However, by the time the Ministry withdrew its support the cooperatives had built up their own staffs. While some cooperative management problems did arise it does not appear that these problems were nearly as debilitating as those facing horticultural cooperatives elsewhere in Kenya. Sometimes payments to farmers were delayed until cooperative bills were paid and sometimes limited quantities of inputs did "disappear." Still, overall cooperative performance was adequate.

Trading performance over the 1968-1972 period was varied, although better than during the earlier years of the project. (17) Exports varied from year to year with the project being adversely affected by drought in the Kinangop during both 1969 and 1971 and by heavy rains during 1970 which resulted in extremely high moisture content in carrots. Export levels were the following: 1968--595 tons; 1969--450 tons; 1971--297 tons, and 1972--572 tons. In 1968 the company diversified its sales into the West German market, and by the early 1970s this was the company's largest market.

While the quality of the factory's product did improve over earlier years, Kenyan sales were still at lower prices than other

major suppliers. Kenyan supplies were largely being sold as second quality to the catering/institutional sector as bacteria count was higher than the limits set by the soup manufacturers.(18) Obtaining long-term contracts thus remained difficult. Quality control problems reduced the prices the company could obtain. Some indication of the magnitude of these quality-related price discounts can be seen in the following figures:

West German Import Prices for Carrots
(\$ per ton)

Year	Average (All countries)	Kenya
1969	817	701
1970	821	795
1971	757	730

Source: ITC 1972 (19)

From 1968 to 1972 the company operated in the red. In most years the factory was provided with an annual government subsidy of 20,000 pounds (\$56,000) in order to cover its expenses.

1973-1974: Enter the Experts

A 1970 government working party examining the condition of the horticultural sector argued that since its establishment the vegetable dehydration project had been operating on an ad hoc basis, never developing a sound, long-term plan to develop the industry and never adequately utilizing experts in this product field. The group recommended that the government enter into a joint-venture project with a major European or American firm that would provide finance, technical know-how, and established distribution outlets. After several aborted contacts, the government finally agreed to a proposal made in 1973.(20)

The new project would entail majority government control through the shareholding of the Industrial and Commercial Development Corporation and a minority shareholding by Sifida Investment Company (Swiss), Bruckner Werke (W. Germany), Barclays Overseas Development Corporation (U.K.), and several other shareholders. The new project would involve \$3.5 million of new investment in the form of equity and debt. A new factory would be built near the old factory site. It would have a capacity to produce 3000 tons of dehydrated vegetables annually.

The central participant in the project would be Bruckner Werke. Bruckner has been the largest producer of dehydrated

vegetables and potatoes in West Germany and has a major share of that country's imports and exports of dehydrated vegetables. Bruckner would be responsible for obtaining and installing the machinery for the new factory. Also, in coordination with company management, Bruckner would determine an annual program for raw-material supply to the factory and a processing plan which would result in a product mix and volume of supplies sufficient to meet sales contracts. Bruckner would provide technical assistance related to raw material production as well as processing and packing methods. Finally, Bruckner would have exclusive overseas marketing rights to the Kenyan company's output. Any local or foreign sales that the company wished to make on its own would require the approval of both Bruckner and SIFIDA.

At full operation four years into the project, the company expected to be producing 2560 tons of dehydrated vegetables using nearly 33,000 tons of raw material. According to the production plan, output and raw material sourcing would be as follows:

Product	Planned Output (Dehydrated Product)	Procurement	
		Large Farms	Smallholders
Carrot	975 tons	25%	75%
Onions	570	100	
Leeks	400	50	50
Peppers	250	100	
Beans	200	100	
Cabbage	125	75	25
Beetroot	45	50	50
Tomatoes	45	100	

Source: SIFIDA

Using company estimates for yields and required acreages, one finds that the investment plan called for raw material supplies from large farms of 20,115 tons (62 percent) while supplies from smallholders would be 12,670 tons (38 percent). This would represent a doubling of smallholder deliveries and a ten-fold increase in large farm deliveries over the actual 1972 levels. Considering differential values for the various crops, approximately 3/4 of farm-level income would accrue to the large farmers under this plan.

While acknowledging that irrigation costs require large farmers to plant crops bringing maximum revenues and while noting the increased interest in producing vegetables for export, the foreign investors were confident that raw material requirements could be met: "No serious difficulties are foreseen to increase

the present production of fresh vegetables (8000 tons p.a.) to the quantity needed for the new factory (33000 tons in 1977) . . ." (SIFIDA, p.2) There was thus considerable optimism about the potential to increase raw material in-take to meet the new factory's large capacity.

There was also considerable optimism felt about marketing prospects. Past trends led the company to believe that West European demand would continue to rise at a steady 5 percent per year. For the three largest markets--West Germany, the U.K., and the Netherlands--combined imports of dehydrated vegetables more than doubled from 1965 to 1970 from 16,102 tons to 35,566 tons. Growth in imports had been steady year-by-year as domestic production of dehydrated vegetables declined in several countries.(21) For example, West German production of dehydrated vegetables actually peaked in 1963, declining thereafter. The market for dried soups continued to grow at a fast pace. Because of the low capacity of its factory, Pan African Foods had not been able to take advantage of the expanding European market during the 1960s and early 1970s.

The investment proposal appeared to provide solutions to the project's existing problems and considerable confidence in expanding the industry. Commercial viability would be guaranteed by the expansion of capacity, by the increased emphasis on higher value products, and by the participation of a firm with technical expertise and excellent marketing skills and contacts. While the relative importance of large farms for raw material supplies would be increased, the company's plan included an expectation of expanding smallholder deliveries, thus increasing income flows into the settlement schemes.

The joint venture investment was approved by the Government. It represented for several parties a risk-reducing effort. For Bruckner Werke the project represented an opportunity to diversify its sources of dehydrated vegetables and thus reduce the risk of shortfalls from its other suppliers. The company's minor equity holding did not represent a substantial investment and even this was off-set by earnings associated with the procurement and installment of the new plant and equipment. The new initiative also enabled various government officials to reduce their political and institutional risk, as now the project had incorporated "international experts." One of the roles of these experts would be to relieve certain officials of decision-making responsibilities over issues for which they lacked training and experience.

