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5. Author(s)  
1. John S. Holtzman  
2. Charles J.D. Stathacos  
3. Thomas Wittenberg

6. Contributing Organization(s)  
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**HORTICULTURAL MARKETING AND  
EXPORT IN SENEGAL:**

**CONSTRAINTS, OPPORTUNITIES AND  
POLICY ISSUES**

**DECEMBER 1989**

**Horticultural Marketing and Export in Senegal:  
Constraints, Opportunities and Policy Issues**

Principal Author  
John S. Holtzman

Contributing Authors  
Charles J.D. Stathacos  
Thomas Wittenberg

Collaborators  
Philip De Ridder  
Holly Wong  
Hans Mittendorf  
Peter de Balogh  
Dennis Winstead

**Agricultural Marketing Improvement Strategies Project (AMIS)**

Abt Associates  
4800 Montgomery Lane  
Suite 600  
Bethesda, MD 20814  
Tel: (301) 913-0500

December 1989

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## ABBREVIATIONS AND ACRONYMS

ACP	African, Caribbean and Pacific Countries
AMIS	Agricultural Marketing Improvement Strategies Project
APHIS/PPQ	Animal and Plant Health Inspection Service/Plant Protection and Quarantine
ASEPAS	Association des Exportateurs des Produits Agricoles du Sénégal
BAME	Bureau d'Analyses Macro-Economiques (part of ISRA)
BUD-SENEGAL	Not an acronym; Joint U.S.-Senegalese vegetable production scheme.
CDH	Centre pour le Développement de l'Horticulture de Cambéréne
CIF	Cost, insurance, freight
CNCAS	Caisse Nationale de Crédit Agricole du Sénégal (National Agricultural Credit Fund)
COLEACP	Comité de Liaison Europe - Afrique - Caraïbes - Pacifique (pour la Promotion des Fruits Tropicaux, Légumes de Contre-Saison, Fleurs, Plantes Ornamentales et Épices)
CSS	Compagnie Sucrière Sénégalaise
DRC	Domestic resource cost
EEC (or EC)	European Economic Community
EPA	Environmental Protection Agency (U.S.)
FAO	Food and Agriculture Organization of the United Nations
FAS	Foreign Agricultural Service (of USDA)
FCFA	West African currency tied to the French franc
FDA	Food and Drug Administration (U.S.)
FF	French francs
FOB	Free on board
GEPAS	Groupement des Exportateurs des Produits Agricoles du Sénégal
GIE	Groupement d'Intérêt Economique
GOS	Government of Senegal
Ha.	Hectare
IFC	International Finance Corporation
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
ISRA	Institut Sénégalais de Recherches Agricoles
ITC	International Trade Centre
KHDA	Kenya Horticultural Development Authority
MADIA	Managing Agricultural Development in Africa (World Bank managed study)
MDR	Ministère du Développement Rural

MNS	Market News Service (of ITC)
MSU	Michigan State University
MT	Metric tons
NPA	Nouvelle Politique Agricole (New Agricultural Policy)
OFADEC	Office Africaine pour le Développement et la Coopération
OICD	Office of International Cooperation and Development (of USDA)
SAED	Société d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal et des Vallées du Fleuve Sénégal et de la Falémé
SAFINA	Société Africaine Industrielle et Agricole de Sebikotane
SARSA	Cooperative Agreement on Settlement and Resource Systems Analysis
SEDRI	Sénégalaise de Développement Rural Intégré
SEPROMA	Société d'Exploitation des Produits Maraîchers
SNTI	Société Nationale de Transformation Industrielle
SOCAS	Société de Conserverie Alimentaire du Sénégal
SONED	Société Nouvelle des Etudes de Développement en Afrique
TA	Technical Assistance
UNCTAD/GATT	United Nations Centre for Trade and Development/General Agreement on Tariffs and Trade
UK	United Kingdom
US	United States of America
USAID	U.S. Agency for International Development
USCS	United States Customs Service
USDA	U.S. Department of Agriculture
UTA	Union de Transports Aériens (French airline)
UV	Unit value

## Preface and Acknowledgements

This report was funded by a buy-in to the Agricultural Marketing Improvement Strategies Project (AMIS) by USAID/Senegal. AMIS is a centrally funded USAID project that seeks to improve the efficiency and effectiveness of agricultural marketing systems through:

- o diagnosis of marketing system constraints;
- o formulation of improved policies, institutional arrangements, and management systems for upgrading the performance of agricultural marketing systems; and
- o design, monitoring and evaluation of pilot innovations in technology, institutional arrangements and management systems.

Assembling a multi-commodity, multi-market report of this magnitude required the efforts of many individuals. Dr. John S. Holtzman, research director of the AMIS Project, is the senior and principal author. He wrote most of the report and coordinated the efforts of the research team. Charles J.D. Stathacos and Thomas Wittenberg were contributing authors. Stathacos, Abt Associates' agricultural economist, spent one week in Senegal in September 1989 doing fieldwork and contributing empirical findings to the final report. Wittenberg, AMIS agricultural economist, carried out market research in the U.S. and wrote section 8.0 of the report. He also examined International Trade Centre price data for green beans, melons and mangoes (see Annex 3), as well as contributing Annex 4 on sources of European market information.

Collaborating researchers included Philip De Ridder, Hans Mittendorf, Peter de Balogh, Holly Wong and Dennis Winstead. De Ridder spent four weeks in Senegal in January-February 1989 gathering data and documents and conducting informal interviews with government officials, exporters and producers. De Ridder prepared a trip report that was an important part of an earlier version of this report. Mittendorf and de Balogh carried out informal interviews with European importers in Germany, the Netherlands and France, and also provided some secondary data on European horticultural imports. Both Mittendorf and de Balogh wrote summaries of their findings in writing which were used in drafting the final report. Wong, an Abt Associates' economist, reviewed the literature on horticultural marketing, with particular reference to the European market for counterseasonal vegetables and tropical fruits, and prepared annotations that appeared in the draft report. She also compiled ITC trade data into LOTUS tables and plots. Dennis Winstead provided additional research assistance in preparing tables and data plots.

In addition to the research team, Paula Hirschhoff helped in editing the final version of the report. Tina Rutledge assisted in preparing tables and in producing several versions of the report.

AMIS wishes to thank Desaix Meyers and Mamadou Kane of the Project Development Office (PDO) of USAID/Dakar for their support and interest in the study. PDO was instrumental in setting up interviews for De Ridder and Stathacos in and around Dakar, which increased the efficiency of the field work. AMIS also acknowledges the cooperation and participation of public officials, researchers and private entrepreneurs in carrying out the field work, many of whom are listed in Annex 1.

## Executive Summary

This report examines marketing of horticultural crops in Senegal, with particular attention to export marketing. It is based on four weeks of fieldwork in January-February 1989, secondary data analysis, review of the literature on export marketing of horticultural crops from Senegal and competing suppliers of the Western European market, interviews with importers and officials in terminal markets in Western Europe and the U.S., and a follow-up field visit of one week in September 1989. The report provides a broad overview of the constraints and potential facing Senegal's horticultural export industry.

Private Sector Domination of the Horticultural Subsector. Production and marketing of horticultural crops have been dominated by private enterprise in Senegal. Horticultural production by small to medium sized farms in Cap Vert and the Niayes zone is a vibrant private sector activity, supplying Dakar and several Western European markets with fresh produce. The Fleuve is a region with new potential for horticultural production, as thousands of irrigated hectares are expected to come on stream during the remainder of the century. Benefitting from higher rainfall than other regions of Senegal, the Casamance has historically produced most of the country's bananas and citrus.

Export marketing is dominated by relatively large firms that are organized into two exporters' associations. According to 1985-86 air freight data, the top five exporting firms shipped 81.0% of recorded exports to Europe (see Horton, 1987). Exporters ship fresh produce, especially green beans, melons and mangoes, to several European terminal markets. Paris is the destination for over 70% of the produce, due to the frequency of air connections, historical trade links, and strong French demand for the horticultural products grown in Senegal (especially fine quality French beans and charentais melons).

Advantages and Disadvantages of Senegalese Horticultural Production Conditions. Senegal is one of the Sub-Saharan African countries closest to Europe where horticultural products can be grown in open fields during the European off-season. North African and Spanish competitors have to grow their horticultural products in greenhouses during the winter months. Senegalese growers do not have to incur the cost of constructing greenhouses, which represents the major investment cost in horticultural production for competitors in North Africa and Spain. The proximity of Senegal to the European market and the volume of the air traffic from Dakar to European markets makes the cost of air freight low relative to many Sub-Saharan African competitors.

The Niayes region, which is the major horticultural production area in Senegal, offers good horticultural growing conditions. Disquieting signs of production problems have begun to emerge, however, the result of below (long-run) average rainfall during the past twenty years and heavy cultivation of soils and exploitation of the water table in some areas (see Ministère du Développement Rural, 1988). These problems include the following:

- o a declining water table;
- o increasing salinity of irrigation water and soil; and,
- o decreasing soil fertility in many areas.

The other region of Senegal with good potential for horticulture is the Fleuve, or Senegal River valley. At this time the Fleuve has only limited horticultural production, restricted primarily to industrial tomato production (and processing) and onion production. The expansion of irrigated cultivable area in the Fleuve will create opportunities for a new set of private horticultural producers and marketing agents. Large-scale enterprises are beginning to acquire some experience with contract farming arrangements.

Trends in Exports of Horticultural Products. Some of the key findings about Senegalese horticultural exports to Europe, emerging from analysis of International Trade Centre (ITC) trade data (see Annex 3) are as follows:

1. France is the key market for Senegalese horticultural products, absorbing 70-82% of the estimated dollar value (which averaged \$6,533,000 per annum) of total Senegalese horticultural exports to Western Europe during the 1982-86 period.

2. The Netherlands absorbed 8-12% of the estimated dollar value (averaging \$797,560 per annum) of Senegalese exports over the 1982-86 period but declined in relative importance. Germany imported an annual average of \$281,640 worth of Senegalese green beans and melons from 1982 to 1986, reaching 5.8% of the total dollar value of exports in 1986. Switzerland imported an average dollar value of \$187,040 of green beans and melons, representing a range of 0.8% to 4.4% of the value of Senegalese exports. Belgium/Luxembourg imported an average of \$835,840 worth of Senegalese green beans and melons, reaching \$1,285,000 in 1986, which was 14.3% of the total value of Senegalese exports. This represented a steady rise from \$451,100 (5.1%) in 1982.

Senegal's exports to the Netherlands and Switzerland have generally stagnated since the second half of the 1970s, representing 10-15% of Senegal's earnings from horticultural exports in the 1982-86 period. In contrast, earnings from exports to Belgium/Luxembourg and West Germany increased steadily over the 1982-86 period, albeit from a low level, reaching 14.3% and 5.8% respectively of the dollar value of Senegalese exports in 1986 for the four horticultural crops for which data are reported by ITC.

3. The two most important export crops to Western European markets were melons, representing 20-35% of Senegal's earnings from fresh horticultural exports, and green beans, which accounted for 62-79% of earnings. Together melon and green bean exports generated an estimated 91-99% of Senegalese export earnings from sales to Western Europe during the 1982-86 period.

4. Senegal's 1986 market share of the off-season French import market for green beans was 10.3%, 5.3% for melons, virtually nil for capsicums (green peppers) and 0.9% for mangoes.

5. Available data for the 1975-79 and 1982-86 periods show that the absolute level of French imports of Senegalese horticultural products rose 6.3% from an annual average of 794 metric tons (MT) to 844 MT for melons, declined 13% from 100 to 87 MT for mangoes, increased 20.1% from 2,343 to 2,814 MT for green beans, and dropped precipitously from 817 to 76 MT for capsicums. Senegalese market shares in France rose significantly for melons from 1975-79 to 1982-86, but declined strongly for mangoes and capsicums between the two periods, and stagnated for green beans. French imports of mangoes and melons doubled from 1982 to 1986, but Senegal was unable to expand its exports in response to the market opportunities. French imports of Senegal's major exports fell off in 1985-86 relative to 1982-84, with the exception of green beans. Senegalese trade data from 1987, 1987-88 and 1988-89 suggest that exports have not rebounded since 1985-86.

Potential for Expanding Exports. Senegal has had an important off-season market presence in several European countries, particularly during the December-April period. However, Senegalese market shares in European countries have declined since the late 1970s, as competition from alternative suppliers increased dramatically. South American countries have become important suppliers of the European horticultural market, particularly of tropical fruit (e.g., mangoes). Competing African suppliers, such as Egypt, Kenya and Burkina Faso, have gained shares in the green bean market at the expense of Senegal. Furthermore, Spain has expanded horticultural production and shipments to other EC countries during the 1980s and is able to produce for the early and late off-season or counterseasonal market (defined as the entire period from October 1 - June 30). Spain and Israel compete with Senegal in the European melon market.

Despite some mixed success during the 1980s, Senegal will be challenged to maintain its current market shares for key horticultural exports during the 1990s. Shares are more likely to decline, primarily due to Spain's entry into the EC and expanding investment in horticulture, increased competition from other developing country exporters, and increasing attention by European importers to quality, reliability and uniformity in produce imports. With the exception of two or three of the larger exporting firms, Senegalese exporters lack investment capital, technical know-how, and the management skills to benefit from counterseasonal export opportunities. This does not mean that exporters and associated producers in Senegal will not improve production, post-harvest handling and marketing practices and skills during the 1990s.

The unification of the European market during the 1990s will likely present the Senegalese with an opportunity to capture some lost market share. The Rungis wholesale market outside Paris is the premier terminal horticultural market destination for tropical countries' exports in continental Western Europe. It is reported that significant volumes of tropical fruit and counterseasonal vegetables are re-exported from Rungis to other points in Europe, particularly Belgium/Luxembourg and the Netherlands.

It appears that Paris-based importers and wholesalers are well-positioned to develop pan-European distribution networks for horticultural products. It is in the best interest of Senegalese exporters to ally themselves, formally or informally, with the larger French importers and to strive to meet their quality, reliability and timeliness specifications. Fortunately, the larger and better managed exporters in Senegal are already collaborating closely with major French importers.

Constraints to Expanding Exports. The GOS generally lacks policies and incentive schemes to promote the horticultural sector and exports to foreign markets. Additional foreign investment will be needed to strengthen the technical capability of Senegalese firms, but the current investment climate does not encourage joint ventures or direct foreign investment. Competing countries such as Egypt, Burkina Faso, and Kenya are reported to be more effective in facilitating and encouraging private enterprise in horticultural crop production and marketing.

The Kenyan horticultural subsector in particular has been cited as a success story in a recent World Bank publication (see World Bank, 1988). The Kenyan public sector played an important role in strengthening varietal research and screening, improving extension services to small farmers, establishing packing stations in some areas (through the Kenyan Horticultural Development Authority), licensing exporters, providing information on international markets, assisting in developing a workable plan for allocating air cargo space, and inspecting horticultural produce shipments at the airport prior to export. In establishing the KHDA, the Kenyan government limited the role of this parastatal to facilitating private sector marketing and competing in produce assembly and export with private firms on a limited scale as a means of fostering competition and maintaining quality standards. The Kenyan government imposed a modest tax of 1% on horticultural exports to partially fund facilitating functions.

In addition to lacking a government that actively promotes the horticultural sector, as in Kenya, Senegal exporters face other disadvantages that undermine competitiveness. A key factor is frequent violation of contract terms by growers and high transaction costs faced by exporters in enforcing contracts with growers (see Horton, 1987). Although exporters provide seed, fertilizer and pesticides on credit to smallholders, they have no assurance of re-capturing this working capital investment at harvest time. Growers can and do violate contracts when alternative buyers offering higher prices appear at harvest time, and the costs of litigation are too high relative to the potential settlement of damages (as smallholders have few assets that an exporter could claim). The alternative buyers are generally smaller volume exporters with few contract producers of their own, which works to growers' advantage and perhaps makes the local market for export-grade produce more competitive. It works to the disadvantage of the horticultural export industry, however. As domestic prices are bid up, Senegal's competitiveness slips in the European market, where the Senegalese are price-takers. Exporter investment in improved grower production practices (e.g., extension and irrigation infrastructure) is also discouraged.

Domestic prices of horticultural exportables have risen steadily during the 1980s. Relative to competing African suppliers, Senegal faces high labor costs. In the Senegalese formal sector, labor is unproductive, discipline is lax, and there appears to be little relationship between productivity and remuneration (see Terrell and Svenjar, 1989). Incentives and grower remuneration in the horticultural sector do not appear to be linked to terminal (European) market preferences. French green beans are often graded below competing Kenyan supplies in Europe, which is due to the absence of a grading scheme in Senegal that rewards producers for harvesting thinner (and higher value) French beans earlier. Growers in Senegal maximize profits by maximizing yield (and hence weight), as prices are determined on a per kilogram basis. This results in a thicker bean, which is classed as lower grade in Europe. Furthermore, post-harvest handling, transport, and (cold) storage are not up to international standards for most Senegalese exporters, which leads to quality deterioration in highly perishable commodities such as French beans.

In addition to exporting lower grade French beans, Senegalese exporters are reported to ship low grade mangoes and sometimes immature melons to European markets. Senegal's greenish colored mangoes are the least desired by European consumers, command the lowest prices, and have essentially dropped out of Senegal's export product mix. Some European importers complain that the Senegalese shipments of charentais melons are greenish and immature. Inadequate post-harvest handling practices affect the market value and presentability of Senegalese melons and mangoes in European markets in the same way that French beans are affected. Exports of bobby green beans appear to be of acceptable quality; bobby beans are far less perishable than French beans.

An important macroeconomic variable influencing the competitiveness of Senegalese exports is the exchange rate. Since the FCFA is pegged to the French franc, and exchange rate and monetary policy are managed on a regional basis, there is probably little scope for the GOS to influence exchange rates in the short run. Nevertheless, a consensus has emerged among many analysts that the exchange rate is overvalued, which penalizes the Senegalese in competing with other horticultural exporters in European and U.S. markets.

The competitiveness of Senegal's horticultural export industry is also affected by the following factors:

- o declining productivity in horticultural production in the Niayes and Cap-Vert areas, due to permanent intensive cultivation, low fertilizer application rates, and declining and increasingly saline groundwater resources.
- o the distance of the Fleuve, the area with greatest potential for expansion of horticultural production, from export shipping points.
- o limited available air cargo space on flights bound for Europe.

Since Senegal exports highly perishable products to Europe, it depends heavily on costly air shipment. Scope for expanding sea freight may be

limited, particularly for French beans and charentais melons. Senegalese exporters and European importers frequently cite limited air cargo allocations as the most binding constraint on Senegal's ability to expand horticultural exports to Europe. Several exporters have chartered air cargo flights, and other firms may need to explore this option.

Another apparent limitation of the Senegalese horticultural export industry is a slow response in its product mix to changing market conditions in Europe. This contributed to the demise of the BUD-Senegal scheme (see Annex 5). FAO (1988) and many importers report that the European market for green beans has become saturated following the emergence of Egypt and Burkina Faso as key counterseasonal suppliers of bobby beans and expanded Kenyan exports of French beans during the 1980s. Potential for expanding mango exports to Europe (see FAO, 1988 and ITC/MNS, 1989) is judged to be excellent, but Senegal does not produce varieties that European consumers prefer. To our knowledge, Senegal's decline from a moderate to virtually non-existent exporter of mangoes has not been accompanied by any forward-looking reading of the European market and planting of mango trees that would produce favored varieties. To the credit of some of the larger, more savvy exporters, Senegal has recently expanded exports of cherry tomatoes, a niche crop with favorable prospects in the European market.

Measures That Would Improve Senegalese Competitiveness. Despite Senegal's decline in market share for its key horticultural exports, market potential is judged to be good in Western Europe for melons, mangoes and possibly cherry tomatoes. U.S. market potential is likely to be extremely limited, given transport availability and cost, strict U.S. phytosanitary regulations, the unfamiliarity of Senegalese exporters with the U.S. market, and the competitiveness of South and Central American and Caribbean suppliers.

A strategy to strengthen the horticultural sector, with the objective of expanding exports to Western Europe, includes these important elements:

#### Short to Medium Term Measures

- o better, more timely market intelligence on the dynamic and growing European market for horticultural products.
- o experiments with shipping horticultural products to Europe by sea, and evaluations of the relative cost, timeliness, and impact on quality of air and sea freight.
- o experiments with alternative contractual arrangements between exporters and growers to provide incentives for smallholders to produce crops that better match European preferences in terms of produce size, maturity and quality. Some strengthening of the legal system would also be necessary to enforce contracts more vigorously and at lower transaction cost to exporters.
- o investment in greater capacity and better quality cold storage at the

Yoff International Airport to minimize product deterioration prior to shipment (due largely to airline delays).

- o upgrading of post-harvest handling practices, phytosanitary controls, and packaging from the farmer's field to the point of export shipment.

#### Longer-Term Measures

- o construction of the Cayor Canal, from the Fleuve to Dakar, which will bring more hectareage in fruit and vegetable production on stream by the end of the century.
- o consideration of the feasibility of upgrading infrastructure, particularly air strips and the port of St. Louis, for direct export of horticultural produce grown in the Fleuve to Europe.
- o far more aggressive horticultural adaptive and applied research and extension.

The public sector, with financial and technical assistance from donors, can play a useful facilitating role in strengthening the private horticultural sector. With the exception of upgrading the airport infrastructure at Yoff, the public sector could provide some assistance on the short and medium term measures at relatively moderate cost. An important consideration is whether the private sector would consider any of these programs of high enough priority to contribute to their cost. The longer-term measures are likely to be very costly and would represent a major commitment by the GOS and donor agencies to the horticultural subsector.

Likely Slow Growth in Domestic Consumption of Horticultural Products. An important factor that will affect the competitiveness of Senegalese horticultural exports is the limited domestic market for horticultural products, particularly outside of Dakar and its environs (some 1.5 million people). There are also limited numbers of higher-income consumers in Senegal, who are the socio-economic group most likely to buy income-elastic fruits and vegetables. Furthermore, stagnant income growth in Senegal during the 1980s and projected modest growth during the 1990s has and will continue to slow growth in domestic consumption of horticultural crops. Given these factors, the domestic market for horticultural products would not appear to hold much promise for helping to spread the cost of expensive investments in irrigation systems, precooling, packing stations, improved packaging, refrigerated transport and cold storage--all of which are necessary to upgrade the quality of Senegal's horticultural exports.

In marked contrast to Senegal, Kenya is reported to consume domestically approximately 90% of its horticultural production (see World Bank, 1989). Kenya's population is 22.1 million (mid-1987), of which nearly five million (22% of total population) reside in urban areas. Kenya's urban population, which generally has more income than rural households and constitutes an important horticultural market, is equal to nearly 70% of Senegal's total population of 7.0 million (of which 37% or approximately 2.6 million is urbanized, as of mid-1987).

Relative to most of its key competitors (with the exception of Burkina Faso and Mali), Senegal has a small population that is not capable of absorbing greater quantities of locally produced horticultural produce in the short-run. Rapid urbanization, particularly in the largest five or six towns, could change this over time. A larger proportion of the production of the key horticultural (exportable) crops, such as green beans, melons, and sweet peppers, is exported in Senegal than in Kenya, where there is a large and captive tourist market. Although niche crops can be targetted for export markets, a broader-based horticultural industry, producing a wider range of products for a large local market, is necessary for private entrepreneurs to make major investments, whose costs are more easily recovered across several crops (not just the exported ones).

Potential for Import Substitution. There appears to be potential for Senegal to substitute locally grown produce for imports of staple vegetables, such as potatoes and onions. Senegalese production of potatoes met 57.9% of total supply available for consumption in 1986-1987, while local onion production accounted for 78.4% of supply available for consumption over the same period. Nonetheless, constraining factors are high production costs in Senegal relative to inexpensive imports from Europe (particularly Holland and France), the decreasing availability of land and water in the Niayes region, and the distance of the Fleuve, a region of potentially expanded production, from the key market of Dakar.

Tomato producers are currently protected from foreign competition, which keeps imports of tomatoes and especially tomato paste from increasing. The international market is awash in processed tomato products, in part due to subsidized production and export programs. There is informal evidence that a significant though unquantified volume of tomato paste is imported into Gambia and re-exported to Senegal.

GOS Policies and Incentive Measures to Promote Horticulture. USAID is advised to encourage the GOS to conduct a thorough and careful review of its policies and programs for promoting private agribusiness development in general and horticultural crop exports in particular. This review should consider the experience of other African countries whose export volumes (and market shares) have expanded or declined in European markets. Assistance for such an effort could come from the Africa Bureau of USAID.

This study was able to uncover several policies with a negative impact on horticultural exports. First, loans for investments necessary for horticultural production and export, such as irrigation infrastructure and refrigerated trucks, do not receive the same treatment as other investments for urban real estate and manufacturing, for example. There is a grace period in paying off loans for the latter, whereas investments in agriculture benefit from no such deferred payments. This difference is a strong disincentive, as investments in agriculture are well-known to have a long gestation period. Second, exporters of horticultural products from other African countries, such as Egypt and Burkina Faso, reportedly receive export rebates, which are not paid out in Senegal. Export subsidies are not a precondition for successful export of horticultural products, however, as

Kenya has taxed exports modestly to generate revenues to pay for public sector activities that facilitate the private sector.

Financial Support to Private Entrepreneurs. USAID has recently provided support for financial analysis of the privatization of SENPRIM into SEPRIMA. This is commendable and USAID could continue to provide assistance to private producers and exporters in financial and economic analysis and formulation of business plans. USAID could also use its influence with the IFC or other potential sources of capital. The experience of GIEs (groupements d'intérêt économique), which have received some funds from the CNCAS (Caisse Nationale de Crédit Agricole au Sénégal) to undertake horticultural production, has not yet been reviewed, although it is likely to be mixed.

Land Tenure: A Sensitive Issue. Land tenure policies and practices will need to be reviewed as land pressure mounts in the Niayes Region, the Fleuve and along the proposed Cayors Canal. Clearly, there are bound to be both winners and losers in any change in tenure patterns. The GOS needs to be sensitive to traditional tenure patterns, as well as to private investors' need for security of tenure in order to make costly investments in irrigation and physical plant. Security of tenure will also be necessary to provide land as collateral. Land tenure changes should not lead to special privileges and incentives for wealthy (largely urban) investors.

Strengthening Marketing Research and Intelligence: Responding to Private Sector Needs. Further marketing research should include a more in-depth analysis of the European market for horticultural products. The CDH (Centre pour le Développement de l'Horticulture) has a weak record in doing economic analysis of the Senegalese horticultural industry and in monitoring domestic and external markets. To be fair, CDH's mandate focuses more on varietal improvement and dissemination.

In collaboration with ISRA (Institut Sénégalais de Recherches Agricoles), CDH collected retail price data in seven markets of Dakar for a wide range of horticultural crops and published summary statistics in ISRA working papers (for 1985 and 1986). These price data are of academic interest but were of no use to private producers, traders and exporters, who base production and marketing decisions on current price and supply data in key markets. While CDH is not in a position to become a price reporting service capable of generating timely inputs into private entrepreneurs' decisions, it could undertake a modest socio-economic applied research program of direct relevance to the private sector.

USAID could consider strengthening CDH's (or perhaps ISRA's) capacity to conduct applied research on market opportunities for high-value commodities, such as horticultural products. It is recommended that any analysts supported with USAID funding work closely with private marketing and export agents, asking them for input on a research agenda which would benefit the private sector. The temptation to overdesign ambitious data collection, processing and analysis efforts is very real; an applied research program responding to the private sector's needs should be more flexible and oriented

more to shorter studies (using rapid appraisal methods) and intensive monitoring of one horticultural production and export marketing season.

Study Trips to Competing Suppliers. As part of this research effort, selected private entrepreneurs could be invited to participate in study trips of the horticultural industry to competing suppliers' countries (e.g., Kenya). It is noteworthy that a European study trip was successfully organized with USAID funding for public and private participants in Jordan's horticultural industry. Most Senegalese exporters, particularly the larger volume ones, visit European markets periodically and maintain continuous professional contact with selected importers. Hence, study trips to Europe have lower priority. In some cases, importers visit Senegal during the growing season to monitor production practices.

Monitoring the Competitiveness of Horticultural Crops in the Fleuve. An important element of a longer term research program in the Fleuve will be to estimate more precisely production and marketing costs for potentially competitive horticultural products under different production systems. Other than for industrially produced and processed tomatoes, the knowledge base for horticultural crops in the Fleuve is very thin. Since large tomato processing enterprises operate at high costs relative to imports and benefit from tariff protection, it is likely that their stated costs are higher than they would be under a competitive production and marketing system.

As irrigated land expands in the Fleuve, the GOS and USAID should promote a competitive system, where no one group receives special privileges to the detriment of others. A variety of institutional arrangements for producing and marketing fresh produce (local large-scale enterprise, GIEs, other farmer organizations, local small to medium scale enterprise, multinational or joint venture schemes, contract farming, etc.) should be encouraged. The effectiveness and competitiveness of these arrangements should then be monitored and evaluated by the GOS and USAID.

Over the short to medium run, it is likely that horticultural crop production will expand in irrigated areas of the Fleuve. These crops will primarily supply domestic markets, mainly in the increasingly urbanized Fleuve. Until transport from the Fleuve to export markets can be improved, produce grown in the Fleuve is unlikely to be competitive in international markets, with the exception of Mauritania, whose population is only 1.9 million (as of mid-1987). Yet Mauritania will also benefit from expanded irrigated production on its side of the Senegal River. Transporting fresh fruits and vegetables grown in the Fleuve to Dakar for air-shipment overseas is costly and will penalize Fleuve producers relative to growers in the Niayes region.

Key Elements of USAID's Action Plan. To conclude, AMIS recommends that USAID promote the Senegalese horticultural subsector through the following means:

1. Supporting improved applied research on horticultural crop marketing, policy and exports that responds more effectively to the expressed needs of the private sector.

2. Examining constraints in international shipping of horticultural exports, the feasibility of expanding sea freight, the adequacy of post-harvest handling methods (and assessing needs in the upgrading of export marketing infrastructure), and needed improvement in institutional coordination of exports.
3. Encouraging larger-scale Senegalese private investors and enterprises to seek financing and TA from numerous sources, including potential U.S. investors, and to assist them, where appropriate and feasible, in preparing supporting materials for loans.
4. Inviting and providing financial support for a USDA/APHIS mission to Senegal, which would assess Senegalese phytosanitary practices and the justification for any APHIS assistance to the Senegalese horticultural industry.
5. Encouraging the Africa Bureau of AID/W to undertake a review of government policies, regulations and incentive schemes (or lack thereof) affecting the horticultural subsector which compares Senegal with selected competing suppliers of European markets.

In the near term, USAID/Dakar can deepen understanding of horticultural export marketing in Senegal by funding a program for monitoring of export organization, practices, procedures and performance during the 1989-90 or 1990-91 export campaigns. Such an effort would begin in November or December and continue through May or June of the following year.

This type of monitoring could be followed by a more in-depth examination of a representative sample of small farms producing horticultural crops in several areas of Senegal, including Cap-Vert and Niayes, which would build upon work done by Rassas (1988). In addition to collecting and analyzing data on the size of holdings, investments in wells and irrigation equipment, labor requirements in producing horticultural crops, planting and harvesting dates, sales and prices received, input use and costs, it would be important to examine the terms and conditions of contractual arrangements faced by farmers and their perceptions of the fairness and workability of such arrangements and suggested improvements.

## 1.0 Introduction

During the latter half of the 1980s many developing country governments and donor agencies have expressed increased interest in diversifying agricultural exports beyond what are commonly called "traditional" exports. Traditional exports are cash crops produced and marketed under well-established and long-standing commodity systems and exported to industrial country markets. In Africa, these commodity systems and international trade networks were developed during the colonial period. The "traditional" exports typically generate a good proportion of a developing country's foreign exchange. Examples in the African context include cocoa in Ghana and Cameroon, coffee in Ivory Coast, Kenya and Ethiopia, tea in Kenya and Rwanda, palm oil and palm kernels in Zaire, cashew nuts in Tanzania, groundnuts in Senegal, Niger and Nigeria, cotton in Sudan, Mali and Cameroon, tobacco in Malawi and Zimbabwe, and livestock in Somalia, Sudan and Botswana.

The increased interest in diversification among African countries and donor agencies is in part a recognition of declining African market shares in international commodity markets and mediocre medium to long term prospects for "traditional commodities" in general. As an example, Senegal's exports of groundnuts and groundnut oil face stiff competition from Malaysian palm oil, U.S. soybean oil, and European sunflower oil in the international marketplace. Hence, many observers conclude that Senegal is losing comparative advantage in groundnut production for export, and that resources need to be reallocated, at least at the margin, to production and marketing of alternative commodities, such as horticultural products and seafood. Other analysts, such as the authors of the MADIA (Managing Agricultural Development in Africa) study at the World Bank (see Lele, 1989), argue that African countries are becoming less competitive in exporting "traditional" export commodities, because they have underinvested in research and development on these crops.

Comparative advantage should not be viewed as static and tied to existing technologies and ways of doing business; rather, it is dynamic and affected by changing technology, management methods, use of market information, policies, and tastes and preferences in export markets. As an illustration, international demand for groundnut oil might expand during the 1990s and in the early twenty-first century, as consumers in industrial countries shift away from oils laden with saturated fats, such as palm and coconut oils, to vegetable oils with polyunsaturated fats, such as groundnut, sesame and safflower oils. From the MADIA perspective, the solution is not to allocate resources away from traditional export lines, but to improve varieties, extension, post-harvest handling, processing, storage, transport, marketing management (typically parastatal), and international market intelligence. The MADIA studies sound a cautionary note, therefore, with respect to diversification programs and promotion of "non-traditional" exports such as horticultural products.

The objective of this report is not to address the question of Senegal's long-run comparative advantage, although the authors approach the issue of

diversification and horticultural export promotion in Senegal with a certain skepticism. Rather, we will examine the organization and performance of the Senegalese horticultural sector, particularly export performance in the Western European market, during the 1980s. We will attempt to identify constraints to expansion, knowledge gaps and areas for further applied research, and elements of an action plan for cautiously promoting horticultural exports.

The findings in this report are based on these sources:

- o review of the available literature;
- o analysis of available secondary data;
- o selective field visits to production zones in Cap-Vert, Niayes, the lower Senegal River valley, and Casamance;
- o informal interviews with private export firms, selected producers, government officials, and donor agency representatives in Senegal;
- o informal interviews with selected importers in Western Europe, and ITC (International Trade Centre) and COLEACP (Comité de Liaison Europe-Afrique-Caribes-Pacifique pour la Promotion des Fruits Tropicaux et des Légumes de Contre-Saison) officials; and
- o interviews with USDA analysts, market monitors and APHIS officials and selected importers in East Coast terminal markets of the U.S.

Based on rapid appraisal methods and in-depth review of the available literature and data, the report findings should be interpreted as illustrative rather than definitive. Further applied research, particularly intensive monitoring of a full horticultural production and marketing season in Senegal, is necessary in order to generate more in-depth, micro-level knowledge of how the horticultural sector is organized, operates and performs. A second useful exercise would be to undertake an Africa-wide review of horticultural export performance and competitiveness, which would analyze factors underlying success as well as loss in market share in several countries (e.g., Kenya, Ethiopia, Egypt, Burkina Faso, Mali, Côte d'Ivoire, Senegal, Gambia). Such an effort would examine the investment climate, policies, regulatory measures, international transport costs and availability, horticultural export quality, reliability and timeliness, and the availability and use of market intelligence in several African countries in comparative perspective.

## 2.0 Organization of Horticultural Production, Marketing and Export

### 2.1 Horticultural Production and Marketing in Senegal

Most horticultural production in Senegal, particularly commercial production, is concentrated in the area around Dakar in the region of Cap-Vert and in a thin strip of land along the coast called Niayes, which runs from Cap-Vert to Louga. Other emerging areas of horticultural production are the lower Senegal River valley (tomatoes and onions), land along the Gambia River in Tambacounda Region (OFADEC managed), land along the Anambé River in Kolda Region, and well-watered areas of Ziguinchor Region (private fruit production). In this section, we will briefly describe production patterns and systems in these different zones. Figure 1 shows the location of key horticultural production areas.

#### 2.1.1 Cap-Vert and the Niayes

Cap-Vert and the production zone of Niayes comprise the most productive and intensively cultivated horticultural areas in Senegal. The Region of Cap-Vert includes Dakar and its surrounding urban, peri-urban and rural areas. Niayes is a coastal strip beginning in the Region of Cap-Vert and extending up to Saint Louis. Niayes spans four administrative regions: Cap-Vert, Thies, Louga and the Fleuve.

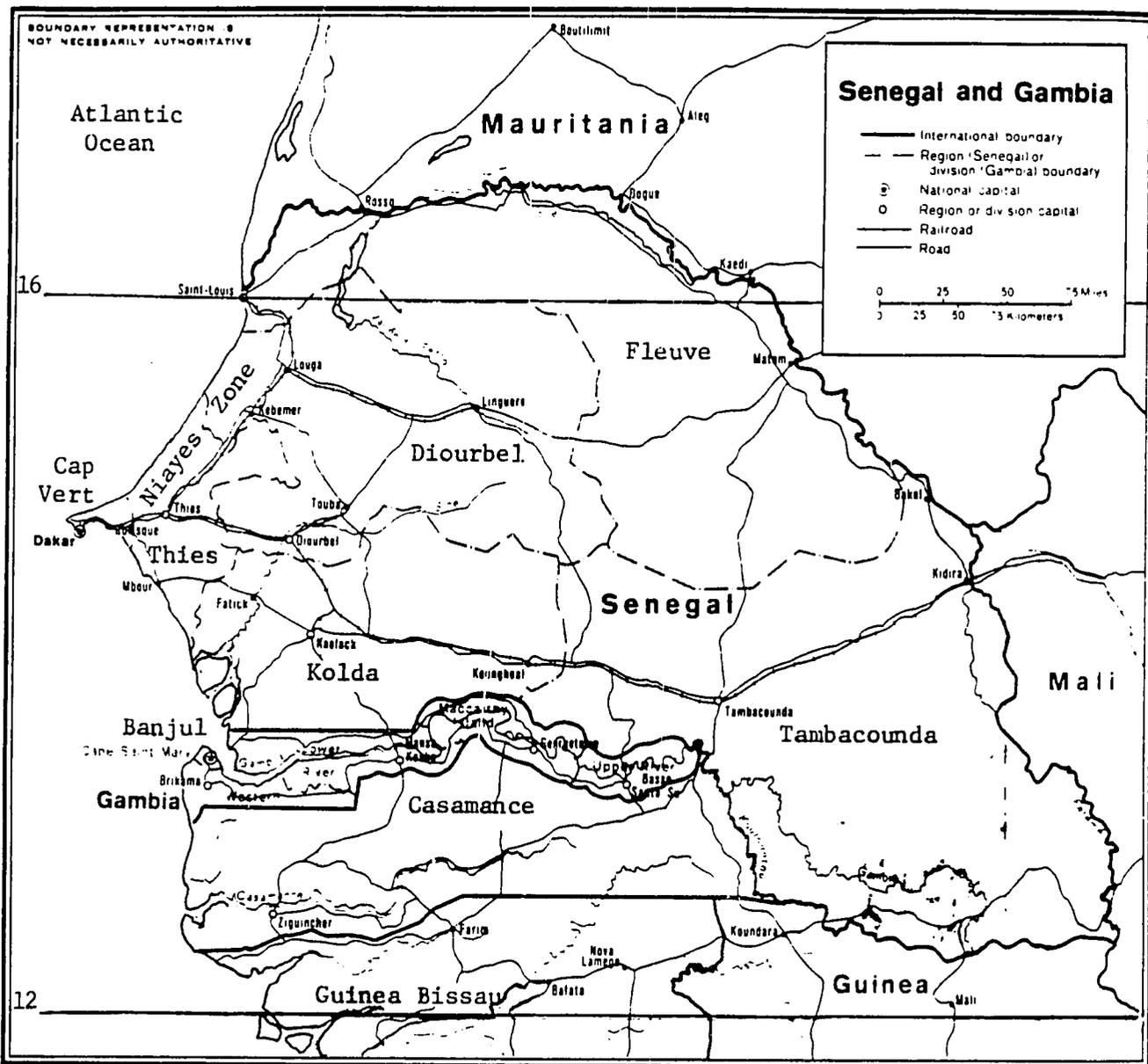
The climate of Cap-Vert and Niayes is sub-canarian and hence milder than the hotter interior of Senegal. It is warm enough during the off-season (November-April) so that all types of vegetables can be grown under open field conditions, rather than in greenhouses (as in Spain and North Africa during this same period). This is a key advantage relative to other competitors to the north, who benefit from their proximity to the European market.

