Public Disclosure Authorized

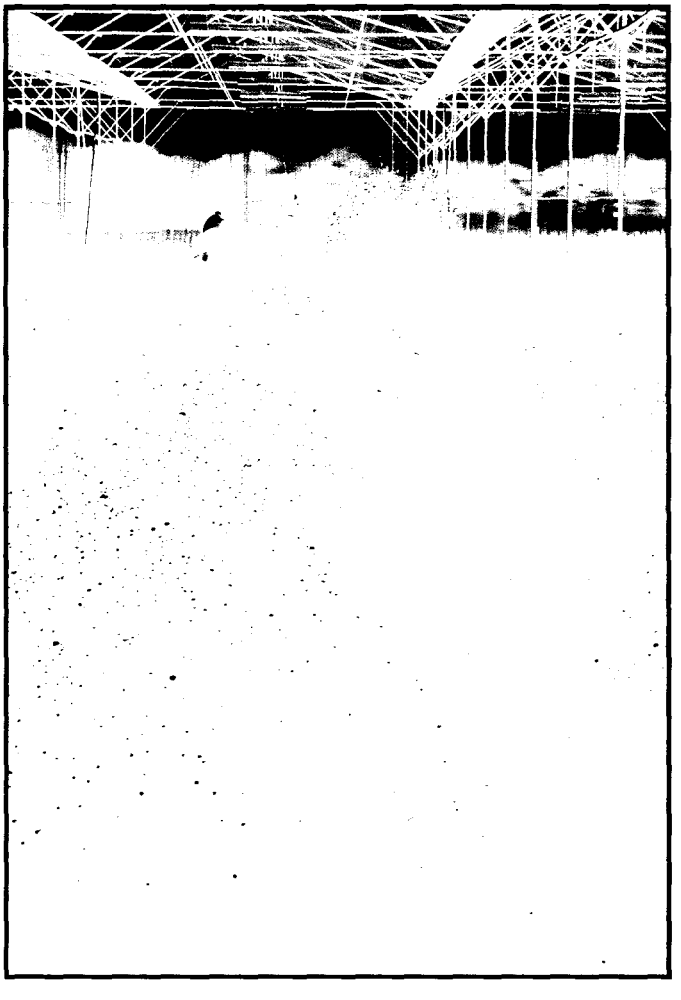
Public Disclosure Authorized

WORLD BANK TECHNICAL PAPER NO. 424

WTP424
February 1999

Southern African Agribusiness

Gaining through Regional Collaboration



Edited by
Steven Jaffee

RECENT WORLD BANK TECHNICAL PAPERS

No. 347 Stock and de Veen, *Expanding Labor-based Methods for Road Works in Africa*

No. 348 Goldstein, Preker, Adeyi, and Chellaraj, *Trends in Health Status, Services, and Finance: The Transition in Central and Eastern Europe, Volume II, Statistical Annex*

No. 349 Cummings, Dinar, and Olson, *New Evaluation Procedures for a New Generation of Water-Related Projects*

No. 350 Buscaglia and Dakolias, *Judicial Reform in Latin American Courts: The Experience in Argentina and Ecuador*

No. 351 Psacharopoulos, Morley, Fiszbein, Lee, and Wood, *Poverty and Income Distribution in Latin America: The Story of the 1980s*

No. 352 Allison and Ringold, *Labor Markets in Transition in Central and Eastern Europe, 1989–1995*

No. 353 Ingco, Mitchell, and McCalla, *Global Food Supply Prospects, A Background Paper Prepared for the World Food Summit, Rome, November 1996*

No. 354 Subramanian, Jagannathan, and Meinzen-Dick, *User Organizations for Sustainable Water Services*

No. 355 Lambert, Srivastava, and Vietmeyer, *Medicinal Plants: Rescuing a Global Heritage*

No. 356 Aryeetey, Hettige, Nissanke, and Steel, *Financial Market Fragmentation and Reforms in Sub-Saharan Africa*

No. 357 Adamolekun, de Lusignan, and Atomate, editors, *Civil Service Reform in Francophone Africa: Proceedings of a Workshop Abidjan, January 23–26, 1996*

No. 358 Ayres, Busia, Dinar, Hirji, Lintner, McCalla, and Robelus, *Integrated Lake and Reservoir Management: World Bank Approach and Experience*

No. 360 Salman, *The Legal Framework for Water Users' Associations: A Comparative Study*

No. 361 Laporte and Ringold, *Trends in Education Access and Financing during the Transition in Central and Eastern Europe.*

No. 362 Foley, Floor, Madon, Lawali, Montagne, and Tounao, *The Niger Household Energy Project: Promoting Rural Fuelwood Markets and Village Management of Natural Woodlands*

No. 364 Josling, *Agricultural Trade Policies in the Andean Group: Issues and Options*

No. 365 Pratt, Le Gall, and de Haan, *Investing in Pastoralism: Sustainable Natural Resource Use in Arid Africa and the Middle East*

No. 366 Carvalho and White, *Combining the Quantitative and Qualitative Approaches to Poverty Measurement and Analysis: The Practice and the Potential*

No. 367 Colletta and Reinhold, *Review of Early Childhood Policy and Programs in Sub-Saharan Africa*

No. 368 Pohl, Anderson, Claessens, and Djankov, *Privatization and Restructuring in Central and Eastern Europe: Evidence and Policy Options*

No. 369 Costa-Pierce, *From Farmers to Fishers: Developing Reservoir Aquaculture for People Displaced by Dams*

No. 370 Dejene, Shishira, Yanda, and Johnsen, *Land Degradation in Tanzania: Perception from the Village*

No. 371 Essama-Nssah, *Analyse d'une répartition du niveau de vie*

No. 372 Cleaver and Schreiber, *Inverser la spriale: Les interactions entre la population, l'agriculture et l'environnement en Afrique subsaharienne*

No. 373 Onursal and Gautam, *Vehicular Air Pollution: Experiences from Seven Latin American Urban Centers*

No. 374 Jones, *Sector Investment Programs in Africa: Issues and Experiences*

No. 375 Francis, Milimo, Njobvo, and Tembo, *Listening to Farmers: Participatory Assessment of Policy Reform in Zambia's Agriculture Sector*

No. 376 Tsunokawa and Hoban, *Roads and the Environment: A Handbook*

No. 377 Walsh and Shah, *Clean Fuels for Asia: Technical Options for Moving toward Unleaded Gasoline and Low-Sulfur Diesel*

No. 378 Shah and Nagpal, eds., *Urban Air Quality Management Strategy in Asia: Kathmandu Valley Report*

No. 379 Shah and Nagpal, eds., *Urban Air Quality Management Strategy in Asia: Jakarta Report*

No. 380 Shah and Nagpal, eds., *Urban Air Quality Management Strategy in Asia: Metro Manila Report*

No. 381 Shah and Nagpal, eds., *Urban Air Quality Management Strategy in Asia: Greater Mumbai Report*

(List continues on the inside back cover)

WORLD BANK TECHNICAL PAPER NO. 424

Southern African Agribusiness

Gaining through Regional Collaboration

Edited by
Steven Jaffee

The World Bank
Washington, D.C.

Copyright © 1999
The International Bank for Reconstruction
and Development/THE WORLD BANK
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

All rights reserved
Manufactured in the United States of America
First printing February 1999

Technical Papers are published to communicate the results of the Bank's work to the development community with the least possible delay. The typescript of this paper therefore has not been prepared in accordance with the procedures appropriate to formal printed texts, and the World Bank accepts no responsibility for errors. Some sources cited in this paper may be informal documents that are not readily available.

The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent. The World Bank does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use. The boundaries, colors, denominations, and other information shown on any map in this volume do not imply on the part of the World Bank Group any judgment on the legal status of any territory or the endorsement or acceptance of such boundaries.

The material in this publication is copyrighted. The World Bank encourages dissemination of its work and will normally grant permission promptly.

Permission to photocopy items for internal or personal use, for the internal or personal use of specific clients, or for educational classroom use is granted by the World Bank, provided that the appropriate fee is paid directly to Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, U.S.A., telephone 978-750-8400, fax 978-750-4470. Please contact the Copyright Clearance Center before photocopying items.

For permission to reprint individual articles or chapters, please fax your request with complete information to the Republication Department, Copyright Clearance Center, fax 978-750-4470.

All other queries on rights and licenses should be addressed to the World Bank at the address above or faxed to 202-522-2422.

ISSN: 0253-7494

Steven Jaffee is a senior agribusiness specialist in the Private Sector Finance Unit of the World Bank's Africa Regional office.