1975-1982 Pan African Vegetable Products, Ltd.

The new company began operations in 1975. It was composed of two legal entities. One was the holding company Pan African Vegetable Products (PVP) whose purpose was to process and market dehydrated vegetables. The second was a wholly-owned subsidiary called Pan African Vegetable Products Estates, which was to manage nucleus farms and supply fresh vegetables to the holding company.

From the beginning, the company's performance trailed behind the expectations of both the Government and the private partners. Even with its expanded capacity and virtually guaranteed market access, the company was never able to earn an annual net profit. Financial losses accumulated year-by-year and frequent government subsidies were required to keep the company operating. The company experienced severe problems in raw material procurement, in processing, and in marketing, and continued financial losses fed back to magnify the problems in each of these areas.

The financial picture of the company was dismal from the start. The quadrupling of oil prices in the mid-1970s considerably increased production costs. Fuel oil would be the prime source of energy for the factory, used to generate the hot-air process for dehydration. Less than one year into the project it was estimated that even if the factory were operating at full capacity, the increased costs would result in an operating profit only 35 percent of that originally forecast in the feasibility study.(22) In fact, the factory never even came close to operating at full capacity. Maximum capacity utilization was reached in 1977 at approximately 70 percent and annual capacity utilization averaged just over 50 percent.

Financial losses were generally in the range of Ksh 2-5 million per year. Accumulated losses reached Ksh 22.8 million in 1979 and Ksh 45 million in 1982. Working capital was also a problem. In 1977 and 1978 the Ministry of Agriculture and the Treasury provided Ksh 4 million. As accumulated losses absorbed all finance, the company's situation was considered irreversible as early as 1978. In that year the company began defaulting in its repayment of overseas loans. It kept operating by delaying payments for inputs and raw materials, by a limited injection of fresh (government) equity, and by making full use of an overdraft facility. By 1980 the company's bankers were refusing to honor its checks. In 1982 PVP went into receivership.(23)

Despite its overall poor financial performance, PVP did have considerable developmental impact. In the late 1970s it earned an average of Ksh 11.5 million per year in foreign exchange. Also, it became the second largest employer at Naivasha with a

combined labor force in its factory and on its estates of 1600 people. Furthermore, the company provided a valuable source of income for up to 3000 smallholder farming families.

We begin our review of PVP by first examining the general market environment in which it operated in the late 1970s. We then go on to examine PVP's marketing, processing, and raw material procurement problems.

Market Stagnation

Pan African Vegetable Products started operations at a time when Western Europe was in the midst of an economic recession. The recession had been brought on partly by the quadrupling of oil prices after 1973. Economic rates of growth were declining and consumer demand for numerous items was down. Both the production and consumption of soup declined in several countries. Between 1973 and 1975, the production of canned and packet soup in West Germany declined from 98,200 tons to 81,000 tons. (24) The dehydrated vegetable industry suffered as a consequence. Compare below the imports of several countries for the year 1970 with those for 1975 in the midst of the recession:

Effect of Recession on Dehydrated Vegetable Imports (Figures are Tons per Year)

Year	W. Germany	U.Kingdom	Netherlands	Total
1970	13271	15574	6721	35,566
1975	11330	11870	6191	29,371

Sources: ITC 1972; 1981

Even with economic recovery in the latter half of the 1970s, the market for dehydrated vegetables remained stagnant. The combined imports for West Germany, the U.K., and the Netherlands for 1978 was only 34,613 tons, a level below that for 1970.

Through its marketing agreement with Bruckner Werke, PVP would be exporting most of its finished product to West Germany. It is significant to note that West German production of packet soups actually declined over much of the 1970s. This can be seen in the data below:

West German Packet Soup Production (tons '000)

1971	42.1
1973	43.4
1975	39.0
1978	39.1
1979	36.5
1980	37.3

Sources: Marketing In Europe, April 1976; July 1984

The D-Mark value of production was no higher in 1979 than it was at the beginning of the decade. This pattern was not limited to West Germany. For example, consumption of packet soups also declined in the Netherlands in the late 1970s, falling from 156 million liters in 1977 to 129 million liters in 1979. (25)

The mid to late 1970s was a period not only of fluctuating and/or declining demand for soups and dehydrated vegetables in Western Europe, but it was also a period when the countries of Eastern Europe as well as Egypt, China, Taiwan, and Morocco were increasing their supplies of dehydrated vegetables onto the market. Price competition thus tightened. Several countries heavily subsidized their dehydrated vegetable industries or used this product in barter or compensation deals. (26)

As a result of stagnant demand and increased market penetration by several suppliers, overall market prices exhibited no nominal increase over the course of the 1970s. Compare, for example, the ex-factory prices in West Germany for several dehydrated vegetables that Kenya also supplied to that market:

Ex-Factory Prices in West Germany

Product	Price (DM/Kg.)	
	1970	1980
Carrots (cubes/flakes)	4.40-5.40	4.00-4.50
Carrots (powder)	4.20	2.50
Leek, white(slices)	5.70-6.00	5.70-6.00
Leek, white-green(slices)	5.00-5.30	4.00-5.50
Beetroot (powder)	7.70	4.50

Source: ITC 1981

With the exception of beans, the import prices in West Germany for items that Kenya also exported do not show a pattern of increase in the late 1970s which would have compensated for

increased production costs arising from higher energy costs. This can be seen in the figures below:

West German Average Import Prices (DM/Kg.)

Product	1975	1976	1977	1978	1979
Carrots	3.79	3.72	3.83	4.02	3.16
Leeks	3.96	3.69	4.31	3.98	4.23
Beans	5.54	5.86	7.95	7.92	7.20
Onions	3.36	3.25	3.79	3.64	3.27

Source: Calculated from data in ITC 1981(27)

The Marketing of PVP's Products

Was the stagnant position of the West European dehydrated vegetable market the prime cause of the company's financial problems and ultimate demise? Did the company's tied marketing arrangements with Bruckner Werke contribute to lower returns from exports? The evidence suggests that neither the overall market situation nor the company's marketing arrangements were major contributors to the problem.