Production Systems. Three types of production systems are found in the Cap-Vert and Niayes production zones (see Ministère du Développement Rural, 1988) as follows:

1. Small, intensively cultivated plots of 0.2 to 0.5 hectare, which use little capital and depend on water from shallow, artisanal wells (céanes). Some of the production is consumed on the farm, especially in the case of "African" or tropical vegetables. Yet most producers sell most of their output. Irrigation on these plots is done using a watering can and by drawing water from a shallow well or "céane". Some argue that producing vegetables on this type of holding is not very profitable, due to the time required to irrigate and the fact that the well occupies 15-30% of the arable land. Cultivation is labor-intensive, typically requiring three to four family members and one to two hired laborers.

2. Medium-size holdings (0.5 - 20 hectares). These farms are generally more capitalized than the smaller plots, often having a cement-lined well and a petrol-powered pump. These farms may also custom-hire tractors to prepare land.

Figure 1  
Map of Senegal



Source: adapted from *Senegal: A Country Profile*, Office of Foreign Disaster Assistance, Agency for International Development, 1979.

This type of holding has expanded recently, and it is typically owned by an absentee landlord. The landowner generally has a profession outside of agriculture, which provides most of his income. The farm manager is paid a salary fixed in advance or indexed to the farm's output, or some combination of the two. Most of the holdings of this size are characterized by low productivity. Many produce fruit (mangoes and citrus).

The owners, generally civil servants or military officers, invest in land for different reasons:

- o Speculation that land prices will rise. The price of one hectare of land in the Niayes has appreciated faster than the population growth rate, which has been high in urban areas in Senegal. Five years ago (1984) one hectare of land was worth 350,000 FCFA, while in early 1989 the same hectare was reported to be worth 1.0-1.5 million FCFA.
- o Proof of social and economic success.
- o Realization that the holdings could be very profitable, particularly in producing onions and potatoes for the local market, which is protected during certain periods of the year.
- o Guarantee of income in the case of loss of principal employment.

3. Large-scale, more capital-intensive farms (20-1,000 ha., though generally over 100 ha.). They are owned and managed by private companies (SAFINA, SEPROMA). The large farms play an important role in production of horticultural crops destined for export. They also help to assemble the output of horticultural products of small farms for export to European markets. These farms are invariably irrigated, use tractors for field preparation, and are owned and managed by formal sector firms. Most of their output is destined for export or supermarkets and high-quality specialty shops in Dakar.

#### Alternative Classification of Horticultural Producers by Farm Type

Horton (1987) proposes an alternative classification scheme based on both the size of holdings and the organization of horticultural production for export:

1. Smallholders grouped together to contract with exporters. Each producer grows vegetables in small gardens of 2,000-4,000 square meters (or 0.2 to 0.4 hectares). Horton estimates that about 70% of all exported produce is grown this way. Exporters complain of frequent breach of contract by this type of smallholder, as growers will often sell at the most favorable price on the spot market.

2. Farmers operating on a larger scale and contracting directly with exporters. Horton claims that there are a few such farmers contracting directly with each major exporter, and that they typically farm one to five hectares. In the aggregate they account for about 17% of total exported output. As

noted above in the medium-sized category, these farms tend to be mechanized. Horton characterizes them as "micro truck farmers," although they are not likely to own trucks or to truck their output to an urban farmers' market.

3. Estate growers. As of late 1986, only one exporter, SAFINA, practiced this form of production, régie directe, accounting for 12% of exported output.

Size Distribution and Productivity of Holdings. Although no reliable data on the size distribution and productivity of holdings specializing in horticultural production are available, Horton states that most of the commercialized horticultural output of Cap-Vert and Niayes comes from the small, intensively cultivated plots (Horton, 1987 and personal communication, 1989). Rassas (1988) surveyed contract and non-contract farms in Niayes and found that the former cultivated an average of 3.7 hectares while the latter cultivated an average of 2.5 hectares. It is unclear from Rassas's work what proportion of this hectarage was cultivated in horticultural crops. It would be useful to extend and update this work by surveying a representative sample of farms producing horticultural crops in several areas of Senegal, including Cap-Vert and Niayes, to obtain data on size of holding, investments in wells and irrigation equipment, labor requirements for major crops, planting and harvest dates, sales (and prices received) during the harvest period, and the terms and conditions of contractual arrangements between growers and buyers.

Organization of the Local Horticultural Market. The local horticultural market, which is essentially the greater Dakar area market, is characterized by a multiplicity of small-scale collectors, wholesalers and retailers (see Seck, 1986). They tend to be poorly capitalized, and they lack cooling, transport and packaging equipment for effective post-harvest handling. The local horticultural market appears to be very competitive to the point where few entrepreneurs are able to generate sufficient capital to make investments which would improve quality, reduce losses, and possibly lower costs (if applied to a larger volume of produce). Seck notes that some horticultural producers who have attempted to sell their own produce complain of earning very low returns, which suggests how competitive local marketing is and how thin margins are for those engaging in the trade.

As the seasonal tourist industry develops in Senegal, one would anticipate increased horticultural market opportunities for local growers and traders. The peak tourist season is from December through April, during which most counter-seasonal horticultural produce is harvested and exported. AMIS was unable to get a good sense of the potential importance of this local, captive tourist market, or of the procurement patterns of hotels and restaurants serving the tourist trade. Our preliminary judgment is that the tourist market is limited, though likely to grow over time. Examination of the requirements of firms serving the tourist trade and their current sources of supply is an area for further useful applied research. In interviews with 10 horticultural marketing and export firms, Horton found that large firms judged the tourist market to be quite limited in potential.

Organization and Market Shares of Horticultural Exporters. According to Senegalese Plant Health Inspection Service statistics (reported in Horton, 1987), a dozen firms exported horticultural products during the 1985-86 export season. Export tonnages and market shares are broken out by firm in Table 1.

Table 1

**Horticultural Export Shares by Firm and Exporter Association, 1985-86**

<u>Association</u>	<u>Firm</u>	<u>Tonnage</u>	<u>Market Share</u>
GEPAS	SENPRIM	1,079.2	17.9%
	SIDCA	144.7	2.4%
	TOLL SELECTION	952.4	15.8%
	SEPAM	1,090.6	18.1%
	SAFINA	779.6	12.9%
	SOEX	242.7	4.0%
	Ets. T. DRAME	358.4	5.9%
	SAAF	80.0	1.3%
	GIPES	NA	NA
	Total GEPAS	4,727.6	78.2%
ASEPAS	JARDIMA	987.6	16.3%
	SCOMI	276.0	4.6%
	SAO	39.5	0.7%
	SENIMEX	12.2	0.2%
		Total ASEPAS	1,315.4
TOTAL		6,043.0	100.0%

Source: Senegalese Plant Health Inspection Service, Yoff International Airport, Dakar, 1986. As presented in Horton (1987).

Ten detailed firm enterprises are provided in Horton's contract farming study. With the exception of SAFINA, these firms procure most or all of their supplies from contract growers.

2.1.2 The Lower Senegal River Valley (Fleuve)

The construction of dams at Diama (in the delta of the Senegal River) and at Manantali (on a tributary of the Senegal River in Mali) will bring on line greater irrigated area of an estimated 375,000 hectares for agricultural production. Irrigation will make possible more intensive cropping, allowing for double cropping. Irrigated area could expand by 267,900 hectares on the Senegalese side of the river, broken down as follows: Delta, 24,500 hectares; Lower and Middle Valley, 123,800 hectares; and Upper

Valley, 119,600 hectares. Horticultural production is currently concentrated in the Delta and the Lower Valley from St. Louis to Podor.

The Fleuve is a region of high priority in Senegalese agricultural development plans for the 1990s. Expanded irrigated rice production is expected to improve Senegal's food security situation, although in-depth analyses show that producing this increased domestic rice supply would be extremely costly and would likely only marginally reduce import requirements (see Martin and Crawford, 1990). Other analyses show that the foreign exchange cost of producing rice in the Fleuve exceeds the value of the rice produced. Recent unpublished calculations by World Bank staff, presented at the third annual USAID/MSU/IFPRI Food Security in the Sahel workshop and updating those of the well-known Rice in West Africa study (1979), showed domestic resource cost (DRC) coefficients of well over 1.0 for irrigated rice production in the Fleuve. This indicates that importing rice at current world price levels would be less costly than producing it domestically.

In light of the gloomy outlook for the competitiveness of rice production, Senegalese policy makers and donor analysts have already begun to think in terms of crop diversification (see World Bank, 1987). Amortization of the heavy capital investments in dams, funded by soft loans from Middle Eastern institutions, requires production and sale of higher value crops. This explains in good part the interest in horticultural production potential in the Fleuve.

Horticultural Production Units. For the most part, horticultural production is limited to tomato production and processing by agro-industrial firms in the Fleuve and to onion production by smallholders in the Delta. Key producers of horticultural products in the Fleuve include the following:

- o producer groups organized in village associations (sections villageoises) and groupements d'intérêt économique (GIE);
- o private, generally small-scale growers; and
- o agro-industrial firms, notably:
  - Société de Conserverie Alimentaire du Sénégal (SOCAS)
  - Société Nationale de Transformation Industrielle (SNTI)
  - Compagnie Sucrière Sénégalaise (CSS)

Onions and tomatoes are the principal crops grown in the Fleuve. In 1986, estimates of total area cultivated to horticultural crops and output were as follows (see Ministère du Développement Rural, Etude du secteur agricole: Filière horticole, 1986):

- o 700 ha in household plots producing 10,500 tons;
- o 200 ha in intensive private plots with an output of 3,400 tons; and
- o 1,500 ha producing 30,000 tons of tomatoes for processing.

Estimated yields are generally less than 20 metric tons per hectare.

Excluding production of tomatoes for industrial processing, the contribution of the Fleuve to horticultural production in Senegal is marginal.

Large-Scale Tomato Production and Processing. Large-scale tomato production is carried out by SOCAS and SNTI. In their first years of operation, these two processors of tomatoes into tomato paste grew tomatoes on large irrigated perimeters adjacent to their processing plants. Intensive production using sprinkler irrigation enabled these firms to supply their plants during a period when tomato cultivation was not widely practiced in the Fleuve. Despite their years of experience and sophisticated sprinkler irrigation, these companies have never been able to achieve average yields of over 20 tons per hectare.

During the 1980s the processors' supplies have come increasingly from small-scale, contract growers. These growers produce tomatoes during the second cropping season (November-April) in rotation with rice. They cultivate SAED irrigated perimeters, obtaining average yields of about 15 tons per hectare.

The shift in production from estate farming to contract production was stimulated by a government policy promoting tomato production by small farmers. In 1988, 900 hectares of tomatoes were cultivated by farmers under the supervision of SOCAS and SAED. SOCAS reduced area cultivated on its estate from 350 to 80 hectares.

Production cost figures shown in Annex 2 show the high degree of protection granted to the two Senegalese firms producing tomato paste. After the 1987-88 production and marketing year, SOCAS had considerable unsold stocks, which the Senegalese market could not absorb. The difficulty of liquidating these stocks is probably in part a function of the availability of cheaper tomato paste, imported into Gambia and smuggled into Senegal. It also seems to be due to the uncompetitiveness of the Senegalese tomato producing and processing firms in the Fleuve, which have benefitted from a protected market for tomato paste over a decade but are still unable to compete with imports on an equal footing.

SOCAS considered exporting its surplus output to Côte d'Ivoire in 1988. To be competitively priced, a carton of 24 kilograms of tomato paste had to be delivered CIF to Abidjan at a price of 9,000 FCFA. Despite the removal of taxes on packaging materials (1,000 FCFA) and an export subsidy of 1,000 FCFA per carton, SOCAS was able to cover only 61% of its costs.

The establishment of industrial-scale tomato processing in the Fleuve was made possible and has been maintained by tariff protection. While such protection may have been justifiable on infant industry grounds in the 1960s and 1970s, it is no longer justifiable, given the disparity between local production and processing costs and cheaply priced imports. Although yields in Senegal are below those of the leading, efficient producers (see Table 2), tomato growing is well-established in Senegal and is unlikely to attain significantly higher levels of productivity.

Table 2

Comparison of Yields and Breakeven Prices for Tomatoes  
Produced in Different Countries

	Senegal	Morocco	Italy	France	Gambia
Price at Factory Gate	43	20		40	52.5*
Yield (tons per ha.)	15-20	40	50-60	50-60	11

Note: All prices are expressed in FCFA per kilogram, using an exchange rate of \$1.00 = 300 FCFA.

\* Retail sales price during periods of peak supply.

Note: The Overseas Development Natural Resources Institute (formerly the Tropical Products Institute and then the Tropical Development and Research Institute) of the U.K. reports that Portugal is able to break even when yields are 29 tons per hectare.

An important tenet of the New Agricultural Policy (NPA) is the promotion of agro-industry in Senegal. Yet sustainable agro-industrial development is possible only when its long-term economic viability is assured. Tomato processing in the Fleuve appears to be uneconomic, resulting in welfare losses for consumers in Senegal, who purchase Senegalese paste at a substantial premium over imported paste. Current levels of protection also offer no incentive for processors to improve the efficiency of their operations by 1) improving yields, 2) staggering production so as to supply the processing plants over a longer period, thereby attaining higher levels of utilization, and 3) lowering overhead, collection and distribution costs.

It is important to note that the shift away from estate farming in the Fleuve to contract production by satellite growers is recent, as is the restructuring of SAED's role from conventional parastatal to service and training organization. This experiment deserves encouragement over a transition period of, say, five years. Beyond that point, rigorous economic criteria will need to be applied in evaluating returns to alternative cropping and processing enterprises. Protecting economically unviable tomato processing indefinitely will carry a high social opportunity cost.

Diversification of Horticultural Production in the Fleuve. Several organizations are pursuing diversification experiments in the Fleuve. CSS and SOCAS are carrying out trials with potatoes, asparagus (only CSS) and confectionary peanuts. The private firm TROPICASEM undertook onion seed trials on SOCAS fields without success. The stems were not strong enough to withstand the heavy winds of the Fleuve.

Other experiments are underway with various tropical fruits. ISRA hopes to find fruit tree varieties that are well-adapted to the the soil and climatic conditions of the Senegal River valley and that can be promoted in village orchards. ISRA is doing adaptive trials on its Ndiol station with

mango trees, bananas, pineapple, papaya, avocado and citrus (lemon, lime, pomelot, orange). Lemon and lime have performed well, but the results with other types of fruits are less encouraging. Nevertheless, these trials have been underway only for a short time, and the results are not yet conclusive.

### 2.1.3 Casamance

The isolation of Casamance from the rest of Senegal constitutes a critical marketing constraint. Negotiating the numerous customs posts and checkpoints entering, leaving and within Gambia and spending hours waiting for the ferry on the Gambia River are time-consuming and costly. Casamance's isolation from Dakar offsets in part its regional comparative advantage in horticultural production, due to its wetter and more tropical climate.

Vegetable production totalled 4,500 tons for an estimated 300 cultivated hectares. Casamance is an important fruit producing region. It is the primary banana producing region, and it also contributes significantly to national production of mangoes and citrus.

The potential of fruit production in Casamance has been little exploited. Most production comes from small household orchards. Few trees are grafted and the quality of fruit produced is very uneven.

There are a few improved production units around Ziguinchor with grafted trees, however. The produce is sold to hotels in Casamance and shipped to Dakar by refrigerated truck. SACICA trucks two tons three times per week. Part of the production is exported to Great Britain via Banjul or to France via Dakar. Mango export prices per kilogram are 300 FCFA, FOB Dakar. Hotels in Dakar sometimes offer as much as 600 FCFA per kilogram for mangoes. According to one orchard owner, gross returns attain 2,500,000 FCFA per hectare.

Transport costs likely declined with the initiation of sea shipping of fruit from Ziguinchor to Dakar. SEMALINE was reported to have acquired a ferry-boat, which began service in March 1989.

### 2.1.4 OFADEC and the Anambé River Basin

AMIS did not make site visits to the Gambia and Anambé River basins in Tambacounda Region. The little available information was gleaned from disparate sources.

OFADEC has invested in irrigated perimeters along the Gambia River in eastern Senegal. Bananas are the most important horticultural product and are expected to be substituted increasingly for imports, which averaged 3,503 metric tons from 1984 through 1988. AMIS was unable to ascertain where most of OFADEC's produce is sold. The Anambé River basin is an area of planned expansion in fruit production (see Ministère du Développement Rural, 1986).

### 2.1.5 Other Small Farm Horticultural Production in Senegal

Most small farms in Senegal produce modest quantities of horticultural crops in non-irrigated kitchen gardens within or near the (extended) family concessions. Tropical vegetables such as tropical tomato varieties, chillies, okra, gourds and cassava are grown mainly for household consumption. Some of this produce is sold in rural markets, or in towns in cases where farmers reside within, say, 20 kilometers, or along roads leading into towns. Income from such sales is likely to be modest, although we lack the micro-level data with which to verify this. More importantly, vegetables from kitchen gardens improve the nutritional quality of the diet for many rural consumers.

### 2.2 Organization of Horticultural Exporters: GEPAS and ASEPAS

There are two associations of exporters in Senegal. ASEPAS was created in 1974 with six member firms. By 1980 there were 15 members, although the larger firms tended to dominate. GEPAS was created as a groupement d'intérêt économique in 1984 and is comprised of larger-volume exporters such as SAFINA, SENPRIM, SOEX, DRAME, GIPES and SEP/M. One of the largest exporters, JARDIMA, remained with ASEPAS, although ASEPAS generally represents the lower-volume exporters and non-exporters.

ASEPAS holds weekly meetings at the Dakar Chamber of Commerce. It is represented on the Airfreight Committee (Comité de Fret Aérien), which is overseen by the Direction de l'Aviation Civile and comprised of representatives of air cargo companies, freight forwarding and transportation companies, the national plant health inspection service and horticultural produce exporters. Apart from representing its members on the Airfreight Committee, ASEPAS provides few services to its members. The president of ASEPAS, Mr. Geloune, who heads SENIMEX, a small exporting firm, recently attended a trade show held in Holland, where he staffed a promotional stall for Senegalese produce.

Both ASEPAS and GEPAS compete for the limited available air cargo space, which has increasingly constrained the horticultural trade in recent years. Airfreight Committee allocations for the 1986-87 export season were 78% (4,730 MT) to GEPAS and 22% (1,320 MT) to ASEPAS. These allocations were set on the basis of produce deliveries for export during the previous season. This system was created, because some exporters had been unable to deliver produce for export in earlier years despite having contracted for air cargo space. Horton observes that "the system allocating access to shipping thus perpetuates and is quite simply predicated upon the status quo" (Horton, 1987, p. 6). He also points out the following:

"A recent (late 1986) meeting of ASEPAS brought up the issue of establishing ground rules for the cancellation of booked space in sufficient time for other firms to take advantage of the space. This approach suggests that the industry perceives the struggle to achieve

consistency and dependability of production and delivery as a collective battle rather than a free-for-all fight to grab space away from competing exporters." (p. 6)

### 2.3 Domestic Market Potential

The viability and profitability of export-oriented companies depend in large part on the strength of local markets. Horticultural products that do not meet quality criteria for the highly competitive European and American markets need to be sold on the local market. Much of the success of the horticultural industry in Kenya is due to the expansion of the local market, which is reported to absorb 90% of horticultural production (see World Bank, 1988). The tourist trade absorbs a good proportion of this domestically consumed output.

Prospects for expansion of the local market are moderately favorable, as the urban population is expanding rapidly, particularly in Dakar, and food consumption patterns shift toward horticultural products as incomes increase. Nevertheless, Senegal has a population of 7.0 million, of which about 2.6 million is urban (as of mid-1987), while Kenya has a population of some 22.1 million, of which approximately 4.8 million is urban. Furthermore, the populations of neighboring countries are small (Mauritania - 1.9 million; Guinea - 6.5 million; Mali - 7.8 million; Guinea Bissau - 920,000), and distances from Senegalese producing areas to consumption centers in these countries are great.

Annual consumption of horticultural products in Senegal is estimated to be 41 kilograms per inhabitant per year (Ministère du Développement Rural, 1988). This contrasts markedly with U.S. consumption of fresh and processed horticultural products, which was estimated to be over 190 kilograms per capita per annum in 1984-85 (FAO, 1988). European consumption of fresh fruit and vegetables was estimated to be 199 kilograms per capita per annum in 1982-83 (World Bank, 1986). The disparity in consumption levels is a good illustration of how income-elastic the demand for horticultural products is.

Processing of fruits and vegetables is a potentially important market outlet that is underexploited in Senegal. The absence of agro-industry is due in large part to the variability of supply in raw materials. The seasonal nature of supply also contributed to severe underutilization of processing plants, as in the case of SOCAS, which operates only 17 weeks per year. The relatively high cost of energy and labor also contributes to the uncompetitiveness of Senegalese agro-industry in comparison to imports.

Another factor undermining viability of agricultural processing is the high protected price of sugar. The local sugar company, SOCAS, has a monopoly on sugar production and distribution, which makes fruit juice and jam production unprofitable.

### 3.0 Recent Horticultural Output and Constraints to Expansion

#### 3.1 Horticultural Production Trends

##### 3.1.1 Data Limitations

Horticultural production data are difficult to collect accurately for small farms in developing countries. The Ministère du Développement Rural publishes vegetable and fruit production data by crop and by region; data for three recent cropping seasons are shown in Table 3. Since the data are not available in longer series, it is not possible to examine trends. Export data, which are available in a somewhat longer series, are more useful for examining trends, assuming that export volume is strongly correlated with underlying horticultural production. This may not be a reasonable assumption if export volumes are declining due to decreasing competitiveness in export markets, yet horticultural production is constant or rising but consumed increasingly in the domestic market. In African countries such as Senegal, where domestic purchasing power is limited, local effective demand for high quality produce, particularly counterseasonal temperate type vegetables, is likely to be limited. This could change if the tourist industry continues to develop in Senegal.

##### 3.1.2 Production Patterns During Three Recent Cropping Seasons

Production by Crop and Region. Table 3 shows Senegalese production of eight types of vegetables (plus a miscellaneous category) for the last three growing seasons. The regions of Dakar (Cap-Vert) and Thies produced 61.7% to 71.9% of total vegetable output during these three seasons. Green beans and melons, the two principal export crops, are grown almost entirely in these two regions. Cap-Vert and Thies also accounted for nearly 90% of national potato production during these three years. The production data also show that these two regions contributed 69.1% to aggregate tomato production in 1987-88, rising from less than half of national output in 1985-86. According to the available data, the Fleuve led all regions in tomato production in 1985-86 but dropped well below production in Dakar and Thies in 1986-87 and 1987-88. Tomato production in Thies is reported to have risen from 1,029 tons in 1985-86 to 9,500 tons in 1986-87, and then dropped off slightly to 8,400 tons in 1987-88. In the Fleuve it fell from 11,520 tons in 1985-86 to 2,500 tons in both 1986-87 and 1987-88. Such dramatic swings in regional tomato production seem implausible. The Fleuve led Senegal in onion production in all years except 1985-86, when Thies is reported to have outproduced all other regions. Thies is reported to have led in cabbage production all three years.

Production in the Aggregate. Aggregating production data across the three years, the vegetable crops can be rank ordered as follows: onions, cabbage, tomatoes and potatoes. Nearly all of the production of these crops is consumed locally, with the possible exception of some exports of onions from the Fleuve to Mauritania. In contrast, some one-half to two-thirds of

Table 3

**Vegetable Production in Senegal - 1985-86 to 1987-88**  
(units in metric tons)

1985-86						
Crop	Dakar	Thies	Louga	St. Louis	Other Regions	Total
Potatoes	5107	12862	2400	369	—	20738
Onions	8250	15660	2500	12842	—	39252
Cabbage	3634	20424	1097	927	—	26080
Tomato	10297	1029	—	11520	—	22846
Green Beans	6542	665	—	—	—	7207
Melons	2200	1726	—	—	—	3926
Hot Peppers	910	367	—	—	—	1277
Eggplant	2040	1625	—	—	—	3665
Other Vegets	3330	6361	1806	6860	6955	18357
<b>Total</b>	<b>42310</b>	<b>60719</b>	<b>7803</b>	<b>32518</b>	<b>6955</b>	<b>143348</b>

1986-87						
Crop	Dakar	Thies	Louga	St. Louis	Other Regions	Total
Potatoes	4415	6870	1025	630	60	13000
Onions	1128	2617	4000	9787	968	18500
Cabbage	8074	10335	2425	1298	2500	25232
Tomato	8440	9500	2012	2500	2300	24752
Green Beans	1200	1535	30	—	—	2765
Melons	3870	2428	—	—	—	6298
Hot Peppers	1040	700	300	150	903	3093
Eggplant	1744	1500	500	900	2500	7144
Other Vegets	5800	3901	2026	3612	3877	19216
<b>Total</b>	<b>35711</b>	<b>39386</b>	<b>12318</b>	<b>18877</b>	<b>13108</b>	<b>120000</b>

Source: Ministère du Développement Rural.

Table 3 (continuation)

Vegetable Production in Senegal - 1985-86 to 1987-88  
(units in metric tons)

Crop	1987-88					
	Dakar	Thies	Louga	St. Louis	Other Regions	Total
Potatoes:	3855	8244	808	600	72	13579
Onions	1809	3140	7224	9120	2208	23501
Cabbage	8614	9500	1528	1300	2100	23042
Tomato	7515	8400	481	2500	3200	22096
Green Beans	2024	3600	45	—	—	5669
Melons	2030	2600	300	—	1500	6430
Hot Peppers	1560	850	250	—	30	2690
Eggplant	1918	1540	418	—	2450	6326
Other Vegets	6090	4055	1832	5840	4200	22017
<b>Total</b>	<b>35415</b>	<b>41929</b>	<b>12886</b>	<b>19360</b>	<b>15760</b>	<b>125350</b>

Source: Ministère du Développement Rural

the output of green beans and melons is exported.<sup>1</sup> Total vegetable production declined from 1985-86 to 1986-87 and 1987-88, due in large part to the dropoff in onion production.

Production and Trade Data for Potatoes, Onions and Tomatoes. Table 4 shows that domestic production of potatoes satisfied an average of 57.9% of domestic supply for 1986-1987. Local onion production covered an average of 78.4% of domestic supply in 1986 and 1987. There is scope, therefore, for expanding domestic production of both potatoes and onions to satisfy the requirements of the local market. Constraints to increasing self-sufficiency are likely to be storage losses and quality deterioration in storage after the sole production season, and higher prices of locally stored potatoes and

<sup>1</sup>Unfortunately, production data are reported by crop year, while trade data are reported by calendar year. Hence, it is not possible to estimate exports as a percentage of output accurately. We are able to make a crude calculation by matching up export data for 1985, 1986 and 1987 with production data for 1985-86, 1986-87 and 1987-88.

Table 4

Production and Trade Data for Potatoes, Onions and Tomatoes, 1985-88

(all figures in metric tons)

Potatoes (Season starts in December and ends in May)					
Years	Production	Import	Export	Total Available (P+I-E)	Production as % of Avail.
1985		12863	703		
1986	20738	9740	624	32977	62.9
1987	13000	13529	1223	25306	51.4
1988	13579	11408	NA	24987	NA
Average, 1986-87	16869	11635	924	29142	57.9

Onions (Season starts in December and ends in August)					
Years	Production	Import	Export	Total Available (P+I-E)	Production as % of Avail.
1985		13533	2453		
1986	39252	14952	15329	38875	101.0
1987	18500	16586	309	34777	53.2
1988	23501	10526	NA	34027	NA
Average, 1986-87	28876	15769	7819	36826	78.4

Tomatoes (Season starts in November and ends in August)					
Years	Production	Import	Export	Total Available (P+I-E)	Production as % of Avail.
1985		35	115		
1986	22846	34	212	22668	100.8
1987	24752	159	270	24641	100.5
1988	22096	NA	324	21772	NA
Average, 1986-87	23799	97	251	23655	100.6

Sources : Production Data : Ministère du Développement Rural - Direction de l'Agriculture  
 2) Import/Export Data : Services phytosanitaires, Port de Dakar et Aeroport de Yoff

onions relative to imported European produce.<sup>2</sup>

The domestic market for tomatoes is protected, benefitting tomato producers (especially large scale ones) in the Fleuve and near Dakar. Reported domestic production covers nearly all of Senegal's requirements, and modest quantities are exported (230 tons per year from 1985 to 1988). Tariff barriers and high international shipping costs and handling difficulties/losses protect domestic producers, but domestic consumers incur welfare losses in paying higher prices than they might pay (for imported tomatoes) during certain times of the year, particularly in the September-December period.

Potato Imports. Table 5 shows that Senegal imported an average of nearly 12,000 tons of potatoes for consumption, almost all from European producers, during the 1982-86 period. Seed potato imports averaged over 1,700 tons a year but fluctuated widely from 638 to 2,652 tons. Senegal produces little potato seed and hence relies heavily on imports of seed from France and the Netherlands.

SAED Tomato Production. SAED tomato production figures, reported in Table 6, conflict with data shown in Table 4 for 1986, when SAED (and its contract growers) produced a reported 30,116 tons. From 1975/76 to 1985/86 SAED production ranged from an estimated 12,700 MT to 26,473 MT. Yields were 12 or more tons per hectare in all of these years except 1985/86, when they dropped to 6.2 tons (an implausibly low figure). In all but four years during the time-series, reported yields were at least 17.3 tons per hectare.

Table 5

Potato Seed Imports, 1982-1987  
(quantities in metric tons; values in millions of FCFA)

Periods	1st, 2nd, 3rd Quarters		4th Quarter		Total Quantities
	Quantities	Values	Quantities	Values	
1982	1326.0	140.0	1326.0	140.8	2652.0
1983	452.2	73.7	185.4	36.8	637.6
1984	678.9	117.2	653.4	112.3	1332.3
1985	1447.4	234.8	1055.8	1675.9	2503.2
1986	922.9	176.7	533.4	108.5	1456.3
1987	1035.9	--	591.6	--	16 7.5
Mean	977.2	123.7	724.3	345.7	1701.5

Supplying Countries : France, Netherlands  
Source: Direction de la Statistique

<sup>2</sup>Imports are predominantly from Holland. Over the 1981-85 period, an average of 96.5% of onion imports were shipped from the Netherlands.

Table 5 (cont.)

Consumption (Table) Potato Imports, 1982-86

Years	Quantities	Values
1982	10380.0	838.6
1983	12302.0	1319.9
1984	13607.0	1492.3
1985	12863.0	1103.0
1986	9740.5	869.0
Mean	11778.5	1124.56

Supplying Countries: France, Netherlands, Italy, Spain, Morocco  
 Source: Direction de la Statistique

Table 6

SAED Tomato Production  
 (Senegal, 1969-1986)

Year	Area (Ha)	Yield (MT/Ha)	Production (MT)
1969/70	6	30.00	180
1970/71	13	30.00	390
1971/72	30	30.00	900
1972/73	77	19.48	1,500
1973/74	144	18.40	2,650
1974/75	650	13.69	8,900
1975/76	1,080	11.76	12,700
1976/77	880	20.00	17,600
1977/78	800	19.50	15,600
1978/79	805	12.11	9,750
1981/82	779	17.30	13,469
1982/83	1,179	19.30	22,755
1983/84	1,084	18.40	20,037
1984/85	1,398	19.00	26,473
1985/86	1,760	6.18	10,884
1986/87	1,190	25.00	30,116

Sources : SAED's various annual crop reports, and  
 Regional Fruit and Vegetable Processing Industries  
 in West Africa, Robert R. Nathan Associates, 1983.

## 3.2 Horticultural Production Constraints

This section draws heavily on recent analyses by the Section Horticole of the Département de l'Agriculture of the MDR (1986, 1988).

### 3.2.1 Factors Constraining Horticultural Production in Cap-Vert and Niayes

While Cap-Vert and Niayes produce a large proportion of the fresh vegetables and melons grown in Senegal, there are disquieting signs that productivity may fall in the future. Probably the most critical factor is the decreasing availability of water. Low rainfall during more years than normal in the 1970s and 1980s has had a negative effect on rainy season production and, more importantly, on the level of the water table. During drought periods salty water tends to penetrate more deeply into the fresh water table, increasing the salinity of well water used to irrigate vegetables. The Niayes strip is especially threatened by saline water, and if growers continue to draw water from the dwindling reserves in that zone, the water table risks becoming irrevocably saline and contaminated (see Ministère du Développement Rural, 1988).

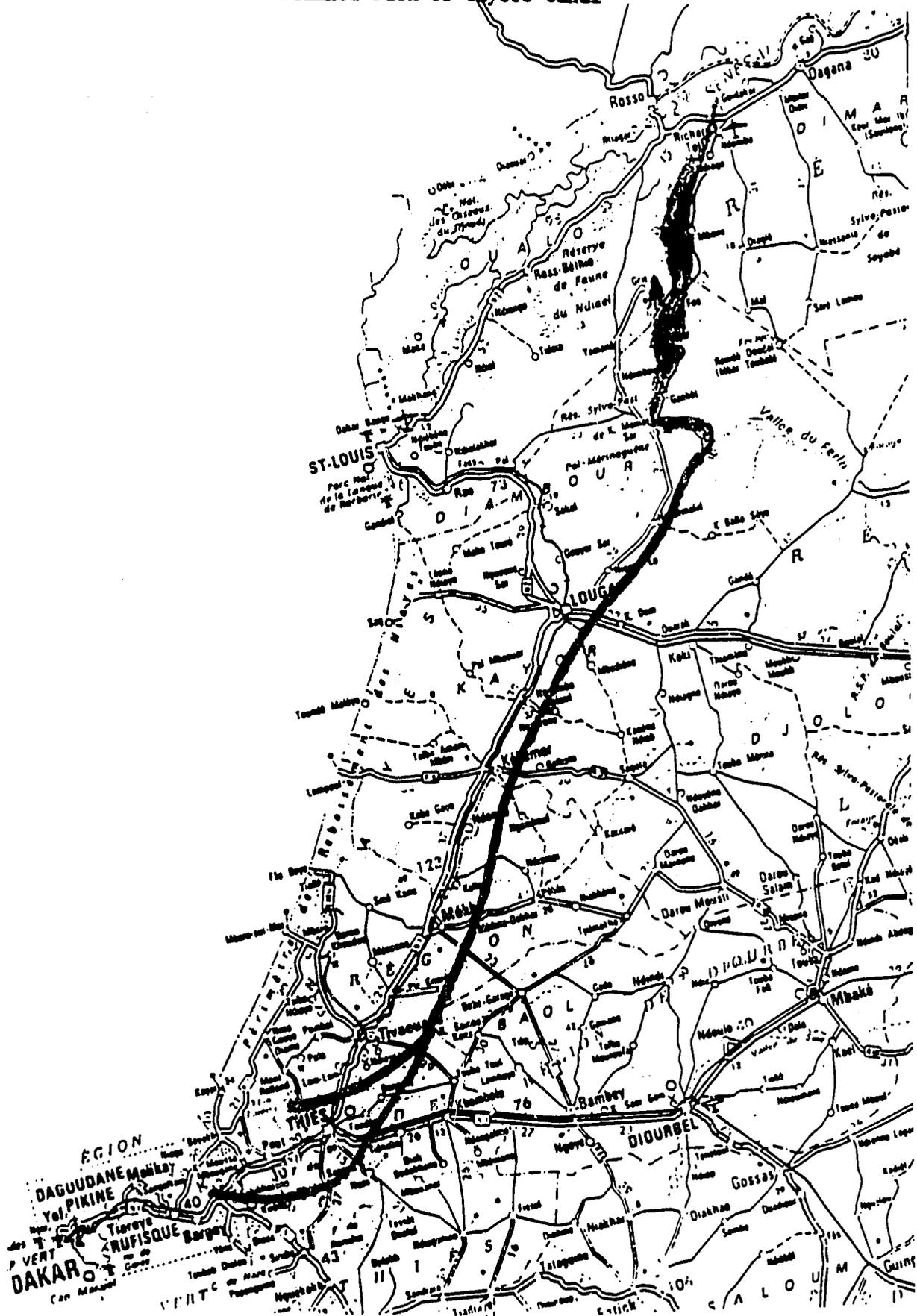
The problem of contamination of the lowered water table could be resolved in the medium term by the construction of the canal of Cayors between Lake Guiers and Dakar (see Figure 2). The dual functions of the canal would be to supply Dakar with water for household and industrial use, as well as to reconstitute the water table of Cap-Vert. Land along the canal could be used for irrigated horticultural production. The feasibility study states that 6,000 hectares could be put under horticultural production.

Three varying uses of the land along the canal have been proposed:

1. 6,000 hectares of irrigated land, of which 3,000 ha. would be located in Cap-Vert, including 500 ha. in fruit culture and 2,500 ha. of vegetable production. The 3,000 ha. along the canal would be broken out in the same manner.
2. 8,500 hectares, of which 3,000 ha. would be located in Cap-Vert and 5,500 ha. along the canal. Among the latter 5,500 ha., 500 ha. would be in fruit culture, 3,000 ha. in capital-intensive irrigation, and 2,000 ha. in double-cropped, small-scale vegetable production.
3. 8,500 ha., of which 3,000 ha. would be located in Cap-Vert and 5,500 ha. along the canal. Among the latter 5,500 ha., 500 ha. would be in fruit culture and 5,000 ha. in vegetable production with capital-intensive irrigation.

A second factor that will constrain horticultural production in the Niayes and Cap-Vert is the declining fertility of the soils, which are heavily and continuously cultivated. In addition, fertilizer use, which would offset this decreased fertility, is limited. Increasing soil salinity is a problem in areas where salt-contaminated well-water is used for irrigation.

Figure 2  
Planned Path of Cayors Canal



In addition to physical production problems and low yields relative to competing countries, Senegalese exporters report dissatisfaction with contracting arrangements with growers (see Horton, 1987). Exporters provide inputs (seed and fertilizer) on credit to contract growers, but they have no assurance that the growers will deliver their horticultural produce to them. Violation of contract terms is quite common, as some smallholders sell produce to the highest bidder, who may often be a small volume exporter with few contractees who is trying to expand market share. Exporters who provide inputs on credit retaliate by refusing to work with contract violators in the future, but they have limited legal recourse. Transactions costs in pressing charges are too high, and smallholders have few assets that could be used to pay damages even if suits were decided in favor of exporters. Hence, exporters bear considerable risk in negotiating resource-providing contracts with smallholders, who may sell to outsiders and fail to pay for production inputs.

The vexing problem of contract enforcement for exporters raises the issue of whether contracts could be better designed to serve both exporters' and producers' needs. Redesign of contractual arrangements would seem to be in the exporters' interest for other reasons as well. French beans produced in Senegal are thicker than those exported by Kenya and hence are graded lower and command lower prices in the competitive European market. Senegalese exporters pay growers by the kilogram, which encourages later harvesting so growers maximize yields and revenues. Earlier harvesting of thinner beans, which are more highly preferred in Europe, would lead to greater revenues for exporters. It is surprising that contracts have not been designed that would provide growers' with incentives to grow thinner beans. It is also reported that immature melons are often harvested and downgraded in the European market. There seems to be scope for a more careful analysis of contracting practices and issues and some creative institutional design (i.e., redesign of contract terms and conditions).

### 3.2.2 Problems Faced in Promoting Horticulture Generally in Senegal

Key constraints to expanding horticultural production are similar in the different production zones of Senegal. They include the following:

- o Inadequately trained growers. Growers have poor knowledge and mastery of production practices, phytosanitary protection, and handling and storage methods.
- o High cost of inputs and difficult access to credit. Producers complain of the high input costs, the lack of good quality seed, and limited access to credit (especially formal credit). Financial institutions are reluctant to lend to smallholders with few assets and uncertain land tenure.
- o Difficult market access of the Fleuve. Farmers complain of difficulties in marketing their production, resulting in large part from the distance between Fleuve production areas and Dakar, as well as limited urban

population and incomes of the Fleuve Region. Market access is also a constraint for the development of horticulture in Casamance and along the Gambia River in Tambacounda Region.

- Gluts and unremunerative prices. Growers produce the same crops and harvest them during the same periods. Domestic market gluts and unremunerative prices ensue. Fortunately for producers, onions can be stored for several months after the harvest and planted/harvested at different times, leading to a smoother flow of product over a longer period (see Daniels, 1988). Both options keep prices from collapsing and ensure an inflow of revenue over a longer period.
- Harvesting before maturity. Some growers harvest their production before it attains full maturity. This results in an inferior product, but one which may fetch an attractive price before greater supplies arrive on urban markets. Early harvesting likely stems from the low incomes and pressing cash needs of smallholders.
- Limited fertilizer use. This leads to low productivity and also contributes to declining soil fertility.