Library of Congress Cataloging-in-Publication Data

Southern African agribusiness : gaining through regional collaboration / edited by Steven Jaffee.
p. cm. — (World Bank technical paper, ISSN 0253-7494 ; no. 424)
Includes bibliographical references (p.).
ISBN 0-8213-4422-6
1. Agricultural industries—Africa, Southern—International cooperation. I. Jaffee, Steven. II. World Bank. III. Series.
HD9017.S752S66 1999
338.1'0968—dc21 98-52185
CIP

Contents

Abstract v
Foreword vii

Introduction 1
Steven Jaffee

The Changing Environment for Southern African Agribusiness: Perspectives of Regional and International Companies 6
Vince Ruddy, Steven Jaffee, Cecilia Sager, and Mihir Desai

Profits from Petals: The Development of Cut Flower Exports in Southern Africa 39
Alan J. Malter, Ard Reijtenbagh, and Steven Jaffee

Summer Citrus: The Role and Prospects for Southern Africa 88
Grahame Dixie

The Development and Propsects for Minor Industrial Crops in Selected Southern African Countries 139
Clinton Green with Jaspar Steele and Johan Willemse

Pro-Growth Regulatory Reforms for Agricultural Inputs in Malawi, Zambia, and Zimbabwe 167
David Gisselquist

ABSTRACT

Recent economic reforms and political changes within Southern Africa have opened up new opportunities for intra-regional agricultural trade and other forms of agribusiness collaboration. This collaboration is vital, given the relatively small size of individual country markets (other than South Africa) and since no single country in the region has the resources and capacity to mount a sustained drive to achieve international market prominence and competitiveness. For example, while South Africa possesses good infrastructure, strong financial institutions, and ample management capability, that country has a comparative disadvantage in many forms of primary agricultural production due to its limited water supplies and relatively infertile soils. In contrast, countries such as Mozambique and Zambia have much greater agricultural potential, yet agribusiness management capabilities and support structures are comparatively weak. Other countries of the region likewise face certain constraints which inhibit their scope, individually, for agribusiness growth and competitiveness.

This study examines private sector perceptions regarding the agribusiness investment environment and the scope for regional collaboration in Southern Africa, and then presents a series of case studies highlighting experiences in such collaboration as well as additional opportunities and constraints. The case studies--covering the cut flower, citrus, spice/essential oil, and agricultural input supply industries--illustrate the varied forms which this intra-regional collaboration has or could take, including the transfer of technologies and management systems, joint logistics and international marketing, cross-border investment, product R&D, human resource development, raw material sourcing, and regional trade in inputs and consumer products. Both the agribusiness company survey and the industry case studies include recommendations for policy-makers, agribusiness managers/representatives, and agricultural and private sector development practitioners.

Key Words: agribusiness, regional trade, investment, cut flowers, citrus fruit, spices, essential oils, seeds, fertilizer, agro-chemicals, South Africa, Zimbabwe, Malawi, Zambia, Mozambique, and Swaziland.

Foreword

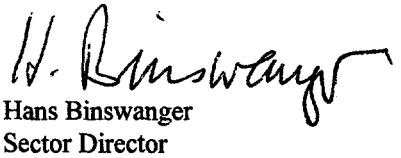
This technical paper is one output of the *Southern Africa Agribusiness Study*, initiated in 1995 with the generous support of the Swiss Development Corporation. This work has sought to identify major constraints and opportunities facing agribusiness in the sub-region and to catalyze discussions among policy-makers, private company representatives, and representatives of farmer and inter-professional associations on measures which can be taken to increase agribusiness investment as well as cross-border trade, technology, and other forms of collaboration. The work has been sponsored by the Bank's East and Southern Africa Rural Development Division and its SADC regional country team.

The work began with a cross-country analysis of the enabling environment for agribusiness and a multi-country survey of firms focusing on this issue as well as perceptions about opportunities and constraints for regional investment and trade. A series of commodity case studies were then undertaken, focusing on common themes. Particular emphasis was again given to the experience of and scope for further intra-regional collaboration. Several of these case studies and a synthesized version of the cross-country survey work are included here. The work has involved study teams, generally involving one international expert working with industry representatives and/or consultants from within Southern Africa. The preparation of the studies themselves contributed to improved intra-regional contacts amongst experts and business groups.

An initial setting for the dissemination of study results was a Regional Agribusiness Forum which took place in Harare, Zimbabwe in 1996. This gave rise to a number of new business or joint venture initiatives as well as the formation of a regional apex organization to promote agribusiness investment in the region, collect and disseminate pertinent information, and advocate policy reforms and harmonization within the region. Still much needs to be done to implement this agenda.

Several of the case studies and other background papers have been distributed informally, especially among industry experts within and outside of the sub-region. The publication of this technical paper is intended to reach a wider audience of policy-makers, business and farming representatives, and development practitioners. While in some cases, the empirical material is dated by a year or so with industries continuing to evolve, the major insights and recommendations regarding the experiences of and opportunities for regional collaboration remain robust and pertinent.

Pamela Cox
Coordinator
Southern Africa Regional Activities
Africa Region



Hans Binswanger
Sector Director
Rural Development and Environment Operations
Africa Region

Introduction

Steven Jaffee

Southern African Agribusiness in Transition

Southern African agribusiness is on the move--forward, outward, and, in some cases, out of business. This movement has been sparked by fundamental political and economic changes which have taken place within the region since the early 1990s. The transition to majority rule in South Africa is one such fundamental change. That process has been accompanied by far-reaching structural changes and policy reforms within South Africa and by a shift in attitudes regarding the opportunities for cooperation within the region at large. [1] This will profoundly influence the patterns of agribusiness development within the region for years to come.

The restoration of peace in Mozambique is another significant development for the region's economy as it offers the prospect of strengthening vital trade corridors for land-locked Zimbabwe, Malawi, and Zambia and reducing the transportation cost disadvantages which firms and farmers in these countries face. Another fundamental change has been the liberalization and otherwise decontrol of agricultural input and commodity markets, and the accompanying contraction and/or privatization of agricultural parastatal enterprises. Broader macroeconomic and financial sector reforms have also had a profound effect on the operating environment for Southern African agriculture and agribusiness.[2]

Prior to the recent reforms, much of the region's agribusiness operated within controlled or restricted markets, in which either monopsony/monopoly channels were enforced or cosy oligopolies were protected. Many input and product prices were officially set or were negotiated with governments. In this environment, competition was often a political process rather than one driven by innovation or consumer demands. With most regional agribusiness firms (and commercial farmers) operating in protected (and generally small) markets, little attention was given to collaborative actions which might enhance international competitiveness.

The situation has now changed. Firms and farmers are now faced with an array of choices, many being strategic in nature. What to produce? What sources and institutional arrangements to use to procure inputs and to channel products? How to negotiate prices or strategically price one's products? With whom to collaborate to accelerate learning, raise productivity, and/or gain market position? More opportunities and greater uncertainty have been two sides of the new era coin for the region's agribusiness firms and farmers. Some firms have moved quickly to restructure their operations, both domestically and in a broader regional/international context. They are enhancing their competitive position. Other firms

---

[1] Southern Africa is defined here to include Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe. Both the Seychelles and the Democratic Republic of Congo are members of the Southern African Development Community.

[2] Agribusiness includes the business and management activities associated with the production and distribution of agricultural inputs and with the handling, processing, transportation, financing, and marketing of agricultural commodities and products. Many analysts also consider commercial farming as part of agribusiness.

have been overtaken by new competition or otherwise not been able to adjust to the changing circumstances. Factory or warehouse closures have occurred. The adjustment process for region's farmers also continues, with varied combinations of gain and pain.

Realizing Market and Supply Potential Through Collaboration

With continued income growth and urbanization, Southern Africa provides a potentially very large market for food, agricultural inputs, and other agribusiness products. The sub-region spans a geographical area about the size of the continental United States. Its countries have a combined GDP of about US$170 billion[3] and a population of about 135 million[4]. Some 34% of the region's population is urban. There exists wide variability within the region in terms of the size, affluence, and economic structure of individual countries. For example, four countries each have a population of less than three million people.[5] On the other end of the spectrum, South Africa is presently the sub-region's dominant economic force, accounting for 84% of its income, two-thirds of its exports (including 75% of intra-regional exports), and 87% of its telephones. South Africa accounts for a preponderant share of the agribusiness product purchasing power within the region.

Southern Africa also has considerable agribusiness supply potential, both to service its own regional market and to compete in international commodity and value-added product markets. The region has abundant and diverse natural resources, albeit unevenly distributed. It possesses a long coastline, several good deep water ports, and no major physical barriers to intra-regional movement. It is a region in which the health and education levels of the population are generally rising. The region has a growing pool of trained and experienced professionals, some in the agribusiness field. The recent political and economic changes have made the region increasingly attractive to potential foreign investors.

However, no country in the region, alone, has the resources and capacity to make a sustained drive to achieve international agribusiness competitiveness. South Africa may well possess ample management capability, strong financial institutions, and good infrastructure, but the country has a comparative disadvantage in most areas of primary agricultural production, due to its limited water supplies and relatively infertile soils.[6] Zimbabwe also possesess certain business-related strengths, yet it too has limited high potential agricultural areas. In contrast, countries such as Mozambique, Zambia, and Angola have much greater agricultural potential, yet current systems of agribusiness operations and support structures are comparatively weak.