Before examining PVP's marketing problems, let us first examine PVP's performance in terms of export volumes and sales. At full operating capacity the company had expected to produce 2560 tons of finished product per year. As we can see in the following figures, its maximum export level was only 53 percent of this figure, reached in 1976.

Kenyan Exports of Dehydrated Vegetables

Year	Quantity (Tons)	Value (Ksh Million)
1975	479	4.08
1976	1362	15.34
1977	1326	17.70
1978	949	18.75
1979	1340	23.81
1980	1044	18.30
1981	832	13.47
1982	385	6.97

Source: Kenya Annual Trade Reports

During this period, between 60 percent and 80 percent of exports went to West Germany, with the remainder going to the U.K. and the Netherlands. By 1979 Kenya had become the leading supplier of dehydrated carrots, leeks, and beans to West Germany.

In the original marketing agreement with Bruckner Werke, the latter would be responsible for all overseas marketing of PVP's products. Marketing had proven to be a major problem of the earlier dehydration company, and it was felt that Bruckner could guarantee PVP market access and obtain for it favorable prices. The exclusive marketing agreement held in force until December 31, 1977. Although a number of draft agreements were drawn up in 1978, no new marketing contract was signed. From that point onward the parties operated on a quasi-contractual basis, sometimes wishing to enforce the terms of the original agreement while at other times seeking alternative arrangements. (28)

From the beginning the marketing links between PVP and Bruckner were an arena of conflict, distrust, and dismay. PVP management felt that Bruckner was paying insufficient prices, that Bruckner was not providing management with sufficient market information, and that under the prevailing marketing arrangements several potentially promising distribution outlets were not being properly developed. Bruckner was disturbed by the factory's inability to maintain high quality standards and by PVP's inability to produce according to production plans. Complicating the marketing situation was the fact that Bruckner was also a shareholder in PVP and had major input into production-related decisions.

From as early as 1976, PVP managers were becoming concerned about the marketing arrangements with Bruckner. PVP had little understanding of the market and was dependent upon Bruckner to provide all market information. Bruckner was unlikely to pass on information that would improve PVP's bargaining position as regards pricing. Thus, only scanty market price information was provided. (29) PVP's information on its own production costs was not very reliable and subject to "editing" by Bruckner. Thus, Bruckner was virtually able to dictate prices. In addition, many PVP shipments were sent direct to end-users without Bruckner taking possession at all. PVP was obtaining enquiries from some of these end-users. This signalled to the management that PVP could perhaps by-pass the "middleman" (i.e., Bruckner) and obtain better prices. PVP management was also suspicious that Bruckner was tailoring the product mix to suit its own sourcing requirements rather than emphasizing a mix that would obtain the best sales return for PVP. (30)

In December 1976, PVP management examined the pattern of its selling prices to Bruckner up until that time. It found that

there had been slight price increases for a few items, but that the price levels for most items were below those predicted in the earlier feasibility study. Still, management did not know whether this was due to the depressed market or due to the Bruckner monopsony on PVP's products. A year later the PVP management gained access to data from the International Trade Center that compared 1976 and 1977 import prices into West Germany and the Netherlands for Kenyan dehydrated vegetables and for these products from other sources. While the results were somewhat mixed, they did show that in 1977 Kenyan leeks, beans, and potatoes were obtaining lower prices than alternative suppliers. Was Bruckner paying "too low" a price? PVP management thought so and put in a claim to Bruckner for D-Marks 293,343. With the original marketing agreement approaching its end-date of December 31, 1977, various attempts were made to draft a renewal contract containing revisions in certain clauses. None of these revised agreements were actually brought into practice, but it is interesting to note some of the proposed changes. For example, it was proposed that the proportion of output going to Bruckner be progressively reduced to 50 percent. It was also proposed that Bruckner's payment be within 30 rather than 60 days in order to improve PVP's cash flow position. Further, it proposed that contract prices be "comparable to world prices." The most interesting proposal was that PVP would develop its own sales unit for direct sales both locally and abroad and that "to enhance direct marketing the company will negotiate for a share of the markets where Bruckner Werke is already represented." (31)

In the late 1970s PVP did increase its level of sales on the local Kenyan market and did begin to make sales direct to several European companies other than Bruckner. The prices obtained on the local market were considerably higher than those offered by Bruckner, converted into Kenyan shillings. Several of the orders made by European companies were also at prices above those offered by Bruckner. However, when PVP sent a delegation to Europe to inquire about the scope for expanding these direct sales, Bruckner threatened to cease its involvement in PVP product distribution altogether.

What was Bruckner's perspective on its marketing links with PVP? Bruckner's marketing strategy was based primarily on long-term (i.e., annual) contracts with major food manufacturers and institutional buyers. Based on buyer requests and the production possibilities in Kenya, Bruckner and PVP were to develop a production plan for the factory and shipping schedule. The PVP operation served as one of many sources for the company and thus the planned product mix for each year would reflect Bruckner's expectations of supplies from other sources. It would be difficult to argue, however, that PVP's product mix was dictated

by the wishes of Bruckner alone. Bruckner's largest orders were for the lower value carrots, cabbages, and leeks. These had unit values only 1/2 to 2/3 those of beans or capsicums. Carrots remained PVP's main item accounting for 60 percent of exports in the late 1970s. However, this proportion is actually lower than the share of carrots in Kenya's exports a decade earlier before Bruckner was involved. Bruckner found that PVP consistently operated far behind schedule on contracted deliveries for beans, leeks, and capsicums, and that Bruckner itself was unable to fulfill its contracts with the customers. Bruckner contended that it was inappropriate simply to examine official import statistics in order to compare supply prices. It responded to PVP's price discount claim by pointing out a number of extenuating circumstances that had influenced the annual "average" import prices in West Germany and the Netherlands during the years for which the PVP claims applied, and provided evidence that PVP was generally receiving prices above average world prices. (32)

Bruckner's critical concerns related to the quality and reliability of PVP products. For many sales, particularly those destined for customers outside of West Germany, products would be sent directly by PVP to the customers without Bruckner inspecting the consignment. For at least four major consignments during 1975 and 1976 either the customer rejected the lot outright or demanded a price reduction from Bruckner. On these and other occasions Bruckner was forced to ship consignments to its own factory for testing, reprocessing, and repacking. Sometimes the material could only be sold to producers of dog food or to chemical companies. Bruckner's customers complained that PVP supplies sometimes had high bacteria counts, high levels of SO₂, contained foreign matter, had vegetables of the wrong cut, or contained rotten material. (33)