## 4.0 Trends in Exports to Western European Markets

This section will examine Senegalese trade data and International Trade Centre (ITC) import data for several major importing Western European countries for the key Senegalese horticultural exports: green beans, melons, mangoes and capsicums (green peppers). Senegalese market shares have generally declined since the late 1970s, while the shares of competing exporters have increased. We will also examine current European market conditions and likely trends in imports during the 1990s.

### 4.1 Trends in Senegalese Exports During the 1980s

Horticultural trade data are collected, compiled and reported by the Direction de la Statistique of the Ministère de la Finance. The data are reported for calendar years, rather than for horticultural production and marketing seasons, which generally run from October through May. Hence, export data for any given year, such as 1987, combine data from both the 1986-87 and 1987-88 production/marketing seasons.

Vegetable and fruit export volume and value data are shown in Tables 7 and 8 for 1981-87. The total FOB values of exports are reported by the Direction de la Statistique. We attempted to derive implicit unit values (average FOB prices) by dividing total values by exported volume on a crop-by-crop basis. Generally, there appeared to be too much variability in derived unit values from year to year, and in some cases a too dramatic increase in the export values over time, which leads us to question the usefulness and reliability of the reported value of exports. The anomalies may stem from recording error or underinvoicing.

#### 4.1.1 Senegalese Vegetable Exports

As shown in Table 7, green beans are the most important export, representing 29.0-56.7% of the reported tonnage of total vegetable exports and 23.7-63.0% of the total value of vegetable exports during the 1981-87 period. In four of these years, "other vegetable" export volumes exceeded green bean exports. "Other vegetables" are not defined, but they may include capsicums (or sweet peppers) and chillies (or hot peppers). Among the defined vegetable categories, potatoes for consumption come in a distant second to green beans, averaging 900 MT per annum from 1981 to 1987. Potatoes are exported to neighboring countries, especially Mauritania. Potatoes are followed by cucumbers/pickles, which averaged 431.5 MT over the 1984-87 period. Tomato exports have increased in importance during the seven-year period, attaining 270 MT in 1987. Reported exports of onions, green onions and garlic have fluctuated a lot during the 1980s, reaching 309 MT in 1987. As in the case of potatoes, these tubers are shipped to nearby African countries.

Total vegetable exports averaged 10,145 MT per year from 1982 to 1986 but then fell precipitously to 5,325 MT in 1987. After averaging 4,062 MT from 1981 to 1986, green bean exports declined 40.4% to 2,387 tons from 1986 to

Table 7

## Senegal: Vegetable Exports, 1981-87

Year	1981		1982		1983		1984		1985		1986		1987	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
Potatoes for Seed	---	121	---	---	23	5290	6	1270	44	17454	5	2250	1	475
Potatoes for Consumption	483	110002	1101	157427	1321	150217	843	142650	704	94629	624	92257	1223	131511
Tomatoes	2	313	9	1377	21	7560	118	69891	115	112383	213	159589	270	178869
Cabbages	165	5187	101	5116	50	3257	23	1900	12	1085	5	47	2	326
Green Beans	4516	326252	5320	315486	2939	219712	3651	1140804	3946	1726177	4000	1970592	2387	1363705
Beans	260	7160	352	12526	132	4797	14	761	---	---	259	63034	1	678
Cucumbers/Pickles	139	6349	90	3927	254	11510	327	90730	497	200125	532	244680	370	186706
Onion/Garlic/Green Onions	48	6302	149	9390	149	12916	97	12853	2	656	15	5862	309	21522
Spinach	13	4440	7	2564	13	5240	87	48568	24	10498	6	1374	4	1214
Lentils	---	61	---	---	*	26	*	25	4	476	*	12	---	---
Yams/Manioc	1	195	---	231	13	2049	12	1979	1	537	1	142	---	---
Turnips/Beets	8	496	59	3867	15	1740	1	409	79	10692	7	2084	5	935
Asparagus	*	20	8	3013	15	7704	11	6164	---	---	---	---	---	---
Sweet Potatoes	307	6130	1	43	20	1104	1	132	---	---	---	---	---	---
Other Vegetables	2017	448100	3899	583100	5166	495242	4583	759497	4547	1238369	4077	894444	753	279216
<b>Total Vegetables</b>	<b>7959</b>	<b>921128</b>	<b>11096</b>	<b>1098062</b>	<b>10134</b>	<b>928364</b>	<b>9774</b>	<b>2277633</b>	<b>9979</b>	<b>3413081</b>	<b>9744</b>	<b>3436367</b>	<b>5325</b>	<b>2165157</b>

Units: Quantities in MT, Values in thousands of FCFA

\* indicates figures less than one.

Table 8

## Senegal: Fruit Exports, 1981-1987

Year	1981		1982		1983		1984		1985		1986		1987	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
<b>Bananas</b>														
Plantains	---	---	---	---	---	---	---	---	2	2209	2	1164	1	225
Fresh Bananas	---	---	---	---	---	---	---	---	1594	179691	484	59681	181	25
Dried Bananas	---	---	---	---	---	---	---	---	---	---	---	---	2	1005
<b>Total Bananas</b>	<b>34</b>	<b>6610</b>	---	---	<b>589</b>	<b>9395</b>	<b>1248</b>	<b>12236</b>	<b>1596</b>	<b>181900</b>	<b>486</b>	<b>60845</b>	<b>184</b>	<b>26662</b>
<b>Pineapples</b>	<b>9</b>	<b>493</b>	<b>6</b>	<b>557</b>	<b>31</b>	<b>6350</b>	<b>102</b>	<b>12421</b>	<b>27</b>	<b>6791</b>	<b>4</b>	<b>6708</b>	---	<b>166</b>
<b>Grafted Mangoes</b>	<b>288</b>	<b>11617</b>	<b>361</b>	<b>24134</b>	<b>69</b>	<b>7840</b>	<b>235</b>	<b>33644</b>	<b>56</b>	<b>25794</b>	<b>49</b>	<b>23428</b>	<b>55</b>	<b>47071</b>
<b>Cashew Nuts</b>	<b>170</b>	<b>23827</b>	<b>352</b>	<b>59641</b>	<b>248</b>	<b>43021</b>	<b>231</b>	<b>72178</b>	---	---	---	---	---	---
<b>Avocados</b>	<b>13</b>	<b>6317</b>	<b>20</b>	<b>2381</b>	<b>2</b>	<b>1515</b>	<b>41</b>	<b>6291</b>	---	---	---	---	---	---
<b>Non-Grafted Mang.</b>	---	---	---	---	---	---	---	---	<b>11</b>	<b>4197</b>	---	---	<b>32</b>	<b>8900</b>
<b>Other Trop. Fruit</b>	---	---	---	---	---	---	---	---	---	---	<b>1611</b>	<b>217209</b>	---	---
<b>Citrus</b>														
Oranges	<b>280</b>	<b>26751</b>	<b>168</b>	<b>28488</b>	<b>10</b>	<b>6438</b>	<b>10</b>	<b>4036</b>	<b>6</b>	<b>1987</b>	<b>2</b>	<b>601</b>	<b>5</b>	<b>2162</b>
Mandarins	<b>3</b>	<b>1004</b>	<b>11</b>	<b>2886</b>	---	<b>72</b>	<b>2</b>	<b>301</b>	<b>1</b>	<b>280</b>	---	---	---	---
Clementines	*	<b>140</b>	<b>1</b>	<b>368</b>	---	<b>142</b>	---	---	*	<b>7</b>	---	---	---	---
Lemons	<b>9</b>	<b>2943</b>	<b>1</b>	<b>393</b>	<b>7</b>	<b>173</b>	<b>12</b>	<b>778</b>	<b>1</b>	<b>269</b>	<b>3</b>	<b>413</b>	---	<b>4</b>
Apples	<b>1</b>	<b>252</b>	*	<b>85</b>	*	<b>30</b>	<b>1</b>	<b>220</b>	---	---	<b>1</b>	<b>75</b>	<b>2</b>	<b>315</b>
<b>Other Citrus</b>	<b>29</b>	<b>9866</b>	<b>26</b>	<b>6552</b>	<b>2</b>	<b>845</b>	*	<b>75</b>	<b>16</b>	<b>2865</b>	<b>5</b>	<b>1014</b>	<b>5</b>	<b>2166</b>
<b>Other Fruit</b>	<b>1685</b>	<b>126540</b>	<b>2607</b>	<b>230601</b>	<b>4919</b>	<b>533410</b>	<b>5151</b>	<b>1057571</b>	<b>4697</b>	<b>965120</b>	<b>1646</b>	<b>776584</b>	<b>2421</b>	<b>847885</b>
<b>Total Fruit</b>	<b>2521</b>	<b>216360</b>	<b>3553</b>	<b>356086</b>	<b>5877</b>	<b>609231</b>	<b>7033</b>	<b>1199751</b>	<b>6401</b>	<b>1189210</b>	<b>3802</b>	<b>1085863</b>	<b>2699</b>	<b>932244</b>

Units: Quantities in MT, Values in thousands of FCFA

\* indicates figures less than one.

1987 to their lowest level during the 1980s. Monthly export figures for the 1987-88 and 1988-89 seasons reported in Table 9 show that green bean exports (both fine quality and bobby type green beans) remained around 1987 levels, totaling 2,517 MT in 1987-88 and 2,200 MT in 1988-89. Exports of green beans in 1988-89 were the lowest reported export levels during the decade of the 1980s.

#### 4.1.2 Senegalese Fruit Exports

As shown in Table 8, "other fruit" represents 67-73% of aggregate fruit exports in all but one year from 1981 to 1987. It is not clear how this category is defined, but it probably includes charentais melons, Senegal's most important fruit export to Europe. Given the importance of melons as a source of foreign exchange, it is unfortunate that melons are not broken out as a separate category. According to ITC trade data compiled from Western European countries, melon imports into Europe from Senegal averaged 1,405 MT per year from 1982 to 1986.

According to Senegalese trade data, mango exports averaged 295 MT a year for 1981, 1982 and 1984, but only 60 MT per annum for 1983 and 1985-87. There are discrepancies between the Senegalese and ITC (European) data, which can be partly--but not completely--explained by the fact that Senegal exports mangoes to other African countries.

In addition to melons and mangoes, the two leading Senegalese fruit exports to Europe, Senegal exports bananas, mainly fresh table bananas, some pineapples and oranges, all in widely varying quantities across years. Some of these exports are likely to be re-exports of bananas imported from Guinea, Guinea-Bissau and perhaps Gambia. The variation in exported volumes may also suggest uneven recording of exports by truck to neighboring African countries. The expansion in reported banana exports from essentially nothing in 1981 and 1982 to 1,596 tons in 1985, followed by a precipitous decline to 486 tons in 1986, is difficult to explain.

Another anomaly in the Senegalese fruit export data is cashew nut exports. They are reported as averaging 250 MT per year from 1981 to 1984, but then dropping to zero for 1985-87. Whether this represents errors in data collection or recording is unknown. In addition, orange exports fell from 280 MT in 1981 to no more than 10 tons per annum from 1983 to 1987, according to the trade data.

#### 4.2 Imports of Senegalese Horticultural Produce into Western Europe

Since 1976 the International Trade Centre has done three comprehensive reviews of Western European imports of off-season horticultural products from tropical countries. In this section, we present ITC compiled and tabulated data for Senegalese horticultural exports of green beans, melons, mangoes and capsicums (bell or sweet peppers) to France, Holland, West Germany, Belgium-Luxembourg and Switzerland for the 1975-79 and 1982-86 periods on a country-by-country basis. Tropical and counterseasonal horticultural imports are reported by commodity and by supplier for the major European importers in Tables 11-14.

TABLE 9. SENEGAL: EXPORTS OF HORTICULTURAL PRODUCTS, VIA AIR FREIGHT, 1988-89 SEASON (METRIC TONS)

Month	Green Beans (Filet)	Green Beans (Bobby)	Melon	Tomatoes	Okra	Peppers	Straw-berries	Eggplant	Cucumber	Gherkin	Lemon	Papaya	Mango	Subtotal	CHANGE FROM 1987-1988
November	17.5		41.6	19.9	24.7						1.8			105.5	89.4
December	204.5	81.6	234.6	69.4	16.9	0.8					2.4	0.1		610.3	-217.0
January	139.6	325.9	68.0	36.5	16.8	15.8					1.4			604.0	-89.4
February	181.1	453.5	83.1	31.4	26.7	29.5								805.3	-12.4
March	215.5	385.7	84.3	41.1	28.6	38.5	0.5							794.2	-366.2
April	122.0	34.7	131.1	77.6	36.8	33.1		1.4	9.3					446.0	-78.0
May										13.0				13.0	-337.8
SUBTOTAL	880.2	1281.4	642.7	275.9	150.5	117.7	0.5	1.4	9.3	13.0	5.6	0.1	0.0	3378.3	-1011.4

SENEGAL: EXPORTS OF HORTICULTURAL PRODUCTS, VIA AIR FREIGHT, 1987-88 SEASON (METRIC TONS)

Month	Green Beans (Filet)	Green Beans (Bobby)	Melon	Tomatoes	Okra	Peppers	Straw-berries	Eggplant	Cucumber	Gherkin	Lemon	Papaya	Mango	Subtotal
November	0.4		2.6	11.3							1.8			16.1
December	255.8	84.4	412.6	71.7		0.3					2.4	0.1		827.3
January	211.6	300.3	126.2	18.8		35.1					1.4			693.4
February	227.2	390.4	112.3	44.2	2.8	40.8								817.7
March	378.0	467.1	199.7	59.3	2.1	53.7	0.5							1160.4
April	177.9	5.3	235.8	50.8	11.6	31.9		1.4	9.3					524.0
May	18.6		251.1	51.5	5.2	11.4				13.0				350.8
SUBTOTAL	1269.5	1247.5	1340.3	307.6	21.7	173.2	0.5	1.4	9.3	13.0	5.6	0.1	0.0	4389.7

SOURCE: PHYTO-SANITARY SERVICE, YOFF AIRPORT, DAKAR.

#### 4.2.1 Overall European Imports

Aggregating across European country markets, Table 10 shows total imports of Senegal's major horticultural products over the 1975 to 1988 period. Import data for commodities other than melons were not available for 1987 and 1988, so Senegalese export data (taken from Table 9) are reported. Total imported tonnage was highest in 1977-1978, during the heyday of the EUD-Senegal scheme and had dropped off to less than 50% of peak export levels by 1988. Total imports from Senegal actually averaged 5260 MT per year from 1982 to 1986, 12.5% below average annual horticultural imports during the second half of the 1970s.

**Table 10**  
**Western European**  
**Imports of Major Horticultural Products from Senegal, 1975-1988**  
(in metric tons)

Year	Green Beans	Melons	Mangoes	Capsicums	Tomatoes	Okra	Total
1975	2158	872	372	1184			4586
1976	1952	1494	333	2069			5848
1977	2890	1503	502	2048			6943
1978	4382	1018	335	1737			7472
1979	2528	1022	330	1312			5192
Mean '70s	2782	1182	374	1670			6008
1980		698					
1981							
1982	3742	1040	196	361	9		5339
1983	3219	1509	158	0	21		4886
1984	3759	1566	110	0	118		5435
1985	4201	1164	47	0	115		5412
1986	3959	1198	54	17	213		5228
1987	2517	1340	0	173	308	22	3941
1988	2162	643	0	118	276	151	2923
Mean '80s	3366	1134	81	96	151		4675

Note: All figures are for recorded imports of horticultural products into Western European markets, with the exception of 1987 and 1988. 1987 data are reported exports for the 1987-88 export season, while 1988 data are reported exports for the 1988-89 export season.

Note: Tomato data are Senegalese export figures. For the most part, tomato exports are cherry tomato exports.

Sources: International Trade Centre, 1981 and 1987. NIMEXE (EC) data base. Phyto-Sanitary Service, Yoff Airport, Dakar, Senegal.

In looking at the commodity composition of imports, the most striking change between the 1970s and 1980s is the precipitous drop in capsicum imports. This is primarily due to BUD-Senegal's emphasis of sweet or bell pepper production during the 1970s, which was not continued by producers and exporters during the 1980s. Data for capsicums in the 1980s are likely to represent both sweet and chilli pepper exports. Mango exports also declined from an average of 374 MT from 1975 to 1979 to virtually nil by the late 1980s. With the exception of 1973, the record year for green bean imports from Senegal (4,382 MT), green bean imports were higher in every year during the 1982-86 period than during the second half of the 1970s. Green bean shipments to Europe dropped off to 1970s levels in 1987 and 1988. Melon imports from Senegal continued at the same level, on average, during the 1980s relative to the second half of the 1970s. Peak imports for melons were in 1983-84, which marginally exceeded import levels in 1976-77.

#### 4.2.2 France

France is by far the most important market for Senegalese horticultural exports. Regular passenger and cargo flights from Dakar to Paris provide significant air freight capacity, which is often shared by the Senegalese and exporters from other African countries. Import volumes and market shares for the key Senegalese horticultural products shipped to France are shown in Table 11.

Green Beans. Senegal exports both filet and bobby type green beans to France. Fine filet quality beans command premium prices, and Senegalese produce competes with Kenyan shipments during the European off-season. Implicit unit values (UV), calculated across all types of beans and shown in Table C-1 (Annex 3), indicate that only Kenyan beans have consistently fetched higher prices.<sup>3</sup>

French green bean imports from Senegal, not disaggregated by type, increased 20.1% from an average of 2,343 MT per year during 1975-79 to 2,814 MT a year during 1982-86, although export volume reached a peak in 1978 (3,496 MT). While French imports of Senegalese green beans expanded slightly between 1982 and 1986, Senegal slipped in relative terms (see Table 1 in Annex 3). Senegal was the second most important exporter of green beans, well behind Spain, in 1982 and 1984, but it faced increasing competition from Italy, Kenya, and Burkina Faso during 1982-86. By 1986 Senegal had slipped to fifth place, shipping 3,044 tons of green beans, which represented 9.6% of total import market share during the counterseason (October 1 - June 30).

Melons. Charentais melon imports from Senegal averaged 844 MT a year between 1982 and 1986, up 6.3% from the mean 794 MT per year over the 1975-

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<sup>3</sup>Implicit unit values are average CIF prices calculated by dividing the total value of annual imports from a supplying country by the total volume of imports. Since intraseasonal variations (i.e., month-to-month) are likely to be quite marked during the off-season, these implicit prices should be viewed as means around which actual monthly prices were likely to fluctuate.

**Table 11**

FRANCE: IMPORTS OF FRUITS AND VEGETABLES FROM SENEGAL, 1975-1986

	1975	1976	1977	1978	1979	1982	1983	1984	1985	1986
<b>Melons</b>										
metric tons	616	976	972	667	740	707	1,159	1,047	784	524
market share	2.2%	3.3%	3.2%	1.8%	1.7%	14.8%	18.6%	15.1%	11.0%	5.3%
<b>Mangoes</b>										
metric tons	44	44	107	146	161	151	110	71	47	54
market share	7.2%	6.0%	11.7%	10.5%	8.7%	5.2%	2.7%	1.6%	0.9%	0.9%
<b>Green beans</b>										
metric tons	1,640	1,731	2,540	3,496	2,308	2,873	2,415	2,703	3,037	3,044
market share	5.6%	7.3%	7.7%	11.6%	8.7%	13.7%	11.4%	11.8%	10.7%	10.3%
<b>Capsicums</b>										
metric tons	586	1,231	840	978	451	361	--	--	--	17
market share	3.7%	6.9%	4.0%	3.7%	1.6%	0.9%	0.0%	0.0%	0.0%	0.0%

Source: International Trade Centre, UNCTAD/GATT, Selected European Markets for Tropical and Off-Season Fresh Fruit and Vegetables, Geneva, 1981.  
 ITC, UNCTAD/GATT, Tropical and Off-Season Fresh Fruits and Vegetables: A Study of Selected European Markets, Geneva, 1987.

1979 period. Although the absolute level of melon imports rose only slightly between the two periods, Senegal's share of the import (counterseasonal) market expanded significantly, attaining 18.6% in 1983 on shipments of 1,159 MT. Exports fell to 524 MT (5.4% of the market) in 1983 to 524 tons (5.4% of the market) in 1986. Over the 1982-86 period, French melon imports from Spain more than doubled, and Spain's market share reached 79.4% in 1986. Italy, Israel and Guadeloupe are other competitors. Senegal was the second largest supplier in all years of the 1982-86 period except 1986.

Mangoes. In contrast to green beans and melons, mango imports from Senegal declined in both absolute and relative terms. Mango imports declined from an annual average of 100 MT in 1975-79 to 87 MT in 1982-86. Senegal's market share in the French mango market has fallen steadily to 1.0% in 1986 as competitors such as Burkina Faso, Brazil, Peru, Mexico, Mali, and Ivory Coast have captured increasing shares (84.5% of the market in 1986).

During the 1980s Burkina Faso emerged as a key supplier, shipping 1,345 MT to France in 1986, which corresponded to a 21.8% market share. Brazil was the second largest supplier in 1986 with 13.5% of the French market. Senegalese mangoes are of relatively poor quality, and Senegal has lost market share as French imports and consumption of mangoes have expanded, doubling from 2,695 MT in 1982 to 5,678 MT in 1986.

Capsicums (bell peppers). French imports of Senegalese capsicums decreased dramatically from an average of 817 MT per annum in 1975-79 to virtually nothing in 1983-86 according to ITC statistics. Pepper exports were reported to be 173.2 MT during the 1987-88 season and 117.7 MT during the 1988-89 season by Senegalese sources. Capsicums were an important horticultural output and export of BUD-Senegal, which was active during the 1970s. Capsicums have largely dropped out of Senegal's export product mix in the European market, although several exporters, including SENPRIM, SOEX and JARDIMA, continue to ship the variety sucette de provence to Europe, principally to France. Morocco is reported to be the main supplier of this "sweet" pepper variety. The main suppliers of the large off-season European market for capsicums during the 1980s have been Greece, Hungary, Italy, the Netherlands, Spain and Turkey. Spain and Italy captured 97-99% of the French market from 1982 to 1986, with Spain supplying 94% in 1986.

Total imports (all crops). With the exception of green beans, French imports of Senegalese produce fell off in 1985-86 relative to 1982-84. Total imports of Senegalese horticultural products stagnated during 1982-86 and were below the record levels of 1978 (see Figure 3). Senegalese trade data (see Tables 7 and 9) suggest a continued stagnation in 1987-89.

#### 4.2.3 West Germany

Senegal is a marginal participant in the West German market for tropical and counterseasonal produce. As shown in Table 12, Senegal only exported green beans to Germany during 1975-79, averaging 57 MT per year. German imports of Senegalese green beans expanded to 108 MT a year in 1982-86, but Senegal had only captured 1.6% of the German market by 1986. Melon imports rose steadily from 40 tons in 1982 to 135 tons in 1986, but only represented 0.5% of the market by 1986. Direct air-freight connections between Dakar and Germany are limited to a weekly Lufthansa air cargo flight.

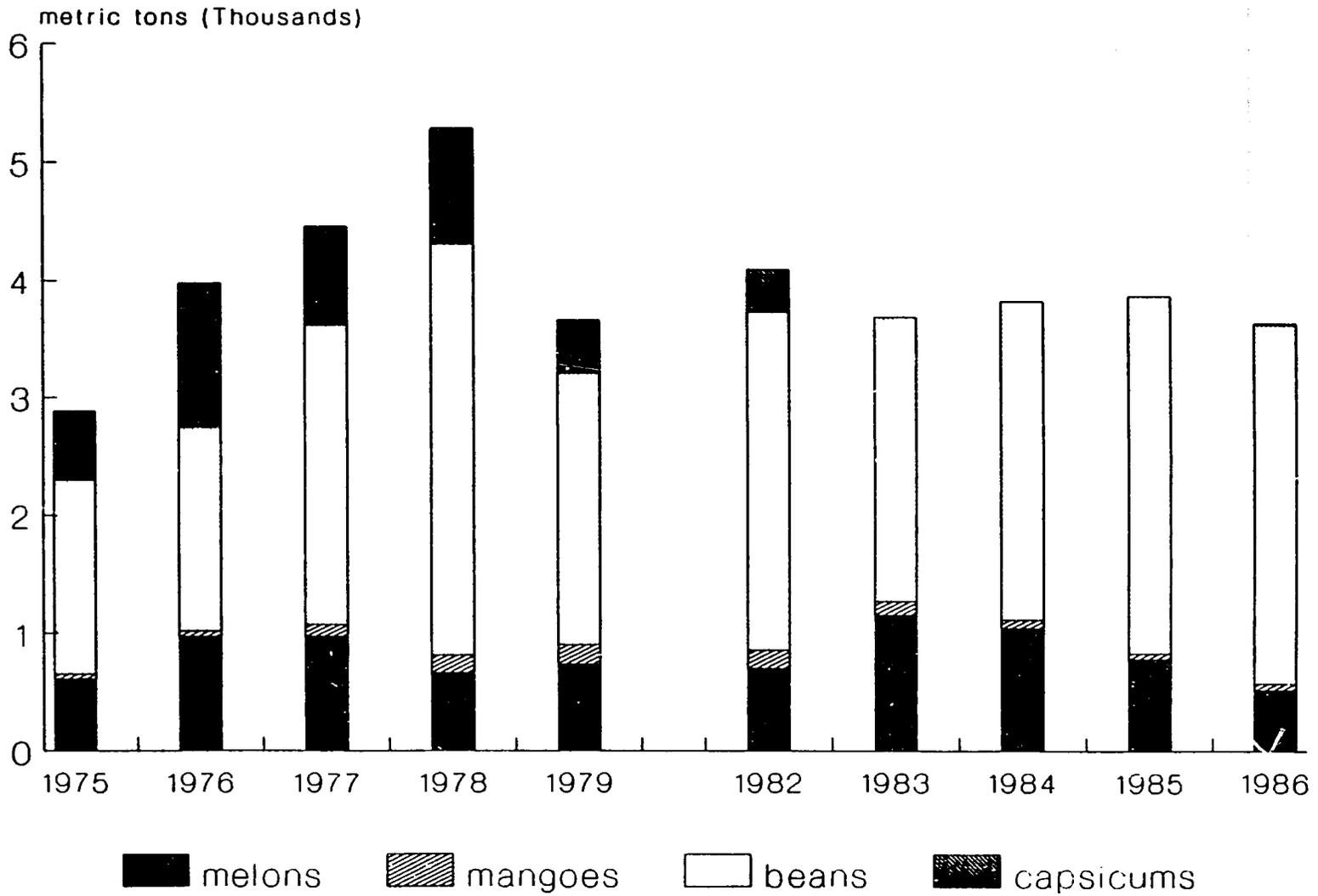
As shown in Table C-2 in Annex 3, Spain supplies over half of Germany's off-season melons, and Turkey and Italy account for another 18-28%. Senegalese green bean imports reached only 161 tons or 1.6% of the German counterseasonal market by 1986. Italy and Spain are the principal off-season suppliers.

#### 4.2.4 Netherlands

For three of Senegal's four key horticultural exports, Dutch imports of Senegalese horticultural products have declined dramatically between 1975-79 and 1982-86 (see Table 13). Mean annual imports of 270 MT of melons and 560 tons of capsicums during the 1975-79 period dropped to zero during 1982-86. This is likely due to the early 1980s demise of the BUD-Senegal horticultural production scheme. Mango imports from Senegal dropped from a 1977 high of 136 tons to zero imports reported for 1985 and 1986. Brazil, Mexico and Mali were the principal suppliers of mangoes to Holland by 1986 (see Table C-3 in Annex 3).

Figure 3

### France: Imports of Produce from Senegal



**Table 12**

FEDERAL REPUBLIC OF GERMANY: IMPORTS OF FRUITS AND VEGETABLES FROM SENEGAL, 1975-1986

	1975	1976	1977	1978	1979	1982	1983	1984	1985	1986
Melons										
metric tons	--	--	--	--	--	40	78	100	118	135
market share	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.4%	0.5%	0.5%	0.5%
Mangoes										
metric tons	--	--	2	--	--	--	--	--	--	--
market share	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Green beans										
metric tons	47	40	84	72	41	73	55	119	134	161
market share	0.4%	0.3%	0.6%	0.5%	0.3%	1.0%	0.7%	1.5%	1.3%	1.6%
Capsicums										
metric tons	--	--	--	--	--	--	--	--	--	--
market share	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**Table 13**

NETHERLANDS: IMPORTS OF FRUITS AND VEGETABLES FROM SENEGAL, 1975-1986

	1975	1976	1977	1978	1979	1982	1983	1984	1985	1986
Melons										
metric tons	328	289	375	189	169	--	--	--	--	--
market share	2.6%	2.1%	2.9%	1.2%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%
Mangoes										
metric tons	42	--	136	99	62	45	48	39	--	--
market share	7.8%	0.0%	16.4%	6.3%	4.0%	2.8%	2.4%	1.9%	0.0%	0.0%
Green beans										
metric tons	426	127	212	79	112	530	524	491	609	417
market share	4.4%	1.5%	1.5%	0.6%	0.8%	5.0%	4.7%	3.8%	4.1%	2.0%
Capsicums										
metric tons	482	388	856	650	422	--	--	--	--	--
market share	13.4%	7.4%	16.6%	9.5%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: International Trade Centre, UNCTAD/GATT, Selected European Markets for Tropical and Off-Season Fresh Fruit and Vegetables, Geneva, 1981.  
 ITC, UNCTAD/GATT, Tropical and Off-Season Fresh Fruits and Vegetables: A Study of Selected European Markets, Geneva, 1987.

The one modestly bright spot for Senegal has been green bean imports into Holland, which have expanded in both absolute and relative terms to an average of 514 MT and a market share ranging from 2% to 5% during the 1982-86 period. Some of the imported Senegalese green beans are re-exported to other Northern European markets. Despite success with green beans relative to other horticultural export crops, Senegal's market share was dwarfed by Dutch imports of green beans from Egypt, Spain and Italy, which had captured 83.2% of the Dutch off-season market (October 1-June 30) by 1986.

#### 4.2.5 Belgium/Luxembourg

Belgium/Luxembourg is a modest but growing market for Senegalese green beans and melons. As shown in Table C-4 of Annex 3, Senegal directly supplied an average of 389 tons per year of green beans during the 1984-86 period, capturing a 9.6% share of the off-season market by 1986. Other counterseasonal exporters are Kenya, Spain, Italy, the Netherlands, France and Germany. Shipments from the latter three suppliers are re-exports of green beans imported from other sources.<sup>4</sup>

Melon imports from Senegal reached 416 MT by 1986 or 2.8% of the market. The reported unit values for imports of Senegalese melons are on average considerably higher than for competing suppliers, reflecting the Belgian preference for the charentais type of melon grown in Senegal and the likely importance of Senegal during the winter months of the European off-season.

#### 4.2.6 The Swiss Market

As shown in Table C-5 of Annex 3, Switzerland is a marginal market for Senegalese counterseasonal melons and green beans. There are two Swiss Air passenger flights per week from Senegal (and other points in Francophone Africa) to Geneva and Zurich. France, Italy and Spain dominate the Swiss market, accounting for 93.5% of melon imports and 78.8% of green bean imports. Senegalese exports to Switzerland declined from 1982-84 to 1985-86 for both products.

#### 4.2.7 Western Europe

Aggregating imports across seven European countries (U.K., France, Germany, Netherlands, Belgium/Luxembourg, Switzerland, Sweden), it is clear that Senegal's horticultural market shares have generally stagnated during 1982-86 relative to 1975-79 (see Table 14). European green bean imports from Senegal remained in the 8-10% range during both periods. Market share for melons has never topped 1.0% (achieved in 1983). Senegalese mango imports accounted for 11-14% of the European market in 1975-77, but market share

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<sup>4</sup>French importers report shipping significant quantities of green beans and melons, arriving at the Rungis wholesale market, by truck to Belgium and Holland.

declined to 0.2-0.3% in 1985-86. Capsicum market share was never more than 1.5%, but it dropped to nil in 1983-86.

**Table 14**

SENEGAL: SUPPLIES OF FRUITS AND VEGETABLES TO EUROPEAN MARKETS (a)

	1975	1976	1977	1978	1979	1982	1983	1984	1985	1986
Melons										
metric tons	872	1,494	1,503	1,018	1,022	1,010	1,601	1,648	1,311	1,425
market share	0.5%	0.7%	0.8%	0.5%	0.4%	0.7%	1.0%	0.9%	0.7%	0.7%
Mangoes										
metric tons	372	333	502	335	330	196	158	110	47	54
market share	12.7%	11.0%	13.9%	5.5%	4.3%	1.9%	1.2%	0.8%	0.3%	0.2%
Green beans										
metric tons	2,158	1,952	2,890	4,382	2,528	3,742	3,219	3,759	4,201	3,959
market share	3.2%	3.4%	3.7%	5.8%	3.5%	4.9%	4.4%	4.9%	4.6%	3.8%
Capsicums										
metric tons	1,184	2,069	2,048	1,737	1,312	361	0	0	0	17
market share	0.9%	1.5%	1.2%	1.0%	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%

Note: a) United Kingdom, France, Federal Republic of Germany, Netherlands, Belgium-Luxembourg, Switzerland, Sweden.

Source: International Trade Centre, UNCTAD/GATT, Selected European Markets for Tropical and Off-Season Fresh Fruit and Vegetables, Geneva, 1981. ITC, UNCTAD/GATT, Tropical and Off-Season Fresh Fruits and Vegetables: A Study of Selected European Markets, Geneva, 1987.

#### 4.2.8 Value Shares of Imports of Senegalese Horticultural Products into European Markets

The value of European imports of Senegalese horticultural products are summarized for the five largest European importers in local currency terms in Table 15. Green bean exports captured the largest share of Senegalese foreign exchange earnings for horticultural products in France, Germany, the Netherlands and Switzerland in 1982-86.

Converting the different European national currencies to dollars (at average annual exchange rates), and aggregating across countries (see Table 16), we find that green bean exports generated from 62.1% to 78.9% of Senegal's European horticultural export earnings (expressed in CIF terms)

Table 15

Annual Imports of Selected Fresh Fruits and Vegetables  
Shipped from Senegal, 1982-86

(all import values expressed in '000 local currency units)

FRANCE (FF)	1982		1983		1984		1985		1986	
	V	% of TV								
SUMMARY TOTAL										
Mangoes	1314	2.8%	858	2.1%	653	1.4%	547	1.1%	598	1.3%
Melons	10058	21.1%	15072	36.1%	11280	23.7%	9398	18.1%	6091	13.5%
Green Beans	33102	69.5%	25871	61.9%	35708	75.0%	41969	80.8%	38382	84.8%
Capiscums	3125	6.6%	---	0.0%	---	0.0%	---	0.0%	177	0.4%
Total	47599	100.0%	41801	100.0%	47641	100.0%	51914	100.0%	45248	100.0%

## FEDERAL REPUBLIC OF GERMANY (DM)

FEDERAL REPUBLIC OF GERMANY (DM)	1982		1983		1984		1985		1986	
	V	% of TV								
SUMMARY TOTAL										
Melons	122	30.3%	165	46.3%	275	41.6%	519	49.0%	437	39.2%
Green Beans	280	69.7%	191	53.7%	386	58.4%	541	51.0%	672	60.8%
Total	402	100.0%	356	100.0%	661	100.0%	1060	100.0%	1109	100.0%

## NETHERLANDS (Guilders)

NETHERLANDS (Guilders)	1982		1983		1984		1985		1986	
	V	% of TV								
SUMMARY TOTAL										
Mangoes	220	9.3%	291	12.0%	171	8.7%	---	0.0%	---	0.0%
Green Beans	2138	90.7%	2138	88.0%	1796	91.3%	2902	100.0%	1879	100.0%
Total	2358	100.0%	2429	100.0%	1967	100.0%	2902	100.0%	1879	100.0%

## BELGIUM-LUXEMBOURG (SF)

BELGIUM-LUXEMBOURG (SF)	1982		1983		1984		1985		1986	
	V	% of TV								
SUMMARY TOTAL										
Melons	10775	52.3%	12087	53.2%	30673	52.7%	24792	42.1%	30355	52.9%
Green Beans	9836	47.7%	10632	46.8%	27538	47.3%	34044	57.9%	27070	47.1%
Total	20611	100.0%	22719	100.0%	58211	100.0%	58836	100.0%	57425	100.0%

## SWITZERLAND (SF)

SWITZERLAND (SF)	1982		1983		1984		1985		1986	
	V	% of TV								
SUMMARY TOTAL										
Melons	136	28.6%	439	80.6%	318	77.4%	150	98.7%	120	31.4%
Green Beans	339	71.4%	106	19.4%	93	22.6%	2	1.3%	262	68.6%
Total	475	100.0%	545	100.0%	411	100.0%	152	100.0%	382	100.0%

Note : V means total value of imports of a particular commodity. TV means the total value of imports of all commodities from Senegal.

Source : ITC trade data; summary statistics tables in Annex 3.

Table 16

U.S. Dollar Value of Imports of Senegalese Horticultural  
Products in Key European Markets, 1982-86

(in '000 U.S. Dollars)

FRANCE	1982	1983	1984	1985	1986
	V	V	V	V	V
Mangoes	199.9	112.6	74.7	60.9	86.3
Melons	1530.4	1977.6	1290.8	1045.9	879.4
Green Beans	5036.7	3394.6	4086.0	4670.9	5541.6
Capiscums	475.5	---	---	---	25.6
Total	7242.6	5484.8	5451.5	5777.7	6533.0

FEDERAL REPUBLIC OF GERMANY					
	V	V	V	V	V
Melons	50.3	64.6	96.6	176.3	200.3
Green Beans	115.4	74.8	135.6	183.8	310.4
Total	165.7	139.4	232.3	360.1	510.7

NETHERLANDS					
	V	V	V	V	V
Mangoes	82.4	102.0	53.3	---	---
Green Beans	800.7	749.1	559.7	873.7	766.9
Total	883.1	851.1	613.0	873.7	766.9

BELGIUM-LUXEMBOURG					
	V	V	V	V	V
Melons	235.8	236.4	530.8	417.5	679.5
Green Beans	215.3	207.9	476.6	573.3	606.0
Total	451.1	444.3	1007.4	990.9	1285.5

SWITZERLAND					
	V	V	V	V	V
Melons	67.0	209.1	129.4	61.0	66.7
Green Beans	167.0	50.5	37.8	0.8	145.6
Total	234.0	259.6	167.3	61.9	212.4

Table 16 (continued)

TOTAL VALUE					
BY COMMODITY	1982	1983	1984	1985	1986
COMMODITY	V	V	V	V	V
Melons	1883.5	2487.8	2047.6	1700.8	1826.0
Green Beans	6168.1	4426.4	5257.9	6301.7	7224.9
Mangoes	282.3	214.5	128.0	60.9	86.3
Capsicums	475.5	---	---	---	25.6
Total	8809.4	7128.7	7433.6	8063.4	9162.8

PERCENTAGE OF TOTAL U.S. DOLLAR VALUE					
COMMODITY	%	%	%	%	%
Melons	21.4	34.9	27.5	21.1	19.9
Green Beans	70.0	62.1	70.7	78.2	78.9
Mangoes	3.2	3.0	1.7	0.8	0.9
Capsicums	5.4	0.0	0.0	0.0	0.3
Total	100.0	100.0	100.0	100.0	100.0

PERCENTAGE OF TOTAL U.S. DOLLAR VALUE					
COUNTRY	%	%	%	%	%
France	82.2	76.9	73.3	71.7	71.3
Germany	1.9	2.0	3.1	4.5	5.6
Netherlands	10.0	11.9	8.2	10.8	8.4
Belgium/Lux	5.1	6.2	13.6	12.3	14.0
Switzerland	2.7	3.6	2.3	0.8	2.3
Total	100.0	100.0	100.0	100.0	100.0

Sources : 1) Dollar values calculated from ITC trade data (see Table 15).  
 2) Exchange rate statistics used in calculating dollar values from IMF International Financial Statistics, 1989.

Note : The calculated dollar values of imports by European countries are not exact. Annual average exchange rates are used in the calculation.

from 1982 to 1986.<sup>5</sup> Melons were an important secondary source of export revenues, earning more foreign exchange than green beans in the Belgium/Luxembourg market. Melons represented 19.9% to 34.9% of Senegal's foreign exchange earnings (expressed in dollars) in 1982-86. Mangoes and capsicums were a minor source of foreign exchange, earning less than 3% of the dollar value of Senegalese exports in European markets from 1983 to 1986.

### 4.3 Recent Developments in the European Horticultural Market

The Western European market for horticultural products is an increasingly competitive market which is demanding better quality and presentation of produce, as well as reliable and timely supplies. Whereas substandard produce of uneven quality could be sold in some European terminal horticultural markets during the 1970s and early 1980s, this is no longer the case (see World Bank, 1986). Opportunities for developing country suppliers will be increasingly limited to tropical horticultural products (especially fruits), niche herb and spice crops and essential oils, and top-quality counterseasonal (temperate type) vegetables.