---

[3] This is approximately the same as that for Thailand ($167 billion) and Turkey ($164 billion).

[4] Compare this to the population of the Russian Federation (148 million) or Brazil (159 million).

[5] E.g. Namibia, Botswana, Lesotho, and Swaziland

[6] Nearly two-thirds of South Africa receives less than 500 mm. of rainfall per year. Just over 10% of the country receives more than 700 mm. of rainfall per year, yet much of this is in mountainous areas. The country's irrigation potential has largely been developed and agriculture will likely fail in its competition with other sectors (including mining, manufacturing, household consumption) for increasingly scarce water supplies. Analysis by the Department of Water Affairs points to potential serious water shortages by the year 2010. Only 6 million ha. of the total land area of 122 million ha. is classified as high potential agricultural land. More of this land is expected to be used for non-agricultural uses (especially with continued urbanization).

It is expected that additional foreign investment and other forms of collaboration will make some contribution to productivity improvement and new product development in Southern African agriculture and agribusiness. Still, a growing number of players and policy-makers are beginning to realize that the ability of Southern Africa to emerge and/or sustain itself as a competitive force in the global food and agribusiness market will depend upon the depth, breadth, and effectiveness of intra-regional collaboration, whether through the transfer of knowledge and technology, cross-border investments, collaborative logistics and marketing, or other means. Even the attraction of foreign agribusiness investment will depend upon regional collaboration, since most prospective investors will be looking to take advantage of a regional (rather than single national) market and of regional resources and capabilities.

Strengthening regional collaboration is now high on the agenda among the region's governments, within private and professional circles, and among donor agencies.[7] The countries of the Southern Africa Development Community (SADC) have recently concluded protocols in energy, water, trade and transport, communications, and meteorology. An array of regional networks have also been formed amongst professionals and private organizations in such diverse areas as agricultural research, media monitoring, transport and freight forwarding, grain milling, and plant biodiversity. There have been bumps along the way. Trust takes time to develop, national considerations remain important, and many fear future South African dominance of a regional economy. Still, there is now a much greater awareness of the opportunties for regional trade, investment, and other forms of collaboration, as well as the administrative, physical, and even psychological barriers which currently hinder this.

Objectives and Outline of this Technical Paper

This collection of papers seeks to highlight the potential for intra-regional agribusiness collaboration within Southern Africa as well as outline many of the perceived constraints to such collaboration. Its core is a series of case studies of high-value commodity subsectors in which regional collaboration has (or could) provide the basis for expanded markets, improved productivity, and longer term international competitiveness.

The series of papers provide an illustrative rather than comprehensive picture. For example, important developments are also occurring in regional collaboration within the grain, livestock product, and cotton/textile sub-sectors. The survey work and commodity case studies contained here also deal with only a sub-set of countries within the region--namely South Africa, Zimbabwe, Malawi, Zambia, and Mozambique, with some limited attention to Swaziland. Still, the wide variation in the agricultural and agribusiness resources and experiences of these focal countries (see Table 1) is representative of the region at large and enables one to highlight both the opportunities and constraints on regional collaboration. The case studies presented here devote relatively little attention to two important dimensions and challenges of agribusiness development within the region. One of these is the emerging patterns of linkage between smallholder farmers and downstream agribusiness. The other relates to the constraints and opportunities facing micro and small-scale agribusiness operations. Both of these topics warrant focused attention.

---

[7] Examples of the latter include the recently completed strategy documents of the World Bank (*Southern Africa: Sub-Regional Strategy*) and USAID (*Regional Integration Through Partnership and Participation*).

Given the length of this Technical Paper, it is expected that most readers will be selective in their attention to the individual case studies. The chapters have therefore been written to be more or less self-contained.

Chapter two summarizes the results of a cross-sectional survey of Southern African and international agribusiness firms. The survey results highlight some of the emerging patterns of agribusiness restructuring within the region as well as the perceptions of firms regarding both the opportunities and barriers to cross-border or international trade and investment. The main survey covers a sample of mostly medium and larger agribusiness companies in South Africa, Zimbabwe, Malawi, and Zambia. A smaller sample of North American and European firms also highlights external perceptions about the agribusiness investment and trade environment in Southern Africa.

Chapter three provides a case study of the region's emergent cut flower industry, highlighting the significant role of cross-border technology and knowledge transfer and the trend toward a common pool of service providers strengthening the industry on a regional basis. Despite the recent growth in this regional industry, the study provides a cautionary note to inexperienced and under-capitalized prospective entrants into this industry. Since the writing of this paper, a situation of oversupply has emerged in some market channels, putting downward pressure on grower, exporter, and distributor profits. This re-enforces the tone of caution.

Chapter four traces the development of the regional citrus industry, highlighting the importance of cross-border technical support, and shared logistical and marketing operations by major firms to improve international competitiveness. The paper illustrates that the competition for regional producers and marketing firms lies not with one another, but with other major Southern Hemispheric citrus fruit producers. The paper outlines a number of possible measures to broaden the patterns of participation in the industry, especially in skilled and managerial positions in the post-harvest and marketing chain.

Chapter five examines the regional market and supply experience with regard to spices, essential oils, and other so-called 'minor' industrial crops. It highlights the scope for regional import substitution, collaboration in product and production research and development, and joint efforts to compete in international markets. This appears to be a product range for which there is ample scope for regional competitiveness, yet also one with demanding technical and quality standards.

Chapter six explores the recent regulatory and policy reforms for agricultural inputs in Zimbabwe, Malawi, and Zambia. It illustrates how such reforms have and are likely to further improve the process of technology transfer and expand the business opportunities for national and international companies. It recommends a number of steps to accelerate this process.

Table 1: Illustrative Indicators for Focal Countries

Country	Agricultural GDP ($ Millions; 1995)	Agricultural GDP as Percentage of Total GDP	Value Added Agro-based Manufacturing ($ million; 1994)	Value Added Ago-based Manufacturing as Percentage of Total Manufacturing Value Added	Agri. Products Exports ($ million; 1995)	Domestic Food Market ($ million; 1992)	Percentage of Land Area >1000 MM. Rainfall/Year	Average Wage Unskilled Agricultural Worker ($/Month; 1995)	Undeveloped Area of Potential Irrigation (000 Ha.)
South Africa	6,802	5	4,380	17	2,156	13,165	5	85	230
Zimbabwe	978	15	609	33	895	1,511	2	28	306
Zambia	896	22	417	51	32	643	61	25	360
Malawi	615	42	31	34	362	437	37	18	265
Mozambique	445	33	N.A.	N.A.	67	N.A.	60	17	3250

Sources: World Development Report, 1997 (World Bank); Industrial Development Global Report, 1996 (UNIDO); FAO Trade Yearbook, 1995; Data compiled by The Services Group.

The Changing Environment for Southern African Agribusiness: Perspectives of Regional and International Companies

Vince Ruddy, Steven Jaffee, Cecilia Sager, and Mihir Desai

Introduction

The context for agribusiness development is undergoing a profound change in the Southern African region. Countries are implementing broad economic liberalization measures, generally including the deregulation of markets for agricultural inputs and commodities, the privatization of formerly state-owned farms and agro-industrial enterprises, and the removal or reduction of barriers to trade. Perhaps the most significant contextual shift has been the recent transformation of South Africa, which has enabled dramatic normalization of political and economic relations in the region, and which is already prompting accelerated integration, in the form of increased levels of investment and trade. South Africa is itself experiencing a profound transition of agribusiness-related policies, including trade liberalization and removal of marketing and price controls.

Underpinned by this liberalization process, the. new regional context for agribusiness development depends largely on the actions and performance of private sector actors, whether farmers and businesses within the region, or international investors and traders from abroad. It is therefore imperative to identify and remove constraints to private sector activity, and *to incorporate agribusiness enterprise perspectives and concerns into ongoing efforts to facilitate adjustment and encourage more rapid development.*

This paper summarizes the findings of a recent survey of agribusiness companies within and outside of Southern Africa.[1] It synthesizes the responses and opinions of selected agribusiness managers regarding the changing operating environment for agribusiness development in the region, the most significant current constraints, and the main factors shaping their patterns of production, investment, and trade. The survey comprised 107 companies, including 77 companies in Southern Africa (i.e. in South Africa, Zimbabwe, Malawi, Zambia, and Mozambique) and 30 companies in the United States and Western Europe.[2]

The paper is organized as follows: The next section presents the findings of the survey of firms undertaken in Malawi, Mozambique, Zambia, and Zimbabwe. This is followed by a summary of the findings from the interviews of European and American agribusiness managers, focusing on their perceptions of Southern Africa and their interest in undertaking new or incremental business activity

[1] The authors would like to thank various public and private sector organizations that generously offered their time and information to the work effort. The World Bank missions in each of the countries examined were generous with their time and support, as were the dozens of agribusinesses surveyed. In each of the focal country, the survey work was supported by local consultants, as follows: A.C.V. Consultancy (Private) Ltd. (Malawi); Austral Consultoria e Projectos, lda. (Mozambique); Economic Research Unit, University of Natal (South Africa); and Imani Development (pvt) Ltd. (Zimbabwe and Zambia). The survey was conducted between April and July 1995.