Delayed deliveries were said to have resulted in cancelled sales contracts for Bruckner. On some occasions the customers went on to buy elsewhere to cover their requirements and paid higher prices. Bruckner would then receive the invoice for the price difference. (34)

On at least two occasions, Bruckner placed claims against PVP to compensate them for the costs associated with problems in quality or delay. The first claim was made in 1977 for documented cases during 1975 and 1976. The value of the claim was DM 105,065, equivalent to about 1.3 percent of PVP foreign-sales revenues. Several later claims were of perhaps questionable authenticity. For example, in 1978 PVP's financial manager transferred to Bruckner the sum of Ksh 406,686 against compensation for undergraded products. The products were neither returned nor certified by an independent statutory body as being

"disposed of." In addition, a clause in the marketing contract stipulated that payments should be made after 60 days of receipt and that any money paid by Bruckner prior to 60 days be treated as an "advance payment," subject to interest. Even though the marketing contract officially lapsed in 1977, over the 1978-80 period Bruckner debited PVP the sum of Ksh 635,329 for such interest payments. (35)

Clearly PVP's marketing position was not optimal. At certain times better prices could have been obtained if the company had bypassed Bruckner and sold directly to end-users. PVP was certainly not obtaining full market information from Bruckner and thus did not know about a number of short-term opportunities. Clearly, the exclusive marketing arrangement limited the scope for Kenyans to learn about the market and develop marketing expertise. PVP was thus extremely vulnerable to strains in its trading relationship with Bruckner as PVP lacked a credible threat of sending most of its supplies to Bruckner's competitors or customers.

However, what Bruckner did provide PVP was guaranteed market access. In the increasingly competitive but stagnant market of the late 1970s, it is not at all clear that PVP would have been able to act independently and supply the volumes that it did. Things might have been different if PVP was supplying consistently high quality products on a reliable scheduling basis. The fact that quality and reliability were indeed major problems made the link with Bruckner (or a similar type of firm) absolutely necessary. It is certainly not clear that Bruckner was paying PVP prices that were "too low." A review of Bruckner's contracts with its customers over the 1976-1978 period revealed wide variations in the firm's selling margins, but certainly not a general pattern of sensational profits. For sales contracts for carrots and beans Bruckner's margins varied between 1 percent and 11 percent with the higher margins being associated with lower volume sales. (36) Bruckner had little incentive to "bleed" PVP since the latter had developed into an important supply source for several items.

PVP's Processing Problems

Throughout the life of the project the factory operated at well under its full capacity. Annual capacity for raw material in-take was 33,000 tons. We can see in the figures below that low rates of capacity utilization prevailed.

Factory Capacity Utilization

	Tons/yr (rounded)	% Utilization
1976	21,000	64
1977	22,000	70
1978	19,000	58
1979	20,000	61
1980	13,000	40
1981	11,000	33
	-----	-----
Average	17,700	54

Operational inefficiencies at the factory also contributed to the poor financial performance of the overall operation. Important inefficiencies were related to poor conversion rates for raw material into finished product and poor quality control. The quantitative significance of these factors can not be assessed since the factory lacked a cost-accounting system calculating unit costs.

Even though the new factory contained modern equipment, the new operation obtained worse conversion rates than that achieved in the old factory. Profitability clearly depends on achieving the optimal ratio of raw material to end product. For carrots this ratio should be 12:1, but the actual results were closer to 16:1 in some years. Similar poor results were being obtained for other crops. (37) Although it was never actually admitted, this loss of dry matter (by leaching or wastage) was a basic cause of unprofitability.

Previously we discussed Bruckner Werke's concerns about the quality of PVP's final product. Factory breakdowns, absence of spare parts, poor maintenance, and frequent management turnovers were all characteristics of factory operations, particularly once the company's financial position reached crisis point. An analysis of 1980 factory production showed that only 50.8 percent of output had a microbiotic content below legal standards. Of 986 tons produced, 186 tons or 18.5 percent was referred for repick. Thus nearly a fifth of factory picking effort was spent on repicking operations. The management report noted that "this high percentage is not explainable or acceptable by standard manufacturing practices." (38)

However, problems of quality control date to the beginning of new factory operations. For example, in 1976 four containers of carrot flakes were sent to West Germany together with satisfactory PVP laboratory quality-control test results. Bruckner noted that "the control in the laboratory of our

customer showed results which were really horrible. Not only the total bacteriological counts were extremely high but there were found such high counts of coliform germs and E-Coli that all the carrots of the four containers were rejected."(39)

Raw Material Procurement Problems

The project's raw material procurement system was to be based on "three legs." One leg was the smallholder farmers in the Kinangop and elsewhere who would provide root crops (primarily carrots) under rainfed production conditions. These farmers would plant in April, May, and June for harvesting from September until March. The second leg was to be Lake Naivasha private farmers. They would supply specialist crops such as beans and capsicums year-round while supplying root crops during the Kinangop's off-season. The third leg would be company estates on land owned or leased by PVP. The estates would concentrate on the specialist crops, but also do some root crops.

Smallholder Contract Farming

The first leg, that of smallholder contract farmers, served its function fairly reliably up until the project neared financial collapse. During the 1970s the project expanded its geographical scope of smallholder contracting bringing in cooperatives as far north as Nyahururu and as far south as Uplands. At one time or another some 30 cooperatives (or Forest Department employee groups) were active in the project with as many as 3000 farmers under contract.

A contract document between PVP and cooperative society committees was prepared annually, and subsidiary agreements were provided with each issue of seed. Seeds were provided on credit to the cooperatives for distribution to members. Each farmer taking seed made a written statement acknowledging his/her receipt of seed and issuing a "guarantee" to supply the company with a certain tonnage of produce. For carrots, this guarantee generally varied from 5 to 10 tons per kilo of seed. A pre-emergence herbicide, afalon, was used by some farmers. It was provided on credit to the cooperatives and then sold to farmers.