#### 4.3.1 The European Market for Green Beans

European producers grow fresh beans for domestic consumption during the northern hemisphere temperate growing season of May/June to October. Green beans are highly perishable and susceptible to bruising and withering. Large quantities are canned and frozen, because much of the crop cannot be marketed in a way that satisfies consumer requirements with respect to fresh visual appeal and turgor (see FAO, 1988).

Europe is by far the leading importing bloc in the world market for various types of green beans, ranging from the high quality and high-priced French beans to bobby beans (also called snap beans or string beans). France is the main importer in Europe. Most beans are imported during the European off-season from October to June. At the beginning and end of this off-season, European countries are supplied primarily by Spain and Italy. African suppliers predominate in the November-December to April-May off-season period.

The counterseasonal green bean market is a highly competitive market, in which a premium is paid for the highest quality fine and extra fine beans. France is the major importer of fine and extra fine beans, while Germany, the Netherlands and Belgium import primarily bobby type beans.

Egypt leads among exporters on the African continent, shipping primarily bobby beans to the Netherlands, from where part of the imports are re-

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<sup>5</sup>Note that using average annual exchange rates provides a rough approximation of the dollar value of imports from Senegal. Horticultural exports are concentrated during the December-May period and not evenly distributed across the year. To calculate precise dollar equivalent values, we would need monthly exchange rate and import value data.

exported to other points in Western Europe. The West African countries of Senegal, Burkina Faso, Cameroon, Mali and Niger export principally to France. All year round Kenya produces and ships predominantly very high quality filet or needle French type beans (95.0% of total green bean exports in 1986 according to World Bank, 1988), destined largely for use by restaurants and specialty horticultural shops in France and the U.K.

FAO (1988) believes that most of the growth in the high quality French bean market has already taken place in Europe, with the largest volume increases during the early 1980s occurring in the Netherlands and the U.K. Generally the European counterseasonal market is already saturated, as Egypt, Burkina Faso and Spain (especially the Canary Islands) have recently expanded exports. The suppliers which will have the most success in increasing market share in Europe will need to supply the highest quality product on a reliable and timely basis. FAO states that top quality produce needs to be packed in small packs of 2-3 kilograms net weight, and shipped in fibre board cartons with sufficient strength and adequate ventilation. Furthermore, "the beans should be placed neatly in rows within the cartons. Filet beans should preferably have a length of 8-12 cm., while bobby beans could be somewhat longer." (p. 87)

Fine quality green beans have varied in price from 14 to 24 FF per kilogram in the Rungis wholesale market outside Paris in recent years, depending upon the season. Bobby type green beans fetch lower prices, varying between 8 and 18 FF per kilogram. Plots of green bean prices during the past two counterseasonal marketing periods are shown in Figures C-2, C-3 and C-4 of Annex 3.

Kenya has consistently outperformed competing exporters in supplying fine and extra fine beans, and Kenyan beans fetch the highest prices in major European markets, especially France. Senegal produces both fine and bobby type green beans for export, shipping most of the fine type to the Paris wholesale market at Rungis.<sup>6</sup> Importers complain that Senegalese beans vary in quality more than Kenyan beans, and that delays in air-shipment and less than ideal handling in transport and loading negatively affect the quality of Senegalese beans. While both Burkina Faso and Egypt have greatly expanded exports to European markets in recent years (see Table 17), they specialize in producing bobby type green beans, and hence do not compete directly with Kenya and Senegal in the fine and extra-fine bean submarkets.

According to a recent COLEACP newsletter (December 1988 issue), EC imports of green beans from developing countries reached nearly 35,000 metric tons in 1986. As shown in Table 17, Egypt and Kenya accounted for 59.8% of

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<sup>6</sup>Recent Senegalese export data, provided by the Phyto-Sanitary Service at the Yoff Airport (see Table 9), suggest that the proportion of filet or French bean shipments from Senegal to Europe among total green bean exports is declining. In 1986-87, 1,778 MT or 62.3% of total green bean volume was French beans. In 1987-88, 1269.5 MT or 50.4% were filet or French beans. By 1988-89, the percentage had dropped to 40.8% on shipments of 880.2 MT of French beans.

European imports from ACP (African, Caribbean and Pacific) countries in 1986. What is most striking is the percentage expansion in imports from these two key suppliers and Burkina Faso during the 1980s, contrasted with the stagnation of green bean imports from Senegal.

Table 17

EC Green Bean Imports, 1986

<u>Supplier</u>	<u>Volume of Imports</u> (in MT)	<u>Percentage of Total</u> (in %)	<u>Percentage Increase,</u> <u>1981-1986</u> (in %)
Egypt	11,940	35.2	106
Kenya	8,340	24.6	67
Senegal	3,991	11.8	11
Burkina Faso	3,341	9.8	260
Others	6,340	18.7	
Total	33,952	100.0	

Source : COLEACP Bulletin, December 1988

4.3.2 The European Market for Melons

There are two main types of melons in the international melon trade.<sup>7</sup> The first type is known as muskmelons and include the cantaloupe and charentais groups. Muskmelons are relatively small (0.4 to 1.2 kg.) and are highly perishable, requiring special handling and transport. The second type of melons, the honeydew group, vary in size, shape and color of skin and fruit. Generally, they are heavier and larger in size than muskmelons, and they are better able to withstand storage (up to a month) and long-distance travel (especially by sea). The Francophone (France, Belgium/Luxembourg, Switzerland) countries import more muskmelons, including the charentais variety which is grown in Senegal. Germany, the Netherlands and the U.K. import larger volumes of honeydew and cantaloupe from numerous suppliers, including Spain, Turkey, Italy, Israel and some countries in the western hemisphere.

According to COLEACP (see December 1988 newsletter), EC countries imported 28,654 tons of melons in 1986, of which 4,356 tons or 15.2% came from the ACP countries (African, Caribbean and Pacific developing countries). The principal exporters and quantities imported into the EC are shown in Table 18.

FAO (1988) considers medium to long-term prospects for melons (all types) to be quite good. Prices for cantaloupe types of melons fetch higher prices

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<sup>7</sup>The following material on melons is adapted from FAO, The World Market for Tropical Horticultural Products, 1988.

than honeydew melons, reaching \$2.00 - \$2.50 per kilogram in European markets. The FOB price of melons in Senegal was 475 FCFA (or \$1.50-1.60) per kilogram in late 1988 and early 1989. Price data for melons sold during the past two counterseasonal marketing seasons in wholesale markets in France, Germany, the Netherlands, Belgium and New York are shown in Tables C-20 through C-24 of Annex 3.

Table 18

EC Melon Imports, 1986

<u>Supplier</u>	<u>Volume of Imports</u> (in MT)	<u>Percentage of Total</u> (in %)
Israel	8,598	30.0
Brazil	4,536	15.8
Turkey	3,718	13.0
South Africa	2,627	9.2
Chile	2,483	8.7
Jamaica	2,224	7.8
Senegal	1,198	4.2
Others	3,270	11.4
Total	28,654	100.0

Source: COLEACP Bulletin, December 1988

#### 4.3.3 The European Market for Mangoes

Mango shipments from developing countries to Western Europe more than doubled between 1982 and 1986, according to ITC import statistics. Total mango imports into Western Europe were reported to be 30,624 MT in 1987, as shown in Table 19.

Total mango imports expanded by 120% over the five-year period to the level of 30,624 MT.<sup>8</sup> Even more striking is the fact that recorded mango imports into the same group of European countries, excluding Italy, Spain and Austria, were a mere 2,873 MT in 1975 and only 7,812 MT in 1979. The compound growth rate over the 13-year period from 1975 to 1987 was nearly 22% per annum.

By 1987 Senegal was not even among the top 14 suppliers of mangoes to Europe. Brazil (3,412 MT), Venezuela (3,219 MT), the U.S. (3,110 MT) and Mexico (2,891 MT) of the Western Hemisphere were the top four suppliers, together comprising 41.2% of the European market. According to ITC's Market

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<sup>8</sup>By way of comparison, U.S. imports of mangoes, entirely from countries in the Western Hemisphere, reached 58,346 MT in 1987 (ITC/MNS, 1989).

News Service, these four countries have expanded their exports through promotional activities and investments in grading and packing facilities (MNS/ITC, "Mangoes," 1989). The leading Sub-Saharan African suppliers were Côte d'Ivoire (fifth place with 1,586 MT), Burkina Faso (eighth with 1,051 MT), Mali (twelfth with 765 MT), Kenya (thirteenth with 500 MT), and Gambia (fourteenth with 216 MT).

The weighted average import (CIF) price for mangoes in EC markets in 1987 was \$1,849 US dollars per metric ton. The two countries that imported at least some mangoes from Senegal during the 1980s, France and the Netherlands,

Table 19

Imports of Mangoes into Major European Markets  
(in metric tons)

<u>Country</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1987 Market Share (in %)</u>	<u>% Increase, 1983-1987</u>
U.K.	4724	5178	6463	8831	9622	31.4	103.7
France	4076	4424	4971	6171	6330	20.7	55.3
Netherlands	1960	2033	2515	4441	4954	16.2	152.7
Germany	1136	1511	1746	3083	4227	13.8	272.1
Italy	234	262	553	599	1018	3.3	335.0
Switzerland	NA	NA	NA	438	972	3.2	NA
Belgium/Lux.	382	458	529	656	833	2.7	118.1
Sweden	424	373	406	481	514	1.7	21.2
Denmark	47	88	135	268	283	0.9	502.1
Spain	37	14	27	11	42	0.1	13.5
Austria <sup>a</sup>	668	692	893	1058	1181	3.9	76.8
Norway <sup>a</sup>	255	369	346	538	648	2.1	154.1
TOTAL	13,943	15,402	18,584	26,575	30,624	100.0	119.6

Source: International Trade Centre, Market News Service (ITC/MNS), Horticultural Products Newsletter, "Mangoes," May 1989. Figures from foreign trade statistics of cited countries.

Note: <sup>a</sup> includes avocados. The totals for 1983-85 exclude Switzerland.

paid slightly higher prices on average (\$1,904 per ton) and significantly lower prices (\$1,653 per ton) respectively.

Prices fluctuate seasonally primarily as a function of the timing of produce arrivals at European markets. There are peak supply periods during the winter months, when imports from southern hemisphere countries predominate, and during the spring-summer period, when northern hemisphere countries harvest and ship their mangoes. Senegal's harvest and export period (May-August) overlaps with the peak season of competing West African

suppliers: Côte d'Ivoire (April-August), Mali (March-July) and Burkina Faso (March-July).

According to FAO (1988), prospects for international mango trade continue to be strong. Importers in Europe and the U.S. consider mangoes as having strong growth potential. FAO reports that some European importers think that mango imports, approximately 30,000 MT in 1987, could attain the level of avocado imports, which range from 90,000 to 100,000 MT. FAO argues that the key constraint to expanding the volume of exports is the . . .

"supply of high quality fruit of attractive varieties, i.e., those with excellent appearance and good eating qualities, which are offered to the consumer at the right point of maturity. This problem has not always been satisfactorily resolved. It requires perfect harvesting, post-harvesting and transport operations. Furthermore, the mango fruit is very delicate and highly perishable resulting in high costs of packaging, transport (by air) and wastage." (see FAC, 1988, p.6)

Senegal's steady decline in mango exports is largely a function of European consumer preferences and expanded supplies of more desirable varieties from other suppliers. Senegalese mango varieties tend to be greenish, which are less popular than yellowish or orange varieties, and immature fruit has sometimes been shipped.

#### 4.3.4 Cherry Tomatoes

Several Senegalese firms have begun growing cherry tomatoes for export, but this commodity is generally not well-known in Europe. As such, there will need to be promotional efforts if cherry tomatoes are to make inroads in European consumption patterns. The East Coast of the U.S. could be a potential export market for cherry tomatoes produced in Senegal if phytosanitary and transport constraints could be relieved. According to statistics for the Rungis wholesale market outside Paris, imports from Senegal expanded 30% during the November 1987-May 1988 period over the previous export season, reaching 324 MT. Cherry tomatoes, delivered to Rungis market in Paris, were commanding 735 FCFA per kilogram in late 1988 and early 1989.

#### 4.3.5 Processed Tomato Products

According to FAO (1988), the two most common processed tomato products on the world market are canned tomato paste and canned whole tomatoes. Canned tomato paste is produced in both developed and developing countries, while processing of canned whole tomatoes is limited to industrial countries. Consumption of tomato paste has expanded rapidly in developing countries, whereas increased consumption of whole tomatoes has been restricted to higher income industrial countries.

World production of tomatoes for processing expanded from 12 million tons in the early 1970s to 19 million tons in 1984-85 (FAO, 1988). EC processing increased over three-fold from 2.3 million tons per annum in 1972-74 to 7.5 million tons in 1984-85, due largely to financial aid to processors

("production aids") and minimum prices paid to growers established in 1978. As with subsidies paid for production of other commodities, the EC was unable to subsidize all processing of tomato products and decided to limit financial aid to processors up to a threshold level of 4.7 million tons of fresh tomatoes as of 1984-85. Despite this measure, oversupply and depressed prices characterized most EC markets in the mid 1980s. It is important to note that the U.S. is the largest producer of tomato paste in the world and second to Italy in production of canned whole tomatoes. Most of the U.S. output is destined for domestic consumption. In contrast, tomato paste shipments from the EC 10 comprised about 60% of total world exports in 1985. Italy alone ships over 70% of total world exports of canned whole tomatoes.

FAO cautions prospective exporters of processed tomato products, citing highly competitive international markets and subsidized production and export. Countries such as Senegal can only hope to substitute for expanding imports, provided the domestic market is large enough to establish a processing industry with adequate scale and sufficient technology to produce tomato products efficiently. Even then, low-priced imports are likely to undermine local processing unless governments are willing and able to intervene in domestic markets to protect local agro-industry. FAO predicts that the level of initial, necessary protection is likely to decline as subsidies granted by the main suppliers of tomato products on the world market decrease, and as domestic demand expands in the developing country granting the protection.

#### 4.3.6 Capsicums

Capsicum is a genus designation for the family of vegetable crops which includes sweet, green and bell peppers, chillies or hot peppers, and paprika. Senegal exported large volumes of bell peppers during the 1970s under the EUD-Senegal scheme. Senegal continues to export capsicums or sweet peppers, principally the variety sucette de provence, but at far lower levels than during the 1970s.

According to FAO (1988), the international market for sweet peppers is growing steadily and prospects for counterseasonal exporters remain good. International traded volume topped 500,000 MT in 1985, with over 60% or greater than 300,000 MT imported into Western Europe. The U.S. is also an important market for sweet peppers, but it is supplied largely through domestic production and off-season imports from Mexico.

Trade in chillies or hot peppers is less important in volume and value terms than trade in sweet peppers, although precise estimates are impossible, because many countries do not differentiate between sweet and hot peppers in trade statistics. FAO (1988) estimates that two-thirds of the hot pepper imports in the U.S. and Western Europe are destined for the industrial or food processing market.

Chillies are an important ingredient in the diets of people of Northern African descent living in Europe. Key suppliers in season are Italy, Turkey, Yugoslavia, Greece, and Spain, while Mexico, Morocco, Kenya, India and China

are important counterseasonal suppliers. Interestingly, Germany is the largest importer.

#### 4.3.7 Okra

FAO (1988) reports that the fastest growing market for okra imports is the U.S., with prospects uncertain in Western Europe. Most of the likely import growth in the U.K. has probably already occurred.

As in the case of chillies, okra does not always appear as a separate item in the export or import statistics of producing and importing countries. The European market is principally an ethnic market. The U.K. is by far the largest importer with its large population of Asian and African descent. According to Senegalese trade statistics (see Table 9), okra exports increased from 21.7 MT in 1987-88 to 150.5 MT in 1988-89.

## 5.0 Opinions and Perceptions of European Importers Regarding Senegalese Horticultural Products

Consultants affiliated with AMIS (H.J. Mittendorf and P. de Balogh) carried out face-to-face and telephone interviews with selected European importers, particularly those in France, the Netherlands and West Germany, after the completion of the 1988-89 marketing season. When asked to evaluate the quality and reliability of Senegalese exports, the importers were rather critical. The primary problems revolve around the quality of Senegalese produce vis-a-vis competing suppliers, and the uncertain reliability of Senegalese shipments.

### 5.1 Quality Problems

French importers stated that the quality of produce exports generally declined after the suspension of the BUD operation in Senegal in the late 1970s. At that time and during the early 1980s a number of firms, lacking in experience with horticultural products, began to air-ship produce. According to importers, these firms did not fully appreciate the exigencies of the French market, and produce quality was uneven. This soured most importers on exports from Senegal. Several importers responded by collaborating more intensively with several firms, including SAFINA, JARDIMA, and a cooperative, which led to improvements in quality. Complaints about quality are directed at green beans, particularly the fine and extra-fine grades, mangoes and melons.

Green Beans. Bobby green beans, the type of green beans found in the U.S. market, generally arrive in good condition. Importers complain of quality deterioration in the higher quality filet or French beans. Poor post-harvest handling practices in the field, in transport to the airport, and while clearing customs at the airport have contributed greatly to quality deterioration in French beans, which are highly perishable. Pre-cooling in the field and at the airport, refrigerated transport, and proper packaging materials are essential for maintaining the quality of fragile horticultural produce. Frequent delays in shipment, due primarily to the inability of the international airlines to comply with announced timetables, leads to significant quality deterioration, which shortens the keeping quality of produce once it reaches Europe. Exporters complain about delays to the airlines, but the problem has not been resolved satisfactorily from the exporters' perspective (see COLEACP Bulletin, August 1989).<sup>9</sup>

Melons. Importers stated that melons shipped from Senegal were too green (harvested immature) for the French market. Senegalese melons fetch far lower prices than melons from other countries. As an example, Senegalese melons sell for 13-14 French francs per kilogram in the Rungis wholesale

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<sup>9</sup>Most observers (see Tropical Development and Research Institute, 1987 and FAO, 1988) anticipate that the air cargo capacity will become an even greater constraint for tropical exporters, particularly new entrants, during the 1990s.

market (outside Paris), while melons from Martinique command 20-25 FF per kilo. Senegalese yields are also reported to be low, ranging from 10 to 15 tons per hectare. Other countries are reported to attain yields of 20-25 tons. Some French importers report re-exporting Senegalese melons to the Netherlands and Belgium, where consumers will accept a less ripe melon.

Mangoes. Mango imports from Senegal are often shipped from Casamance to the Dakar airport, which leads to bruising in transport and difficulties in coordinating shipments with international air freight. The green color of Senegalese mangoes is a disadvantage, as red and yellow colored varieties exported by South and Central American countries are strongly preferred.<sup>10</sup> According to the Tropical Development and Research Institute (1987), European importers prefer the varieties Haden, Tommy Atkins, Keitt, Kent and Sensation, which are not grown in Senegal. The Senegalese variety is called Aivine (Ministère du Développement Rural, 1988).

Cherry Tomatoes. Importers are satisfied with the quality of Senegalese cherry tomatoes. As a relatively new product with potential for significant expansion, Senegalese exporters appear to be well-placed to profit from increased demand. A German importer reported that Spain is increasing production of cherry tomatoes, although labor costs and hence prices are rising steadily.

Pepper. Exports declined 60% from the 1986-87 export season to 1987-88. The sweet, green variety "sucette de provence" is the main export and comparable in quality to shipments (of the same variety) from Morocco. According to importers, market prospects for Senegal depend heavily on supplies from Morocco. As a minor, residual supplier of the French market, Senegal needs to time production and harvesting so as to ship before Moroccan supplies arrive in European markets.

## 5.2 Reliability Problems

The perception that the Senegalese exporters are not as reliable or timely in shipping produce as, say, their Kenyan competitors, stems in large part from international shipping difficulties. Air cargo capacity is limited in West Africa and often shared among several countries. Much of Senegal's horticultural produce is shipped on passenger planes with limited cargo space. Allocation of the limited available space is a source of contention between the two Senegalese export associations, which compete for space, among horticultural produce exporters and airline officials (particularly those of Air Afrique), and among exporters of horticultural and seafood products. Air Afrique has planned to allocate 40% of available cargo space to seafood products, which command higher shipping rates.

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<sup>10</sup>In one study of horticultural imports into Europe from tropical countries (see Hoermann and Will, 1987), the authors interviewed importer in several European terminal markets. Senegalese mangoes were rated lower in quality and consumer preference than nearly all other types of mango imports.

Uncertainty in shipping dates and delays in arrival on days when horticultural produce is shipped create problems for large-volume importers, who increasingly contract with institutional buyers, such as supermarkets (les grandes surfaces), specialty stores, and hotels and restaurants. These buyers are willing to pay top dollar but intolerant of breach of contract. Two large importers based in Paris, Pascual and Pomona, do not import from Senegal, because discontinuous shipments make it difficult to fulfill supply contracts.

Another transport problem affecting exporters of horticultural products in several West African countries is the preponderance of international flights to Paris, Brussels and Geneva towards the end of the week. This is unfavorable for exporters, because institutional buyers tend to purchase their supplies early in the week. French importers stated that imported produce needed to arrive in time for the Tuesday or Wednesday markets to fetch the best prices. Horticultural products arriving Friday or Saturday are generally not sold until the following Tuesday, by which time quality deteriorates and prices received decline.

### 5.3 Recommended Improvements

European importers stressed that it was essential for Senegalese exporters to improve the timing, post-harvest handling and logistics of export operations to be as competitive as possible. Planting and harvesting need to be properly timed to correspond to periods of highest prices in foreign markets as well as shipping opportunities, and to harvest fruit of the proper maturity.

One practice in Senegal that works against precise timing in harvesting is the payment of one price to growers for all green beans (i.e. one price for all French beans and another for all bobby beans). Producers let the beans grow longer in order to maximize yields and their profits. Unfortunately, this practice leads to lower returns for exporters in the European market, where premium prices are paid for the thinnest fine and superfine beans. Beans that are harvested later are thicker than the Kenyan beans and hence command lower prices in the highly discriminating French market.

Importers also insisted that the logistics of exporting horticultural produce needed to be carefully coordinated. They recommended that produce should not be harvested much in advance of planned delivery to the airport. Produce should not sit for long periods at the airport, and it needs to be palletized for ease of handling. European produce "distribution systems are highly mechanized and produce is transported as pallet loads. For this, packs that fit well onto the customary pallet and retain rigidity are required." (Tropical Research and Development Institute, p. 18, 1987)

### 5.4 Targetting Non-Francophone Markets

Expansion of Senegalese exports to non-Francophone European markets (such as Germany, the Netherlands and the U.K.) is problematic without promotional

efforts, because consumers in these countries do not widely consume fine and extra-fine green beans or the French-type charentais melon. Bobby green beans and other melon varieties, such as honeydew and cantaloupe, are widely consumed and appreciated. Without some form of external assistance, it is questionable whether Senegalese exporters would be willing and able to mount a costly promotional effort in introducing new varieties in markets other than France, Belgium/Luxembourg and Switzerland. If foreign assistance were provided, it might be directed to the exporters' associations rather than to individual firms.

Interviews with German importers revealed a skepticism regarding Senegal's ability to export horticultural products, particularly bobby beans, on a reliable basis. Air cargo space limitations were frequently cited as a recurring problem for Senegalese exporters, and one importer suggested holding a workshop with Senegalese exporters to discuss a strategy for strengthening Senegalese exports, which would address issues of air shipment and produce quality. German importers believe that Senegalese exports of green beans would be competitive during the January-March period, provided prices were not out of line with the competition (e.g., Kenya, Ethiopia, Egypt). Another importer would be interested in investing in production and export of horticultural crops in Senegal, provided the GOS favors European investment and does not interfere in private business ventures. A couple of German importers thought that there was scope for expanding melon exports, particularly by sea.

## 6.0 Key Constraints to Reversing Senegal's Decline in European Horticultural Markets

The biggest constraints to promotion of Senegalese horticultural products are post-harvest handling and packaging technology and international transport.

### 6.1 Post-Harvest Handling and Packaging Technology

As the European market has become increasingly competitive, developing country exporters of horticultural products are under pressure to upgrade post-harvest handling in the field, in transport and cold storage, and in preparing produce for international shipment. Most Senegalese exporters are operating with out-moded post-harvest handling techniques, which lead to produce losses and lower prices for produce that deteriorates in shipment but is not heavily damaged.

Few of the Senegalese exporters use state-of-the-art packing, precooling and cold storage technology. Horton (1987) reports that only JARDIMA, a firm whose shipments receive high marks from European importers, and SAFINA (Filfili) were using packing and cooling systems that compare well with international industry standards as of late 1986.

### 6.2 Freight

#### 6.2.1 Air Freight

Air freight is cited as a severe constraint to expansion of Senegalese exports. Air freight rates are presented below in Table 20. Exporters complain of the high and rising cost of air freight. Nevertheless, rates are lower than for exports from Kenya, which are 300 FCFA per kilogram during slack periods and 315 FCFA during the peak season (COLEACP Bulletin, December 1988).

In addition to its cost, availability of cargo space is a binding constraint. Most of the air freight is shipped by passenger airplanes with limited cargo capacity. This limited capacity is shared by several competing African countries (Senegal, Guinea, Côte d'Ivoire, Mali, Gambia). These passenger flights typically service two or more countries on any given flight to Europe. It is also important to note that airline companies favor shipments of seafood products, which command a higher price per kilogram, over horticultural products.

Exporters complain about delays in shipment, particularly by Air Afrique. Fresh produce will sometimes sit for several hours on tarmac areas adjacent to runways before loading. In Dakar's hot and humid climate, this can seriously diminish product quality.

**Table 20**

**Air Freight Rates from Dakar to Various Points**

<u>Destination</u>	<u>Products</u>	<u>1988-89 FCFA/Kg.</u>
Paris	Mangoes Avocados Pineapples Green Beans (Bobby)	225 FCFA/kg. for 2.5 MT minimum, i.e., one container.
	Lemons Eggplant Okra	240 FCFA/kg. for 500 kg. minimum.
	Green Beans (Filet) Melon Strawberries	245 FCFA/kg. for 2.5 MT minimum, i.e., one container.  260 FCFA/kg. for 500 kg. minimum.
Geneva	All fresh fruits and vegetables	285 FCFA/kg. for 500 kg. minimum.
New York	All fresh fruits and vegetables	345 FCFA/kg. for 500 kg. minimum.

In an October 1989 meeting of the Airfreight Committee, air freight capacity on passenger flights was allocated for December 1989-May 1990 by the major airlines serving Dakar. Allocations were set as follows:

**Table 21**

**1989-1990 Allocation of Air Freight Capacity by Airlines Serving Dakar**

<u>Month</u>	<u>Air Afrique</u>		<u>Air France</u>	<u>Swissair</u>	<u>Sabena</u>	<u>Lufthansa</u>
	<u>Total</u>	<u>Hort.</u>				
December	549	329	210			
January	584	350	348			
February	512	307	305			
March	541	329	241			
April	545	327	133			
May	520	313				
<b>Total</b>	<b>3,269</b>	<b>1,955</b>	<b>1,287</b>			<b>330</b>

Source: Airfreight Committee

Note: Air Afrique allocates 60% of its capacity to horticulture and 40% to seafood products.

Total air shipments of horticultural products were 4,093 MT during the 1986-87 export season, 3,853 MT in 1987-88 and 3,377 MT in 1988-89. The Airfreight Committee anticipates 4,600 MT of air shipments in 1989-90. Space allocations among the export associations and SEPROMA are 3,034 MT (66%) to GEPAS, 906 MT (20%) to ASEPAS, and 660 MT (14%) to SEPROMA.

### 6.2.2 Sea Freight

Sea freight using refrigerated containers is a lower cost alternative to air freight and is exploited very successfully by South and Central American exporters of horticultural produce. It is not widely used in Senegal, although several exporters are interested in its viability. Sea freight is unsuitable, however, for highly perishable produce such as French beans. Another possible constraint is that smaller exporters tie up scarce financial resources longer by using sea freight rather than air freight.

Shipping lines offer regular service from Dakar to Le Havre and Rotterdam. The BUD-Senegal scheme of the 1970s shipped much of its produce in containers by sea, but it has been little used during the 1980s by Senegalese exporters. However, it is reported that 437 MT of horticultural produce was shipped by sea in 1986-87, 501 MT in 1987-88 and 196 MT in 1988-89, principally to Rotterdam.

The cost of sea freight provided by TRANSCAP SENEGAL per refrigerated container of horticultural produce shipped from Dakar to Rotterdam (or to Le Havre) is 614,932 FCFA. This includes all handling charges and taxes. Transit takes six days, and the produce is kept at 6-7 degrees C. The per kilogram charge, assuming a fully loaded container, is 88-102 FCFA, which is about 40% of the cost of air freight. Transit costs from the seaport to the terminal market are generally higher than comparable costs for air freight.

One possible disadvantage to sea shipment from Dakar may be that vessels calling on Dakar make multiple stops along the West African coast before returning to Europe. This would clearly extend transit time beyond six days and could lead to produce quality deterioration, in spite of refrigeration.

### 6.3 Organization of the Horticultural Industry and Government Support

Most of the Senegalese firms which export horticultural produce are small relative to the international competition. As such, many lack the scale to make the necessary investments to upgrade irrigated production technologies and post-harvest handling practices. In addition, it is not clear whether the two exporters' associations provide any significant support to individual firms other than serving as a forum to discuss common problems such as air cargo availability.

Improving the performance of the Senegalese horticultural industry will most likely require foreign investment, technology and marketing management skills. The public sector has an important role to play, however, in

assisting exporters. In Kenya (see World Bank, 1988), the government (largely KHDA) has helped private exporters by the following:

- o improving varietal research and screening,
- o strengthening extension services to small farmers,
- o establishing packing stations in some production zones,
- o licensing exporters (and hence screening out unqualified entrants who could damage Kenya's excellent reputation as a reliable and high quality produce supplier in European markets),
- o providing market information on international horticultural markets to exporters in collaboration with ITC,
- o assisting in developing a workable system for allocating air cargo space,
- o inspecting produce shipments at the airport prior to export (to maintain quality standards and ensure that regulations are followed), and
- o helping to standardize air shipment containers.

In Senegal, it is not clear how effectively the government has played a facilitating role other than in establishing the Airfreight Committee. Horticultural sector development documents prepared recently (see Ministère du Développement Rural, 1986 and 1988) seem to be quite broad-brushed calls for greater government and donor investment and greatly expanded production by the year 2000. The GOS plans for increased diversification in irrigated agriculture in the Fleuve as more irrigated land comes on stream, although there is little economic analysis of costs and benefits of alternative crops. Generally, the MDR documents provide few operational details about how to attain these expanded production objectives. The GOS (and donor agencies, particularly FAO and the Belgians) have funded the research trials, extension activities, and minimal economic research of the CDH. Although it is beyond the scope of this paper to evaluate the CDH experience, the benefits of public investment to date do not appear to have been very significant. Horton's profiles of 10 horticultural export firms suggest little or no GOS assistance to the horticultural industry.

In the short run, the GOS can probably most effectively assist private exporters by continuing to mediate in air cargo space allocation disputes and encouraging exporters to consider the sea freight option. Over the medium term, the GOS can also provide resources for research on post-harvest technology and handling for horticultural products. It is probably beyond the scope of the MDR, ISRA or CDH to provide up-to-date market intelligence for exporters, and these public agencies should not be the sole beneficiaries of specialized training in horticultural economics and trade or study tours. Donors could consider channeling assistance to the export associations, which would be the prime beneficiaries of such a service. Establishing some

private sector willingness to pay (at least partially) for the costs of improved market intelligence would be desirable rather than providing such a service free of charge.

It is interesting to note that most of the major exporting firms are subscribers to COLEACP, in addition to maintaining close contact with selected importers through periodic visits to Europe, or visits by importers to Senegal, and frequent telexes and telephone calls (Horton, 1987 and interviews with importers).<sup>11</sup> Sources of information about the European horticultural market are discussed in Annex 4.

#### 6.4 Relationships of Exporters to European Importers

Most Senegalese exporters ship their horticultural produce to European importers on a consignment basis. This means that the exporters bear all the risk of price fluctuations which can lower returns and sometimes lead to losses. Importers handle the consignment, taking the current spot market price, and deduct a certain percentage as a brokerage and handling fee.

While there is little doubt that Senegalese exporters will continue to be price-takers in European markets in the medium term, it would be advantageous if they could lock in positive and adequate returns on every shipment to Europe. Individual Senegalese exporters, particularly lower volume exporters, are clearly at a bargaining disadvantage in their negotiations with importers, and there is probably little they can do in the short-term. In the medium to long term, exporters can develop closer relations with importers, encouraging them to invest resources in Senegalese horticultural production and marketing, and working out well-defined contractual arrangements which guarantee minimum prices or in some way spread the risk of adverse price fluctuations. As Senegalese exporters increase their scale over the longer term and develop reputations for supplying high-quality products on a timely basis, they will begin to exercise greater bargaining power.

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<sup>11</sup>Some French importers are reported to be investing in Senegalese horticulture through informal joint ventures.

## 7.0 Other Potential Export Markets

### 7.1 The West African Market

Exports to (and imports from) neighboring countries (Mali, Mauritania, Guinea and Guinea Bissau) are often not accounted for or underreported, and the trade data appear to be unreliable. There appear to be exports of citrus fruit and bananas from Senegal to Mali and Mauritania. It is reported that much of the fruit and some of the vegetables exported from Senegal to Mauritania originate in Guinea or Guinea-Bissau. Senegal should continue to benefit from this interregional trade between tropical coastal countries and the Sahel. Senegal has a better road system than its neighbors, and it could develop a larger horticultural service industry handling transport, packaging and conditioning of horticultural products.

In addition to exporting horticultural products to neighboring African countries, there may be limited scope for shipping fresh produce to other African countries such as Gabon. Horton reports that SOEX has exported melons to Gabon.

### 7.2 European Market Opportunities Other Than France

Approximately three-quarters of Senegal's horticultural exports go to France. Current transport and trading links orient francophone African countries towards France and Belgium/Luxembourg and the anglophone countries towards Great Britain and the Netherlands. Germany and the Scandinavian markets have not been tapped by francophone African exporters.

This situation will likely change with the creation of the single European market in the 1990s. Horticultural product marketing and distribution will probably change quite dramatically. The large importing/wholesaling firms will develop more pan-European than national distribution strategies. Market opportunities for counterseasonal and tropical products could expand significantly. The European firms which benefit from these opportunities will be the largest and best organized firms, able to achieve scale economies and provide the highest quality products to retail firms and other institutional buyers (restaurants, hotels, etc.) along with professional, quality service. Effective packaging, timely delivery of pre-specified quantities, and phytosanitary treatment in accordance with European legislation will be key elements of the pan-European companies' strategies.

The entrance of Spain and Portugal into the EC has heightened competitive pressure on developing country exporters. ACP (Africa, Caribbean and Pacific) producers and exporters will have to invest significant sums in order to deliver quality products or to explore other niches. The tropical fruit market (for mangoes, papayas, and guavas) remains underexploited. The market for "ethnic" products, such as "Asian vegetables," may also offer potential for expansion.

It is also important to note that European unification will likely remove special trade preferences granted by France to ACP (Lomé Convention)

countries, particularly duty-free entry of tropical fruit and counterseasonal vegetables. This could worsen the competitive position of Francophone African countries such as Senegal vis-a-vis competitors around the Mediterranean Sea (Egypt, Israel, Turkey) and South and Central American countries.

## 8.0 Export Opportunities in the U.S. Market

This section will discuss the U.S. market for the horticultural products exported by Senegal, transport costs from Senegal to the East Coast, and U.S. Government import regulations.

### 8.1 Characteristics of the U.S. Market for Off-Season Fruits and Vegetables

Sizable quantities of green beans, green peppers, mangoes, melons, and cherry tomatoes are imported to the United States during the off-season.<sup>12</sup> Perhaps more importantly, with the exception of mangoes and cherry tomatoes, the levels of imports of these products continue to follow an upward trend. As a point of reference, quantities imported in 1988 and the percentage changes from the prior year are presented in the Table 22.

Table 22

#### U.S. Horticultural Imports in 1988

<u>Product</u>	<u>1,000 CWT</u> <u>(as reported)</u>	<u>Metric Ton</u> <u>Equivalent</u>	<u>Change from 1987</u>
Green Beans	344	15,636	+21%
Cantaloupe	3,492	158,727	+12%
Honeydew Melons	910	41,364	+11%
Green Peppers	2,316	105,273	+3%
Cherry Tomatoes	835	37,955	-1%
Mangoes <sup>13</sup>	813	36,955	-37%

The seasonal pattern of these imports has remained fairly constant over the last four years. As one would expect, the vast majority of foreign produce is imported during the months when U.S. production is at its lowest. Indeed, imports of these particular products tend to complement, rather than compete with, U.S. production. In addition, higher import tariffs for melons, mangoes and tomatoes are applied during the U.S. growing season, thus contributing significantly to the seasonal nature of these imports.

It is also worth noting that the stability of the seasonal patterns over time suggests that the import market windows for these products have been well exploited. Industry participants and USDA officials have agreed that the current U.S. off-season market for these products, with the exception of mangoes, is, in fact, very well supplied. The seasonal nature of domestic production and import quantities is depicted in Table 23.

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<sup>12</sup> It should be noted that the variety of melon that is produced in Senegal, charentais, is not produced or widely consumed in the U.S.

<sup>13</sup> Imports of mangoes have fallen drastically over the last two years due to a tightening of APHIS restrictions. See below.

Table 23

U.S Horticultural Imports by Source and Date

<u>Product</u>	<u>Source</u>	<u>Season</u>
Mangoes	Domestic: Imports:	June through August (Minimal) March through December.
Green Beans	Domestic: Imports:	November through May (Heavy) June, August and September (Light) Mainly January through March (Some Year-round)
Cantaloupes	Domestic: Imports:	May through October December through May
Green Peppers	Domestic: Imports:	Year-round December through March (Lighter) December through April (Heavy) May through November (Lighter)
Honeydew	Domestic: Import:	May through October (Heavy) Rest of Year (Light) December through May (Heavy) November (Light)
Melons (Mixed)	Domestic: Imports:	June through August January through May
Cherry Tomatoes	Domestic: Imports:	Year-round November through May

The list of foreign countries that supply the above products to the U.S. market has also remained fairly constant over the last four years. Current suppliers are listed in Table 24.

Given U.S. domestic supply periods and Senegal's production season, Senegalese exports would not compete with U.S. production but instead with the production of other foreign suppliers. Thus, the characteristics of the current foreign suppliers should be carefully considered.

Most of the countries that currently supply the U.S. market with off-season fruits and vegetables have a significant advantage over Senegal in terms of geographic location and therefore transportation cost. Mexico, the largest supplier of off-season fruits and vegetables to the U.S market, in particular, is able to rely substantially on less expensive truck transportation. Similarly, Caribbean and Central American suppliers are able to transport horticultural products in refrigerated containers by sea at relatively low costs. In contrast, Senegal would have to resort largely to costlier air cargo to bring products to the U.S. market.

Table 24

**Foreign Suppliers of Selected Horticultural Products to the U.S. Market**

<u>Product</u>	<u>Primary Suppliers</u>	<u>Secondary Suppliers</u>
Cherry Tomatoes	Mexico	None
French Beans	Mexico	Canada, Guatemala, Belgium
Green Peppers	Mexico	Many others in small amounts
Melons - Misc.	Mexico, Panama, Chile Guatemala, El Salvador Ecuador, Costa Rica	Dominican Republic, Brazil
- Honeydew	Mexico	
Mangoes	Mexico, Haiti	Jamaica
Cantaloupes	Mexico	Honduras, Guatemala, Dominican Republic

It is also important to note that many of the foreign countries that currently supply the U.S. off-season market have done so for a number of years. Most have well-established export infrastructures in addition to long-standing relationships with wholesalers and importers in the U.S.

**8.2 U.S. Government Import Regulations and Procedures**

Agricultural imports are regulated by four separate government agencies: the Department of Agriculture (USDA), the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), and the U.S. Customs Service (USCS).

**8.2.1 Applicable Tariffs for Senegal**

The USCS is responsible for enforcing regulations that govern the flow of goods into the U.S. (e.g. import quotas) and for assessing import duties and taxes.

Import tariffs vary with the status of the exporting country, the commodity imported and, for agricultural products, with the season. Senegal qualifies for a special tariff rate structure due to its developing country status under the General System of Preferences (GSP). Import duties for selected fruits and vegetables applicable to Senegal are shown in Table 25.<sup>14</sup>

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<sup>14</sup> A complete copy of the Tariff Schedules of the United States can be obtained from the Government Printing Office, Washington, D.C., 20402.