[2] There are thousands of companies and small businesses engaged in agribusiness activities in Southern Africa. The present survey did not attempt to be comprehensive in its coverage. Emphasis was placed on firms regarded to be 'movers and shakers' in their respective sectors. This generally implied a bias toward medium-to-large scale companies, although a number of smaller, innovative companies were interviewed. In the case of the European and United States survey segments, the focus was on firms either presently engaged in agribusiness trade or production in Southern Africa, or with the clear potential to do so in the future. The sample selection sought to ensure representation across several different forms of of agribusiness activity, including food/agro-processing, agricultural input and equipment supply, and commodity and non-traditional product trading.

in the region. The subsequent section summarizes the results of interviews conducted with agribusiness enterprises and organizations in South Africa. Particular attention is given to company responses to changing sectoral and trade policies and attitudes toward and experiences with trade and investment elsewhere in Southern Africa. The last section provides conclusions and recommendations based on the findings of the different survey segments taken as a whole. Annexes include comparative data for the five focal countries related to sources of comparative and competitive advantage.

Survey Findings: Malawi, Mozambique, Zambia, and Zimbabwe

Profile of Firms

Between Malawi, Mozambique, Zambia, and Zimbabwe, a total of sixty-one firms were interviewed under this survey. Table 1 depicts the breakdown of firms by major activity. The total exceeds sixty-one since several firms have major activities fitting into two or more of the categories. The survey spanned across a broad range of commodity fields including staple grains, traditional industrial crops, livestock, non-traditional products, and agricultural inputs and equipment. Such a cross-section of firms was covered in order to gauge generic problems and perceptions and to compliment the more in-depth commodity-specific studies being undertaken in parallel.

Table 1: Activity Breakdown of Interviewed Firms

	Number of interviewed firms engaged in activity				
Activity	Malawi	Mozambique	Zambia	Zimbabwe	Total
Food/Agro-Processors	9	6	12	8	35
Commodity Traders	2	0	3	1	6
Non-Traditional Product Exporters	6	3	4	4	17
Vertically Integrated Agribusiness	1	3	6	2	12
Commercial Farming/Farm Management	6	4	6	5	21
Irrigation/Farm Equipment, Supplies	2	2	2	3	9
Seed, Agro-Chemical, Fertilizer Supply	2	2	1	4	9

Source: TSG Survey.

The majority of firms in the sample are medium- to large in size, with more than 100 employees (Table 2). However, in Malawi and Zambia, half or more of the interviewed companies are smaller, with between ten and 100 employees. The sample did not include any microenterprises. In terms of turnover, most firms interviewed were generating US $1 million or more in annual sales; only 13 of 61 respondents fell below this threshold, again primarily in Malawi and Zambia. Only three firms reported turnover below US$200,000. Hence, the sample survey was not representative of the broader universe of agribusiness enterprises in the focal countries which features large and growing numbers of microenterprises engaged in agro-processing (i.e. hammermillers; vegetable oil expressors) and retail trade. It was biased toward medium-to-larger firms operating in the formal market.[2]

[2] There is a growing literature on agro-processing microenterprisess. For example, the expansion of Zimbabwe's hammermilling sub-sector is examined *in Financial and Economic Survey of the Small-scale Milling Industry in Zimbabwe* (1997) by CODA Consulting Services.

Table 2: Firm Size Distribution in Survey Sample

Number of Employees	Malawi	Mozambique	Zambia	Zimbabwe	Total	Percentage of Interviewed Firms Responding
10-100	8	3	8	3	22	42
101-500	3	2	4	7	16	30
501+	3	3	4	5	15	28

Note: Data on number of employees were obtained from only 53 of the 61 interviewed firms, thus 53 is used to calculate percentages indicated in the last column.
Source: TSG Survey.

Operating Strategies

Raw Material and Intermediate Input Procurement

At the regional level, procurement mechanisms and strategies are in a period of transition. Many producers and processors have had to develop totally new supply channels in the wake of price and marketing channel decontrol. This is true both for inputs such as fertilizer and seeds, as well as for raw commodities such as grains and horticultural products used for processing. The following presents a summary of some of the most salient trends and issues arising from the company interviews within the focal countries:

- Local importers/distributors of agricultural inputs remain competitive. Larger-sized companies, cooperatives, and associations tend to use international tenders for procurement of necessary inputs. Local importers/distributors participate, and frequently win these tenders, even under the more competitive conditions caused by import deregulation. Now that import licenses are largely unnecessary, anyone can directly import needed inputs -- large producers, associations, processors, etc. But importer/distributors have maintained advantages that allow them to beat these options. These include a broader base of clients which permits large and regular purchase orders, and agreements with manufacturers to prevent competing direct sales, or having their prices undercut.

- Credit is a key factor. With the current imperfections in financial markets throughout the region, credit availability has become a key factor affecting agribusiness procurement. Suppliers that can offer credit enjoy important advantages -- including the ability to charge higher prices. While reputable firms with good credit records frequently utilize overdraft facilities, others cannot, and must find suppliers willing to make credit arrangements, even if at a great cost. This drives up production costs.

- Cash talks. Cash-rich traders have enjoyed benefits in the wake of market deregulation. They receive large price discounts by paying smallholders cash upon delivery. Many smallholders previously experienced problems of delayed or non-payment for commodities delivered to parastatal marketing boards and/or cooperatives. This experience, together with immediate household consumption needs, induces many smallholders to sell, at a discount, immediately after harvest. Provided that market outlets are available or that effective storage facilities are in place, this can translate into higher margins for the traders.

- Bartering arrangements take the place of cash transactions. Some providers of inputs (such as fertilizers) forego cash payments and instead receive commitments for given quantities of crop output upon harvest. Such arrangements have become particularly common in Zambia. Transactions based on second-hand clothes instead of cash were also widely reported in Zambia.

- Supply problems drive backward integration. In one country, a textile manufacturer unable to secure sufficient quantities of domestically produced cotton lint (local cotton growers preferred to export to receive foreign exchange and commissions) decided to initiate cotton farming operations itself. A food processor in another country integrated into vegetable farming, but found the operation unprofitable and thus sold this business off. Another company found itself obligated to start new service companies to make up for deficiencies in services provided by other firms (e.g., security). These new ventures helped company performance, not only by improving services, but by generating increased revenue when other firms began contracting for the same services.

- Contract farming is done frequently, but often proves to be unsustainable. Although many traders and processors would prefer to source directly from farmers, payment on delivery is now the most common mode, whereas contract farming has seen only limited use in each of the countries. The main reason is lack of enforceability of contracts -- producers are accused of side-selling whenever prices at harvest exceed those agreed to in contracts. They then render only part or none of the stipulated production quantities to contract counterparts, using drought or other factors as excuses. Farmers typically see and use contracts as a "safety net", to insure a minimal price for their production. Buyers point out that contracts are often little more than symbolic agreements, because of the impossibility of carrying out legal processes in their interest. In spite of this, many processors express a desire to engage in contract farming in the future, typically as a measure to guarantee supply. Indeed, in their haste to secure raw materials, many are contract farming for commodities less well-suited for such arrangements-- while it may work better for vegetables and other commodities easier to monitor and more difficult to side-sell (storage times are lower, with fewer alternative market opportunities), several contracts are made for maize, oil seeds, and other more problematic commodities, from a contractual point of view.[3]

- Procurement bottlenecks increase inventory carrying costs. Unreliable supply chains, caused by transport problems, import procedure bottlenecks and other constraints, lead companies to carry larger inventories of necessary raw materials/inputs. Inventories of three months or more are common. This introduces tremendous costs, since working capital is absorbed, greater levels of damage/spoilage/theft are likely, larger storage space is required, and overall production efficiency is reduced. Higher-value products, for which material costs comprise greater percentages of total finished product price, are particularly vulnerable to inventory carrying costs.

Importation of Materials and Inputs

Agribusiness firms depend greatly on several inputs and capital goods imported from abroad. The most common of these include agro- and industrial chemicals, fertilizers, seeds, fuel, packaging, machinery, and other technology-intensive goods such as genetic material (cuttings, root stock, etc.). Cereal and grain imports have occurred to lesser extents, except in the aftermath of recent droughts. Many firms are only in the early stages of exploring sourcing opportunities for raw agricultural commodities, since the possibility of competitively importing them is only a recent occurrence.