Producer prices were decided at the beginning of each year at meetings between the company and cooperative society committees. These prices were then offered on a "take it or leave it" basis to farmers.(40) The producer price consisted of a basic rate and a bonus rate. The basic rate was paid for all deliveries, subject to deductions for produce that was not first quality. (See below.) Farmers delivering quantities at least as large as their "guarantees" would then receive a lump sum payment calculated by multiplying a bonus rate by the guaranteed

quantity. Crops delivered before reaching the tonnage guarantee or accepted after the guaranteed quantity had been reached would be payable at only the basic rate. The bonus rate was generally 40 percent or more of the basic rate. For example, in 1977 the basic rate for carrots was Ksh 195/ton while the bonus was Ksh 80/ton.

The grading of crops was on the basis of acceptable material delivered. Grade I consisted of 0-5 percent unacceptable produce and the full price was paid for this crop. Grade II consisted of 6-10 percent unacceptable produce. For these deliveries the farmer would be docked for the weight of the reject material and would receive 95 percent of the full price for the balance. Produce was denoted as Grade III if 11-20 percent was unacceptable. Farmers would be docked for the weight of reject material and paid 90 percent of the full price for the balance. Deliveries with more than 20 percent of unacceptable material were totally rejected and the owner was given the option of having the delivery returned at his expense, collecting it himself, or leaving the factory to dispose of it.

The company provided field assistants and placed them in each major growing area. The field assistants were to work closely with the cooperatives to ensure proper planting and cultivation, to determine the timing of harvests, and to organize collection. They provided information to company management by preparing monthly reports on individual production areas. These reports provided information on seed distribution and planting, use of herbicide, weather, incidence of disease, harvesting patterns, demonstrations given, and the illegal sale of the crop to alternative outlets.(41)

The farmers in the Kinangop had ample land and generally grew vegetables in a shifting pattern, without the use of fertilizers. Initial ploughing would be carried out by local enterprises and paid for in cash by the farmer. Planting was done during the long rains (i.e., April-June) and harvests took place over the September to March period. While carrots take 4-6 months to reach maturity, they can remain in the ground before harvesting for up to nine months. Most field activities were performed by family labor although some paid labor was used for harvesting. The use of resistant seed varieties made it unnecessary to apply insecticides or fungicides. On the basis of an average yield of 10 tons of carrots per acre, the smallholder farmer could expect a net profit of Ksh 1000 to 1500/acre. A sample 1980 income estimation can be seen below:(42)

Smallholder Production Cost and Income Per Acre(1980)

Seed	Ksh 170
Ploughing	140
Harrowing	130
Sowing	40
Afalon (1 kg)	94
Spraying	40
Hand Weeding and Thinning	400
Harvesting	500
Transport (Ksh 50 per ton)	50
-----	-----
Total Costs	2014
Income 10 tons @ Ksh 330 (Includes Bonus)	3300
Net Income	Ksh 1286

Demand for seed in the rain-fed areas generally far exceeded what the factory was prepared to issue to meet its requirements. One key problem was to spread this requirement over an extended period. In the early years of the project smallholder supplies were heavily concentrated in only four or five months of the year. PVP attempted to lengthen the smallholder supply season by issuing seed supplies to the cooperatives in three phases over April, May, and June.(43) During several years smallholder deliveries were indeed extended over seven or eight months. For example, during both the 1976-77 and 1977-78 seasons smallholder vegetable supplies exceeded 1000 tons in each month from September to March.

The contracts were theoretically legally enforceable although in fact legal action was never resorted to. Instead, PVP depended on close supervision and disciplinary action by the cooperative committees. Field assistants also monitored the progress of a crop and provided frequent estimates of the standing crop and the crop being harvested. For cases where the farmer sold the produce on the fresh market, the cooperative would issue fines. For persistent cases the farmers would not be issued further seed. Where cooperative support was lacking, contracts with the offending cooperatives were withdrawn. During periods when produce "leakage" was very strong, police checks were established to inspect trucks leaving the smallholder areas.(44) The extent of "leakage" was partly controlled by the selection of a particular carrot variety for processing. The factory distributed seed of the red-cored Chantenay variety. The Nantes variety, favored by the fresh market, was unsuitable for

processing. The Char'tenay variety was not well liked on the fresh market.

The extent of "leakage" differed by production area. Areas close to Nairobi and well served by all-weather roads were more vulnerable to "leakage" than areas far into the settlement schemes having very poor feeder roads. During periods of glut Nairobi traders avoided the Kinangop altogether as supplies were sufficient from areas adjacent to Nairobi. Some parts of the Kinangop had extremely poor feeder roads and the company needed to hire tractors and even army trucks to collect produce during the rains. Traders would normally avoid these areas.

Part of the attraction of the fresh market was price. Raikes (1978) compared factory prices with those offered by "lorry-traders" and found that while the factory's prices were "marginally" higher during the peak season, they were as little as 1/6 the market price during the off-season. There is no doubt that during certain times of the year market prices were considerably above those of the factory. However, it does appear that the traders' buying procedures reduced the price advantage of selling on the fresh market.

Carrots are sold by producers by the sack, which, when full, should weigh 60 kgs. Generally the transporters would force farmers to overload the sacks. Woven cord then held the surplus produce in place. Both transport and market levies are charged per unit container irrespective of weight, so the traders have the incentive to maximize the loaded weight of their containers. It was not uncommon for carrot sacks to be overloaded by 100 percent. In fact, a 1983 survey found the average weight of a carrot sack brought to Nairobi's wholesale market was 103 kg. (45) Thus, farmers were providing two sacks of produce while receiving payment only for one sack. Considering this, the prices that the farmers received from the factory may have actually exceeded those for the fresh market over much of the main harvesting season. (46)

Perhaps a more important advantage of selling to local traders was the fact that farmers could avoid paying certain dues and outstanding debts to their cooperatives. Some of these debts were related to inputs for the vegetable project, while other debts would have been related to the other services provided by the cooperatives. Farmers could get ready cash in hand from the traders while payment from the cooperative might have been delayed until all "cooperative expenses" were covered first. Delayed payments became more problematic over time due to the worsening financial position of PVP.