Table 25

Import Duties for Selected Horticultural Products Entering  
the U.S. Market

<u>Product</u>	<u>Tariff Incidence</u>	<u>Months Applicable</u>
Tomatoes	No Tariff \$0.046 per kg.	Nov. 15 through Feb. Mar. through July 14
Green Beans	\$0.033 per kg \$0.077 per kg	July 15 through Aug. Jan. through Dec.
Melons (Other)	8.5% 35%	December through May June through Nov.
Green Peppers	No tariff	
Mangoes	No tariff \$0.0827	Sept. through May June through August
Cantaloupes	No Tariff 20%	Sept.16 through July Aug. through Sept 15

8.2.2 Animal and Plant Health Inspection Service (APHIS) Regulations

A regulatory agency within USDA, APHIS, is responsible for enforcing import regulations that protect U.S. livestock and agriculture from foreign pests and insects.

Indeed, many agricultural products from Senegal, such as mangoes, melons, green peppers and cherry tomatoes, are absolutely prohibited from entering the United States due to concern over pests and insects which are endemic to the African continent. The import status may be changed, however, if - upon solicitation from an exporter - a new investigation by APHIS finds the prohibition unwarranted. Historically, the predominant reason for a change in status has been the development of an acceptable pest eradication treatment.<sup>15</sup>

For many fruits and vegetables, such as French beans, acceptable treatments such as vaporizing, hot baths, or freezing can even reduce quality and shelf life and thus market value.

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<sup>15</sup> To be acceptable, a treatment must be totally effective in eliminating live pests, must not leave unsafe chemical residues in the product, and must not reduce marketability of the product (e.g. shelf life or quality). Due to these stringent requirements, there is only a limited range of acceptable treatments for perishable products. Any new treatments require a rather lengthy processtesting and approval by the Environmental Protection Agency.

### 8.2.3 Food Safety Regulations

The Food and Drug Administration (FDA) is responsible for ensuring that foods in the U.S. (imported and domestically produced) are safe, pure and wholesome. While FDA regulations are more applicable to processed foods, some regulations, such as those governing packaging materials, do apply to horticultural products.

### 8.2.4 Environmental Protection Regulations

The EPA is responsible for enforcing regulations that delineate what constitutes acceptable levels of pesticide residues in food products. Thus, the EPA determines which treatments against pests are considered acceptable.

### 8.2.5 Import Procedures

Prior to transporting most agricultural products to the U.S., an importation permit must be obtained. These permits are issued by APHIS and generally take two full weeks for processing. Also, some products, such as French beans, are restricted to specific ports of entry. Other products, however, such as coconuts, Macadamia nuts and fresh mushrooms can be imported into any U.S. port without import permits.

All imports are subject to inspection upon arrival in the United States by APHIS and USCS. APHIS inspectors can reject imports that are deemed insect-infested or alternately can require the shipment to be treated at the expense of the importer (under the supervision of the APHIS) in the U.S. In practice, inspection and release of perishable imports generally take less than 24 hours. Inspection and release of non-perishable imports can take substantially longer.

The risk of U.S. rejection of imports at the port of entry can be reduced through the implementation of a Cooperative In-Country Inspection Program. The program posts APHIS inspectors in the exporting country during the export season and is jointly operated by APHIS and a counterpart agency in the exporting country. For a cooperative program to be undertaken, the exporting country must initiate a request for the program and must export a sufficiently large volume to the U.S. to justify the program. Currently, there are no In-Country Programs operating on the African continent. In contrast, many of the countries that currently export off-season fruits and vegetables to the U.S., such as Mexico, Haiti, Honduras, Dominican Republic, Brazil, and Chile, do have some form of In-Country Inspection Programs.

Further information about quarantines and import permits can be obtained from APHIS at the following address.

U.S. Department of Agriculture, APHIS  
Plant Protection and Quarantine  
Permit Unit  
Federal Building, Rm. 632  
Hyattsville, Maryland 20782  
Tel.: (301) 436-8645

### 8.3 Sources of U.S. Market Information

Current and historical information on U.S. agricultural markets is readily available from the United States Department of Agriculture. Various agencies within the USDA collect and analyze data on prices, quantities produced, quantities shipped within the U.S., quantities imported, and basic supply and demand forecasts. This information is collected at representative market points and at various levels in the marketing chain. The data and analyses made available to the general public through a variety of media include daily telephone price quotes, daily and weekly bulletins, and monthly and annual reports. Report and subscription services are provided on a fee basis. Three publications which appear particularly relevant to Senegalese exporters are listed below:

#### USDA -Agricultural Marketing Service (AMS)

##### **"Fresh Fruit and Vegetable Shipments"**

Interstate shipments and imports by commodity, by origin and by month. Published annually.

##### **"National Shipping Point Trends"**

Information on shipments, prices, trading, crop conditions, harvesting progress, and outlook for the next two weeks for various products at selected shipping points. Distributed weekly.

##### **"Terminal Market Reports"**

Prices by commodity and by origin. Disseminated through daily bulletins and annual reports for all major terminal markets.

Contact: USDA, AMS, Fruit and Vegetable Division, Market News Branch  
Rm 2503 - South Building  
P.O. Box 96456  
Washington, DC 20090-6456

#### USDA - Economic Research Service (ERS)

##### **"Fruit and Tree Nut Situation and Outlook Report"**

Supply and demand analysis for selected fruits and nuts. Published annually (August).

Contact: USDA, ERS  
Publications Office  
Rm. 208  
1301 New York Ave., N.W.  
Washington, D.C. 20005

The Market News Service (MNS) of the International Trade Centre (an UNCTAD/GATT affiliated U.N. agency) also provides information on prices of imported and domestic horticultural products in selected U.S. markets.

Services that are provided on a fee basis include weekly bulletins, monthly and annual reports, and custom historical price series reports.

Tables showing wholesale prices for green beans, mangoes and melons in selected U.S. markets over the last two years appear in Annex 3. The prices of mangoes and melons vary significantly over the course of the season. Prices vary somewhat between markets but more as a result of size and quality of the fruit. Indeed, less desirable sizes of mangoes and melons sold for as much as 75% less on a per pound basis than the preferred sizes.

#### 8.4 Quality and Packaging

Clearly, the U.S. market demands that imports be the highest quality available. Consequently, U.S. wholesalers and importers prefer uniformity in the size and color of produce and in packaging. Prices can vary significantly as a result of handling procedures, grading and presentation, regardless of the fruit's intrinsic value. Commonly accepted packing sizes are listed below:

Mangoes	Single layer flat crate or carton - 10 or 14 lbs - often wrapped individually
Green Beans	1 bushel <sup>16</sup> basket, carton or crate
Melons	30 lb carton or crate
Green Peppers	1 bushel or 1 and 1/9 bushel cartons or crates
Cherry Tomatoes	12 1-pint flat (12 cartons grouped by flat for shipment)

#### 8.5 Transportation and Handling

In general, all perishables must be precooled and transported under temperature controlled conditions to maintain quality. Air cargo can be transported from Dakar to New York on Air Afrique passenger flights (DC-10) twice weekly (Wednesdays and Saturdays). The rate for air cargo on Air Afrique as of August 1989 was FCFA 345 per kilogram, equivalent to US\$1.10 at an exchange rate of US\$1 = FCFA 315. Cargo space (which includes passenger baggage) is limited to 15 tons per flight. Senegal could theoretically ship approximately 1,000 MT of horticultural produce to New York over an eight-month production/marketing season.

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<sup>16</sup> One bushel equals approximately 14 kilograms (30 pounds) of green beans.

## 8.6 Implications for Senegal Entering the U.S. Market

Although the demand for off-season fruits and vegetables in the U.S. continues to rise, the ability of Senegal to tap into this market is severely limited by a number of factors. Clearly, USDA restrictions regarding pests and insects preclude the import of many agricultural products from Senegal. Senegal's inability to consistently meet the high quality standards of the U.S. market is also a factor. In addition, poor knowledge of the U.S. market and lack of English fluency represent significant entry barriers for Senegal.

Perhaps most importantly, the ability of Senegal to compete in the U.S. market is hindered by geographic location and high transport costs. As mentioned above, the U.S. market is well supplied by countries that are closer to the U.S. and that have been exporting to the U.S. for some time. The importance of the long-term relationships between existing suppliers and U.S. wholesalers/importers should not be underestimated.

Finally, it is interesting to note that several U.S. importers who were interviewed for this study wondered why we would even consider imports of horticultural products from African countries. There is a good deal of skepticism regarding the viability and reliability of African exporters.

## **9.0 The Potential for Developing Joint Ventures to Promote Senegalese Horticultural Exports**

The expansion of horticultural production and exports to Europe and the U.S. will probably depend increasingly on participation of foreign partners in joint ventures with Senegalese exporters. Informal interviews revealed that European importers, especially French importers, are collaborating increasingly with the best organized and managed Senegalese exporters in producing and coordinating marketing of horticultural products. As horticultural markets in industrial countries become increasingly competitive and demanding, Senegalese horticultural producers and exporters will need to make significant improvements in field production, post-harvest handling practices, transport and cold storage, packaging, international shipping, and distribution in order to protect their market share and expand shares in key markets.

The participation of foreign partners is necessary for two key reasons: technology transfer and access to distribution networks in European or American markets.

### **9.1 Technology Transfer**

Horticultural production and export are exacting from a quality standpoint, and exporting countries need technology to assure the highest possible quality. Quality refers to attractive physical presentation, ensured by uniformity of produce color, size, shape, texture and turgescence, produce freshness, desired flavor (ensured by harvesting at the proper point of maturity), and required phytosanitary treatment. In an increasingly competitive market, only those exporting countries meeting the most rigorous quality and phytosanitary specifications will be able to maintain or augment their market share. Kenya has been the most successful African country in doing this. In order to acquire technology to meet increasingly stringent requirements, most Senegalese firms will probably have to associate themselves with foreign partners who have mastered state-of-the-art production, post-harvest handling, packaging, cold storage, and transport technologies.

### **9.2 Tapping into Foreign Market Networks**

Developing exporting countries such as Senegal will increasingly need to target special segments or niches of foreign markets as competition increases. In-depth, first-hand knowledge of the characteristics of targetted export markets and commodity preferences will be a valuable asset in competing effectively. This market knowledge cannot be easily gained from Senegal. Rather, it needs to be acquired through collaboration with firms in the horticultural trade in each European country market, which have well-established distribution networks with large-scale institutional buyers. As the EC moves toward eliminating trade barriers, developing country exporters will at least need to consider working out marketing arrangements with those

horticultural trading firms with efficient, pan-European distribution systems.

### 9.3 Factors Constraining the Development of Joint Ventures

There are a number of factors which may limit the emergence of joint ventures in Senegal, including:

- o A limit of 49% on foreign ownership in food industries.
- o Lack of viable Senegalese partners. Many Senegalese investors prefer to invest in sectors offering less risk and an assured profitability, such as trading and real estate development in large cities (particularly Dakar). Investments with a short term payoff are strongly preferred, as are investments with quick turnover of capital (such as trading).
- o A poor investment climate linked to the economic and political difficulties of the country. Recent political turmoil following the 1988 election and the extradition of Mauritanian residents (and seizure of their assets in Senegal) have not strengthened the perception of Senegal as a "safe haven," despite its well-known reputation as one of the few long-standing democracies in Sub-Saharan Africa.
- o A tax code with high tax burdens levied on formal sector firms.
- o An investment code which does not favor private sector development in agriculture. To illustrate, there is no grace period for agricultural investments, which generally have longer gestation periods than non-agricultural investments (which benefit from a grace period). In addition, working capital requirements are greater than in the industrial sector in order to handle delays in marketing products and in financing the following year's production.
- o Very limited formal agricultural credit. The Caisse Nationale de Crédit Agricole du Sénégal (CNCAS) hesitates to finance the horticultural sector due to the disappointing performance of several loans. The commercial banking industry in Senegal also appears to be teetering on the edge of insolvency and will generally not extend loans for agricultural purposes. Banks hesitate to loan to smallholders who lack collateral and land title.
- o The weakness of the judicial system in Senegal, and a well-known propensity on the part of the Senegalese to litigate in order to resolve business differences. These two factors create a ripe climate for influence peddling to the detriment of prospective foreign investors.
- o Reluctance of producers under contract to respect contract terms and high transaction costs in sanctioning non-compliers.
- o A traditional land tenure system that makes it difficult for foreign investors to acquire large tracts for horticultural production. Uncertainty of tenure in irrigated areas along the Senegal River will

likely limit foreign investment, although it may encourage land-grabbing by Senegalese firms and investors.

- o Powerful labor unions, which push formal wage rates to levels that are high relative to competing developing country producers. Labor-management relationships in the Senegalese formal sector are characterized as "highly adversarial" and by "deep mistrust," with highly negative effects on labor efficiency (see Terrell and Svejnar, 1989, pp. 117-119).
- o Furthermore, labor in the formal sector is characterized as low in effort, motivation and discipline by Senegalese managers, which leads to low productivity. Terrell and Svejnar argue that there is generally a "lack of a direct link between performance and remuneration in most enterprises." This may start to change, as a recent governmental decree (no. 3547 issued in 1989) grants employers the right to dismiss poorly performing workers.
- o Competition of the informal sector, where wage rates are far lower.
- o The subtle, yet increasingly widely held perception that Senegal is not an African country that facilitates private enterprise, and that some local firms and entrepreneurs insist on unreasonable guarantees, attempting to shift all risks of new enterprises (or new forms of enterprise organization) to the GOS, donors or foreign investors.

## **10.0 Information Gaps and an Applied Research Agenda**

This rapid appraisal of the horticultural subsector in Senegal has drawn together available secondary data from a number of sources and presented them in a form that is new and hopefully useful to policy-makers and exporters. It has not generated significant new knowledge, however. Rapid appraisals are not intended to diagnose subsector constraints definitively or in a way leading to the formulation of investment strategies. RA does typically illuminate knowledge gaps and point the way toward further focused and policy-relevant applied research.

### **10.1 Production Costs and Comparative Advantage**

Available production cost data, presented and discussed in Annex 2, are unsatisfactory and give the impression of being back-of-the-envelope guesstimates rather than strongly empirically based. Learning more about the range of production costs for different types of horticultural production units and enterprises in Senegal is an important step in assessing Senegal's competitiveness relative to other exporters.

Generating viable production costs estimates is no easy matter for horticultural enterprises, given the diversity in enterprise scale and crop mix, labor costs, capital investment, access to water and other key inputs, and financial resources. Rather than launching costly longitudinal surveys of production costs for different enterprise types, we recommend that all horticultural production projects, whether it is a pilot or one that broadly diffuses new technology, have an economic monitoring and evaluation component. Available production cost estimates seem to have been put together by agronomists or horticulturalists, who cost out the most obvious factor inputs, but who tend to treat labor, working capital and investment capital costs unsatisfactorily from an economic perspective. Rather than collecting detailed labor and input data for a large sample of farms, each horticultural production project should strive to develop representative enterprise budgets for key crops grown on two to three different farm types.

### **10.2 Domestic Marketing Costs**

There appears to have been little attempt to generate marketing cost estimates, where handling, sorting and grading, transport, (cold) storage, and distribution costs are explicitly costed out. A representative marketing enterprise budget for green beans, based on informal interviews with selected exporters, is presented in Table 26. This is an indicative budget showing the range of likely costs for exporting green beans to Paris. The lower end of the range is typical of bobby bean marketing costs, while the upper end represents fine or extra-fine French bean marketing costs.

Learning more about domestic marketing costs is important in assessing Senegal's comparative advantage in horticultural production. Marketing costs for horticultural crops are higher per ton or per kilogram than for grains or

Table 26

**Marketing Costs for Green Beans Shipped Ex-Farm in Senegal to  
the Rungis Wholesale Market in Paris: Low-Medium-High Cost Scenarios**

Cost Components (FCFA/kilogram)	Low	Medium	High
Farmgate Price	80	115	150
Transportation (pre- and post-conditioning)	15	20	25
Costs of Conditioning	20	30	40
Cardboard Containers	45	55	65
Airport Transfer Costs	50	60	70
Airport Cold Storage	15	15	15
Air Freight Costs	240	260	280
Transfer Costs at Receiving End	35	45	55
<b>Total Costs (FCFA/kilogram)</b>	<b>500</b>	<b>600</b>	<b>700</b>
<b>Total Costs (FF/kilogram)</b>	<b>10</b>	<b>12</b>	<b>14</b>

Note: Filet beans tend to be more fragile and therefore have higher costs of production and air freight charges.

legumes, and they typically are at least as great as prices received by farmers at the farmgate or in nearby collection centers (see FAO, 1982). Marketing costs, particularly transport costs, are higher for more distant production zones, such as the Fleuve, than for nearby zones such as Niayes. Barring investments in upgrading the port of St. Louis or constructing an airstrip which can accommodate cargo airplanes, horticultural products grown in the Fleuve and destined for export will pass through the airport or seaport of Dakar. In planning the long-run development of the Senegal River valley, marketing costs will play an important role. High transport costs and losses in transit from the Fleuve to Dakar could undermine any crop diversification strategy, particularly one that seeks to promote non-traditional exports.

### 10.3 Price and Marketing Cost Data

Short of collecting detailed marketing cost data, gathering price information for horticultural products at different points in the marketing chain is useful in examining the competitiveness of different production zones in supplying domestic urban markets or export destinations. At a minimum, prices should be collected at the "farmgate," in areas where transactions take place on the farm, or in rural assembly markets, at wholesale markets in key urban areas, and at the point of export.

If the purpose of a price collection effort is to help assess Senegal's competitiveness in export markets, then collecting price information from several reliable exporters would probably suffice. Most exporters procure most of their supplies on contract from small growers, and they bear all of the costs of transferring horticultural produce to the point of export. Stated contract prices need to be cross-checked with a sample of growers to make sure that the latter actually received these prices.

Price data collection for analysis of the efficiency of domestic horticultural marketing needs to be balanced between farmgate (or rural market), wholesale market and retail levels. By obtaining price data at key transaction nodes, a firm basis is laid for examining marketing costs and margins. High costs for performing particular marketing functions indicate where cost reductions and hence efficiency gains are possible. Putting together crop enterprise and export budgets is an important step in looking at marketing efficiency.

CDH, in collaboration with ISRA, collected daily horticultural retail price data in seven markets in Dakar in 1985 and 1986. In retrospect, this appears to have been an unfortunate misallocation of scarce research resources. One wonders if the price data collection could have been weekly or bi-weekly, rather than daily, so that the enumerators could have been dispatched to collect marketing cost data from a sample of horticultural traders as well.

### 10.4 Domestic Horticultural Consumption Patterns

Little is known about domestic consumption patterns, other than the fact that per capita consumption is higher in major urban areas than in rural areas. Demand for horticultural produce, particularly temperature types of fruits and vegetables, has been shown to be highly income elastic in many countries, and there is no reason to suspect that this is not the case in Senegal. Demand for tropical vegetables, such as okra and tropical tomato varieties, and lower grade tropical fruit (non-grafted mangoes, smaller bananas, oranges with seeds) is likely to be considerably less income elastic yet probably quite price elastic, given the lower incomes of people who consume this produce.

These general pronouncements are no substitute for an empirically based knowledge of rural and urban consumption patterns, where applied research in urban areas would take priority. Yet household budget and expenditure surveys, which are the preferred instrument for generating detailed knowledge

of consumption patterns and expenditures by socio-economic (income) group, are costly to mount and require large samples to be statistically valid and representative. Few African countries have the capability to do such a survey successfully or to generate research results in a reasonable time frame. All too often data from such surveys in Africa are never really exploited.

Short of consumption surveys in one or more urban areas, applied research on the organization and distribution channels for horticultural products in Dakar and perhaps one other city would generate useful knowledge of consumption patterns and preferences. This applied research would focus on two areas:

1. Organization of the wholesale and retail trade. Structured informal interviews with selected key wholesale informants, as well as a sample of institutional buyers (hotels, restaurants, hospitals, schools, armed forces) would be carried out.
2. In-depth case studies of the consumption patterns and preferences of selected urban households, which would be representative of important socio-economic or ethnic groups, would also be useful. Combined with estimates of the breakdown of the urban population into various socio-economic and ethnic groups, information from structured informal interviews could be used in generating reasonably reliable estimates of consumption patterns and magnitudes for different groups.

#### **10.5 Monitoring of Export Operations and Performance During the 1989-90 Production/Marketing Campaign**

Horticultural export volume data are available disaggregated by month and crop for the past two seasons, which is useful in looking at seasonal concentration of exports for each crop. Unaccompanied by export and farm prices by month and crop, and by a breakdown of export volume by association or firms, such data provide a limited understanding of export performance.

In order to better understand the organization of the horticultural trade and constraints faced by producers, assemblers and exporters, there is a need to monitor in-depth export operations out of Dakar over at least one season. A monitoring program would have the following key elements:

1. Periodic interviews (probably monthly) with a sample of horticultural exporters based in Cap-Vert or Thies. Exporters would be asked about export volume (by crop and by supplying production zone), prices paid to growers (under contract or on the spot market), transfer costs (and losses) from production zones to the point of export, international shipping modes (air vs. sea) and costs, costs of complying with GOS customs and trade regulations, other costs of doing business, and relations with importers (financial arrangements, use of contracts, specifications with regard to quality, delivery dates and locations, packaging, etc. and penalties for non-compliance).

2. Periodic interviews with the Airfreight Committee and representatives of the two export associations in order to learn about air freight space allocations. Interviews with the export associations would also focus on sources and uses of market intelligence, promotional efforts, and the nature of (and any changes in) the membership.

3. Intermittent visual inspection of horticultural produce in farmers' fields, in rural collection centers, in transit, in storage, and at the point of shipment (port, airport).

4. Informal interviews with selected small-scale growers to learn their opinions and perceptions of contractual arrangements with exporters or first handlers, likely future market opportunities, sources of price and market information, credit uses and needs, production constraints, and other issues and concerns which they raise.

Such a monitoring program will provide the GOS, donors and exporter associations with a much better understanding of the organization and performance of the horticultural export subsystem. In addition to updating Horton's excellent report on contract farming (1987), it will generate new micro-level insights and knowledge needed in diagnosing and rank ordering constraints and in assessing further policy, regulatory and investment alternatives.

## 11.0 Elements of a Horticultural Subsector Action Plan

Based on rapid appraisal field work and extensive review of the available literature and secondary data, we will prescribe elements of a horticultural subsector action plan for USAID/Senegal consideration.

### 11.1 Applied Research

The key components of an applied research effort are detailed in the previous section. AMIS recommends that USAID/Senegal consider monitoring a full export marketing season. This type of monitoring would require at a minimum a full-time analyst, based in Cap-hart, and probably several part-time enumerators. AMIS or another U.S. based contractor could assist in designing and monitoring the operation of a modest and workable data collection and analysis system, as well as assisting in the analysis of data and synthesis of findings.

### 11.2 Improving Market Intelligence for Public and Private Users

The larger volume horticultural exporters in Senegal have their own private sources of market information, particularly in France and other important European markets. Several also subscribe to the COLEACP monthly newsletter. Knowledge of the U.S. market appears to be extremely limited, however, as reflected in interviews with exporters and a request by one firm for Abt Associates' assistance in gaining entry into the U.S. market.

The Senegalese government and donors should not contemplate setting up elaborate price and market information systems that compete with exporters' networks. Public agencies do not have a comparative advantage in generating and disseminating up-to-date market information that could be useful in making private export timing, delivery and pricing decisions. The public sector can play a useful facilitating role, however, in collecting and analyzing (both primary and secondary) data, paying special attention to trends in prices, the evolution of market shares, and consumption patterns and preferences in importing countries. This information and analysis would be useful in longer-run strategic planning, policy formulation, and consideration of investment alternatives.

Such a public applied research and analysis capacity cannot be provided exclusively by outside donor agencies or private consulting firms. The latter can play a useful role in setting up a workable system and in training local analysts on the job. Local analysts need to participate in primary data collection and analysis in Senegal, in interpretation of outside sources of information (ITC Market News Service, COLEACP news bulletins), and in assessing alternative policy and investment options in collaboration with capable expatriate analysts dedicated to human capital development.

An important capacity building issue is where such a Senegalese market intelligence capability should reside. CDH and ISRA are obvious candidates for assistance. Favoring one or another of the export associations would be

politically undesirable, while developing the capability in both organizations would be unworkable and unnecessarily duplicative. AMIS cannot advise on the relative strengths of CDH and ISRA. Perhaps an independent private sector market intelligence alternative to the export associations could be contemplated, although it is doubtful that private users would be willing to pay the full cost of generating and disseminating high-quality market analysis.

### 11.3 Review of International Shipping Issues and Options

The European and ACP (African, Caribbean and Pacific) association COLEACP has held four international workshops in Africa to discuss horticultural transport issues in collaboration with airline companies. The most recent workshop was held in Abidjan in July 1989. These workshops serve largely as a useful forum for African exporters to voice complaints about the quality, reliability and capacity of international air freight to Western Europe and the airline companies (Air Afrique, UTA, Air France and other) to respond.

Since Dakar benefits from an excellent ocean port, which is capable of handling containers, the Senegalese situation calls for more in-depth analysis of comparative air and sea transport costs and constraints. Furthermore, an additional infrastructural issue for consideration in formulating a longer term Senegal River valley agricultural development strategy is direct international air and sea links to Europe. That is, the GOS, USAID, and other donors are advised to consider the costs and estimated benefits of upgrading the port and airport at St. Louis if horticultural production for export becomes an important element of an agricultural development plan for the Fleuve.

Unfortunately, diversifying into horticulture (for export) is problematic, given the limited urban population, incomes and demand for horticultural products in the Fleuve. This may, of course, change as economic opportunities increase in the river valley. As pointed out in the Kenya case (see World Bank, 1989), a seemingly important precondition for the emergence of a viable horticultural export subsector in developing countries is a large enough domestic market to absorb most of the produce. Costly investments in irrigation, sorting and grading, cold storage, processing, packaging and refrigerated transport infrastructure are more feasible if domestic consumers are willing and able to pay more for higher quality produce in the short term, and if only the highest quality produce is selected for export. Waiting for the local market to emerge presents untenable risks for most prospective investors, who would be too dependent upon export markets.

Being able to sell most horticultural produce in the domestic market over the short to medium term provides several key advantages. First, local consumers are likely to be less demanding than European consumers, so growers can experiment, make mistakes and perfect production and handling methods without fear of outright produce rejection, as would most likely occur if all produce were shipped to Europe. Having a large local market also allows exporters to sell only premium grade produce to European importers at top

dollar, while disposing of adequate but below premium grades in the domestic market at lower prices.

Returning to the transport issue, further analysis of costs and quality maintenance using different transport modes is desirable. In addition, review of infrastructural improvements in the Fleuve and their costs would provide a sense of the level of horticultural production and export volume that would be needed to offset at least a part of investment costs. Finally, continued Senegalese participation in COLEACP workshops and other international fora where transport problems and options are discussed is strongly recommended.

#### **11.4 Workshops and Study Tours for Senegalese Exporters in Kenya and Other Competing Countries**

To the extent that lower-volume Senegalese exporters are unwilling or unable to pay for workshops and study tours, USAID and other donors can help at the margin by funding these. Most importers maintain good contacts with European exporters and are increasingly cognizant of European handling methods, wholesale/retail distribution systems, and consumer preferences. Perhaps ITC or COLEACP could assist in organizing a study tour for selected Senegalese exporters in Kenya and one or more other competing suppliers of the European market. If Senegalese exporters are seriously interested in tapping into the U.S. market, a study trip to the U.S., including terminal markets on the East Coast and production zones such as Florida and California, could be arranged. Discussions with APHIS officials of USDA would also be necessary. If an applied research and market analysis unit were established in the public sector, it would be useful for a representative or two of such a unit to accompany the group of exporters on study tours.

#### **11.5 Proposed APHIS Mission to Senegal**

As the agency responsible for enforcing U.S. phytosanitary regulations, APHIS of USDA reviews regulations and practices in developing country exporters to the U.S. market. APHIS places agents in key countries export to the U.S. during the export season to monitor compliance with U.S. regulations.

If Senegal has aspirations of exporting to the U.S., it is strongly recommended that a USDA/APHIS team visit Senegal during the current (1989-1990) production and marketing season to:

- o conduct site visits to fields in key horticultural produce assembly areas, wholesale markets, the installations of major exporters, and shipping points (airport, port), and
- o discuss U.S. phytosanitary regulations with USAID and Senegalese officials and private exporters.

It is recommended that a USDA (but non-APHIS) official accompany the APHIS team in order to provide information about U.S. market conditions and requirements other than phytosanitary measures. USDA/OICD could be contacted regarding a prospective APHIS mission, and possibly arrange APHIS assistance through a PASA agreement.

#### **11.6 Improving Contracting Mechanisms and Enforcement and Incentives for Growers to Comply**

Several observers have reported that the current contractual arrangements and pricing mechanisms do not provide growers with incentives to produce top-quality produce for the European market. The case of French beans is especially noteworthy, where growers maximize profits by harvesting the beans when they attain their maximum weight (or yield). Clearly, an improved grading system, which rewards producers for harvesting the beans when they are thin so that they will be classified as top grade in European markets, would improve Senegal's competitiveness in Europe and should increase exporters' and producers' profits. Encouraging growers to harvest melons when they are more mature could also lead to greater export revenues. A possible constraint is Senegal's high production costs and low productivity in growing horticultural products (manifested in low yields relative to competitors), which limits flexibility in pricing and probably the extent to which premia above current prices could be paid. Examining the current pricing mechanisms in further depth, and designing a workable grading system that offers incentives to growers to produce horticultural crops corresponding better to European consumer preferences, could be part of an ongoing program of applied research.

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## Annex 1

### List of Officials and Entrepreneurs Contacted

#### Senegal and Gambia

##### USAID:

Ms. Sarah Jane Littlefield, former Mission Director, USAID/Dakar  
Mr. Wayne Nilsestuen, Agricultural Development Office, USAID/Dakar  
Mr. Rod Kite, Agricultural Development Office, USAID/Dakar  
Mr. Moribajan Keita, Agricultural Development Office, USAID/Dakar  
Mr. Desaix Myers, Project Development Office, USAID/Dakar  
Mr. Mamadou Kane, Project Development Office, USAID/Dakar  
Mr. Jean Lebloas, USAID/Dakar  
Mr. Omar Diallo, Program Specialist, USAID/Banjul  
Mr. Donald Dega, Agriculture, USAID/Banjul

##### Government of Senegal:

Mr. Macoumba MBodj, Director, Horticulture Division, Direction de l'Agriculture  
Mr. Moctar Sylla, Cellule Après Barrage, Tel: 22-38-75  
Mr. Harel, Responsable Secteur Horticole, Tel: 23-11-10  
Mr. Mallière, Ministère de l'Hydraulique, Tel: 23-91-27  
Mr. Ousmane Seck, Director, DPCS-MDR, Tel: 32-68-78  
Mr. Wally N'Diaye, Director, Département de l'Agriculture  
Mr. Cissé, Caisse Nationale de Crédit Agricole du Sénégal (CNCAS) Rue  
Aristide Le Dantec, Tel: 21-50-36  
Mr. Tidiane Wane, Président de la Commission de Suivi de l'Après Barrage  
Mr. Beye, Délégation du Secteur Parapublique

##### Horticultural Producers and Traders:

Mr. Mounir Filfili, SAFINA, Tel: 36-33-04  
Mr. Koné, SONAFOR, Tel: 32-13-79  
Mr. Abdou Karim, Farm at ENAMPORE  
Mr. Abdoul Rany Ben Geloune, SENIMEX, and President of ASEPAS,  
Tel: 22-59-90 and 21-85-50.  
Mr. Alassane Diallo, Director, SOEX, Tel: 21-42-22  
Mr. Ddibril N'Dour, SEDRI, Tel: 36-77-44  
Mr. El Hadj Malick Dia, GIPES, Tel: 22-42-92  
Mr. Lamine Ndiaye, Director, SEPRONA, Patte d'Oie, Tel: 25-67-89

## Others:

Mr. Abdoul Aziz M'Baye, Director, Centre de Développement Horticole (CDH), Camberene, Tel: 35-25-06  
Mr. Papa Abdoulaye Seck, Centre de Développement Horticole (CDH), Tel: 35-25-06  
Mr. Geoffrey Livingston, USAID Agro-Forestry Project, Tel: 32-00-45.  
Mr. Cheikh Tidiane N'Diaye, Ingénieur Agronome, SONED-Afrique, Rue Calmet, Tel: 21-22-31  
Mr. Jacques Ndongue, Chamber of Commerce, Head of the Directorate of Assistance and Promotion of CICES, Foire Internationale de Dakar, Tel: 20-13-75/20-14-54  
Mr. Kazem Charara, Tel: 22-19-92  
Mr. Ibrahima Niang, Director, African Development Foundation, République, Dakar, Tel: 22-70-27  
Mr. Sidy Touré, SOCOPTAO, Tel: 23-10-01  
Mr. Vitz, Former Specialist in Horticulture at SOMIVAC, Banjul, Gambia  
Mr. Kauffman, Mission Director of GTZ, SOMIVAC/Ziguinchor, Tel: 91-12-84/91-13-54  
Mr. Chambellant, FED, Tel: 21-13-24  
Mr. Abrahima Seydi, Financial Analyst, Tel: 23-03-95  
Mr. Claude Fauque, Conseiller Technique, CNCAS, Tel: 21-50-36  
Mr. Waffelaert, FED, Responsable Agriculture, Tel: 21-50-36  
Mr. Manneh - SEMALINE

## Western Europe

### 1. FRANCE (importers)

SIIM - Société Internationale d'Importation, 70 rue de Chateaurenard, Bâtiment DZ, Fruileg 268, 94582 Rungis Cedex. Phone: 46872501, Fax: 45600129. Contact: Mr. Henry Beaulieu. Firm regularly imports from Senegal.

La Goele, 102 rue de Ghateaurenard, Fruileg 262, 94582 Rungis Cedex. Phone: 46864826, FAX: 49780322. Contact: Mr. Michel Cuypecs. One of the main importers from Senegal, who regularly visits the producers and makes arrangements for shipments.

LACOUR S.A., 106 rue de Montpellier, Bâtiment C2, Fruileg 375, 94622 Rungis Cedex. Phone: 46872427, Telex: 270961, Fax: 45604293. Entrepôt: rue des Tropiques, 94558 Rungis Cedex. Contact: Mr. Venot. Imports beans regularly, but not much from Senegal.

Ets. G. Lagueyrie, 16 à 20 rue d'Avignon, Fruileg 643, 94621 Rungis Cedex. Phone: 46864082, Telex: 250036. General Manager: Mrs. Gisèle Lagueyrie. Specialized in exotic and tropical products.

Réne Ferrand, 31 rue d'Angers, Fruileg 728, 94584 Rungis Cedex, Phone: 46860470, Contact: Mr. José Iborra. Limited size firm which imports beans from Senegal.

Estrivier & Cie, 75 avenue du Lyonnais, Fruileg 525, 94571 Rungis Cedex, Phone: 46873438, Telex: 204015. Contact: Mr. Jacques Estivier, works with JARDIMA, importing considerable quantities.

Agence Laparra, 62A rue de Montpellier, Bâtiment C2, Fruileg 369, 94622 Rungis Cedex. Phone: 46864030, Telex: 260078. Imports beans from other origins.

Klein S.A., 8 rue des Tropiques, Entrepôt 110, 94538 Rungis Cedex. Phone: 468725 00, Telex: 270904. Works with supermarkets. Under present conditions, they find it difficult to make purchases in Senegal.

POMONA, 10 avenue de l'Europe, Entrepôt 112, 94538 Rungis Cedex. Phone: 46872406, Telex: 270862. One of the leading firms of the French fruit and vegetable importer business. Rather than work with small Senegalese firms, they do no business with Senegal.

PASCUAL FRANCE, Cour d'Alsace, 94155 Rungis Cedex. Phone: 46872515, Telefax: 45609510. Contact: Mr Allène. This is an important company which prefers commission business. So far no imports from Senegal.

## 2. Netherlands (importers)

PASCUAL - Netherlands. Contact: Mr. Hans van der Heuve. Pascual works with CEPAN and imports melons from Senegal, but considers the keeping quality to be poor. Would be interested in cherry tomatoes.

VELLEMAN & TASS, P.O. Box 6118, 3002 AC Rotterdam. Phone: 4768644, Telex: 22189. Contact: Mr. Doesburg. One of the leading importers in Rotterdam. Is doing little business with Senegal.

FRUIT TRANSITOKANTOOR, Klappolder 191, 2665 MP Bleiswijk. Phone: 1892-41700.

HAGE INTERNATIONAL, Spoorwegemplacement 4, Barendrecht 2991 VT. Phone: 1806-12000, Fax: 1806-20309 and 1806-11802. Contact: Mr. Kashoek. Firm is buying smaller quantities of produce from Senegal.

WESTLAND IMPORT, P.O. Box 224, 2680 AE Poeldijk. Phone: 1749-46712, Fax: 1749-46890. Contact: Mr. van Bergen. Importer of off-season vegetables.

## 3. Germany (importers)

Mr. Tietze and Mr. Meier, c/o Scipio, Breitenwet 29-33, Bremen. Phone: 0421/3092266

Mr. Krasemann, Fruchthansa Grosmarket, 5000 Koeln 51. Phone: (0221) 376810

Dr. D.M. Hoermann, Institute of Horticultural Economics, University of Hannover, Hannover, Germany.

4. Switzerland

Mr. O. Karsegard, International Trade Centre, UNCTAD-GATT, 54-56 rue de Montbrillant 1202, Geneva, Switzerland. Telex: 289466MNS CH, Telefax: 22337176, Phone: 22300252.

Mr. Henry, International Trade Centre, UNCTAD-GATT, 54-56 rue de Montbrillant 1202, Geneva, Switzerland. Telex: 289466 MNS CH, Telefax: 22337176, Phone: 22300252.

United States

Ms. Sharon Hecker, International Trade Centre, UNCTAD-GATT, 112 Water Street, Boston, MA 02109. Phone: (617) 523-2211, Fax: (617) 523-2017, Telex: 4430252 MNS UI.

U.S. Government Contacts

Animal and Plant Health Inspection Service (APHIS)

Mr. Robert L. Griffin, Head, Permit Unit, (301) 436-8645  
Ms. Janet Holmes, Fruits and Veg. Division, (301) 436-8393

Agricultural Marketing Service

Mr. Winfred H. Crocker, Chief, Market News Branch, (202) 447-2745  
Mr. Philip Montgomery, Market Reporter, New York, (212) 542-2225  
Mr. Arthur Munchow, Market Reporter, Boston, (617) 387-4498  
Mr. Michael Cramer, Market Reporter, Philadelphia, (215) 547-4536  
Ms. Holly Roland, Market Reporter, Baltimore, (301) 799-4840

Economic Research Service

Foreign Agricultural Service

Importers/Wholesalers/Brokers

Boston

Bay State Produce (mangoes, melons), (617) 884-5400  
Mr. John Novellini  
Mr. John Grant

Mutual Produce (melons), (617) 889-0035  
Mr. Tom Ciovacco

G.T. Rodes (beans), (617) 884-2030  
Mr. Terry Rodes  
Mr. Chris Rodes

Strock Enterprises (beans, melons, mangoes), (617) 884-0263  
Mr. Sam Strock

**New York**

H. Schnell and Company (mangoes, melons), (212) 991-5050  
Mr. Byron King  
Mr. Seymour Schnell

Prevor Marketing (Chilean fruits), (212) 589-5200  
Mr. Mike Pflueger

D'arrigo (mangoes, melons), (212) 991-5900  
Mr. Steve D'arrigo

**Miami**

Central American Produce (melons, mangoes), (305) 934-2303  
Mr. Mike Warren  
Mr. Dave Warren

## Annex 2

### Cost of Production Estimates

#### 1.0 Introduction

One way to establish whether Senegal has a comparative advantage in horticultural production is to compare Senegalese border prices with export parities (or the prices of Senegalese horticultural exports in European markets with the prices of competing suppliers for comparable products). The most important components of Senegalese border or FOB prices are production costs and transfer costs from production zones to the point of export. If data were available for a range of horticultural crops for a number of African competitors of Senegal, comparative analysis would be possible. Unfortunately, AMIS does not have access to these data.

As a fallback, we can examine various estimates of production costs for the most important horticultural products grown in Senegal. Limited data are available for tomatoes, onions, and green beans. The data appear to be of questionable reliability and are probably based on limited samples. In the case of tomatoes, they reflect stated production costs of agro-enterprises such as SOCAS and SNTI.