Although most firms buy imported inputs from locally based distributors, they are well aware of the source countries for the products they buy. South Africa is the most important supplier throughout the region. Approximately 84 percent of respondents currently use imported inputs from this country. These include: capital equipment, fertilizer and agro-chemicals, food additives, packaging, and seeds. The second most important source of inputs is Europe, with the U.K. playing a

[3] On a related theme from East Africa, see *French Bean Connections: Sustaining Success in a Kenyan Contract Farming Venture* by Steven Jaffee and Gilbert Bintein.

dominant role. Common imports from Europe include fertilizer, seeds and plant material (particularly for horticultural products), capital equipment, agrochemicals and food additives. Finally, only a small percentage use North American-produced inputs. Higher transport costs and historical ties between Southern Africa and Europe are the main reasons. Nevertheless, certain U.S. machinery (e.g., cotton ginning machines) and genetic material (horticultural seeds) are used, particularly in Zimbabwe (see Table 3)

Table 3: Source Countries of Principal Agribusiness Imports in Focal Countries

Country	% of Respondents* Receiving Imports From: RSA	EEC	United Kingdom**	United States	Other Southern Africa
Malawi	81.3	50.0	37.5	6.3	43.8
Mozambique	77.8	77.8	33.3	11.1	22.2
Zambia	100	35.7	14.3	0	40.0
Zimbabwe	72.7	54.5	18.2	27.2	18.2
Average	84	54.0	26.5	10.0	33.3

* Total percentages do not equal 100 because respondents source goods from more than one country.
** U.K. included in EEC column figures-- separated here to show relative weight of U.K. compared to overall EEC sourced inputs.
Source: TSG Survey.

Respondents in Southern Africa import relatively little from other countries of the region, although several report using inputs produced in Zimbabwe. Thirty five percent of respondents in Malawi, Mozambique, and Zambia indicate Zimbabwe as a source of imported inputs. Only a handful mentioned importing from other less developed countries of the region, these including Mozambique (one firm each in Zimbabwe and Malawi); Botswana (one firm each in Zimbabwe and Malawi); Malawi (one firm in Zimbabwe); and Zambia (one firm in Malawi).

The new trade environment facilitated by liberalization has placed a premium on information, particularly for those seeking to import. In general, information gathering mechanisms relevant to regional imports are undeveloped among most agribusiness enterprises. In spite of a desire to identify potential suppliers in other countries, many are simply unaware of opportunities. Much of this can be explained by the historical orientation of firms toward European produced inputs, whether because of tied aid or other obstacles to sourcing from within the region. Another contributing cause is the orientation of trade and investment organizations toward major markets, as opposed to the smaller markets of the region. Producers and processors of agricultural products depend greatly on traders and stockists to alert them to availability, price, and quality of goods available in the region. These intermediaries play an important role in the evolution of intraregional trade patterns. Informal contacts, friends and family also serve as key factors. Telecommunication linkages are sometimes better with distant, traditional markets than with neighboring countries.

Marketing, Sales, Distribution

In general, firms throughout the region possess limited marketing and sales capacity, a problem common within countries which have recently emerged from controlled economies. The domination of parastatals and selected cooperatives in marketing suppressed the more widespread development of marketing abilities. However, some larger firms do employ more advanced marketing and sales organizations and strategies. Even some of the smaller companies -- particularly newer firms oriented toward non-traditional exports -- have managed to establish sophisticated and

successful marketing and sales approaches. Some of the main findings of the survey with regard to marketing, sales, and distribution were the following:

- In general, organizational structures are weak. Many firms do not use formal marketing/sales departments nor do they have managers dedicated to marketing. In many cases, general managers are largely in charge of sales, or an export manager must "change hats" and deal with domestic sales of processed food items. Without dedicated human and physical resources, most firms are weak in collecting and effectively using market information, and developing and implementing solid sales strategies. Little knowledge on state-of-the-art product and process technologies is used or available; and the information base on export opportunities is generally weak.

- Firms with past dependence on public or institutional clients are experiencing difficulties. Companies which supplied food to hospitals, schools, parastatal mining companies, etc. in the past are finding it difficult to sustain operations in the new environment. Many of these institutional clients are reducing their food purchases while those that continue rarely provide suppliers with incentives to improve quality or price. Companies which had relied upon institutional supply contracts were generally not compelled to develop higher quality standards for products, packaging, or processes. This has made it especially difficult for them to compete in a conventional retail environment, particularly with the onset of competitive imports.

- National companies have difficulty competing against locally based subsidiaries of multinational corporations (MNCs). Subsidiaries of MNCs are able to plug into the vast technological, marketing, and financial resources of parent corporations, which gives them a distinct advantage over smaller, locally based firms. New process and product developments which first appear in industrialized country markets can more quickly and effectively be adopted to local conditions and used to expand market share. Local companies are generally less effective at establishing brand names and staying on top of recent market and food technology trends.

- Retail outlet evolution is having a profound effect on product quality standards and general distribution patterns. Supermarkets are expanding throughout the region. Products are increasingly presented in shelf formats which allow several competing products to be displayed, and hence compared by consumers. South African retailers are expanding investments into several neighboring countries of Southern Africa. They bring with them the standards for delivery, quality, packaging, and overall presentation that have given them success in South Africa's relatively more sophisticated retail market sector. Locally based suppliers, if they are to supply products to these emerging retail chains, will need to upgrade processing and packaging, ensure high levels of quality, and meet the more stringent delivery requirements necessitated by a more competitive retail marketing sector. Existing retailers are under pressure to upgrade their own standards to compete with the new market entrants.

- Transition in distribution and purchasing networks. Distribution networks in rural areas were relatively thin even during the period of widepread public marketing enterprises. With the withdrawal of many such enterprises, private companies hoping to expand sales of inputs and other products in rural areas have needed to develop entirely new distribution networks involving their own staff and local traders (and others) serving as stockists or collectors/buyers. In some countries (especially Zambia), firms have been able to acquire or lease public facilities for storage or collection points. The expectation among many firms is that the transition from state to competitive private distribution networks will take at least five years.

Exports and Trade Channels

The surveys produced various insights regarding the condition and performance of the agricultural product export sector. Several interviewed firms provided information based on their extensive experience in exports, both to industrialized country markets, and to markets within the Southern Africa region. Other companies with little or no such experience highlighted apparent constraints or incentive-related issues associated with exports. Some salient points derived from the survey include:

- Successful export marketing implies key market connections and, increasingly, technical ties with buyers in industrialized country markets. The most successful exporters of non-traditional agricultural products are those that have developed strong marketing links with brokers, wholesalers, and in some cases retailers in the industrialized country markets. These links are typically the result of frequent trips to buyers' markets; attendance at relevant industry exhibitions or trade fairs; or paid invitations given to buyers to visit production facilities, etc. Many buyers employ strict quality/hygiene standards that require them to maintain close liaison, send inspectors and technicians on a monthly basis, and keep producers constantly informed of new market trends. Hence, exporters are frequently on the receiving end of technology transfer originating in industrialized country markets.

- Use of brokerage services compensates for information and marketing management know. Because of weak market know-how in Europe, growers in Southern Africa often use brokers/agents who arrange for sales to relevant entities. An example is the broker who handles sales at the Dutch flower auction. Firms often use agents for regional exports as well, since they require low levels of investment and are relatively easy to administer. The commission charged by brokers reduces margins for producers, but the reliability and ease of this arrangement makes it attractive. Some exporters have begun to experiment with alternatives, including flower producers who are setting up joint ventures with European flower importers/wholesalers. Outward investment restrictions have caused problems for some firms wishing to expand exports into regional countries through the establishment of direct sales subsidiaries.

- Start-up capital is critical and has generally come from abroad. Some development of non-traditional agribusiness operations has been financed from proceeds from traditional industries. The development of Zimbabwe's cut flower industry 'on the back' of the tobacco industry is one example. Otherwise, export-oriented agribusiness is largely financed from abroad. For example, a great portion of Zambia's non-traditional export companies are financed from overseas sources of capital, including the EEC and EIB schemes for working capital and investment capital, respectively. Other overseas sources include equity investments by joint venture partners, including flower/spice importers from Europe. No interviewed exporters used local finance as the primary source of start-up capital, due to its comparatively high cost.

- Certain kinds of incentives have supported switches into exports. Several traditional farmers went into non-traditional exports primarily because of their need for foreign currency to buy spare parts. They later found the non-traditional crops to be more profitable than their traditional activities, and began to place more emphasis on export crops. Hence, incentives linked to foreign currency retention appear to have worked, particularly in Zimbabwe, before foreign exchange regimes were liberalized. In more liberalized environments, the maintenance of realistic exchange rates, and incentives such as capital goods duty exemptions or tax breaks are pointed out as favorable factors by exporters. On the other hand, restrictions on outward investment have inhibited some frims from exporting. Although appointing agents/distributors working on a commission basis requires little or no investment, this arrangement can be insufficient for effective market penetration. Outward investment in the form of distribution outlets and associated management teams can be necessary for certain kinds of sales-- particularly

those requiring greater post-sales service (e.g., farm equipment, agrochemicals, seeds, and other inputs).

- Small is not yet beautiful. In spite of an almost universal desire to export, most smaller firms are finding the penetration of regional, let alone international markets to be problematic. Many such firms are pre-occupied with measures needed to survive in the more competitive conditions at home and have not done the necessary planning and operational adjustments to enable them to compete externally.