Still, in general terms the smallholder scheme generated a fairly consistent flow of raw materials to the factory throughout the late 1970s. Unlike for largeholder production, raw material supplies from smallholders were not far below the long-term production plan set out in the feasibility study. The following figures represent the factory intake of carrots from the cooperatives:

1976	8961 tons
1977	10281
1978	8195
1979	9141
1980	4849

Performance was generally good until 1980. In that year various problems contributed to a considerable decline in deliveries. One problem was that a large quantity of seed that was provided to the farms was of poor quality and had low germination rates. A second problem was that due to mechanical faults and inadequate fuel supplies the factory was unable to operate during part of the peak harvesting period. At the same time PVP had inadequate working capital, and payments to farmers were being delayed for several months. With the factory broken down and with payments being delayed, some of those farmers who did have a crop sold it to Nairobi traders. Vegetable producing areas in close vicinity of Nairobi experienced a drought in 1980, and market prices rose considerably. The smallholder scheme did recover for the 1980-81 season with raw material deliveries topping levels for several years in the late 1970s.

Large-scale Farmers

The second eg, that of the Lake Naivasha farmers, never fulfilled the company's expectations, and by the late 1970s raw material supplies from this source had virtually ceased. As early as 1976 it was becoming clear to PVP management that the Lake farmers would not be a reliable source of supply and that greater reliance would have to be put on the company developing its own estates. (47) Horticultural production was expanding around Lake Naivasha, but costs per acre had risen considerably from a decade earlier. In addition to rising fuel costs (for irrigation pumps) these farmers were facing rising agrochemical costs. Furthermore, with the rapid development of the flower sector and with a large number of farmers going heavily into labor-intensive french-bean production, a labor shortage existed in the area and the cost of labor was rising.

Many of the Lake farmers who did not have large acreages found that with normal yields it was only marginally profitable for them to grow for the factory. Even a small reduction in

yields brought about by weather, nematodes, or disease would result in losses.(48) These smaller farmers felt that it would be useful to perhaps grow for the factory during the export off-season. Alternatively, they were inclined to send their third-quality produce to the factory after fresh produce exporters and Nairobi greengrocers were provided first and second grades. Neither of these two practices were acceptable to the factory. The factory needed raw materials all year long and not simply during three or four months. It was also impossible for the segmented marketing procedure to work. The factory actually needed first grades and applied its price discounts for any other deliveries. In addition, the factory required particular varieties and these were not the varieties preferred by the local or export fresh market. For example, beans for export are mainly the Monel or Masterpiece varieties which at an early stage develop fibrous strings and are thus unsuitable for dehydration. The Saxa or Contender varieties were required by the factory. Some indication of future trends was seen in 1976 when the Lake farmers absolutely refused to grow leeks on the basis of the prices and grading arrangements offered.

The factory did have a different price structure for the smallholder farmers growing under rain-fed conditions and the larger farmers growing under irrigation, but due to its accumulation of losses it was unable to increase the prices it paid to the large growers. For most items there was absolutely no price change between 1977 and 1979. By the latter year factory prices had become well out of line with prices for comparable products in the fresh market. Compare below the factory's prices with those offered by a leading exporter:

Producer Price Comparison (1979)

Item	Factory (Ksh/ton)	Exporter (Ksh/ton)
Beans	1020	5600
Leeks	515	2000
Chillies	500	2000
Capsicum	450	750

Some factors were clearly outside of PVP's control. This can be seen in the cases of onions and capsicums. Growing onions for the factory could not be economical given the very low yields that are obtained for this crop in Kenya. No short-day white onion variety of high solid content was available. At the same time a protected market for onions was being established by the Horticultural Crops Development Authority in order to maintain their statutory monopoly on onion wholesaling and in order to protect smallholders in the Perkerra Irrigation Scheme whose yields were less than half those of the Naivasha farmers. While

production licensing deterred some growers it encouraged others to grow the product and find grey market outlets. (49)

Farmer deliveries of capsicums subsided with the dying export trade in this product. While peak export levels were reached in 1972 at 1128 tons, thereafter competition from Spain, Israel, and the Netherlands cut into Kenya's market, and exports were down to just 333 tons by 1977. Many of the Italian farmers at Naivasha who had grown capsicums reduced their plantings. Given the factory's price structure, it was not economic for these farmers to grow exclusively for processing.

The Lake farms that were of larger size retained somewhat more interest in growing for the factory. They were in a better position to risk possible losses and in any case wanted to spread their overhead costs among a larger cropped acreage. However, when PVP's financial troubles prevented the company from increasing producer prices in line with changing production costs, some large farms found that they could get better returns by growing for other Kenyan processors. Tomatoes sold to canning companies generally brought better returns than various vegetables sold to PVP.

Company Estates

The third leg, estate production, was required to compensate for the declining supplies from the private Lake farms. Since 1970 it had become apparent that the factory could not hope to operate effectively on a continuous basis without a nucleus farm under its full control. Until the new project was started in 1975, funds had not been available for such a farm. In any case it had been the policy to depend on the support of local farmers, particularly those in the Kinangop settlement schemes. While not explicitly stated in the feasibility study, the development of a nucleus farm was viewed as a central part of the new project's crop-production component. (50)

Initially an agreement was entered into with Marula Estate to place 400 acres at the full disposal of PVP with the option of a further 400 acres. A contractor was hired to clear the land, but at the last moment the owner withdrew from the agreement. Alternative areas were sought. A plot of land between the factory and Lake Naivasha, owned by the company, was brought into use under irrigation by factory waste water. Although the soil on this 200-acre plot was sodic and restricted in use and also subject to flooding during heavy rains, the company found that it could get a good leek crop from it. Two plots were leased at Morendat. One section of 200 acres was already fully developed and under irrigated lucerne, while another 200 acre plot was developed with irrigation installed by PVP. One additional 200

acre plot was leased on the South Lake side. By 1978, the company thus had a total of 800 acres of land under its direct management.