It is important to keep in mind that there is no one cost of production for a particular horticultural enterprise around which real costs cluster (with limited variance). Production costs for horticultural enterprises vary greatly across production units, reflecting differences in farm size (and scale of operations), capital and labor intensity, access to key production inputs (and credit terms), availability of irrigation water and the type of irrigation system, and management inputs. Costs for 0.2-0.5 hectare units are likely to be quite different from costs facing horticultural farms of over 100 hectares. Keeping these caveats in mind, we will present estimates for large-scale tomato production and processing, as well as green bean production on small and larger commercial farms.

#### 2.0 Tomato Production Costs in the Senegal River Valley

##### 2.1 Production Costs on Estate Farms

The figures presented in Table B-1 are for estate production costs in a protected market. As such, they are likely to represent an upper limit on breakeven costs of tomato production. In a less protected environment, the two processing firms would be pressured to increase the efficiency of their farming operations, and production costs would doubtlessly be lower. In a competitive and open market, they might be driven out of business.

##### 2.2 Production Costs for SOCAS Contract Farmers

SOCAS reports breakeven prices of 30 FCFA/kg at the farmgate and 34.5 FCFA/kg. at the factory gate. SOCAS estimates its breakeven price at 43

FCFA/kg., accounting for interest on working capital required at planting (110,000 FCFA per contractee), extension services, and losses relating to non-compliance with contract conditions.

Table B-1

**Cost of Tomato Production on an Estate Farm**

<u>Cost Categories</u>	<u>FCFA/Ha.</u>
Seed and nursery development	30,000
Fertilizer (NPK 13-18-22): 700 kg./ha.	170,000
Phytosanitary Products	70,000
Hired Labor	90,000
Equipment	52,000
Pivot Irrigation	110,000
Depreciation	n.a.
-----	-----
Total Costs	542,000
Yield	20 t/ha
Breakeven Price for Tomatoes (farmgate)	27 FCFA/kg.

**2.3 Breakeven Cost for Tomato Paste**

Breakeven prices for processing of tomato paste are calculated in Table B-2. All costs are for a tin of two kilograms, having a Ph of 4.2, a Brick index of 28%, and 15.3% dry matter. Note that 6.55 kilograms of fresh tomatoes are required to produce one kilogram of tomato paste.

The cost estimates in Table B-2 clearly show that the production costs of Senegalese tomato processing firms are high and well above world price levels. Retail prices for Senegalese tomato paste are over double the world price and 60% above the Gambian retail price. These differentials stimulate significant illegal imports into Senegal from Gambia.

**3.0 Analysis of Production Costs on Farms in Cap-Vert**

Analysis of production costs is not possible for many horticultural firms, because they do not maintain sufficiently detailed records. The data below are based on estimates from other sources (see Ministère du Développement Rural, 1988 and Corlier, 1988) and synthetic data. The key factors of production which determine production costs in the horticultural sector are seeds, fertilizer, phytosanitary products, irrigation water, labor, fuel, depreciation and financial charges. The importance of each of these factors or production varies as a function of the size and type of production unit.

Table B-2

Breakeven Price Calculation for Tomato Paste Production

<u>Production Costs</u>	<u>in FCFA/kg.</u>	<u>% total</u>
Raw Material Delivered to Plant	564	55
Packaging/Tins	300	29
Energy (Fuel, Machinery)	62.5	6
Hired Labor at Plant	30	3
Depreciation on Plant	29	3
Maintenance	20.4	2
Other Production Costs	16	1.5
Chemical Products	1.7	0.5
<hr/>		
Total Direct Cost (1)	1,023.6	100.0
Overhead (2)	233.4	
	<u>Cost Per Two</u>	<u>Cost Per Kg.</u>
	<u>Kg. Tin</u>	
Breakeven Price (3)	1,257	628.5
Breakeven Price with Value-Added Tax (4)	1,493	746.5
Sales Price (semi-wholesale) (5)	1,534.6	767
Retail Price (6)	1,600	800
Profit Margin (5-4)/(4)	2.8 %	
Retail Price in Gambia		500
CIF Price on European Tomato Paste		375

We distinguish two types of production units:

Type A: Small traditional holding in the Niayes with manual irrigation using a watering can and water supplied by a well of 5-10 meters in depth.

Type B : Large mechanized holding with sprinkler irrigation and water supplied from deep artesian wells.

### 3.1 Seeds

Seed prices represent 1-10% of production costs, except in cases such as potatoes, where seed represents up to 35%. The cost of seed will likely increase as a proportion of total production costs with greater use of

hybrids. Typical seed costs per hectare are:

	Type A	Type B
Green beans	110,000	110,000
Melon (charentais)	255,000	255,000
Cherry tomatoes	123,000	123,000
Green pepper; yellow melon	30,000	30,000

### 3.2 Fertilizer

Chemical fertilizer used in horticultural production is generally of the (N-P-K) formulation 10-10-20. This fertilizer typically costs 3,500 FCFA per sack of 50 kilograms or 70,532 FCFA per ton (Price quoted by I.C.S. SENCHIM, 1988). This works out to 70 FCFA per kilogram. This price is subsidized by 8,000 FCFA per ton. Fertilizer represents 8% to 15% of total production costs.

Organic fertilizer must also be considered. Local costs and availability of manure are unknown, but dried manure can be imported from Europe. Alternatively, dried peanut (shell) powder costs 6,000 FCFA per ton.

Cost of fertilizer in FCFA per hectare:

	<u>Type A</u>	<u>Type B</u>
	130,000	130,000

### 3.3 Phytosanitary Products

Phytosanitary protection is an essential element in successful horticultural production, given pest and viral problems in Senegal. Phytosanitary products represent 5-12% of total production costs. Import duties average 30%. Duty levels of this magnitude obviously work against the competitiveness of the Senegalese horticultural subsector. Cost of phytosanitary products in FCFA per hectare by crop are roughly:

	<u>Type A</u>	<u>Type B</u>
Green beans	60,000	60,000
Melon	175,000	175,000
Hot pepper, green pepper, eggplant	74,000	74,000
Cherry tomatoes	50,000	50,000

### 3.4 Irrigation Water

Water requirements range from 40 to 60 cubic meters per hectare per day. Estimated water costs per farm per day of the growing season are 5,120-7,680 FCFA on Type A farms and 4,000-6,000 FCFA on Type B farms. The higher cost of irrigation on small farms is due to the heavy labor requirements.

Irrigation represents up to 35-40% of the cost of production for green beans (see Table B-3). The preferential rate, charged by SONEES and granted to agricultural and industrial users, is 40-50 FCFA per cusec. Irrigation costs per hectare can vary greatly, depending upon whether the company is connected to the national water network. Water costs per hectare over an entire growing season for different crops are estimated as follows:

	<u>Type A</u>	<u>Type B</u>
Green beans :	420,000	420,000
Tomato, melon :	705,000	225,000
Hot pepper, eggplant :	300,000	300,000

### 3.5 Labor Costs

Formal sector enterprises pay their agricultural laborers an hourly wage of 300 FCFA (SOCAS). Depending upon the type of production unit and the crop, labor costs represent between 20% and 30% of total production costs for green beans (see Table B-3). In comparison, wage rates for agricultural laborers in the informal sector in zones of horticultural production range between 1,000 and 1,500 FCFA per day of 6-8 hours. Day laborers are paid considerably less in areas where horticultural production is not an important cropping alternative. ISRA/MSU researchers in Senegal have found that the daily agricultural wage rate is generally at least 500 FCFA and higher during peak periods.

In contrast to Senegal, the average daily wages for formal sector agricultural laborers are as follows in selected African countries:

Gambia	500 FCFA
Swaziland (sugar plantation)	1,050 FCFA
Kenya (harvest of green beans)	190-420 FCFA/hour

In addition to the relatively high cost of Senegalese agricultural labor, limited comparative evidence for the formal sector suggests that hired labor is less productive in Senegal than in other African countries which export horticultural products.

#### Labor Productivity in Harvesting

	<u>Senegal</u>	<u>Côte d'Ivoire</u>	<u>Swaziland</u>
Tomato	1 kg./hr.	2.5 kg./hr.	
Sugar Cane	4-5 T/day	-	8-12 T/day

### 3.6 Financial Costs

According to Ministère du Développement Rural, Section Horticulture estimates, investment costs per hectare are on the order of 300,000 FCFA for traditional, small-scale farms. Annual depreciation is valued at 41,000 FCFA

where two crops are grown in rotation (or 20,500 FCFA/ha./crop). Average interest charges for financing the purchase of needed material are 11,500 FCFA per crop. Depreciation plus finance charges represent only 3% of production costs on the smallest farms.

Investment costs attain 1,240,000 FCFA per hectare for large commercial farms. Depreciation costs are on the order of 307,000 FCFA per hectare for a rotation of 2.2 crops. Hence, depreciation costs are 137,000 FCFA per crop per hectare. Finance charges for financing the purchase of needed material are estimated to be 44,000 FCFA per crop. Depreciation and interest charges represent 16%, proportionally more of total production costs than for smaller units.

### 3.7 Production Cost Estimates for Green Beans

Using the above data, production costs can be estimated for selected enterprises. Table B-3 presents indicative and preliminary cost estimates for bobby beans, which need to be verified with more empirical work.

Table B-3

**Estimated Production Costs for Bobby Type Green Beans  
(in FCFA/hectare)**

<u>Cost Category</u>	<u>Type A</u>	<u>Type B</u>
Seed	110,000	110,000
Fertilizer	130,000	130,000
Phytosanitary Products	60,000	60,000
Irrigation Water	420,000	420,000
Depreciation	20,500	137,000
Finance Charges	11,500	44,000
Labor Costs	300,000	250,000
Total Costs	1,052,000	1,151,000
Yield Per Hectare (metric tons)	10	10
Cost Per Kilogram	105	115

As noted above, depreciation charges are higher on the type B farm, which has greater investment in capital. Labor costs are higher on the smaller type A farm, as more labor is required relative to the more capital-intensive type B farm.

Assuming yields of 10 MT per hectare, estimated production costs vary between 105 and 115 FCFA/hectare. These cost estimates appear to be

consistent with marketing costs (and reported farmgate prices paid) shown in Table 22.

### **3.8 Production Cost Estimates for Other Commodities**

Production cost estimates are available in recent reports by the Ministère du Développement Rural (1988) and Corlier (1988) for potatoes, onions, cabbage, and tomatoes.

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Table C-1

FRANCE: Annual Imports of Selected Fresh Fruit and Vegetables Shipped From Senegal and  
Competing Suppliers, 1982-86

Product/Origin	1982				1983				1984				1985				1986			
	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV
<b>MANGOES</b>																				
of which from:	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV
Burkina Faso	950	35.3%	7785	8195	889	22.9%	7074	7957	1087	24.9%	9703	8926	1168	24.1%	12839	10992	1345	23.7%	11570	8602
Brazil	148	5.5%	2539	17155	282	7.3%	4279	15174	580	13.3%	10320	17793	747	15.4%	11312	15143	831	14.6%	11509	13850
Peru	388	14.4%	4913	12662	208	5.4%	3222	15490	511	11.7%	8035	15724	412	8.5%	6565	15934	680	12.0%	8742	12856
Mexico	181	6.7%	2314	12785	387	10.0%	5448	14078	609	14.0%	8336	13688	443	9.1%	6179	13948	678	11.9%	7315	10789
Mali	547	20.3%	5084	9294	793	20.4%	6622	8351	658	15.1%	6351	9652	599	12.3%	6493	10840	646	11.4%	7090	10575
Cote d'Ivoire	---	0.0%	---	---	428	11.0%	3430	8014	515	11.8%	5070	9845	557	11.5%	6433	11549	617	10.9%	5615	9100
Venezuela	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---	125	2.6%	2230	17840	193	3.4%	2284	11834
Israel	82	3.0%	1004	12244	141	3.6%	1034	7333	34	0.8%	524	15412	246	5.1%	3145	12785	192	3.4%	2121	11047
Guinea	50	1.9%	372	7440	124	3.2%	1028	8290	64	1.5%	477	7453	264	5.4%	2552	9667	156	2.7%	1400	8974
South Africa	56	1.3%	612	17000	295	7.6%	4277	14498	129	3.0%	1905	14767	127	2.6%	1733	13646	143	2.5%	1842	12881
United States	92	3.4%	1142	12413	118	3.0%	1609	13636	42	1.0%	495	11786	117	2.4%	1615	13803	80	1.4%	836	16730
Kenya	70	2.6%	895	12786	109	2.8%	1884	17284	64	1.5%	782	12219	---	0.0%	---	---	63	1.1%	1115	17698
Senegal	151	5.6%	1314	8702	110	2.8%	858	7800	71	1.6%	653	9197	47	1.0%	547	11638	54	1.0%	598	11074
Total	2693	100.0%	27974	10380	3884	100.0%	40765	10496	4364	100.0%	52651	12065	4852	100.0%	61643	12705	5678	100.0%	62037	10926
<b>MELONS</b>																				
of which from:	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV
Spain	3386	72.2%	12617	3726	4293	69.8%	20397	4751	4905	72.2%	22921	4673	5146	74.0%	27223	5290	7675	79.4%	41441	5399
Italy	509	10.9%	1935	3802	613	10.0%	2906	4741	610	9.0%	3260	5344	517	7.4%	2638	5103	660	6.8%	3664	5552
Senegal	707	15.1%	10058	14226	1159	18.8%	15072	13004	1047	15.4%	11280	10774	784	11.5%	9398	11987	524	5.4%	6091	11624
Israel	87	1.9%	360	4138	84	1.4%	417	4964	233	3.4%	2019	8665	418	6.0%	4060	9713	485	5.0%	5099	10713
Guadeloupe	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---	93	1.3%	1007	10828	318	3.5%	4861	15286
Total	4689	100.0%	24970	5325	6149	100.0%	38792	6309	6795	100.0%	39480	5810	6958	100.0%	44326	6371	9662	100.0%	61156	6330
<b>GREEN BEANS*</b>																				
of which from:	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV
Spain	9186	44.0%	64219	6991	9391	44.7%	67844	7224	9310	41.5%	75097	8066	13374	48.1%	102912	7695	12517	43.2%	97886	7820
Italy	2457	11.8%	15635	6363	2771	13.2%	20262	7312	2684	12.0%	25180	9382	3299	11.9%	23501	7124	3969	13.7%	30931	7793
Kenya	2235	10.7%	27562	12332	2028	9.7%	27062	13344	2575	11.5%	36360	14198	2061	7.4%	32401	15721	3267	11.3%	48368	14805
Burkina Faso	1371	6.6%	13026	9501	1778	8.5%	18670	10501	2088	9.3%	14090	6748	2740	9.9%	26482	9665	3150	10.9%	34725	11024
Senegal	2873	13.8%	33102	11522	2415	11.5%	25871	10713	2703	12.1%	35708	13211	3037	10.9%	41969	13819	3044	10.5%	38382	12609
Morocco	478	2.3%	3756	7858	734	3.5%	6750	9196	328	1.5%	3274	9982	333	1.2%	2804	8420	1045	3.6%	8620	8249
Cameroon	1610	7.7%	19137	11886	1354	6.4%	17087	12620	1802	8.0%	24307	13489	1468	5.3%	19789	13480	991	3.4%	13168	13288
Mali	287	1.4%	3034	10571	432	2.1%	4774	11051	686	3.1%	8132	11854	282	1.0%	3384	12000	351	1.2%	5085	14487
Egypt	63	0.3%	410	6508	91	0.4%	755	8297	133	0.6%	1013	7617	144	0.5%	1248	8667	297	1.0%	2427	8172
Belgium-Luxb.	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---	914	3.3%	1783	1951	238	0.8%	3080	12941
Niger	328	1.6%	2756	8402	---	0.0%	---	---	103	0.5%	1155	11214	146	0.5%	1597	10938	87	0.3%	843	9690
Total	20888	100.0%	182637	8744	20994	100.0%	189075	9006	22412	100.0%	224516	10018	27798	100.0%	257870	9277	28956	100.0%	283515	9791

Table C-1 (continued)

Product/Origin	1982				1983				1984				1985				1986			
	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV
<b>GREEN BEANS**</b>																				
of which from:	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV
Italy	1223	12.8%	6521	5332	1869	29.1%	10013	5357	2478	46.2%	15967	6444	2462	55.9%	13817	5569	1632	60.4%	9531	5840
Belgium-Luxb.	8287	86.9%	11938	1441	4167	64.9%	6576	1578	2891	53.8%	6889	2383	1901	42.8%	4230	2225	979	36.3%	2264	2313
Netherlands	---	0.0%	---	---	382	6.0%	602	1576	---	0.0%	---	---	---	0.0%	---	---	89	3.3%	306	3438
Cameroon	26	0.3%	321	12346	---	0.0%	---	---	---	0.0%	---	---	60	1.4%	913	15217	---	0.0%	---	---
<b>Total</b>	<b>9536</b>	<b>100.0%</b>	<b>18780</b>	<b>1969</b>	<b>6418</b>	<b>100.0%</b>	<b>17191</b>	<b>2679</b>	<b>5369</b>	<b>100.0%</b>	<b>22856</b>	<b>4257</b>	<b>4442</b>	<b>100.0%</b>	<b>18960</b>	<b>4268</b>	<b>2700</b>	<b>100.0%</b>	<b>12101</b>	<b>4482</b>
* (from 1 October to 30 June)																				
** (from 1 July to 30 September)																				
<b>CAPSICUMS</b>																				
of which from:	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV
Spain	34639	97.0%	146963	4243	37814	98.6%	177805	4702	43490	98.7%	239711	5512	51223	99.1%	242825	4741	49646	98.9%	238042	4795
Netherlands	50	0.1%	536	10720	110	0.3%	1098	9982	147	0.3%	1877	12769	212	0.4%	2235	10542	335	0.7%	4058	12113
Morocco	329	0.9%	1379	4191	335	0.9%	1961	5854	229	0.5%	1547	6755	267	0.5%	1626	6090	188	0.4%	1190	6330
Israel	143	0.4%	558	3902	83	0.2%	309	3723	---	0.0%	---	---	---	0.0%	---	---	27	0.1%	122	4519
Senegal	361	1.0%	3125	8657	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---	17	0.0%	177	10412
Mali	64	0.2%	363	5672	---	0.0%	---	---	46	0.1%	451	9804	---	0.0%	---	---	10	0.0%	143	14300
Cuba	126	0.4%	460	3651	---	0.0%	---	---	133	0.3%	833	6263	---	0.0%	---	---	---	0.0%	---	---
<b>Total</b>	<b>35712</b>	<b>100.0%</b>	<b>153384</b>	<b>4295</b>	<b>38342</b>	<b>100.0%</b>	<b>181173</b>	<b>4725</b>	<b>44045</b>	<b>100.0%</b>	<b>244419</b>	<b>5549</b>	<b>51702</b>	<b>100.0%</b>	<b>246686</b>	<b>4771</b>	<b>50723</b>	<b>100.0%</b>	<b>243732</b>	<b>4853</b>

Quantity (Q): tons; Value (V): FF'000; Unit Value (UV): FF/ton

Source: Tropical and Off-Season Fresh Fruits and Vegetables: A Study of Selected European Markets, International Trade Centre, UNCTAD/GATT, Geneva, 1987.

Table C-2

FEDERAL REPUBLIC OF GERMANY: Annual Imports of Selected Fresh Fruit and Vegetables Shipped from Senegal and Competing Suppliers, 1982-86

Product/Origin	1982				1983				1984				1985				1986			
	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV	Q	I of Q	V	UV
<b>MELONS</b>																				
of which from:																				
Spain	7304	42.2%	9375	1284	10300	54.6%	14225	1351	11115	60.4%	12436	1119	13183	56.3%	15265	1158	15570	56.5%	15724	1010
Turkey	3319	20.3%	2973	845	3090	16.4%	2869	928	1936	10.6%	1602	819	3678	15.7%	2571	699	3245	11.8%	2254	695
Italy	1327	7.7%	11512	8675	1124	6.0%	1510	1343	1331	7.2%	1660	1247	1789	7.0%	3124	1746	2909	10.6%	3800	1306
France	1141	4.6%	1793	1571	1121	5.9%	2783	2483	1035	5.7%	2260	2142	1604	6.8%	2736	1706	2028	7.4%	3717	1833
Israel	2422	14.0%	4387	1811	1600	8.5%	2666	1666	1211	6.6%	3031	2503	1510	6.4%	4733	3134	1884	6.8%	4519	2399
South Africa	306	1.8%	788	2575	401	2.1%	895	2232	570	3.1%	1325	2675	464	2.0%	1409	3037	678	2.5%	2060	3038
Brazil	244	1.4%	412	1649	218	1.2%	443	2032	463	2.5%	1070	2311	656	2.8%	1480	2256	678	2.5%	1277	2033
Netherlands	160	0.9%	504	3150	299	1.6%	567	1963	269	1.5%	712	2647	181	0.8%	568	3158	204	0.7%	477	2338
Senegal	40	0.2%	122	3050	78	0.4%	165	2115	100	0.5%	273	2750	118	0.5%	519	4398	135	0.5%	435	3222
Chile	210	1.2%	432	2037	187	1.0%	444	2374	136	0.7%	382	2809	37	0.2%	115	3108	128	0.5%	333	2602
Jamaica	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---	118	0.4%	359	2873
Guatemala	92	0.5%	170	1848	122	0.6%	234	1918	8	0.0%	?	375	200	0.9%	---	---	31	0.1%	115	3710
Greece	391	2.3%	323	826	152	0.8%	167	1099	190	1.0%	137	721	---	0.0%	---	---	---	0.0%	---	---
United States	142	0.8%	366	2377	162	0.9%	369	2278	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---
<b>Total</b>	<b>17298</b>	<b>100.0%</b>	<b>33137</b>	<b>1917</b>	<b>18254</b>	<b>100.0%</b>	<b>27337</b>	<b>1431</b>	<b>18404</b>	<b>100.0%</b>	<b>23093</b>	<b>1363</b>	<b>23420</b>	<b>100.0%</b>	<b>32520</b>	<b>1389</b>	<b>27538</b>	<b>100.0%</b>	<b>35050</b>	<b>1272</b>
<b>GREEN BEANS*</b>																				
of which from:																				
Italy	3719	49.7%	5116	1376	4089	51.7%	8011	1959	3002	38.5%	8007	2667	4298	43.3%	12139	2824	4588	48.0%	9153	1995
Spain	2454	32.8%	6169	2514	2517	31.8%	3296	2501	2690	34.6%	6903	2559	3374	34.0%	8234	2440	2921	30.6%	7295	2497
Kenya	318	4.2%	987	3104	323	4.1%	933	2877	491	6.3%	1512	3079	456	4.6%	1309	3309	482	5.0%	1448	3004
Egypt	76	1.0%	158	2079	117	1.5%	310	2650	267	3.4%	805	3015	231	2.3%	682	2952	478	5.0%	1468	3071
Turkey	68	0.9%	150	2206	156	2.0%	383	2453	132	1.7%	341	2583	128	1.3%	266	2078	284	3.0%	626	2204
Ethiopia	45	0.6%	133	3400	96	1.2%	335	3490	48	0.5%	118	2950	177	1.8%	694	3921	248	2.6%	764	3081
Netherlands	370	4.9%	1014	2741	275	3.5%	1172	4262	685	8.8%	390	1299	851	8.6%	784	921	191	2.0%	559	2927
Senegal	73	1.0%	280	3836	55	0.7%	191	3473	119	1.5%	386	3244	134	1.3%	541	4037	161	1.7%	674	4186
France	116	1.5%	400	3468	149	1.9%	425	2839	184	2.4%	454	2467	214	2.2%	695	3248	128	1.3%	450	3316
Roumania	245	3.3%	793	3237	127	1.6%	439	3457	182	2.3%	474	2604	71	0.7%	178	2307	71	0.7%	122	1718
<b>Total</b>	<b>7484</b>	<b>100.0%</b>	<b>13220</b>	<b>2834</b>	<b>7906</b>	<b>100.0%</b>	<b>18495</b>	<b>2339</b>	<b>7808</b>	<b>100.0%</b>	<b>19892</b>	<b>2550</b>	<b>9934</b>	<b>100.0%</b>	<b>23722</b>	<b>2389</b>	<b>9332</b>	<b>100.0%</b>	<b>22361</b>	<b>2362</b>
<b>GREEN BEANS**</b>																				
of which from:																				
Netherlands	2823	41.8%	4728	1675	4223	53.5%	5082	1203	2075	32.1%	4408	2124	2170	36.6%	2274	1048	3074	48.3%	4467	1433
Italy	2204	32.6%	2636	1203	2419	30.7%	6058	2504	3647	56.4%	7969	2185	3216	54.2%	6401	1990	2556	40.1%	4386	1716
Poland	257	3.8%	229	891	166	2.1%	320	1928	107	1.7%	152	1421	162	2.7%	152	938	263	4.1%	155	589
Belgium-Luxb.	1437	21.3%	2361	1643	923	11.7%	1696	1837	359	5.3%	1093	3050	285	4.8%	725	2344	233	4.0%	843	5332
Spain	---	0.0%	---	---	89	1.1%	219	2461	192	3.0%	465	2422	---	0.0%	---	---	116	1.8%	270	2328
Kenya	40	0.6%	107	2675	68	0.9%	137	2015	89	1.4%	257	2888	97	1.6%	235	2423	108	1.7%	211	1934
<b>Total</b>	<b>6761</b>	<b>100.0%</b>	<b>10081</b>	<b>1491</b>	<b>7888</b>	<b>100.0%</b>	<b>13512</b>	<b>1713</b>	<b>6469</b>	<b>100.0%</b>	<b>14346</b>	<b>2218</b>	<b>5930</b>	<b>100.0%</b>	<b>9787</b>	<b>1650</b>	<b>6370</b>	<b>100.0%</b>	<b>10332</b>	<b>1622</b>

\* (from 1 October to 30 June)

\*\* (from 1 July to 30 September)

Quantity (Q): tons; Value (V): DM'000; Unit Value (UV): DM/ton

Source: Tropical and Off-Season Fresh Fruits and Vegetables: A Study of Selected

Table C-3

NETHERLANDS: Annual imports of Selected Fresh Fruit and Vegetables Shipped From Senegal and  
Competing Suppliers, 1982-86

Product/Origin of which from:	1982				1983				1984				1985				1986				
	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	
<b>MANGOES</b>																					
Brazil	68	4.4%	431	6338	55	3.1%	306	5564	133	7.1%	802	6030	281	12.5%	1409	5014	698	17.5%	2849	4110	
Mexico	111	7.2%	581	5234	235	13.0%	1019	4336	295	15.7%	1413	4790	313	13.9%	1542	4927	675	17.0%	2318	3434	
Mali	631	41.2%	3393	5377	830	46.0%	4690	5631	659	35.1%	3004	4558	617	27.4%	3986	6460	623	15.6%	2621	4207	
United States	17	1.1%	104	6118	135	8.6%	501	3232	126	6.7%	539	4278	122	5.4%	374	3066	496	12.5%	1727	3482	
Venezuela	35	2.3%	142	4057	---	0.0%	---	---	43	2.3%	190	4419	66	2.9%	386	5848	280	7.0%	1020	3643	
Guatemala	---	0.0%	---	---	14	0.8%	80	5714	176	9.4%	692	3932	285	12.7%	1010	3544	270	6.8%	753	2789	
Burkina Faso	216	14.1%	1130	5231	84	4.7%	479	3702	48	2.6%	196	4083	114	5.1%	763	6693	191	4.8%	717	3754	
France	109	7.1%	459	4211	118	6.5%	518	4390	87	4.6%	396	4552	99	4.4%	390	3939	181	4.5%	724	4000	
South Africa	19	1.2%	116	6105	93	5.2%	490	3269	67	3.6%	332	4955	64	2.8%	313	4891	179	4.5%	517	2888	
Kenya	43	2.8%	244	5674	58	2.1%	210	3526	95	5.1%	501	5274	56	2.5%	274	4893	161	4.0%	539	5472	
Para	60	3.9%	313	3217	36	2.0%	190	3278	71	3.8%	386	5437	126	5.6%	663	5278	130	3.3%	502	3862	
Israel	56	3.7%	259	4625	43	2.4%	225	3233	22	1.2%	117	5318	81	3.6%	381	4704	66	1.7%	246	3727	
Thailand	67	4.4%	433	6463	34	3.0%	353	6537	15	0.8%	112	7467	27	1.2%	210	7778	31	0.8%	202	6516	
Senegal	45	2.9%	220	4889	48	2.7%	291	6063	39	2.1%	171	4385	---	0.0%	---	---	---	0.0%	---	---	
Guinea Bissau	55	3.6%	132	2400	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---	---	0.0%	---	---	
<b>Total</b>	<b>1532</b>	<b>100.0%</b>	<b>7957</b>	<b>5194</b>	<b>1803</b>	<b>100.0%</b>	<b>9352</b>	<b>5187</b>	<b>1876</b>	<b>100.0%</b>	<b>8851</b>	<b>4718</b>	<b>2251</b>	<b>100.0%</b>	<b>11703</b>	<b>5199</b>	<b>3981</b>	<b>100.0%</b>	<b>14773</b>	<b>3711</b>	
<b>GREEN BEANS*</b>																					
Egypt	5564	53.7%	13563	2438	5772	53.0%	12876	2231	7083	57.2%	15900	2245	6441	46.7%	13709	2128	10739	53.6%	16439	1528	
Spain	1410	13.6%	2422	1718	1381	12.7%	2401	1739	1680	13.6%	3536	2117	2297	16.6%	4516	1966	2428	12.1%	4987	2034	
Italy	1493	14.4%	3575	2395	1835	16.9%	4157	2265	944	7.6%	2968	3144	1753	12.7%	4144	2364	2015	10.0%	4799	2382	
Germany, FR	156	1.5%	339	2173	98	0.9%	276	2816	551	4.4%	339	615	783	5.7%	477	608	1789	8.9%	813	454	
Ethiopia	---	0.0%	---	---	57	0.5%	221	3877	51	0.4%	142	2784	359	2.6%	1303	3630	811	4.0%	2834	3519	
France	440	4.2%	1611	3661	337	3.1%	1343	3985	460	3.7%	2048	4452	549	4.0%	2530	4608	804	4.0%	3062	3808	
Canary Islands	208	2.0%	749	3601	403	3.7%	1441	3576	356	2.7%	1217	3622	584	4.2%	2549	4565	673	3.4%	2768	4113	
Senegal	530	5.1%	2138	4034	324	4.8%	2138	4080	491	4.0%	1796	3658	609	4.4%	2902	4763	417	2.1%	1879	4566	
Kenya	259	2.5%	818	3158	273	2.5%	903	3315	214	1.7%	731	3416	180	1.3%	608	3378	210	1.0%	747	3557	
Burkina Faso	300	2.9%	1090	3633	208	1.9%	829	3986	576	4.7%	2080	3611	241	1.7%	1012	4199	174	0.9%	724	4161	
<b>Total</b>	<b>10360</b>	<b>100.0%</b>	<b>26305</b>	<b>2539</b>	<b>10888</b>	<b>100.0%</b>	<b>26587</b>	<b>2442</b>	<b>12386</b>	<b>100.0%</b>	<b>30777</b>	<b>2483</b>	<b>13798</b>	<b>100.0%</b>	<b>33750</b>	<b>2446</b>	<b>20880</b>	<b>100.0%</b>	<b>39072</b>	<b>1946</b>	
<b>GREEN BEANS**</b>																					
Germany, FR	1520	46.3%	781	514	383	31.8%	247	645	1045	31.6%	639	611	2441	56.4%	1500	615	3897	73.3%	1666	428	
Belgium-Luxb.	983	30.0%	814	828	163	13.5%	335	2055	885	26.8%	882	997	664	15.3%	1005	1514	1095	20.6%	781	713	
Italy	709	21.6%	1328	1873	585	48.5%	1169	1998	1189	36.0%	2211	1860	1179	27.2%	2560	2154	271	5.1%	465	1716	
Kenya	31	0.9%	82	2645	29	2.4%	53	1828	43	1.3%	144	3349	46	1.1%	127	2761	52	1.0%	135	2596	
France	37	1.1%	66	1784	45	3.7%	63	1400	145	4.4%	84	579	---	0.0%	---	---	---	0.0%	---	---	
<b>Total</b>	<b>3280</b>	<b>100.0%</b>	<b>3071</b>	<b>936</b>	<b>1205</b>	<b>100.0%</b>	<b>1867</b>	<b>1549</b>	<b>3307</b>	<b>100.0%</b>	<b>3960</b>	<b>1197</b>	<b>4330</b>	<b>100.0%</b>	<b>5172</b>	<b>1194</b>	<b>5315</b>	<b>100.0%</b>	<b>3047</b>	<b>573</b>	

\* (from 1 October to 30 June)

\*\* (from 1 July to 30 September)

Quantity (Q): tons; Value (V): '000 Guilders; Unit Value (UV): Guilders/ton  
Source: Tropical and Off-Season Fresh Fruits and Vegetables: A Study of Selected

Table C-4

BELGIUM-LUXEMBOURG: Annual Imports of Selected Fresh Fruits and Vegetables Shipped from Senegal and Competing Suppliers, 1982-86

Product/Origin	1982				1983				1984				1985				1986			
	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV
<b>MELONS</b>																				
of which from:																				
France	7606	67.6%	256908	33777	6922	67.5%	287648	41559	6864	57.8%	283241	41265	7577	59.4%	281787	37190	8621	57.4%	301621	34987
Spain	1765	15.7%	48690	27586	1809	17.7%	56252	31096	2743	23.1%	73662	26855	2970	23.3%	110083	37065	3326	22.2%	111739	33596
Italy	412	3.7%	10283	24959	378	3.7%	10451	27648	606	5.1%	19131	31549	437	3.4%	11633	26620	859	5.7%	21113	24579
Netherlands	366	3.3%	12787	34937	420	4.1%	16630	39955	557	4.7%	20676	37120	567	4.4%	23625	41667	772	5.1%	29128	37751
Senegal	379	3.4%	12743	33623	268	2.6%	10360	38657	519	4.4%	30583	58927	631	4.9%	43746	69328	770	5.1%	46167	59957
Turkey	259	2.3%	10775	41602	263	2.6%	12087	45958	404	3.4%	30673	75923	279	2.2%	24792	88860	416	2.8%	30355	72969
Greece	87	0.8%	1252	14391	30	0.3%	364	12133	105	0.9%	1409	13419	8	0.1%	90	11250	---	0.0%	---	---
<b>Total</b>	<b>11256</b>	<b>100.0%</b>	<b>359563</b>	<b>31944</b>	<b>10248</b>	<b>100.0%</b>	<b>395402</b>	<b>38583</b>	<b>11882</b>	<b>100.0%</b>	<b>460556</b>	<b>38761</b>	<b>12756</b>	<b>100.0%</b>	<b>498810</b>	<b>39104</b>	<b>15010</b>	<b>100.0%</b>	<b>543321</b>	<b>36197</b>
<b>GREEN BEANS*</b>																				
of which from:																				
Kenya	929	27.7%	59286	63817	784	24.6%	53980	68852	754	17.4%	51577	68405	779	15.4%	65349	83888	1037	20.8%	81516	78608
Spain	1112	33.2%	62461	56170	645	20.2%	37759	58541	1001	25.1%	53713	53659	1027	20.3%	50258	48937	1008	20.2%	49278	48887
Italy	443	13.2%	18868	42591	656	20.6%	28217	43014	376	8.7%	18904	50277	663	13.1%	28475	42949	936	18.7%	39028	41697
Netherlands	124	3.7%	8674	69952	381	12.0%	25582	67144	1198	27.6%	43261	36111	1204	23.8%	31350	26038	816	16.3%	33552	41118
Germany, FR	27	0.8%	1028	38074	1	0.0%	45	45000	103	2.4%	773	7505	468	9.3%	4042	8637	592	7.8%	4599	11732
France	448	13.4%	28212	62973	266	8.3%	17721	66620	433	10.0%	17904	41349	459	9.1%	20795	45305	358	7.2%	18134	50654
Senegal	174	5.2%	9836	56529	186	5.8%	10632	57161	416	9.6%	27538	66197	420	8.3%	34044	81057	330	6.6%	27070	82030
Egypt	51	1.5%	3130	61373	14	0.4%	682	48714	31	0.7%	1681	54226	50	0.6%	1347	44900	112	2.2%	7008	62571
Burkina Faso	40	1.2%	2012	50300	4	0.1%	273	68250	23	0.6%	1136	45440	---	0.0%	---	---	8	0.2%	613	76623
Ethiopia	---	0.0%	---	---	250	7.8%	1863	7452	---	0.0%	---	---	4	0.1%	135	33750	---	0.0%	---	---
<b>Total</b>	<b>3348</b>	<b>100.0%</b>	<b>193507</b>	<b>37798</b>	<b>3187</b>	<b>100.0%</b>	<b>176754</b>	<b>35481</b>	<b>4337</b>	<b>100.0%</b>	<b>216487</b>	<b>49916</b>	<b>5054</b>	<b>100.0%</b>	<b>235795</b>	<b>46655</b>	<b>4997</b>	<b>100.0%</b>	<b>260798</b>	<b>52191</b>
<b>GREEN BEANS**</b>																				
of which from:																				
Netherlands	3777	71.0%	31610	8369	2997	26.8%	28808	9612	1156	30.8%	10679	9238	2420	40.4%	19223	7943	5946	51.7%	47963	8066
France	135	2.5%	5052	37422	574	5.1%	9542	16624	1049	27.9%	14178	15516	1659	27.7%	17696	10647	3521	30.6%	42181	11980
Germany, FR	1091	20.5%	7064	6475	871	7.8%	6089	6991	976	26.0%	9270	9498	1349	22.3%	12531	9289	1668	14.5%	15155	9086
Kenya	173	5.3%	11848	68486	176	1.6%	11450	55057	221	5.9%	15223	68882	141	2.7%	11947	74205	237	2.1%	16908	71342
Italy	146	2.7%	4829	33075	179	1.6%	6225	34777	355	9.4%	15769	38786	402	6.7%	15810	39328	137	1.2%	4468	32613
<b>Total</b>	<b>5322</b>	<b>100.0%</b>	<b>60403</b>	<b>11350</b>	<b>11171</b>	<b>42.9%</b>	<b>62114</b>	<b>5560</b>	<b>5757</b>	<b>100.0%</b>	<b>63119</b>	<b>16800</b>	<b>5991</b>	<b>100.0%</b>	<b>77207</b>	<b>12887</b>	<b>11509</b>	<b>100.0%</b>	<b>126673</b>	<b>11007</b>

\* (from 1 October to 30 June)

\*\* (from 1 July to 30 September)

Quantity (Q): tons; Value (V): BF'000; Unit Value (UV): BF/ton

Source: Tropical and Off-Season Fresh Fruits and Vegetables: A Study of Selected European Markets, International Trade Centre UNCTAD/FAO, Geneva, 1987.