- South Africa is perceived as a closed market, but increasingly, exporters are encountering opportunities. Many non-traditional exporters commenced operations by targeting the European market; prior sanctions and other barriers to trade closed off the South African market for many producers. Now, however, several producers have begun to successfully export horticultural commodities, meats, and other products to South Africa. Personal contacts, family ties, and other relations are often key factors in facilitating market entry and staying on top of emerging opportunities. One producer born in South Africa, but currently operating in Zimbabwe, started off exports to RSA, which then led to opportunities opening up in Europe.

- Interviewed firms indicate Zambia, RSA, and Malawi as primary regional destinations for exports. Export sales, as opposed to investment and/or production, are the primary cross-border activity for most regionally-based agribusiness firms. Traders and processors are more frequently engaged in cross-border sales than agricultural producers, with the exception of export-oriented horticultural producers, who often export to South Africa, in addition to Europe. Suppliers of specialty inputs such as packaging, irrigation and farm equipment are also exporting to neighboring countries.

Technology/Technical Information

Firm access to technology was explored through a specific survey question which inquired about the sources and adequacy of technical information. The following summarizes findings in this regard:

- Most firms cite their own personnel as primary sources of technical information. Although they generally lack in-house R&D and specific departments dedicated to technology development, regional agribusiness firms have key personnel on whom they depend for providing basic information and know-how related to product and process technologies. Many firms acknowledge weaknesses in access to technology and technical information, but are simply unprepared to dedicate additional resources to strengthening this area. Many express interest in accessing technical assistance through donor agencies.

- A significant portion of firms depend on foreign consultants. Many firms make frequent use of foreign consultants, particularly for higher-value specialty crops (cut flowers, vegetables, etc.) and advanced production processes for which local expertise is relatively weak. Often, foreign-based suppliers of equipment, inputs, and other supplies provide necessary technical information, even training regionally-based distributors or users. Buyers are also becoming more frequent providers of technical information, sending consultants, technicians, etc. to ensure quality standards and provide necessary support to export growers located in Southern Africa.

- Zimbabwe has become a regional hub for horticultural technology and expertise. Zimbabwe's local and foreign knowledge base serves neighboring countries such as Zambia with needed technical expertise relevant to horticultural production. Dutch specialists based in Zimbabwe

have provided important support both in this country and in others of the region. Zimbabwean floriculturalists have even moved to nearby countries to manage growing operations. [4]

- Learning by doing is often the only way firms can develop advanced technical capabilities. Several respondents indicate that they use frequent traveling and various learning by doing, trial and error approaches to acquiring technical expertise. Although mistakes are often made, the experience gained compensates for short-term set-backs, and allows committed firms to move forward with a broader knowledge base for future activities.

- Firms located in countries with more advanced research and extension institutions use these services more. Aside from a few firms in Zimbabwe and South Africa, most interviewed firms do not indicate that they are using publicly funded research and extension services. Indeed, firms in each focal country except South Africa point out that weak research and extension is a problem that directly or indirectly affects their performance.

Perceptions of Agribusiness Environment

The survey included a specific segment dedicated to rating twenty five policy, institutional, and basic production factors in terms of their impact on firm profitability and performance. Respondents rated each factor on a 1 to 5 scale, with 1 being a very negative impact, 5 being very positive, and 3 being neutral/no effect. The goal was to identify primary constraints to investment, trade, and general agribusiness development. Although answers varied from country to country, and according to the type of firm interviewed, in general, there was broad agreement as to which factors presented the most positive and negative influence on firm performance. Table 4 summarizes the results, listed in order from the most negative to the most positive factors, according to global scores averaged across all the countries together. Average scores for each country are also provided, allowing cross country comparison.

Basic Production Factors

- As seen in Table 4, the most problematic basic production factor is finance. That this factor received the lowest global score is no surprise-- respondents consistently pointed to finance as the most substantial obstacle to agribusiness investment, trade, and development. Many emphasized the high cost of finance as well as the stringent lending requirements of major financial institutions.

- Worker skills and productivity, general level of technology, and transport facilities and services are also primary constraints. Although the region's low wage levels are positively perceived, low productivity reduces this benefit. Many firms would rather pay higher wages in return for greater output; some who have experimented with incentive based salary schemes have witnessed productivity improvements, but general technical and administrative skills are so low that limits are quickly reached. Transport services and costs are considered especially problematic in Malawi and Mozambique.

- Several firms complain about packaging quality and price. Both domestic- and export market-oriented firms complain about the low quality and high price of packaging for horticultural and processed food products. Many import despite the availability of locally produced packaging. For these firms, products are made less competitive since duties are paid, and drawback systems do not provide timely refunds upon reshipment. Packaging manufacturers complain that import duties for raw materials are higher than those applied to finished products, placing them at a disadvantage.

[4] See *Profits from Petals: The Development of Cut Flower Exports in Southern Africa.*

Table 4: Agribusiness Firm Ratings of Production, Policy, and Institutional Factors Malawi, Mozambique, Zambia, and Zimbabwe

Production Factors					
	Avg.	Malawi	Mozambique	Zambia	Zimbabwe
Access to Finance, Terms and Conditions	2.09	1.78	3.00	1.93	2.12
Worker Skills and Productivity	2.32	2.20	2.17	2.22	2.53
Level of Technology	2.46	3.00	1.67	2.15	2.82
Transport Facilities and Services	2.52	2.00	1.50	2.70	2.88
Intermediate Goods and Supplies	2.72	2.43	2.00	2.94	2.81
Availability of Raw Materials	2.99	2.38	2.60	3.04	3.35
Wages	3.59	3.73	3.75	3.57	3.47
Quality of Raw Materials	3.64	4.14	2.70	3.93	3.47
Policy, Institutional, Procedural Factors					
Agriculture Extension/Research Services	2.02	--	2.17	1.72	2.17
Customs Supervision/Control	2.31	3.00	1.50	2.03	2.65
Policy Consistency/Stability	2.35	1.30	2.42	2.70	2.65
Land Buying/Leasing Procedures	2.45	1.67	3.20	2.71	2.27
Monetary Policy	2.50	1.71	2.70	3.07	2.26
Tax Regime	2.64	2.00	2.33	3.30	2.31
Tariff Regime	2.72	2.33	3.00	3.03	2.47
Health/Sanitary Requirements	2.76	2.33	2.50	2.37	3.37
General Investment Climate	2.81	2.33	2.17	2.97	2.97
Labor Regulations	3.03	2.40	2.67	3.54	2.90
Import/Export Procedures	3.14	3.00	2.60	3.53	3.00
Investment Approval Process	3.18	2.57	2.00	3.73	3.25
Currency Controls	3.71	2.71	3.00	4.03	3.97
Import Restrictions/Lack Thereof	3.76	3.17	2.50	4.19	4.08
Foreign Exchange Access	3.80	2.50	2.40	4.44	3.91
Agricultural Subsidies/Lack Thereof	3.82	--	--	3.75	3.89
Price Controls/Lack Thereof	4.00	2.20	--	4.27	4.50

Note: Interviewees used 1 to 5 scale to rank each factor's impact on firm's performance. 1 = very negative impact on firm's performance; 2 = negative impact; 3 = neutral/not a problem; 4 = positive impact; 5 = very positive impact
Source: TSG Survey

Policy/Institutional Factors

The respondents' ratings of policy and institutional factors provide interesting insights. For example:

- The lowest rated policy/institutional factor was agricultural research/extension services. Although many firms do not directly depend on such services, there appears to be broad concern about the limited and even declining effectiveness of public research and extension services and

the resultant impact on agricultural productivity generally. In response to weak public efforts, the most aggressive firms are engaging in their own forms of research and extension. Seed producers are forming alliances with foreign-based conglomerates to develop new varieties and benefit from the larger resource pools such enterprises have. Larger agribusiness firms such as the local subsidiaries of multinationals provide extension services as part of their outgrower schemes. However, even these companies report that the weakness of publicly extension services leaves a gap that they are unable to fill.

- Customs supervision and control are seen as inadequate throughout the region. Contraband is rife throughout Southern Africa. This reduces government revenue collection, and effectively removes protection of national industries already suffering serious disadvantages compared to international rivals. Customs control improvements were recently noted in Zimbabwe, although many are skeptical regarding continuing enforcement. Mozambique and Zambia appear to suffer the most serious problems of customs control at the moment. In response, some agro-processing firms are shifting out of production, and into importing and distribution, which entails less investment and risk, and allows them to take advantage of their existing distribution networks as opposed to closing down all operations.

- Companies deride the lack of consistency and stability in government policies. Many cite unstable policy environments as undermining their ability to effectively plan and engage in strategic investment decisions. Common problems include lack of confidence in exchange rate policies, liberalization of import duties while the "playing field" is still not "level", and government stalling of fiscal reform and necessary privatization. Where parastatal enterprises have been weakened, but still operate with varying levels of government financing, firms are concerned about the contestability of markets.