During the late 1970s the factory's raw material procurement from company-operated estates did increase considerably. In 1976 company estates provided 3185 tons accounting for 17.3 percent of intake. By 1980 company estates provided 7889 tons, accounting for 60.7 percent of raw material supplies. These nucleus estates operated at a continuous loss, however, and by the end of 1979 they had run up an accumulated loss of Ksh 5.8 million.

Part of the poor financial performance of the estates can be attributed to the accounting prices offered by the factory. PVP and its estates subsidiary operated separate accounts and issued independent financial statements. The estates department essentially absorbed some of the losses of the overall holding company. (51) Farm production costs were estimated in 1976 and accounting prices were set then. These prices remained constant over the next five years despite changes in production costs. A second factor that contributed to losses was the relatively poor yields obtained on the farms. These low yields were attributable partly to inadequate finances that caused problems for the timely application of material inputs, and partly to the poor quality of several plots of land. Over the 1978-80 period average bean yields were 2.2 tons/acre while the estimated break-even point was 3.7 tons/acre. For leeks actual production averaged 8.4 tons/acre while the break-even level was 11.3 tons/acre. (52)

A third factor contributing to the poor financial performance of the estates was their excessive production costs. An FAO mission examining the finances of the estates found excessive costs attributed to permanent employee salaries that were increasing production costs per crop area by as much as 20 percent.

The estates department reacted to the financial losses and the low factory prices in a rational way. The estates began selling increasing quantities of their vegetables on the fresh market. In 1980 comparisons of estate break-even points for sales on the fresh market versus sales to the factory (at accounting prices) found that factory prices as a proportion of average fresh market prices were as follows: beans 35 percent; tomatoes 30 percent; onions 33 percent; cabbage 40 percent, leeks 30 percent. In 1979 and 1980 estate sales to the fresh market totaled 15 percent and 19 percent of quantities sold and 34 percent and 42 percent of revenue earned. In 1980 the estates sold 2400 tons of vegetables on the fresh (local and export) market at an average price of Ksh 1100/ton, which was 130 percent

higher than the average accounting price of Ksh 420 for factory intake.

In 1981 two of the leases held by the company were discontinued by the landowners. By this time the price of land around Naivasha had begun to rise rapidly as Kukuyu farmers who had greatly benefited from the tea and coffee price booms of the late 1970s were seeking farms at Naivasha. The company could neither purchase nor lease land at a cost that could be recovered by growing vegetables for the factory.

As the company could not afford to pay the commercial rates for land at Naivasha it sought to have the Commissioner of Lands compulsorily acquire 2000 acres from the European-owned Marula Estate on the strength that the farming activities constituted a public use. A High Court ruling went against the company's position. A proposal was later submitted whereby the Ministry of Agriculture would provide the company with at least 1000 acres currently being used by the Naivasha Livestock Research Unit and then acquire the 2000 acres from Marula Estate, since livestock research falls within the definition of public use. After the acquisition the Ministry would provide an additional 1000 acres to the company. The Ministry rejected these proposals and could not provide any land from the research station.

Concluding Remarks

We have reviewed various features and historical segments in the development of Kenya's vegetable dehydration industry and have related these to changing conditions in both domestic and international markets. The industry was born largely in the pursuit of social and political objectives related to the smallholder settlers in the Kinangop. While the project received strong political backing in its early years, it lacked strong technical management and an economically viable production program. The industry was thus unable to take advantage of the expanding West European market for dehydrated vegetables.

The industry's transition into economic viability was increasingly seen to depend upon the injection of international capital and the involvement of a multinational firm with technical and marketing expertise. A marriage, worked out between Government investment, international loans, and multinational management, appeared to provide an optimistic future for the industry.

A major assumption of the reformulated project was that it would be economically rewarding for the Naivasha farmers to grow vegetables for the factory. In fact, it was supposed to be the large farmers who would play the key role in raw material

production. Changes in factor and commodity markets combined with the factory's grading standards and inability to raise producer prices, however, made sales to the factory increasingly unattractive for these farmers.

The collapse of large farmer supplies considerably undermined the viability of the project. The factory was operating at well below its capacity, with overhead costs thus pushing up unit production costs. The company's product mix was dominated by the low value root crops grown by the smallholders. In response, the company needed to develop its own estates. In this effort there were several constraints. With the Naivasha area experiencing increased horticultural production, less land was available and at a higher cost. The plots of land that the company could operate were not of first-rate quality. Company financial problems constrained the farm-level activities of the estates department. Government political backing for estate acquisition remained weak as an incipient fear that estate production would marginalize the smallholder farmers prevailed. The extent of political opposition to estate production requires further study.

Thus, the raw material component of the project remained problematic. Only the smallholder contract production scheme provided fairly reliable supplies. With the available information we have been able to examine in only general terms the organization of production, the form of contract, and a few indicators of performance. We have not been able to examine the evolution of the contractual structure and the changing roles of the company and the cooperatives in supporting producers and in enforcing the contracts. Horticultural cooperatives have not generally been successful in Kenya, least of all in relation to contractual arrangements with processors or exporters. It would be useful to understand the wider relationship between the farmers and the cooperatives (i.e., for milk) in order to discover reasons for the apparently useful role of the cooperatives in the case of the dehydrated vegetables project.

It would also be interesting to compare the services provided by PVP and the cooperatives with those offered by the "lorry-traders" in order to gain a better understanding of the "leakage" issue. Was price the main factor? Was the escape from cooperative dues or delayed payments a more important incentive? Was the provision of technical services important to the farmers? Presently we have only limited information on farmer yields and incomes. It would be useful to examine in greater detail actual farmer yields and their variance by area and over time. One would also wish to place the income earned in the vegetable project within the context of the wider sources of income for the

smallholder farmers and to trace the uses to which this income was put.

In this study we have noted some of the problems associated with the processing operations. Again, limited information has been available. Was the problem largely one of management? Was any of the equipment inappropriate for the tasks being undertaken, or were inefficiencies in operating procedures and poor maintenance of equipment the dominant factors? Why couldn't quality or conversion-rate results be improved through the provision of technical assistance by Bruckner?