Table C-5

**SWITZERLAND: Annual Imports of Selected Fresh Fruit and Vegetables Shipped from Senegal and  
Competing Suppliers, 1982-86**

Product/Origin	1982				1983				1984				1985				1986			
	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV
<b>MELONS</b>																				
of which from:	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV
France	7056	50.3%	14750	2090	7005	45.0%	16125	2302	6116	40.3%	14962	2446	7180	40.5%	15179	2114	7957	39.4%	15978	2008
Italy	4349	31.0%	4681	1076	5921	38.0%	5922	1000	5708	37.6%	5989	1049	5918	33.4%	5592	945	6389	31.6%	6627	1037
Spain	1437	10.2%	2007	1397	1445	9.3%	2156	1492	2006	13.2%	3270	1630	3185	18.0%	5615	1763	4543	22.5%	8325	1832
Israel	987	7.0%	3098	3139	926	5.9%	3035	3278	1034	6.8%	2982	2884	1050	5.9%	3201	3049	960	4.7%	2633	2743
South Africa	142	1.0%	556	3915	170	1.1%	636	3741	206	1.4%	821	3985	318	1.8%	1095	3443	279	1.4%	1142	4693
Chile	---	0.0%	---	---	---	0.0%	---	---	19	0.1%	33	1737	22	0.1%	69	3136	39	0.2%	59	1513
Senegal	34	0.2%	136	4000	101	0.6%	439	4347	97	0.6%	318	3278	37	0.2%	150	4054	32	0.2%	120	3750
United States	21	0.1%	100	4762	9	0.1%	41	4556	8	0.1%	39	4875	18	0.1%	93	5167	15	0.1%	211	14067
<b>Total</b>	<b>14026</b>	<b>100.0%</b>	<b>25328</b>	<b>20380</b>	<b>15577</b>	<b>100.0%</b>	<b>28354</b>	<b>20715</b>	<b>15194</b>	<b>100.0%</b>	<b>28414</b>	<b>21885</b>	<b>17728</b>	<b>100.0%</b>	<b>30994</b>	<b>23671</b>	<b>20214</b>	<b>100.0%</b>	<b>35095</b>	<b>31043</b>
<b>GREEN BEANS</b>																				
of which from:	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV	Q	% of Q	V	UV
Italy	1488	38.2%	3117	2095	1757	44.6%	3216	1830	1845	44.7%	3547	1922	1683	42.5%	3308	1966	1600	42.3%	3097	1936
Spain	1200	30.8%	2461	2051	1282	32.5%	2889	2254	1409	34.2%	3125	2218	1213	30.6%	2584	2130	858	22.7%	1737	2024
Egypt	464	11.9%	1301	2804	281	7.1%	923	3285	202	4.9%	548	2713	215	5.4%	668	3167	523	13.8%	1623	3103
Kenya	280	7.2%	1106	3950	271	6.9%	1139	4203	320	7.8%	1416	4425	328	8.3%	1468	4476	360	9.5%	1382	3839
France	316	8.1%	750	2373	265	6.7%	698	2634	263	6.4%	1450	5513	346	8.7%	1000	2850	273	7.2%	786	2879
Burkina Faso	52	1.3%	164	3154	47	1.2%	132	2809	53	1.3%	176	3321	172	4.3%	551	3203	105	2.8%	332	3162
United Arab Emirates	---	0.0%	---	---	---	0.0%	---	---	1	0.0%	4	4000	1	0.0%	2	2000	60	1.6%	262	4367
Senegal	92	2.4%	339	3685	39	1.0%	106	2718	30	0.7%	93	3100	1	0.0%	5	5000	7	0.2%	22	3143
<b>Total</b>	<b>3892</b>	<b>100.0%</b>	<b>9238</b>	<b>20112</b>	<b>3942</b>	<b>100.0%</b>	<b>9103</b>	<b>19732</b>	<b>4123</b>	<b>100.0%</b>	<b>10359</b>	<b>27212</b>	<b>3959</b>	<b>100.0%</b>	<b>9586</b>	<b>24772</b>	<b>3786</b>	<b>100.0%</b>	<b>9241</b>	<b>24453</b>

Quantity (Q): tons; Value (V): SF'000; Unit Value (UV): SF/ton

Sources: Tropical and Off-Season Fresh Fruits and Vegetables: A Study of Selected European Markets, International Trade Centre UNCTAD/GATT, Geneva, 1987.

Table C-6

## Senegal: Imports of Vegetables, 1981-1987

Year	1981		1982		1983		1984		1985		1986		1987	
	Qty.	Value												
Potatoes for Seed	1644	184924	1326	140770	452	73743	679	117178	1447	234767	923	176688	1873	332142
Potatoes for Consumption	9750	781414	10380	838630	12302	1319894	13607	1492261	12863	1103289	9741	868986	13530	1036809
Tomatoes	82	13123	67	12564	45	8768	61	15018	35	10680	34	8476	159	41216
Cabbages	36	5524	75	11897	46	8704	34	6931	48	10387	31	6833	97	17592
Green Beans	*	26	*	2	*	106	2	771	1	601	*	94	4	1553
Beans	94	18776	66	36972	44	14323	45	13848	13533	127987	15055	1366966	16586	1570437
Cucumbers/Pickles	13	1114	13	1847	4	1239	2	651	56	19895	168	30570	83	30158
Onion/Garlic/Green Onions	11395	900895	14223	1111027	15645	1508487	15378	1596371	47	30066	28	20192	46	29096
Spinach	51	25266	106	29936	110	22342	47	26402	80	8986	5	1466	96	16029
Dry Peas	95	10420	89	12674	39	5331	86	11599	39	16722	98	29005	151	30711
Lentils	78	19057	55	15621	128	31801	96	28027	13	588	31	795	*	139
Yams/Manioc	1	159	*	50	15	1811	*	78	424	48941	445	58293	531	70379
Turnips/Beets	245	26285	288	35072	302	43945	421	55433	2	887	1	299	3	1215
Other Vegetables	117	69827	130	26850	192	106851	130	118352	839	1591608	199	176121	216	154797
<b>Total Vegetables</b>	<b>23601</b>	<b>2056810</b>	<b>26818</b>	<b>2273312</b>	<b>29324</b>	<b>3147345</b>	<b>30588</b>	<b>3482923</b>	<b>29427</b>	<b>3205404</b>	<b>26759</b>	<b>2744784</b>	<b>33375</b>	<b>3332273</b>

Units: Quantities in MT; Value in thousands of FCFA

\* indicates figures less than one.

Table C-7

## Senegal: Imports of Fruits, 1981-1987

Year	1981		1982		1983		1984		1985		1986		1987	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
<b>Bananas</b>														
Plantains	37	3960	6	437	152	196	*	47	*	64	23	3896	76	10336
Fresh Bananas	1792	215335	1659	206207	4520	558467	5694	830058	4082	604269	4138	720045	2706	464145
Dried Bananas	*	227	*	194	*	64	*	33	*	113	*	80	*	238
<b>Total Bananas</b>	<b>1829</b>	<b>219522</b>	<b>1665</b>	<b>206838</b>	<b>4672</b>	<b>558727</b>	<b>5694</b>	<b>830138</b>	<b>4082</b>	<b>604446</b>	<b>4161</b>	<b>724021</b>	<b>2782</b>	<b>474719</b>
<b>Pineapples</b>	<b>62</b>	<b>7412</b>	<b>36</b>	<b>4540</b>	<b>151</b>	<b>20169</b>	<b>272</b>	<b>43147</b>	<b>62</b>	<b>10401</b>	<b>71</b>	<b>1112</b>	<b>12</b>	<b>2202</b>
<b>Grafted Mangoes</b>	<b>9</b>	<b>286</b>	<b>---</b>	<b>74</b>	<b>26</b>	<b>2660</b>	<b>1</b>	<b>183</b>	<b>12</b>	<b>919</b>	<b>---</b>	<b>115</b>	<b>---</b>	<b>---</b>
<b>Citrus</b>														
Oranges	2595	319030	2836	353665	1891	286637	1912	311390	1189	241687	1869	333708	1768	323082
Mandarins	77	12161	89	17368	29	6000	30	7156	8	2387	21	4717	---	---
Clementines	64	11345	139	24876	277	52989	504	99392	360	74934	320	72384	286	62645
Lemons	19	3180	43	3594	29	5821	37	7347	28	6229	29	5618	7	1899
<b>Total Citrus</b>	<b>2755</b>	<b>345716</b>	<b>3107</b>	<b>399503</b>	<b>2226</b>	<b>351447</b>	<b>2483</b>	<b>425285</b>	<b>1585</b>	<b>325237</b>	<b>2239</b>	<b>416427</b>	<b>2061</b>	<b>387626</b>
<b>Other Fruits</b>	<b>11727</b>	<b>1915214</b>	<b>13061</b>	<b>310618</b>	<b>7073</b>	<b>238096</b>	<b>14603</b>	<b>2700007</b>	<b>10657</b>	<b>2088963</b>	<b>10982</b>	<b>2077383</b>	<b>12945</b>	<b>2463179</b>
<b>Total Fruit</b>	<b>16382</b>	<b>2488150</b>	<b>17869</b>	<b>921573</b>	<b>14148</b>	<b>1171099</b>	<b>23053</b>	<b>3998760</b>	<b>16398</b>	<b>3029966</b>	<b>17453</b>	<b>3219058</b>	<b>17800</b>	<b>3327726</b>

Units: Quantities in MT; Values in thousands of FCFA

\* indicates figures less than one.

Table C-8

## Senegal: Fruit and Vegetable Imports by Commodity and Source, 1987

Products	Total (Kg.)	Source
<b>Fruits</b>		
Apples	2418.1	France
Pineapples	409.8	Ivory Coast
Oranges	2049.4	Morocco
Raisins	71.9	France
Clementines	237.8	Morocco
Pears	59.2	France
Dates	0.9	France
Bananas	3023.5	Ivory Coast
Mandarines	15.5	Morocco
Peaches	12.6	Spain
Coco Nuts	1042.9	Ivory Coast
Grenadines	0.6	France
Apricots	4.0	Spain
Large Cola Nuts	35.9	Ivory Coast
Nectarines	5.0	France
Melon	7.7	France
Prunes	19.5	France
Citrus	8.2	France
Small Cola Nuts	1.6	Ivory Coast
<b>Total</b>	<b>9424.2</b>	
<b>Vegetables</b>		
Potatoes for seed	591.6	Holland-France
Onions	14951.6	Holland-France
Potatoes for consumption	15161.3	Holland-France
Endives	3.2	Belgium
Artichokes	1.6	Holland-France
Beans	203.1	France
Tomatoes	45.2	France
Carrots	329.1	France
Peas	20.2	France
Lentils	67.9	France
Pimentoes	1.7	Holland-France
Beets	11.9	France
Spinach	6.0	Belgium
Pepper	91.6	France
Green Peppers	85.7	Morocco
Garlic	738.9	Spain
Bay Leaves	29.9	Morocco
Other Vegetables	958.3	---
<b>Total</b>	<b>33298.8</b>	

Source: Service Phytosanitaire du Port de Dakar; DPV/MDR

Table C-9

## Monthly and Annual Average Retail Prices for Selected Vegetables in Seven Markets of Dakar

(in FCFA/Kg.)

1986 Month	Eggplant	Carrot	Cabbage	Okra	Green Beans	Jaxatu	Turnip	Sweet Potato	Chilli	Green Onions	Tomato	Cherry Tomato
January	171	252	230	510	239	221	195	236	933	343	198	509
February	165	231	180	476	192	174	167	233	852	348	135	373
March	166	223	121	423	174	263	147	222	839	326	116	338
April	162	191	119	359	151	202	132	194	836	213	113	239
May	163	191	154	346	169	244	142	193	859	147	148	227
June	151	175	193	290	303	259	171	189	613	145	145	204
July	163	219	259	357	835	296	246	204	727	155	186	210
August	200	343	330	391	835	349	265	217	736	170	210	228
September	193	481	475	413	835	334	305	222	685	226	271	252
October	180	516	519	316	---	249	295	234	779	324	276	331
November	165	405	560	278	---	308	271	220	785	278	267	509
December	163	345	408	283	---	281	264	224	689	201	208	533
Average	170	298	296	370	---	265	217	216	778	240	189	329

## Annual Mean Prices for 1985

1985	Eggplant	Carrot	Cabbage	Okra	Green Beans	Jaxatu	Turnip	Sweet Potato	Chilli	Green Onions	Tomato	Cherry Tomato
Average	161	233	248	345	213	264	177	210	681	193	192	292

## Increase in Average Annual Price from 1985 to 1986

1985 to 1986	5.5%	27.5%	0.19	7.3%	---	0.4%	22.1%	2.6%	14.2%	24.1%	-1.5%	13.0%
--------------------	------	-------	------	------	-----	------	-------	------	-------	-------	-------	-------

Source: Papa Abdoulaye Seck et Landina Goudiaby, "Les prix de detail des legumes dans la region de Dakar, Janvier-December 1985," ISRA/CDE, Mai 1986.

Papa Abdoulaye Seck et Landina Goudiaby, "Les prix de detail des legumes dans la region de Dakar, Janvier-December 1986," ISRA/CDE, Aout 1987.

Table C-10

## Kenya

## Composition of Exports of Fresh Horticultural Produce, 1983 and 1986

Product	1983				1986			
	Volume (metric tons)	Percent- age	Value (KSh millions)	Percent- age	Volume (metric tons)	Percent- age	Value (KSh millions)	Percent- age
Cut flowers	5,209	18.1	145.85	41.6	8,265	22.8	247.95	39.3
French beans	6,447	22.3	70.92	20.2	9,097	25.1	154.65	24.5
Mangoes	1,446	5.0	17.35	5.0	2,941	8.1	50.00	7.9
Okra	1,873	6.5	16.86	4.8	1,738	4.8	21.90	3.5
Chilies	1,895	6.6	15.16	4.3	2,087	5.8	26.30	4.2
Bitter melons	1,010	3.5	10.10	2.9	1,279	3.5	17.39	2.8
Eggplants	2,152	7.5	9.68	2.8	1,692	4.7	12.65	2.0
Courgettes	1,164	4.0	8.15	2.3	231	0.7	1.98	0.3
Avocados	1,073	3.7	7.35	2.1	2,151	5.9	17.21	2.7
Pineapples	1,093	3.8	5.19	1.5	863	2.4	5.18	0.8
Passion fruit	425	1.5	4.25	1.2	646	1.8	11.23	1.5
Squash	499	1.7	3.99	1.1	868	2.4	9.29	1.5
Bobby beans	400	1.4	3.20	0.9	478	1.3	5.06	0.8
Melons	156	0.5	1.56	0.5	...	...	...	...
Strawberries	...	...	...	...	275	0.8	11.01	1.8
All Others	4,008	13.9	30.96	8.8	3,600	9.9	38.53	6.1
<b>Total</b>	<b>28,850</b>	<b>100.0</b>	<b>350.57</b>	<b>100.0</b>	<b>36,211</b>	<b>100.0</b>	<b>630.37</b>	<b>100.0</b>

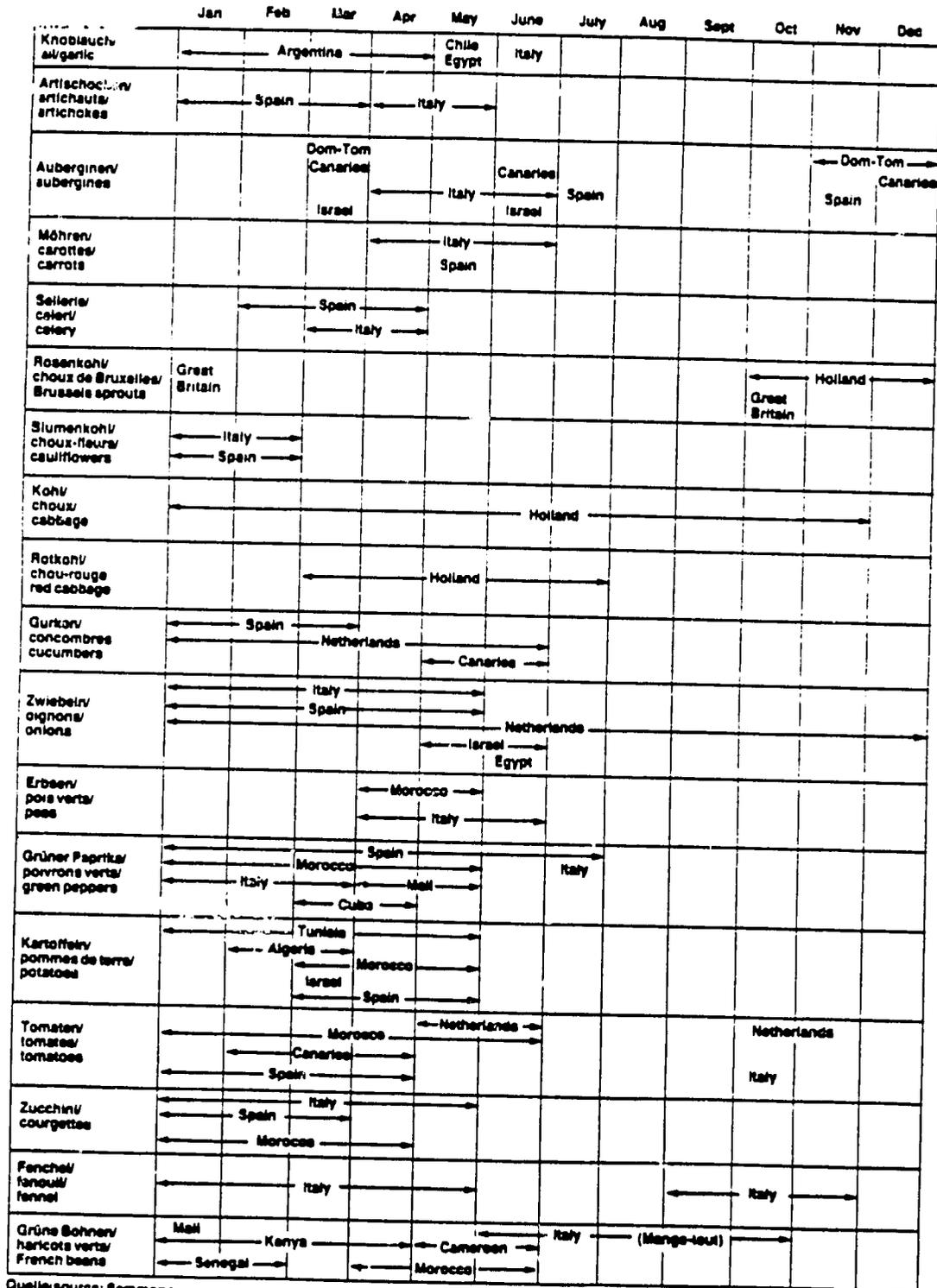
... = negligible

Source: Horticultural Crops Development Authority (1984, 1987)

As cited in Schapiro and Wainaina, "Kenya: A Case Study of the Production and Export of Horticultural Commodities," in World Bank, Successful Development in Africa, 1988.

Figure C-1

Calendar of Vegetable Imports to Rungis  
(Calendrier des importations de légumes à Rungis)



Quelle source: Semmans.

Table C-11

## Green Bean Prices in France by Quality, by Source and by Week

Prices in French Francs per kilogram

	Extra Fine						Fine				Bobby				
	Kenya	Spain	Senegal	Burkina	Morocco	Local	Kenya	Senegal	Burkina	Morocco	Kenya	Spain	Egypt	Senegal	Italy
Jan 27 88		26.00	18.00					15.00	14.00				6.50	15.00	
Feb 03 88			18.00					15.00							
Feb 10 88	14.00		14.50					12.00	10.50				7.50	11.00	
Feb 17 88								11.00							
Feb 24 88	14.50		14.50				12.00	12.00	12.50				7.50	12.00	
Mar 02 88	18.00		19.00				14.00	15.50	16.50					15.50	
Mar 09 88	21.00		21.50	15.50			17.00	16.50						18.00	
Mar 16 88	23.00		22.00				19.00		19.50						
Mar 23 88	23.50		22.00				20.00	17.00	15.50					17.00	
Mar 30 88	22.50			19.00			19.00							18.00	
Apr 13 88	20.00						14.00								
Apr 20 88	21.00				18.50		19.00		18.00	17.00					
Apr 27 88	22.00				19.00		17.50			11.50			11.00		
May 05 88	20.00				17.50		16.00			15.00			9.50		
May 11 88	18.00		18.00		19.00		14.50	14.00		16.00			7.00		
May 18 88	15.50				12.50		13.00			11.50			6.00		
May 25 88	20.00				15.00		15.50			12.50					
Jun 01 88	18.00				14.00		14.00			12.00					
Jun 08 88	18.00				14.00		14.00			12.00					
Jun 15 88					18.00					14.00					12.50
Jun 22 88															
Jun 26 88															
Jul 06 88															
Jul 13 88															
Jul 20 88															
Jul 27 88						20.00									7.50
Aug 03 88															
Aug 10 88															
Aug 17 88															
Aug 24 88															
Aug 31 88															
Sep 07 88															
Sep 14 88	19.00					17.50	14.00								
Sep 21 88	16.00					15.50	11.00								
Sep 29 88	16.00					15.50	11.00								
Oct 05 88	17.50						13.00								8.50
Oct 15 88	20.00						13.00								8.50
Oct 19 88	19.00					16.50	13.50								7.50
Oct 26 88	16.50											8.50			7.50
Nov 09 88	17.50											8.50			7.50
Nov 16 88															
Nov 23 88	20.00				16.50		14.50			13.00			6.00		7.00
Nov 30 88	21.00		20.00				15.50	15.00							8.00
Dec 07 88	21.00														
Dec 13 88	17.50		16.00		16.50		13.50	12.00		13.00			6.00		7.50
Jan 11 89	16.00		17.00				13.00	14.00	14.00				9.00	14.00	
Jan 18 89	19.00		18.50				16.00	16.00	16.00					15.00	
Jan 25 89	19.00		19.50				17.00	17.00							
Feb 01 89	19.50		18.50				16.00	16.00	15.00					15.00	
Feb 08 89	16.50		16.50				13.50	15.00	14.00		14.00				
Feb 15 89	18.00		18.00				14.00	14.00	14.00					14.00	
Feb 22 89	17.00		17.00				14.00	14.00	14.00						
Mar 01 89	20.00		17.50					13.50	14.50						
Mar 08 89	21.00		19.00				16.50	17.00						20.00	
Mar 15 89			24.00					21.50	19.00					20.00	
Mar 22 89			24.00					19.00	19.00					20.00	
Mar 29 89			27.50						17.00					20.00	
Apr 04 89	21.00		20.00					18.00	17.00						
Apr 12 89	20.00				20.00		16.50		12.50	15.00			11.50		
Apr 19 89	20.00						15.00		10.00						
Apr 26 89					18.50		15.50			13.50			7.00		
May 03 89	17.50				17.00		14.00								
May 10 89	17.00				17.00		13.00			14.00					
May 17 89	24.50				17.00					12.00			7.00		
May 24 89	16.50				12.00		13.00			8.50					12.00
May 31 89	19.00				16.00		14.00			13.00					

Source: Market News Service, ITC

Table C-12

## Green Bean Prices in Belgium by Quality, by Source, and by Week

Prices in Belgian Francs per kilogram

	Extra Fine	Fine	Bobby			
	Kenya	Kenya	Kenya	Spain	Egypt	Senegal
Jan 27 88	112.00	92.00				
Feb 03 88	112.00	92.00				
Feb 10 88	115.00	92.00				
Feb 17 88	116.00	96.00				
Feb 24 88	116.00	96.00				
Mar 02 88	120.00	100.00	65.00			90.00
Mar 09 88	120.00	100.00	65.00			90.00
Mar 16 88	124.00	110.00	65.00			92.50
Mar 23 88	116.00	96.00	65.00			92.50
Mar 30 88	120.00	96.00	75.00			92.50
Apr 13 88	124.00	104.00	75.00			
Apr 20 88	120.00	110.00	70.00			
Apr 27 88	120.00	110.00	75.00			
May 05 88	116.00	106.00	65.00			
May 11 88	116.00	106.00	65.00			
May 18 88	116.00	106.00				
May 25 88	112.00	90.00				
Jun 01 88	112.00	90.00				
Jun 08 88	116.00	98.00				
Jun 15 88	116.00	98.00				
Jun 22 88	120.00	98.00				
Jun 26 88	124.00	106.00				
Jul 06 88	116.00					
Jul 13 88	110.00	92.00				
Jul 20 88	110.00	92.00				
Jul 27 88	100.00	92.00				
Aug 03 88	100.00	80.00				
Aug 10 88	100.00	80.00				
Aug 17 88	100.00	80.00				
Aug 24 88	96.00	80.00				
Aug 31 88	96.00	52.00				
Sep 07 88	100.00	64.00				
Sep 14 88	104.00	64.00				
Sep 21 88	104.00	64.00				
Sep 29 88	104.00	80.00				
Oct 05 88	104.00	80.00				
Oct 15 88	100.00	80.00				
Oct 19 88	104.00	80.00				
Oct 26 88	104.00	88.00				
Nov 09 88	104.00	88.00				
Nov 16 88	108.00	92.00				
Nov 23 88	108.00	92.00				
Nov 30 88	108.00	92.00				
Dec 07 88	112.00					
Dec 13 88	116.00	96.00				
Jan 11 89						
Jan 18 89	116.00	102.00	90.00			
Jan 25 89	120.00	104.00				95.00
Feb 01 89	104.00	92.00	85.00			85.00
Feb 08 89	112.00	100.00	90.00			90.00
Feb 15 89	120.00	100.00	75.00			75.00
Feb 22 89	128.00	108.00	95.00			95.00
Mar 01 89	128.00	112.00	105.00			105.00
Mar 08 89	128.00	112.00	105.00			105.00
Mar 15 89			145.00			110.00
Mar 22 89	136.00	122.00	105.00			125.00
Mar 29 89	138.00	124.00	105.00	180.00		120.00
Apr 04 89	130.00	124.00	105.00	100.00		110.00
Apr 12 89	145.00	135.00	105.00	70.00	95.00	110.00
Apr 19 89	128.00	104.00		105.00	60.00	
Apr 26 89	128.00	108.00		105.00	60.00	
May 03 89	128.00	108.00		95.00	50.00	
May 10 89	112.00	96.00			50.00	
May 17 89	120.00	104.00		85.00	55.00	
May 24 89	108.00	90.00			32.50	
May 31 89	106.00	90.00				

Source: Market News Service, ITC

Table C-13

## Green Bean Prices in Germany, by Quality, by Source and by Week

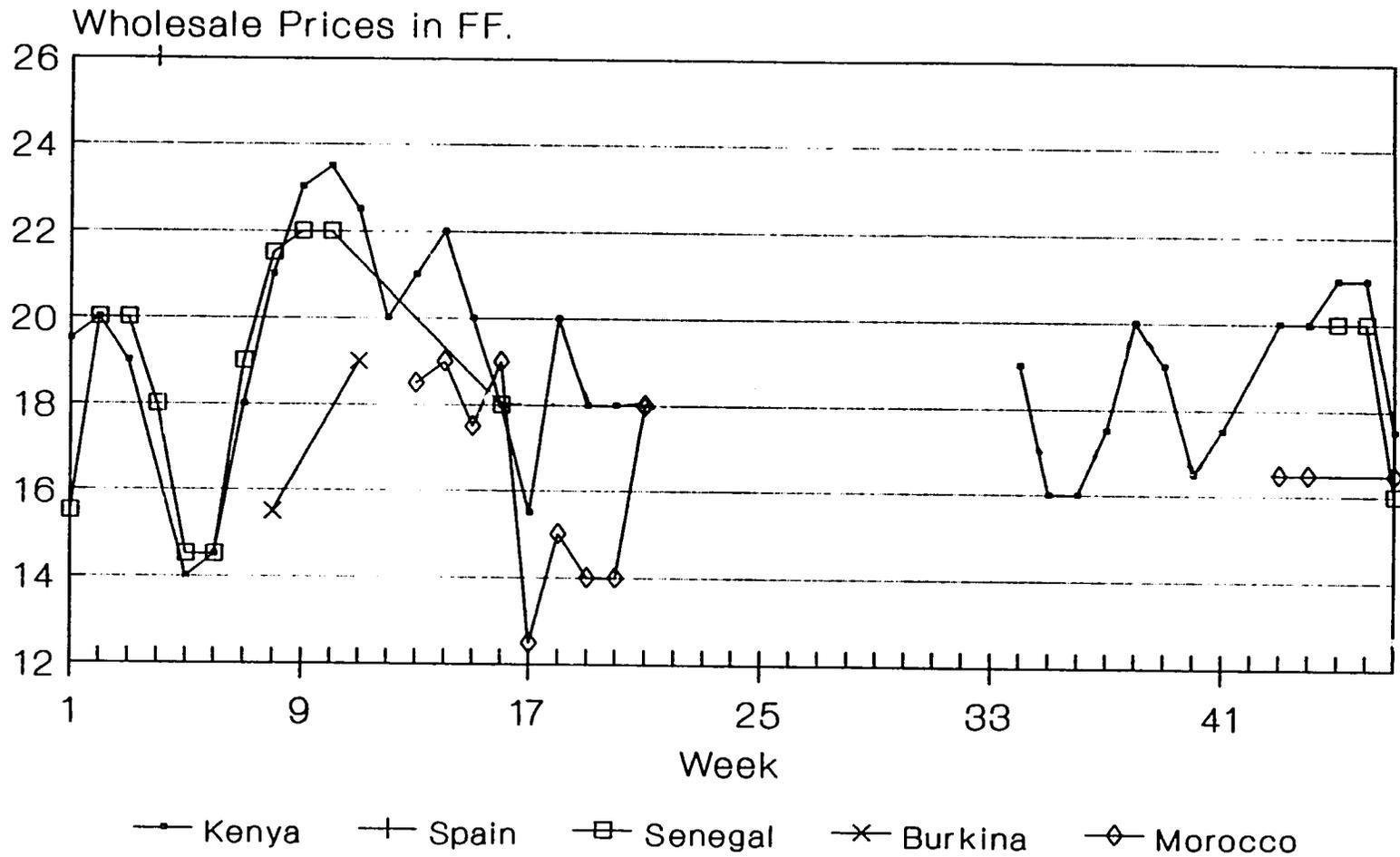
Prices in German Marks per kilogram

	Extra Fine		Fine		Bobby					
	Kenya	Other	Kenya	Other	Kenya	Spain	Egypt	Senegal	Italy	Other
Jan 27 88	6.20				3.20	4.00	2.00			
Feb 03 88	6.00				2.90		2.20			
Feb 10 88	6.00				3.80		2.20	3.20		
Feb 17 88	6.20									
Feb 24 88	6.10				4.40					
Mar 02 88	6.00				4.60					
Mar 09 88	6.00				5.00					
Mar 16 88	6.00				5.00					
Mar 23 88	6.00						4.30	5.00		3.30
Mar 30 88	6.00				4.20		3.55	4.40		
Apr 13 88	6.00				4.60		4.00			
Apr 20 88	5.90				3.80		3.67			
Apr 27 88	6.00				4.40					
May 05 88	5.80				3.80					
May 11 88	6.00				3.60					
May 18 88	5.80								3.00	
May 25 88	NA									
Jun 01 88	6.00					3.00				
Jun 08 88	5.90									
Jun 15 88	6.40								2.50	
Jun 22 88	5.40					3.00				
Jun 26 88	5.80					5.00				
Jul 06 88	5.80									
Jul 13 88	6.00									
Jul 20 88	6.00									
Jul 27 88	6.30		5.60							
Aug 03 88	6.40		5.80							
Aug 10 88	6.40		5.60							
Aug 17 88	6.30		5.60							
Aug 24 88	6.20									
Aug 31 88	6.40		5.60							
Sep 07 88	6.00									
Sep 14 88	6.20									
Sep 21 88	6.20		5.90							
Sep 29 88	6.00									
Oct 05 88	6.20									
Oct 15 88	5.75								2.60	
Oct 19 88	6.00								2.50	
Oct 26 88	5.80								2.00	
Nov 09 88	6.80						2.40			
Nov 16 88	5.80									
Nov 23 88	5.90									
Nov 30 88	6.00					4.00	3.75			
Dec 07 88	6.40		4.00				3.75			
Dec 13 88	6.20		4.00				4.00			
Jan 11 89	6.00				4.40					
Jan 18 89	6.20				4.40					
Jan 25 89	6.20				4.50	3.50				
Feb 01 89	6.20				4.50			4.80		
Feb 08 89	6.40				4.00					
Feb 15 89	6.20				4.00					
Feb 22 89	6.70				3.80					
Mar 01 89	6.20				4.25					
Mar 08 89	6.40				4.75					
Mar 15 89	6.40							6.50		
Mar 22 89	6.60				5.50			5.50		
Mar 29 89	6.80				5.13					
Apr 04 89	6.60				5.75					
Apr 12 89	6.00				4.50					
Apr 19 89	6.20				3.75		17.00			
Apr 26 89	6.00				3.50	5.00				5.00
May 03 89	6.00									4.00
May 10 89	5.80									3.30
May 17 89	5.80									
May 24 89	5.80									
May 31 89	5.40									

Source: Market News Service, ITC

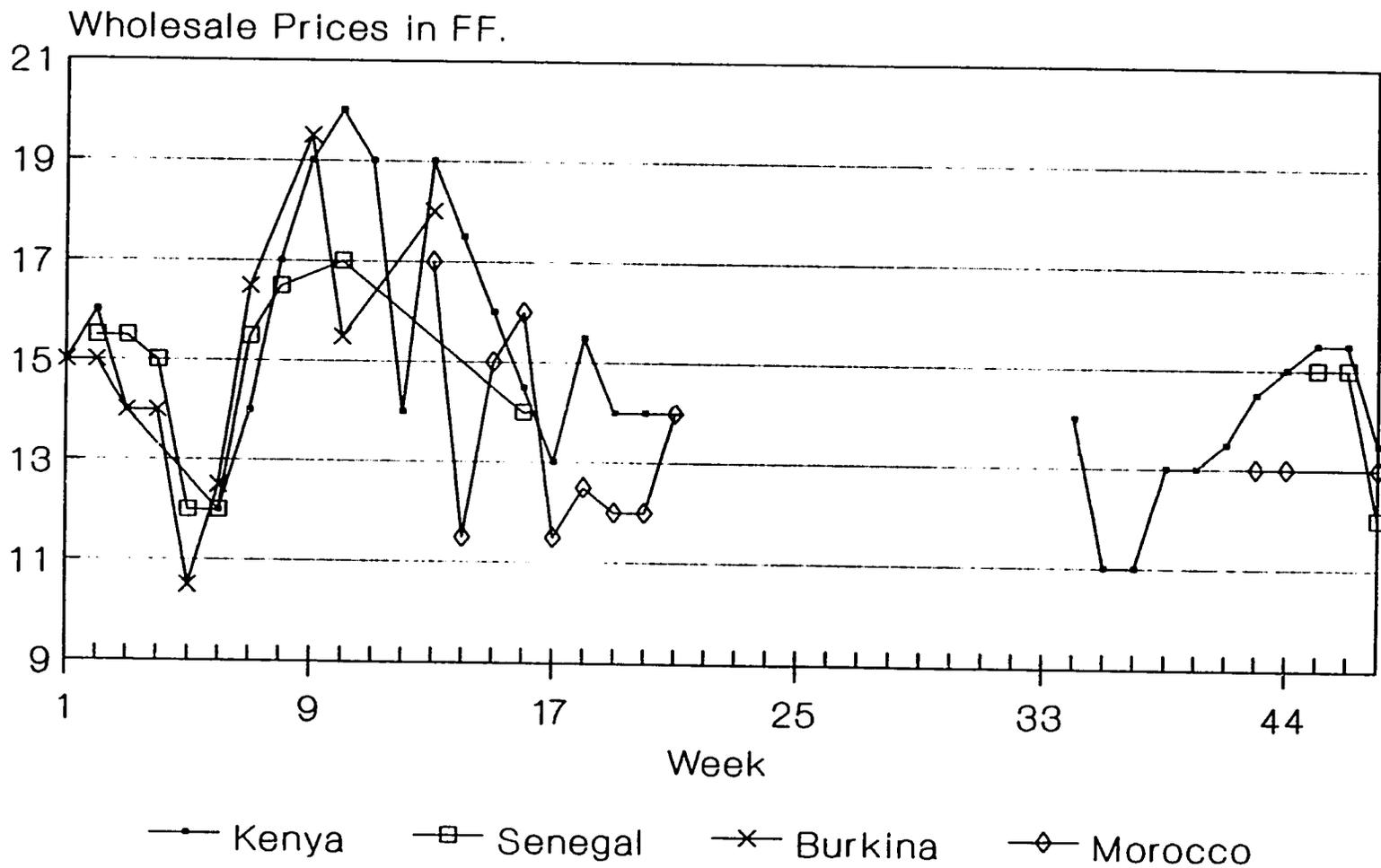
Figure C-2  
**Weekly Prices for French Beans in France**  
 (Extra Fine Quality, 1988)

114



Source: ITC Market News Service

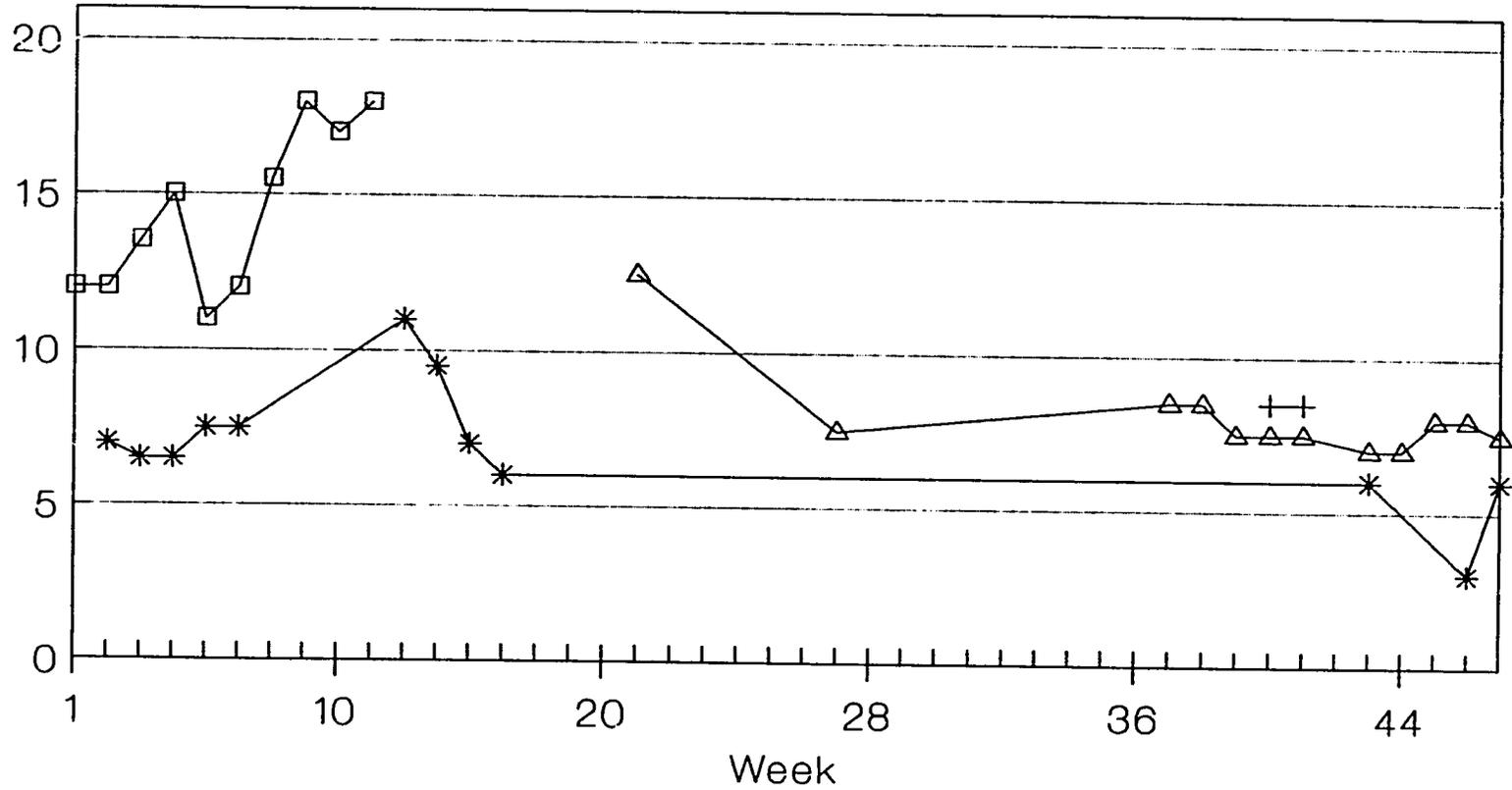
Figure C-3  
**Weekly Prices for French Beans in France**  
 (Fine Quality, 1988)



Source: ITC Market News Service

Figure C-4  
**Weekly Prices for Green Beans in France**  
 (Bobby Quality, 1988)

Wholesale Prices in FF.