- Land buying and leasing procedures are weak. Companies in Mozambique and Zambia complain that land purchasing and/or leasing procedures are extremely cumbersome for new investments, reducing the resource advantage held by each country. Malawian and Zimbabwean companies also report problems, although these are due mostly to the non-availability of land (Malawi) or the requirement that land be first offered to government before private land transactions can be undertaken (Zimbabwe).

- Criticism of monetary policy generally stems from dissatisfaction with interest rates available for finance. Finance was identified as the most significant basic production factor constraint, but monetary policy was rated somewhat less negatively, since several firms perceive certain advances in such variables as foreign exchange control and others they associate with monetary policy.

- Producers and processors are pleased with recently implemented trade, foreign exchange, subsidy, marketing and price control reforms. Most indicated either neutral/no effect (implying "not applicable"), or rated these factors with positive scores, expressing their support of recently implemented reforms. Foreign exchange access and (elimination of) price controls were two of the most consistently highest ranked factors in Zambia and Zimbabwe. Malawi and Mozambique still rate foreign exchange access lower, reflecting problems with foreign exchange availability during the mid-1990s.

Survey Findings: Europe and the United States

One of the survey's objectives was to gauge perceptions of the Southern African region among agribusiness investors, operators, and traders from other parts of the world. The views of such firms serve as an important compliment to the information gathered within each focal country, since they highlight those aspects most relevant to international trade and investment, from the vantage point of foreigners who see Africa in its global context.

Profile of Firms

The European and U.S. surveys queried 30 agribusiness-related firms, traders, and institutions in several different countries with agribusiness interests in the region (see Table 5). These firms were selected on the basis of representing a broad cross section of producers, processors, input/machinery supply companies, and traders with activities in Africa. Efforts were made to include firms involved with higher value products, inputs, and services with relevance to agribusiness in the Southern African region. The majority were medium- to large-sized companies, including three multinational agribusiness companies with long histories of production and trading activities in Southern Africa and other regions around the world. Several interviewed companies engage in commodity trading and/or production activities. However, for the vast majority of interviewed firms, South Africa as well as the entire African continent represent only small percentages of total sourcing or sales turnover.

Table 5: European/U.S. Interviewed Firm Breakdown

The United Kingdom (13):
3 Multinational Conglomerates
1 Retail supermarket
2 Commodity traders
4 Traders of spices, essential oils, flavorings
1 Fresh produce importer/producer
1 Development corporation
1 Financial Institution
The Netherlands (4):
1 Importer/retailer of fine coffees and teas
1 Multinational beer and beverage company
1 Plant/flower material breeder and importer/wholesaler
1 Food process engineering company
France/Other (5)
1 Food process engineering company
1 Vegetable grower/cannery/distributor
1 Bilateral Trade Investment Promotion Agency (Semi-private, RSA-focused)
1 Seed Certification Institution
1 Flower wholesale importer with Southern African investment*
United States (8)
3 Spice/Tobacco/Oil Traders/Distributors
4 Farm equipment manufacturers with sales/operations in Southern Africa
1 Food additive company with RSA office (soy protein)

Source: TSG Survey

Operating Strategies

Given the wide variety of countries and types of companies involved, it is difficult to make broad generalizations regarding operating strategies vis-a-vis agribusiness in Southern Africa or other regions. Each firm has its own approach to doing business; many have self interests which influence

their perceptions and responses. For example, a trader who already possesses a strong sourcing network of specialty spices or flavorings may have an interest in ensuring that world supplies remain low, so that prices for their products stay at higher levels. More than one trader complained about overproduction of certain products, which was "undermining" the profitable conditions existing beforehand.

In spite of the difficulty in generalizing, several trends and strategic perceptions are worth noting, as they may affect to a certain degree future investment and trade dynamics relevant to the focal countries of the present study. The following summarizes several of the most salient trends and developments regarding the operating strategies of interviewed firms in Europe and the U.S.:

Multinational Firms

- Large multinationals are restructuring, and some are planning substantial new investments relevant to the Southern African region. One firm is consolidating country-specific subsidiaries which previously operated independently under the global corporate umbrella. They are re-organizing under a new Africa Division which will handle all operations (mining, tourism, trade, agribusiness and other activities) for the entire continent. At the same time, a public flotation of a new Africa-targeted investment fund will allow the firm to expand investment in several African countries. Another company is expanding commodity and trading activities in Africa and around the world, and is placing increasing emphasis on services such as agricultural management consulting for governments and donor institutions, as well as for private businesses.

- Firms with historical presence enjoy advantages. Long-established firms in the African context have developed comparative advantages in being able to deal with adverse conditions and manage operations in an environment which most other firms prefer to avoid. This allows for profitable operations, and greater bargaining power with governments which stand to lose a great deal if the few established firms pull operations out of the country. Long-standing firms acquire specialized knowledge and contacts with public officials and the business elites where they operate. They are generally able to understand frequently important cultural issues and motivate workers more effectively.

- In some cases, agribusiness activities have been initiated for larger strategic purposes. Certain firms---significant mining and/or manufacturing interests-- have been directly or indirectly obligated to engage in agricultural production even though this was not a desired or priority area of activity. Some have had negative experiences with agriculture; others have had a number of profitable ventures.

Commodity Traders

- Inter-linkage of trust and trade. Traders often try out new suppliers by starting with small orders sold on consignment, developing more confidence before engaging in larger orders and other more risky transactions such as providing credit and/or necessary inputs. Many investments/sourcing arrangements develop out of personal contacts and family ties. One European company exploring new investment sites for horticultural production and processing included Zimbabwe on its list of candidate countries, primarily because cousins of a key executive were already running an operation in this country, and it was perceived to be doing well. Another company already importing fresh fruits and vegetables from around the world is intimately tied to family-run companies producing horticultural products in Kenya. A Zimbabwean farmer developed key European market contacts through a friend based in South Africa.

- As a general rule, trading/sourcing firms develop supply links in more than one developing country and/or region. This common sense strategy enables firms to diversify and have alternative sources should something go wrong with any one.

- Restrictions on profit/capital repatriation force companies to resort to transfer pricing, over-invoicing, and other methods to get money out of countries. Producers/investors report having to engage in such practices, while suppliers report frequent requests from regional companies to be over-invoiced so that they can get money out of the country. Countries that have liberalized capital controls do not have this problem-- specifically, over-invoicing requests have stopped coming from Zambia now that its capital control regime has been liberalized.

Retailers/Wholesalers of Horticultural Products

- Overseas sourcing of many horticultural products expected to increase. Many anticipate GATT-mandated trade reforms and removal of subsidies will drive European firms to more aggressively outsource horticultural products in other countries. These reforms/changes will not take place overnight, but companies have already begun looking for supply channels in less developed countries with favorable growing conditions and cost structures. French firms are investing in Eastern Europe and are increasing their activities in Africa; one interviewed firm was exploring Southern Africa because of quotas placed on its Moroccan production, which is now losing money due to insufficient market access. U.K. wholesalers and retailers have long been developing sourcing relations with several African countries, which has enabled them to gain competitive edges in bringing high quality, low cost products to market.

- Buyers demand high levels of quality control and insist on accountability/auditing consistency among suppliers in foreign countries. U.K. firms cite due diligence legislation which makes them responsible for health and safety aspects of all food products they sell. Retailers now have direct contacts with overseas (African) suppliers, sending technicians on a regular basis to coordinate growing and packing processes, ensure necessary health standards, etc.. Environmental concerns are also being transferred to source countries, and increasingly, buyers demand that growers meet high standards for environmental health and safety -- not only geared toward final consumers, but toward local workers. Importers provide comprehensive lists of requirements and norms to suppliers, including recommendations relevant to organization structure and management (see Box 1).

European/U.S. Perceptions of Focal Countries

- South Africa commands the most interest as a potential investment location, followed by Zimbabwe, Mozambique, and Zambia. South Africa's large market size and advanced infrastructure development stand out in the region. Firms indicate greater responsiveness by firms and public agencies to grievances and claims, and an overall better trade and work ethic. Zimbabwe's production capabilities and infrastructure are recognized as strong, but most interviewees characterize government policies as inhibiting private sector growth. Zambia and Mozambique are seen as improving, with Zambia enjoying a head start, but Mozambique holding even greater potential in the future. Malawi is generally perceived as land-locked and too small to warrant attention, although firms with agricultural operations report favorable agro-ecological conditions. Table 6 shows which focal countries receive the highest degree of interest as potential sites for trade/investment among interviewed firms.

- Larger spice, oilseed, seed, and commodity traders tend to view Africa as inefficient and obstacle ridden, or as a low-priority region for sourcing products. Respondents complain of past negative experiences with unscrupulous traders and producers, high levels of bureaucracy, inefficient

government, corruption, and problems with quality and payment in Africa. Another strategic disadvantage of Africa is the lack of local markets for produced products, which makes investment riskier. Traders/investors indicate that they can always find local markets for spices in Asian countries when world commodity prices fall, due to the local diet which includes a greater use of a variety of spices. Asian countries are also perceived as possessing superior conditions for general business, trade, and investment. As a result, scouting trips are made more often to Asian countries, while traders typically let the African suppliers come to them.