We have examined aspects of the marketing arrangement between Bruckner and PVP, including the conflict over the issue of price. Relatively little information was provided about the marketing procedures and terms of trade that characterized the 1964-1972 period before a major multinational company was involved. Access to relevant material could provide for an interesting comparison with the later period. While it does not appear that Bruckner generally paid prices to PVP which were "too low," it would be interesting to examine further the general nature of PVP's relationship with Bruckner. Particularly important issues would be information flows, alternative sales outlets, payment procedures, and quality control and claims.

Our analysis of the Kenyan dehydration industry has shown the critical links between production, processing, and marketing, in any export operation. It demonstrates that contract farming schemes should not be examined in isolation from world market patterns for the final product or from changes in domestic factor and product markets. Although apparently successful itself, the smallholder contracting scheme was first undermined and then terminated entirely because of operational inefficiencies in other components of the project.

Notes

1. Philip Raikes (1978) obliquely discusses the project, but is most interested in espousing a general argument about the relationship between international capital and "middle peasants." He provides few actual facts about the project. Dinham and Hines in their book *Agribusiness in Africa* (1983) mention the project as an example of collaboration between governments and multinational companies in the development of "new luxury crops." They provide a few facts about the case, drawing basic information from a few issues of the government magazine, *Kenya Export News*.

2. Tropical Products Institute, p.7.
3. Ibid.
4. ITC 1981, p.11;50.
5. Ibid., op cit.
6. Tropical Products Institute, p.8.
7. ITC 1981; Interview with David Hirst, former Agricultural Manager of the dehydration project (October 17, 1986).
8. SIFIDA (1973), p.22.
9. David Hirst interview.
10. SIFIDA, p.22.
11. Some farmers initiated vegetable production during World War II in order to supply the prisoner of war camp at Naivasha which was holding Italian soldiers.
12. Interviews with Naivasha farmers including Dorian Rocco and Cesare Bellyngeri.
13. Ministry of Agriculture (1981), p.1; SIFIDA, p.22.
14. SIFIDA, p.22.
15. Calculated from data in SIFIDA, p.17.
16. Data in SIFIDA and from the Horticultural Crops Development Authority.
17. Information drawn from SIFIDA, Ministry of Agriculture (1970), and East Africa Excise and Customs data.
18. ITC (1972).
19. This discount cannot be accounted for by Kenya's "low costs." Several high wage countries had supply prices below the average price while a low wage country such as China had supply prices above those of Kenya.
20. As discussed in Ministry of Agriculture correspondence on the project and reported by Makanda (1986) pp.17-24.
21. ITC 1972.

22. Letter from PVP Managing Director D.M. Watene to PVP Board of Directors dated May 29, 1976.

23. Financial data drawn from FAO (1981) and Ministry of Agriculture (1981).

24. Marketing In Europe, April 1976.

25. Marketing In Europe, January 1984.

26. ITC 1981.

27. However, even slightly declining D-Mark import prices should not have adversely affected the company's ability to repay its loans. The company's foreign currency loans had been denominated in US\$. During the 1970s the dollar devaluated against the Mark by approximately 50 percent and in the second half of that decade the level of devaluation was about 26 percent. In 1970 \$1=3.68 DM. The rate for 1975 was \$1=2.46 DM and in 1979 \$1=1.83 DM. Thus, in the second half of the decade even if prices in DM did not show a favorable trend, their dollar value certainly did as seen below:

US\$ Equivalent of West German Import Prices (Per kg.)

	1975	1976	1977	1978	1979
Carrots	1.54	1.48	1.65	2.00	2.19
Leeks	1.61	1.46	1.86	1.98	2.31

Source: Calculated from data in ITC 1981; IMF International Financial Statistics, 1980

28. This is the general impression provided by correspondence between Bruckner and PVP management in the late 1970s.

29. "We get no information whatsoever on the prices paid by the end-user; such information is vital in conducting price negotiations with Mr. Bruckner since it would enable us (to) take advantage of favorable demand conditions." This statement was made in a PVP management memo dated December 20, 1976 entitled "Management and Marketing Agreement: Main Aspects Requiring Review."

30. Ibid; also KETA 1981.

31. Draft Cooperative Agreement Between Pan African Vegetable Products and Brueckner-Werke KG.

32. Letter from H. Glockner (Bruckner) to General Manager Watene (PVP) dated September 15, 1978.
33. Ibid; also letter from Glockner to PVP on December 8, 1977 concerning quality claims.
34. See note 32 above.
35. Letter of November 14, 1980 from General Manager H.A. Odour of PVP to the Chairman of PVP's Board of Directors.
36. "A Review of Bruckner Werke's Sales Contracts" dated June 21, 1978 and carried out by PVP's Financial and Administrative Director. It examined contracts over the 1976-78 period.
37. Correspondence with David Hirst; Also a document called PVP Review 1980 showed conversion rates for most items considerably less than "standard" rates.
38. PVP Review 1980, p.31.
39. See note 33 above.
40. Correspondence with David Hirst.
41. Included in field assistant reports were discussions of cooperative committee meetings that had taken place and what was said about PVP at these meetings.
42. Revised from an estimate found in PVP records. The PVP calculation was based on a yield of 14 tons/acre. David Hirst reports that 10 tons/acre was more the norm.
43. Raikes (1978) contends that because farmer yield was affected by the time of planting, the company had "an intermediate form of control over the producers through the ability to reserve "prime-time" contracts to producers who are "cooperative." Raikes admits that he has no evidence for this "but it is almost certain that the extension agents of the company, who implement the regulations, do so to their own benefit even if the company does not." I have come across no evidence for this discrimination in seed distribution and this issue is not one that farmers have raised when rendering complaints about the project.
44. Interview and correspondence with David Hirst.
45. "An Analysis of all Fruits and Vegetables Sold at Wakulima Wholesale Market During 1983" FAQ/Ministry of Agriculture. Horticultural Marketing Proj.

46. It should be noted that farmers sometimes complained that company staff were underweighing produce at times and taking part of the supplies for their own use or sale.
47. See note 22 above.
48. "Minutes of Meeting at PVP with Naivasha Farmers" dated May 1, 1976.
49. This paragraph is based on FAO (1981) and interviews with Hirst and with Naivasha farmers.
50. Correspondence with David Hirst.
51. Argued in FAO (1981), financial section.
52. Ibid.

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