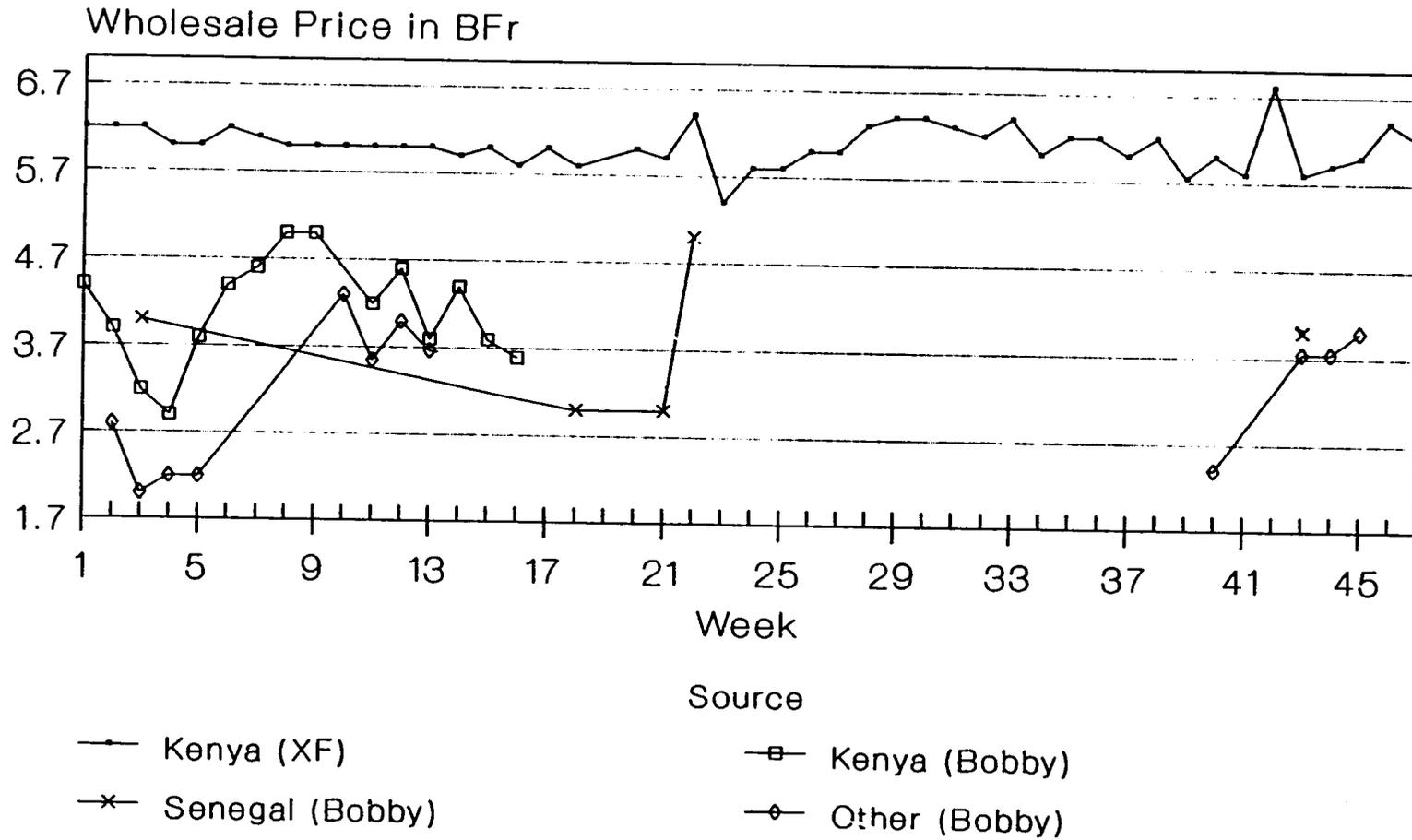


+ Spain   \* Egypt   □ Senegal   △ Italy

Source: ITC Market News Service

Figure C-5  
**Green Bean Prices in Belgium**  
**1988**

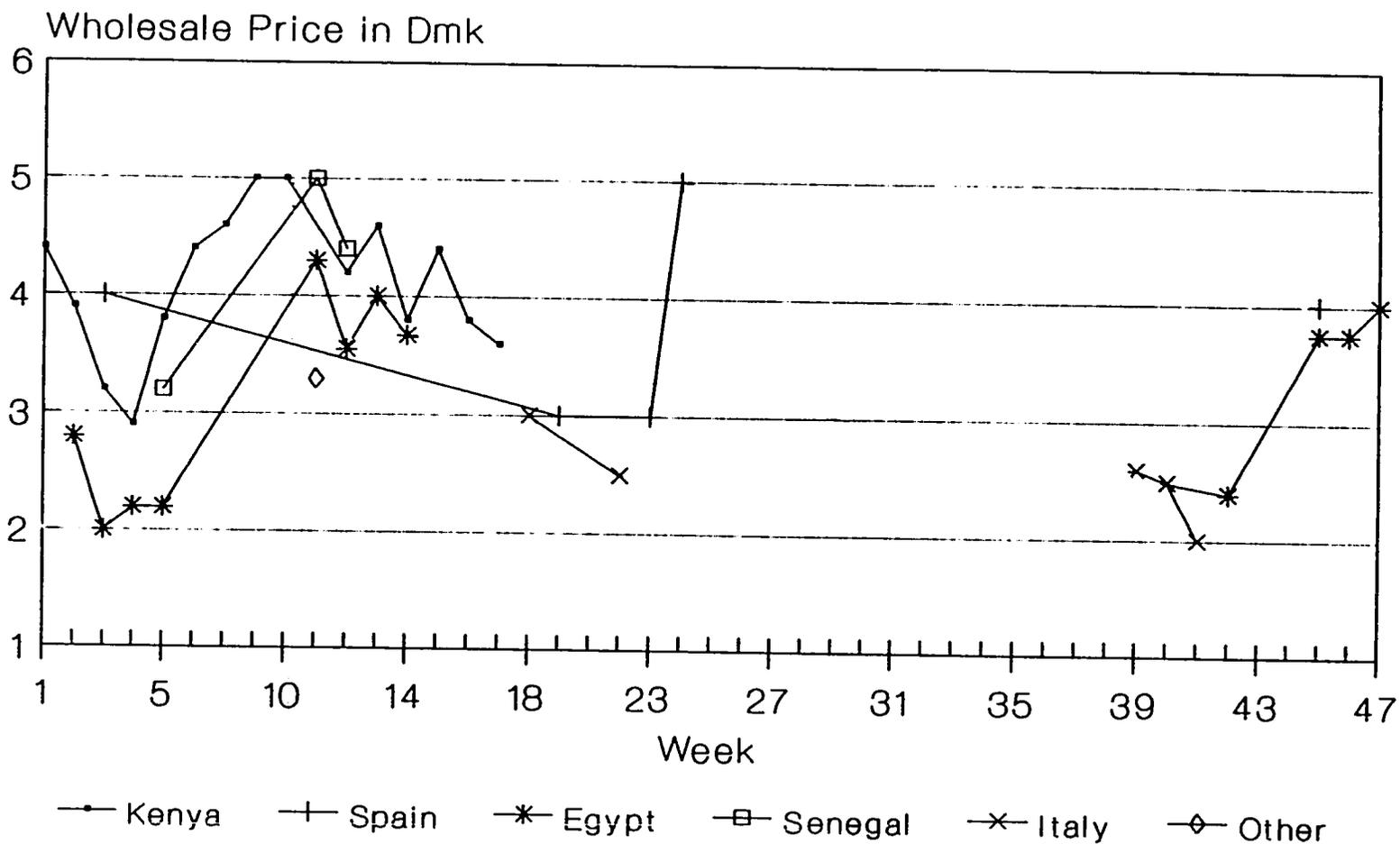
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Source: ITC Market News Service

Figure C-6  
**Green Bean Prices in Germany**  
**(Bobby Quality, 1988)**

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Source: ITC Market News Service

Table C-14

## Mango Prices in France, by Source and by Week

French Francs per kilogram

	Brazil	Peru	Colombia	South Africa	Burkina Faso	Mali	Ivory Coast	Kenya	Venezuela	Puerto Rico	Mexico	Egypt	Israel	Other
1/13/88	19.50	22.50												
1/20/88	18.00	22.50												
1/27/88		22.00												
2/03/88	18.00	22.00		19.00										
2/10/88	18.00	22.00												
2/17/88	18.00	22.00		16.00										
2/24/88														
3/02/88	18.00	20.00		16.00										
3/09/88		20.00		16.00										18.00
3/16/88		18.00		16.00										
3/23/88				20.00										
3/30/88						16.00								
4/13/88					18.00	18.00								
4/20/88					15.00	15.00								
4/27/88					11.50	11.50	14.00		21.50					
5/04/88					12.50	11.50	15.50		21.50					
5/11/88					12.50	12.00	15.50		20.00					
5/18/88					10.50	10.50	14.50		20.00					
5/25/88					9.00	10.00	16.50		20.00					
6/01/88					9.00		16.00		20.00		16.00			
6/08/88					9.00	12.00	10.00		20.00		15.00			
6/15/88						9.00			18.00		14.00			
6/22/88									18.00		18.00			
6/28/88										16.50	22.00			
7/06/88					11.50	11.00			15.00					
7/13/88						11.50								
7/20/88						11.50				17.00	17.00			
7/27/88						14.00					15.00			
8/03/88											15.00			
8/10/88						11.00			14.00		15.00			
8/17/88						11.00			14.00		16.50			
8/24/88						11.00			14.00		16.50			
8/31/88									14.00		19.00		20.00	
9/07/88											19.00		20.00	
9/14/88											19.00		22.00	
9/21/88									14.50		18.00		20.00	
9/29/88									14.50				19.00	
10/05/88									14.50	18.00				
10/15/88										18.00				
10/19/88														
10/26/88	26.50									26.50				
11/09/88	27.50									26.50				
11/16/88	26.00							22.50						20.00
11/23/88	22.50							21.00						15.00
11/30/88	20.00							19.00						14.00
12/07/88	20.00							19.00						14.00
12/13/88	18.00							15.00						12.00
1/11/89	15.00	17.50												
1/18/89	16.50	17.50												
1/25/89	16.50	20.00												
2/01/89	16.50	16.00												
2/08/89	16.50	20.00												
2/15/89		17.00												
2/22/89	17.00	20.00		17.00										
3/01/89		21.00												
3/08/89		21.00												
3/15/89				22.00										
3/22/89				23.50										
3/29/89				23.50										
4/04/89				22.00										
4/12/89					14.00	10.00	16.00							
4/19/89					10.50	10.00	16.00							
4/26/89					10.50	10.00	16.00							
5/03/89					10.00	9.50	13.00							
5/10/89					10.00	9.50	13.00							
5/17/89					10.00	9.50	15.00							
5/24/89					7.00	7.00	10.00							
5/31/89					6.50	6.50	8.50		16.00	16.00			16.50	20.00

Source: Market News Service, ITC

Table C-15

## Mango Prices in Belgium, by Source and by Week

Belgian Francs per kilogram

	Peru	South Africa	Ivory Coast	Venezuela	Mexico	Puerto Rico	Israel	Brazil
2/03/88	102.50	102.50						
2/10/88	109.00	1.50						
2/17/88	113.50	107.50						
2/24/88								
3/02/88	113.50	95.00						
3/09/88	113.50	95.00						
3/16/88		102.50						
3/23/88		105.00						
3/30/88								
4/13/88								
4/20/88								
4/27/88								
5/04/88								
5/11/88								
5/18/88				89.00	85.00			
5/25/88				100.00	95.00			
6/01/88			60.00					
6/08/88						75.00		
6/15/88						72.50		
6/22/88						70.00		
6/26/88					80.00	70.00		
7/06/88					80.00	70.00		
7/13/88					80.00	75.00		
7/20/88					75.00	77.50		
7/27/88					73.00	75.00		
8/03/88					73.00	77.50		
8/10/88					77.70	77.50		
8/17/88					77.50	77.50		
8/24/88					100.00	85.00		
8/31/88						85.00	120.00	
9/07/88						97.50	120.00	
9/14/88						87.00	100.00	
9/21/88						84.00	104.00	
9/29/88						85.00	98.00	
10/05/88						88.00	105.00	
10/15/88						88.00	103.00	
10/19/88						125.50		
10/26/88						137.00		
11/09/88						146.50		
11/16/88						146.50		
11/23/88								
11/30/88						130.00		
12/07/88								100.00
12/13/88								100.00
1/11/89								
1/18/89								80.00
1/25/89								105.00
2/01/89	80.00							
2/08/89	105.00							
2/15/89	105.00	87.00						
2/22/89	100.00	80.00						
3/01/89	100.00	80.00						
3/08/89	100.00	80.00						
3/15/89		87.50			100.00			
3/22/89		125.00			380.00			
3/29/89		125.00			350.00			400.00
4/04/89		125.00		88.00				105.00
4/12/89		120.00			90.00			105.00
4/19/89		120.00						
4/26/89					105.00			
5/03/89			87.50		105.00			
5/10/89			91.00		107.00			
5/17/89			59.00	75.00	85.00			
5/24/89				60.00	90.00	60.00		
5/31/89			40.00			63.00		70.00
6/07/89			70.00			59.00		90.00
6/14/89			52.50			52.50		47.50

Source: Market News Service, ITC

Table C-16

## Mango Prices in Germany, by Source and by Week

	German Marks per kilogram												
	Peru	Brazil	South Africa	Kenya	Venezuela	Puerto Rico	Ivory Coast	Costa Rica	Guatemala	Colombia	Mexico	Israel	Other
1/27/88			5.50	6.25									
2/03/88	4.75		5.50	4.75									
2/10/88	5.00		5.50	5.50									
2/17/88	5.50		5.25	4.75									
2/24/88	5.10		4.75	4.35									
3/02/88	5.00		4.37	4.87									
3/09/88	4.50		4.25										
3/16/88			3.87	5.00									
3/23/88			3.00										
3/30/88	7.63										7.63		6.25
4/13/88	6.68			5.67							6.13		4.05
4/20/88				5.67							5.67		
4/27/88				4.25	5.75						5.75		
5/04/88				5.13	4.50		3.70				4.60		
5/11/88					5.00		2.50				5.38		2.50
5/18/88					4.75	4.75	3.10						6.00
5/25/88					4.50		3.40		4.75		5.50		
6/01/88					3.75			4.00	4.50				
6/08/88						3.75			4.25				
6/15/88					4.37			4.37	4.25				
6/22/88						3.68		4.25	4.00				
6/26/88					3.85	3.85		4.30					
7/06/88					4.25				4.25				
7/13/88													
7/20/88						3.50					5.00		
7/27/88		4.25				3.50					4.50		
8/03/88						3.38					4.00		
8/10/88						4.50					4.63		
8/17/88						4.75					4.50		
8/24/88											5.00	6.00	
8/31/88						4.38					5.25	5.68	
9/07/88						4.13					5.38	5.68	
9/14/88						4.13					4.25		
9/21/88		5.00				4.25					5.00		
9/29/88		5.50				4.75						4.25	
10/05/88		5.50				4.68							
10/15/88						5.00					6.00		
10/19/88		5.88				4.75							
10/26/88		7.25				5.50							
11/09/88		6.45		6.15									
11/16/88		5.88											6.25
11/23/88		5.00											
11/30/88	4.75	4.50		4.50									
12/07/88	4.68	4.50		4.75									
12/13/88	4.00	4.25		4.50									
1/11/89	4.25	5.16											
1/18/89	3.88	4.75											
1/25/89	4.38	5.25		4.25									
2/01/89	4.00	5.00	4.75	4.75									
2/08/89	4.38		4.00	4.75									
2/15/89	4.75		4.50	5.50									
2/22/89	6.25	3.37	5.00										
3/01/89		5.25	3.68	4.75									
3/08/89			5.75	4.75									
3/15/89			5.50	5.38									
3/22/89			5.50	5.25									
3/29/89			5.00	5.13									
4/04/89			6.50		5.00	4.50					5.10		
4/12/89					5.50			3.80			5.50		
4/19/89	4.50				5.00			4.45			4.00		
4/26/89	4.75				4.50		3.75	4.68			5.50		
5/03/89			2.90		4.13		2.70	4.38					2.90
5/10/89	3.75			4.75	3.75		2.50	4.50	5.25		3.75		
5/17/89						4.25	2.50	4.25	4.25		4.25		2.50
5/24/89			3.68	3.68	3.68	3.25	2.25	3.25	4.25		3.25		2.25
5/31/89				3.75	4.50	3.25	2.00		4.50		2.88		
6/07/89					4.50	2.75	2.75	2.75	4.75		4.75		
6/14/89						3.00			5.00				

Source: Market News Service, ITC

Table C-17

## Wholesale Mango Prices in Selected U.S. Markets

US\$ per Pound

	-----San Francisco-----			-----Chicago-----			-----Boston-----			New York	Miami
	Hayden	Keitts	Francis	Francis	Hayden	Keitts	Atkin	Keitts	Francis	Atkin	Francis
Mar 23 88			1.75		1.70				1.55	1.45	1.30
Mar 30 88					1.30				1.35	1.40	0.90
Apr 6 88					1.28				1.18	1.15	0.95
Apr 13 88					1.20				1.25	1.15	0.95
Apr 20 88	1.75				1.20				1.28	1.15	0.95
Apr 27 88	1.73				1.20		1.25		1.27	1.30	0.95
May 4 88				1.05					0.95		0.70
May 11 88				0.85	0.95				0.90	0.75	0.68
May 18 88	0.95		0.95	0.80	0.90		0.88		0.73	0.78	0.55
May 25 88	0.95		0.95	0.95	1.25		1.15		0.88		0.68
Jun 1 88	1.18			0.98	1.22		0.85				0.68
Jun 8 88	1.10			0.93	1.15		1.12		0.85	0.85	0.68
Jun 15 88	0.80			0.85	0.93		0.97		0.85	0.85	0.65
Jun 22 88	0.75			0.85	0.78		0.95		0.85	0.85	0.60
Jun 29 88	0.75			0.85	0.85		0.78		0.85		0.55
Jul 6 88	0.78				0.70		0.78		0.80	0.75	0.55
Jul 27 88	0.61				0.65		0.60			0.70	
Aug 3 88	0.55				0.55		0.55		0.60		
Aug 10 88					0.65		0.55				
Aug 17 88					0.68		0.78				
Aug 24 88					0.68		0.78		0.73	0.75	
Aug 31 88							0.83		0.75	0.75	
Sep 7 88		0.58				0.68	0.80		0.82	0.75	
Sep 14 88		0.58				0.68	0.82			0.95	
Sep 21 88										0.95	
Sep 28 88											
Oct 5 88											
Oct 12 88											
Oct 19 88											
Oct 26 88											
Nov 2 88											
Nov 8 88											
Nov 16 88											
Nov 23 88									1.90		
Nov 30 88									1.90		
Dec 7 88									1.75		
Dec 14 88									1.90		
Feb 8 89	1.35						1.20				
Feb 15 89			1.35					0.85		0.90	0.90
Feb 22 89			1.35				1.20				
Mar 1 89											
Mar 8 89				1.50				1.80			
Mar 15 89							1.20			1.50	1.05
Mar 22 89	1.60				1.25		1.18			1.10	1.00
Mar 29 89	1.60				1.20		1.15			1.10	0.95
Apr 5 89					1.85		1.10			1.10	0.98
Apr 12 89				1.08	1.25				1.13	1.35	0.99
Apr 19 89	1.13			1.00	1.15				0.88	1.15	0.68
Apr 26 89				0.70	1.05		1.25		0.65	1.05	0.60
May 3 89	0.95			0.73	0.83		1.20		0.65	1.10	0.45
May 10 89	0.83			0.70	0.90				0.68	0.90	0.45
May 17 89	0.88			0.70	0.90				0.73	0.88	0.55
May 24 89	0.83								0.73	0.88	0.55
May 31 89	0.95								0.70	0.94	0.60
Jun 7 89	0.90			0.78					0.78	0.68	0.68
Jun 14 89	0.78				0.70				0.78	0.60	0.55
Jun 21 89							0.70			0.85	0.55
Jun 28 89							0.70		0.70	0.65	0.68
Jul 5 89	0.68						0.70		0.78	0.53	0.58
Jul 12 89	0.63						0.60		0.70		0.58
Jul 19 89	0.63						0.65			0.60	0.58
Jul 26 89	0.63						0.80			0.70	0.58
Aug 2 89										0.60	0.58
Aug 9 89		0.50						0.60		0.60	0.60

Source: Market News Service, ITC

Table C-18

## Melon Prices in France, by Source and by Variety

Prices in French Francs per kilogram

	Venezuela Charantais	Senegal Charantais	Guadeloupe Charantais	Local Charantais	Israel Galila	Spain Charantais	Venezuela Galila	Other Charantais	Spain Galila
2/03/88			16.00						
2/10/88			16.00						
2/17/88			16.00						
2/24/88	13.50		13.50						
3/02/88	13.50		13.50	40.00					
3/09/88	13.50		13.50	34.00					
3/16/88	13.00		13.50						
3/23/88			13.50	27.00			13.00		
3/30/88			13.50	31.00			13.00		
4/13/88			20.50				19.00		
4/20/88			20.50				14.00	16.50	
4/27/88			15.00	30.00		12.00		17.50	
5/04/88			15.00		16.50			17.50	
5/11/88			14.00	26.00	29.00	16.50		19.00	8.00
5/18/88			15.00	26.00		14.50		14.00	
5/25/88				27.50		13.50			8.00
6/01/88		13.50				12.00		13.50	7.00
6/08/88					11.00	9.00		7.00	5.00
6/15/88									
6/22/88									
8/10/88									
10/19/88									
10/26/88									
11/03/88									
11/10/88									
11/16/88									
11/23/88									
11/30/88									
12/07/88									6.00
12/13/88		20.00							
1/11/89		17.50							
1/18/89		13.50							
1/25/89		13.50							
2/01/89		13.50							
2/09/89		16.00							
2/15/89		16.00							
2/22/89		16.00	40.00						
3/01/89		16.00	40.00						
3/08/89		16.00	40.00						
3/15/89			31.50						
3/22/89			31.50						
3/29/89			31.50						
4/04/89			32.00						
4/12/89			32.00						
4/19/89			32.00						
4/26/89			32.00						
5/03/89			30.00			14.50			18.50
5/10/89			25.00			13.50			13.50
5/17/89				30.00		13.50			13.50
5/24/89				27.50					
5/31/89				17.50					9.75

Source: Market News Service, ITC

Table C-19

## Melon Prices in Belgium, by Source and by Variety

Prices in Belgian Francs per kilogram

	Senegal Charantais	Israel Galila	S.Africa Rock	Guadeloupe Charantais	-----Spain----- Charantais    Cantaloupe	Italy Charantais	France Cantaloup
3/02/88							
3/09/88		115.00					
3/16/88		120.00					
3/23/88		120.00					
3/30/88		120.00					
4/13/88	110.00	115.00					
4/20/88	95.00	113.00					
4/27/88	90.00	110.00					
5/04/88	85.00	90.00					
5/11/88	76.00	70.00					
5/18/88	85.00	74.00					
5/25/88	87.50	74.00					
6/01/88	90.00	74.00					
6/08/88		55.00					
6/15/88		54.00					
6/22/88		67.00					
8/10/88		65.00					
10/19/88							
10/26/88							
11/03/88							
11/10/88							
11/16/88							
11/23/88							
11/30/88							
12/07/88							
12/13/88							
1/11/89							
1/18/89			85.00				
1/25/89			95.00				
2/01/89			85.00				
2/08/89	110.00		94.00				
2/15/89	90.00		94.00				
2/22/89	90.00		100.00				
3/01/89	95.00		96.00				
3/08/89	95.00		96.00				
3/15/89			96.00	125.00			
3/22/89			96.00	135.00			
3/29/89		160.00	96.00				
4/04/89	120.00		96.00				
4/12/89	125.00	145.00			90.00		
4/19/89	120.00	150.00		100.00	90.00		
4/26/89	100.00					96.00	
5/03/89	85.00	82.50					45.00
5/10/89	85.00	82.50				60.00	
5/17/89		70.00				52.00	
5/24/89		62.00				52.00	
5/31/89		70.00				68.00	
6/07/89		70.00					

Table C-20

## Melon Prices in Germany, by Source and by Variety

Prices in German Marks per kilogram

	-----S.Africa-----				---Israel---		Senegal	Kenya	Chile	-----Spain----		Venezuela	Colombia
	Ogen	Galia	Honeydew	Rock	Galia	Ogen	Charantais	Galia	Honeydew	Galia	Charantais	Galia	Galia
1/27/88	4.60	4.60		4.60									
2/03/88	4.80	4.80		4.80									
2/10/88	4.70	4.70		4.70									
2/17/88	4.75			4.20				4.20					
2/24/88	4.50	4.50		4.50									
3/02/88	4.90	4.90		4.60		5.80							
3/09/88	4.60	4.60		4.60									
3/16/88	4.60	4.60		4.60	4.40								
3/23/88	4.70	4.70											
3/30/88	4.80	4.80											
4/13/88	5.00	5.00			4.00		6.50						
4/20/88					3.75								
4/27/88					3.40								
5/04/88					3.60								
5/11/88					3.40								
5/18/88					3.60								
5/25/88													
6/01/88					3.40					2.60			
6/08/88													
6/15/88					2.60								
6/22/88					3.40								
8/10/88													
10/19/88					2.60								
10/26/88					2.90								
11/03/88					4.00								
11/10/88					3.10								
11/16/88													
11/23/88					4.45								
11/30/88					3.80								
12/07/88					5.00					3.30			
12/13/88				4.60	4.80								
1/11/89	4.80	5.20		4.80									
1/18/89	4.80	4.80		4.80								4.40	
1/25/89	4.75	4.75		4.30									
2/01/89	5.30	5.30		4.60									
2/08/89	5.50	5.50		5.50									
2/15/89	5.00	5.00		5.00									
2/22/89	5.00	5.00		5.20									
3/01/89	5.30	5.30		5.30									
3/08/89	5.20	5.20		5.20									
3/15/89	4.90	4.90		4.90									
3/22/89	5.00	5.00		5.00				2.05				5.00	
3/29/89	5.10	5.10	1.35	5.10									
4/04/89	5.00	5.00	1.60	5.00	7.00								4.80
4/12/89			1.60	5.00									
4/19/89		4.00		4.00	4.40								4.50
4/26/89			2.00	4.00	4.50								
5/03/89					3.80								
5/10/89					4.20								
5/17/89										2.55	3.35		
5/24/89													
5/31/89													

Source: Market News Service, ITC

Table C-21

## Melon Prices in the Netherlands, by Source and by Variety

Prices in Dutch Guilders per kilogram

	Senegal		South Africa		Chile		Israel	Ecuador	
	Charantais	Honeydew	Ogen	Rock	Galia	Honeydew	Open	Galia	Honeydew
1/27/88									1.10
2/03/88					5.10				1.10
2/10/88				3.60	3.90				1.10
2/17/88			4.25			1.25			
2/24/88			4.25			1.95			
3/02/88			4.20			1.75	5.80		
3/09/88			4.50			1.75	6.50		
3/16/88			4.30		5.10	1.58	6.40		
3/23/88			4.30		5.00	1.63	6.50		
3/30/88			4.15		5.40	1.55	6.00		
4/13/88						2.15	5.50		
4/20/88		2.15				2.15	5.20		
4/27/88							4.40		
5/04/88							3.90		
5/11/88						2.05	3.30		
5/18/88						2.05	3.00		
5/25/88						2.05			
6/01/88							3.20		
6/08/88							2.50		
6/15/88							2.50		
6/22/88							3.50		
8/10/88									
10/19/88									
10/26/88									
11/03/88									
11/10/88									
11/16/88							3.60		
11/23/88							4.00		
11/30/88							4.50		
12/07/88							4.40		
12/13/88							4.40		
1/11/89							4.50		
1/18/89							3.60		
1/25/89									
2/01/89							3.60		
2/08/89							3.60		
2/15/89				5.50	5.50				
2/22/89				5.50	5.50				
3/01/89				4.70	4.70				
3/08/89				4.50	4.50				
3/15/89				4.50	4.50				
3/22/89				4.85	4.85				
3/29/89				4.85	4.85				
4/04/89							7.20		
4/12/89							6.60		
4/19/89							6.60		
4/26/89							4.50		
5/03/89									
5/10/89							3.80		
5/17/89							3.80		
5/24/89							3.80		
5/31/89							3.80		

Source: Market News Service, ITC

Table C-22

## Wholesale Melon Prices in New York by Source and Variety

Cantaloupe: US\$ per 40 pound carton

Honeydew: US\$ per 30 pound carton

	Cantaloupe: US\$ per 40 pound carton					Honeydew: US\$ per 30 pound carton				
	Mexico	Guatemala	Domestic	Dominican Republic	Other	Guatemala	Mexico	Puerto Rico	Panama	Other
Jan 13 88	12.75						6.00			7.50
Jan 20 88	17.00				10.50		8.50			8.50
Jan 27 88	18.50						18.00			
Feb 3 88	17.00	19.00			11.00	14.75				14.75
Feb 10 88	18.00				15.00		18.00			17.50
Feb 27 88	18.50				17.00				19.50	18.75
Mar 3 88	13.00				16.00			11.00	19.00	18.00
Mar 16 88	15.00	16.00			16.00				22.00	22.00
Mar 23 88	15.00						18.00	20.00	21.00	22.00
Apr 6 88	15.00	16.00		16.50		11.50	15.50	12.50	12.75	12.75
Apr 13 88	16.75	16.00		16.50	16.50	11.50		9.00	9.25	9.00
Apr 20 88	19.00			21.50		9.00	10.00	9.00	9.25	9.00
Apr 27 88	24.00			24.00	24.00	13.00	11.00		12.75	12.00
May 4 88	13.00			16.00	16.00	11.00	8.00	10.00	12.00	10.00
May 11 88	16.00			10.00		12.75		12.00	11.75	12.00
May 18 88	26.00				17.00	10.50		10.75	9.50	10.50
May 25 88										
Jun 8 88							7.00			
Jun 15 88			8.75							
Nov 2 88										
Nov 9 88										
Nov 16 88		11.50								
Nov 23 88										
Nov 30 88										
Dec 7 88										
Feb 8 89	12.50				19.00		9.00		9.50	13.00
Feb 15 89	19.00				18.00		10.00		8.00	9.50
Mar 1 89	12.00				15.50	8.50				10.00
Mar 8 89	13.00				13.75					10.00
Mar 15 89	13.50				16.25				9.75	10.75
Mar 22 89	22.75				23.00		11.00		10.00	9.00
Mar 29 89	21.75				22.50		9.00		11.00	11.00
Apr 5 89	12.75			12.50	13.50		9.00		9.00	9.00
Apr 12 89										
Apr 19 89	17.00					9.00	9.50		11.00	
Apr 26 89	15.75				17.50		9.00		10.75	
May 3 89	15.75				17.50	12.50	12.00	12.00	12.00	
May 10 89	13.75				12.75	12.00				
May 17 89	9.75					15.50	19.00		18.50	
May 24 89	7.50			11.50		14.50				
May 31 89						11.00	11.00			
Jun 7 89										
Jun 14 89							4.50			
Jun 21 89										

Table C-23

Monthly Imports of Green Beans, Mangoes and Melons  
into the Rungis/Paris Wholesale Market,  
1987-89 (in metric tons)

Month	Green Beans			Mangoes			Melons		
	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
January	1179	1100	920	198	295	396	23	72	78
February	1046	1163	960	117	313	446	111	121	112
March	1266	1070	960	202	283	380	210	240	330
April	1309	1117	1235	464	536	444	592	657	467
May	1468	1780	1580	725	839	885	946	1314	1554
June	1909	1481	1560	513	460	513	1175	1806	1710
July	487	390	N/A	421	343	375	664	370	342
August	36	144	N/A	312	157	203	159	142	214
September	255	329	N/A	219	244	N/A	195	330	N/A
October	884	730	N/A	142	142	N/A	257	643	N/A
November	1222	1200	N/A	254	217	N/A	211	260	N/A
December	<u>1163</u>	<u>1200</u>	<u>N/A</u>	<u>455</u>	<u>557</u>	<u>N/A</u>	<u>207</u>	<u>145</u>	<u>N/A</u>
Annual Total	12224	11700		4022	4388		4750	6100	
Total Jan/Aug	8177*	7711*	7215*	2952	3226	3642	3880	4722	4807

Source: Le Marché des Fruits et Legumes, Ministry of Agriculture, Rungis office.

\* This total is for the January-June period (only the case of green beans).

## Annex 4

### Sources of Market Information for Horticultural Products in European Markets

A short list of potential sources of market information for tropical fruits and off-season fruits and vegetables in Europe is presented below.

#### International Trade Centre (ITC)

The International Trade Centre (ITC), an agency under the auspices of UNCTAD/GATT, provides market information on a subscription and fee basis through its **Market News Service (MNS)** program. The MNS program monitors and analyzes the conditions in 50 world markets for approximately 120 agricultural commodities. The program focuses on commodities that are generally considered "nontraditional" exports of developing countries. Specifically, fresh fruits and vegetables, cut flowers, common spices, hides, skins and semi-tanned leather are the main categories of products that are monitored by the MNS. Prices of products and quantities marketed are generally reported on a weekly basis at the wholesale or point-of-entry levels. Also, information on weight, level of quality, method of packaging, prevailing exchange rates, and mode of transportation employed are specified.

Collected data is disseminated to subscribers on a weekly basis via airmail or electronic media. More comprehensive analyses of market data are presented in monthly newsletters. The MNS also generates custom **historical price summaries** for selected commodities upon request.

Availability of information and the cost of subscription varies somewhat by product category, region of coverage and method of transmittal of the information. As a bench mark an airmail subscription to weekly price information and monthly market reports for the fruit and vegetable category costs US\$250 per region (e.g. Europe, North America, Asia) per year. Custom historical price summaries are available at a cost of US\$25 per product/region/year.

For additional information on the services provided by the MNS, contact:

Market News Service-ITC  
Mr. David B. Flood  
Senior Marketing Advisor  
112 Water Street  
Boston, MA 02109 USA  
Telephone: (617) 523-2211  
Telex: 4430252  
Telefax: (617) 523-2017

Market News Service-ITC  
Mr. Olof Karsegard  
Project Coordinator  
54-56 rue de Montbrillant  
Geneva, Switzerland  
Telephone: (022) 300252  
Telex: 28-94-66 MNS CH  
Telefax: (022) 33-71-76

### C.O.L.E.A.C.P.

The Comité de Liaison Europe-Afrique-Caribes-Pacifique (COLFACP) pour la Promotion des Fruits Tropicaux et des Légumes de Contre-Saison also provides a weekly and monthly market information service on a subscription basis. The COLEACP focuses on tropical fruits and off-season fruits and vegetables in European markets. Newsletters are produced quarterly and include information on prices and quantities marketed in addition to short articles on export markets in the European Community.

An annual subscription to the newsletter costs FF 1,200 (roughly \$US 200). For additional information, contact:

C.O.L.E.A.C.P.  
5, rue de la Corderie, Centre 342  
F-94586 Rungis Cedex  
France  
Telephone: (33 1) 4 687 02-06  
Telex: 205166 F

### U.S.D.A. Foreign Agricultural Service

The Foreign Agricultural Service (FAS) of the U.S.D.A. is oriented toward U.S. agricultural products. As such, the FAS does not normally collect price information for commodities produced outside the U.S. and subsequently sold in European markets. Occasionally, however, the FAS may collect foreign price information for tropical and off-season fruits and vegetables for special studies or articles in the *Horticultural Products Review Series*. However, the frequency of these reports is irregular.

### The European Price Commission

The European Price Commission, a multinational organization of the European Community, publishes monthly and annual price data for selected commodities, by country, through its series of *EUROSTAT* publications. However, prices reported are generally for commodities produced within the European Community. Thus, prices for many common tropical commodities, such as mangoes, are not reported. Also, prices are collected for the European harvest period only. Hence, using *EUROSTAT* price series to examine off-season market potential can be somewhat misleading.

### Food and Agricultural Organization of the United Nations (FAO)

The FAO produces a number of publications that present and analyze market and production information for selected agricultural products. The publications range from the FAO Production and Trade Yearbooks, which present country-level data on an annual basis, to various monthly bulletins and working papers.

### EUROFRUIT

Market Intelligence, Limited in London produces EUROFRUIT, a monthly international magazine for the fruit trade.

### Centre Français du Commerce Extérieur

Located in Paris, the Center produces two reports: "Marché International des Fruits et Légumes Frais" and "Marché International des Conserves de Fruits et Légumes." The former is available on a weekly basis and the latter is available monthly.

## Annex 5

### A Brief Account of the BUD-Senegal Scheme

This account abstracts sections from recent reports in which the BUD-Senegal scheme was discussed.

#### 1.0 Section from John Horton, Characteristics of the Horticultural Export Enterprises Utilizing Contract Farming Schemes in Senegal, 1987

The parent company of BUD-Senegal was Bud Antle of Salinas, California, "a majority family-owned private company" ... The individual who was most closely associated with the start-up of the BUD-Senegal operation is Mr. Fritz Marschal, a German produce broker. Marschal held the majority of the shares of the House of Bud, S.A., a firm set up and incorporated in Brussels in 1968 with the primary purpose of launching the Senegal project." (p.32)

"BUD-Senegal was a market-driven company from its inception. Mr. Marschal, who is credited with launching the venture, was a produce broker in search of a country and a production scheme that could respond to his needs for off-season commodities for a market with which he was quite familiar. Specifically, the original market program emphasized specialty peppers."

"The difficulty with the orientation of the original scheme is that the plan appears to have been part of a strategic marketing scheme with expedience rather than long-range durability in mind. As the market niches and windows have changed, and the initiators have had the luxury of moving on to new and 'greener gardens,' the Senegalese committed to national development do not have the same freedom. Under SENPRIM little has been done to reexamine the marketing plans systematically." (p.37)

#### 2.0 Section from John C. Abbott and colleagues, Marketing Improvement in the Developing World: What Happens and What We Have Learned

"A partnership between the biggest American produce wholesaler and the enlightened Government of Senegal, a stable African country, BUD-Senegal seemed to have everything on its side. The firm was experienced in transporting lettuce under refrigeration from California to east-coast cities in the United States, and to Europe. The project was to grow green beans, melons, etc., on a large scale in Senegal and ship them to Europe during the off-season. By 1978, 3,600 ha. of land would be taken up and 80,000-100,000 tons of produce exported annually. In fact, the company never cultivated more than 800 ha. or exported more than 5,000 tons per year. In 1980 it was wound up (closed down).

BUD's plan was to organize sea transport along the lines of the Geest banana boats, which maintained a regular two-weekly service from the Caribbean to the United Kingdom. Now refrigerated containers were available. BUD hoped to load produce into them at the packing plant and send them as a

unit to European terminal markets. It was never able, however, to exploit this potential innovation. Exports from Senegal depended on boats stopping on the way from Côte d'Ivoire to Europe. This service remained irregular. There were frequent and regular air freight services, but only high-value products could support the cost of US\$0.50-0.70 per kg. Factors complicating this enterprise were obligations to support small-scale producer schemes, provide settlement facilities, and promote employment rather than mechanization. There were breakdowns in the supply of irrigation water, and pest and weed infestations. It was also required to keep off the local market.

In contrast, a structure of about 15 small vegetable exporters buying their produce from peasant growers in Senegal has remained fairly stable. They each export 100-1,000 tons annually. They suggest the crops and make agreements with producers to provide seeds, fertilizer and other inputs on credit or in kind. The exporters have an agent in each village known as the "sector chief," who supervises the growers, organizes harvesting and ensures that those who have received credit deliver to the export who provided it. The growers are paid prices within a range agreed upon with government representatives. Sales in Europe, however, are on consignment. The exporters carry the price risk, generally losing money on some shipments and making it on others, depending on the state of the market and the competition." (pp. 123-24)

### **3.0 Section from the Contract Farming in Africa, Volume I, Comparative Analysis, SARSA, 1988**

"Private local firms in Senegal seemed to have learned from the BUD-Senegal experience, which confronted several social and political problems. The BUD-Senegal venture proved that there was a market for Senegalese products; subsequently a number of small private firms were formed to capitalize on this established market, or already existing firms diversified into horticultural activities. Further, when the BUD-Senegal operation, which was renamed SENPRIM when it was subsequently taken over by the government, initiated contracting activities with local smallholders, this proved to be a forceful demonstration model that the small local firms began to replicate in their own activities. Apparently some of the firms were able to establish contracts with agriculturalists who had formerly worked on the BUD-Senegal operation. Thus they were able to benefit from the trained pool of farmers experienced in horticultural crop production. Some companies also hired former staff members of the BUD-Senegal company, thereby benefitting from the training and experience that they had received while working for the BUD operation. Finally, apparently some private farmers on the perimeter of the BUD-Senegal/SENPRIM scheme have begun copying the model by initiating small contracting schemes of their own with other small farmers.

In summary, our analysis of the Senegal horticultural sector suggests that one extremely powerful role that can be played by private local firms is to replicate successful models and disseminate technologies already proven by other institutional structures. Most (local firms) lack the means to

identify and develop new technologies and markets and can only utilize simple processing technologies. Support structures to assist in new product/market development through the provision of market information and contacts, financing, and information on appropriate technologies are not readily available in most African countries." (see pp. 142-143)

#### 4.0 Conclusion

To summarize, key points regarding the BUD-Senegal scheme coming out of the literature include:

1. The scheme provided a positive demonstration effect for other exporters, showing that Senegal could produce fresh vegetables for the counterseasonal market in Western Europe.
2. It illustrated the importance of growing and shipping high-quality horticultural produce, and the need for technical mastery in production, post-harvest handling, packaging and shipping.
3. The contract farming model used by BUD-Senegal seems to have been widely and successfully copied by other exporters.
4. The BUD venture seems to have failed largely because a) it was unable to shift its product mix and production scheduling to meet changing opportunities and market windows in Europe, and because b) the scheme faced pressures to meet GOS social and employment objectives for BUD employees and small-scale contract producers.