Box 1: Buyers Increase Pressure on Suppliers to Raise Quality and Phytosanitary Standards

Various trends are causing changes in traditional buyer/supplier relations in the fresh horticultural product sector. In the U.K., for example, due diligence legislation makes retailers and wholesalers responsible for the safety of the products they sell. As a result, these buyers are increasing the standards and specification they use to source from both local and overseas suppliers. Other trends include international quality standards conventions such as the ISO 9000 and subsequent generations, which affect not only product quality, but management practices as well.

One interviewed importer revealed an advanced and formalized approach to demanding necessary quality standards. It provides current and potential suppliers with detailed guidelines regarding "Supplier Requisites", including a detailed document. This document provides a detailed explanation of due diligence regulations, provides recommendations on the qualifications for personnel and management involved in quality control, outlines the features of a quality Code of Practice, and outlines an array of recommended quality and environmental hazard control practices which should be adopted at different stages of production and logistics.

Meeting such stringent requirements presents considerable challenges to suppliers from Southern Africa. Although several large producers/suppliers are already involved in (quality and environmental management) demanding relationships with buyers, many regional producers, lack know-how regarding advanced management techniques involving quality assurance. Students, particularly in agronomy disciplines, rarely have opportunities to learn about modern buyer/supplier relations and the new management techniques and quality standards necessary to satisfy an increasingly demanding export market. Business schools often provide these skills in other parts of the world, but in Southern Africa, there is a dearth of educational institutions with high quality business administration programs. Individual consultants and accounting firms offer training and services relevant to quality control and overall production management, but these are infrequently used by most companies/producers, particularly smaller ones. Even large producers often avoid using consultants, lacking an awareness about the possible benefits of using outside expertise.

- Language ties influence trade and investment patterns. Dutch firms indicate language and historical ties as principal reasons for their involvement in South Africa. U.S. firms are managing many African operations from headquarters established in the U.K., reflecting patterns of African trade and business management established during the colonial period. Mozambican firms report that ties with Brazilian agribusiness equipment suppliers are the result of shared language ties. On the other hand, French firms are now targeting South Africa, due to its large market size and transformed political environment (the number of French companies with offices in RSA doubled from 1993 to 1995-- from 50 to 100[5]). French firms believe they offer a strategic advantage to RSA joint venture partners, in that they have easier access to French-speaking African countries.[6]

[5] Source: Jean Labesse, General Manager, Organisation pour la Cooperation Industrielle et l'Investissement entre l'Afrique du Sud et la France, personal communication.

[6] Thus far, most French investment into RSA has concentrated in telecommunications and power. Despite potential synergies in agribusiness related fields, investment has been rather small, limited to wine, seeds, and fisheries sectors.

Table 6: Indicated Interest in Potential Trade and Investment in Focal Countries

Firm Location	Number of Firms Indicating Potential Trade/Investment Interest in: Malawi	Mozambique	Zambia	Zimbabwe	South Africa
United Kingdom	7	5	8	8	9
Netherlands	0	3	2	3	3
France	0	2	0	1	1
Belgium	0	0	1	0	1
Sub-Total	7	10	11	12	14
Percent of Total Respondents	47%	67%	73%	80%	93%

Note: The total number of respondents was 15, several firms expressed interest in more than one country.
Source: TSG Survey

Perceptions of Key Factors Driving Agribusiness Investment and Trade

The survey sought to determine which factors are most important in influencing agribusiness investment and trade decisions by industrialized country firms. Interviewed firms rated a number of factors in terms of their importance for regional business activity. In addition, several specific questions were aimed at generating qualitative descriptions of the factors which lead to the initiation of new business operations, whether these be political, economic, etc.

Important Factors Affecting Regional Agribusiness Activity

Respondents were asked to rate eight different factors in terms of their importance to business activity in the Southern African region. Using a scale of 1 to 5 (one being of little or no importance, 5 being very important), interviewed firms gave numerical scores to each factor. These factors and their scores are shown in Table 7, and are summarized below:

Table 7: Most Important Factors Relevant to Business Activity in Southern Africa

Factor	Average Score	Producers and Investors	Traders
Personal Relations	4.15	3.89	4.75
Economic Conditions	3.50	4.00	2.38
Previous Trade Relations	3.26	3.06	4.50
Favorable Information	3.17	2.19	4.75
Political Climate	3.16	3.78	2.13
Incentives (host country)	2.79	3.07	3.25
Incentives (home country)	2.75	2.56	3.50
Following the Competition	2.42	2.67	2.33

Note: Respondents used scale of 1 to 5, with 1 being little to no importance, and 5 being very important.
Source: TSG Survey

- Firms rate personal relations as one of the most important factors influencing their regional activities. Traders place particular importance on their relations with producers and trading counterparts, preferring those with whom they have previous trade relations and reliable references. Unfortunately, they do not have frequent opportunities to develop new relations with African traders and suppliers, largely because the Africans are less aggressive than their competitors in pursuing new marketing leads, and there is a conspicuously small number of appropriate forums, trade shows, etc. where buyers and sellers can network at an international

level. Training in marketing and organization of events which foster face-to-face contacts between regional and international agribusiness enterprises are highlighted as areas needing additional attention.

- Economic and political conditions within each country, tend to weigh more on the activities of producers with larger investments. Traders are less concerned with the overall economic and political conditions in the countries from which they source. Producers, however, have a different outlook due to investments and their greater exposure to local economic and political conditions.

- Incentives are important to some firms. British respondents rated home country incentives (e.g., preferential duty access to U.K. markets) higher than did firms from other countries. Producers/investors see incentives in host countries of Southern Africa as more important than those in their home countries. In many cases, this is because their overseas operations are not necessarily oriented toward re-export to their home market. Big players negotiate individually with each country for tax, tariff, and other incentives, except in South Africa, where the rules are standardized for all firms.

- Most firms do not acknowledge "following the competition" as an important factor affecting their business activities in Southern Africa. However, the one French processor of vegetable products points out that competition is driving many French firms to seek greater outsourcing relations in other countries, including Southern Africa.

Political Change in RSA

The survey inquired if the normalization process/political change in South Africa is affecting business plans or perceptions of doing business in the region. Among the perspectives offered:

- South Africa is seen as the motor that will drive agribusiness and general economic growth in the region, provided political stability is maintained. The view of South Africa as an engine of growth finds many adherents among European and U.S. firms. South Africa is the main priority for many suppliers of equipment, technology, and other supplies. However, many are making only preliminary "shallow" investments, awaiting further signals about the directions of economic and political change. Many envision distribution/sales bases in South Africa serving neighboring countries in the medium to long term; some are already initiating activities in the smaller neighboring countries, using South African subsidiaries as springboards.

- U.S. firms re-enter and start new operations in South Africa. The transition to the new political regime in South Africa has stimulated many U.S. firms to re-establish offices and operations in this country. Other U.S. firms are arriving for the first time. In 1995, U.S. companies have been establishing RSA offices at a rate of nearly one a week, including several investing in agriculture or food processing sectors[7]

Other Factors

The survey interviews also revealed several other insights regarding companies' views on initiating investments and engaging in production and trading activities in Southern Africa. These include the following:

---

[7] Source: "New S. Africa's Old Problem: Luring Foreign Capital," The Journal of Commerce, Sept. 12, 1995 p. 6A.

- Several different factors can lead to initial interest in sourcing and/or investing in a given country. Traders tend to be less interested in the local market conditions, focusing instead on securing reliable producers or traders who can deliver significant quantities at consistent quality levels. Many spice/essential oil traders express interest in locating new or unique products, ones that offer distinctly high quality or special flavor/appearance attributes that will allow them to command price premiums. Relations with new counterparts are developed by beginning with small orders and strict payment/delivery conditions. Eventually, trust is developed, and depending on the particular case, credit may be extended, and sometimes even equity capital for production. Producers and processors of consumption items, on the other hand, tend to be more concerned about local market size and conditions. Overseas investments are often the result of aggressive strategies to expand sales, particularly when home market performance is flat or deteriorating, and other key markets are saturated and/or already penetrated to the greatest extent possible. Sometimes they will begin by exporting products to African countries, to build brand name recognition and image as a high quality, imported product. Subsequently, local production can be established, reducing costs due to lower transport costs and duty avoidance, permitting price reductions and improvement of market share position. In several cases, serendipity, gut feelings, and personal contacts play important roles in determining target countries for both sourcing and investment decisions. Producers of mass consumption items, such as food and beverages, cite the desirability of stable governments and large populations, preferably concentrated in small geographical areas so that easier distribution is facilitated. Both interviewed traders and investors cite the importance of historical ties and language commonalties; often, activities are simply extensions of trading relations established during colonial times.

- Trade and market liberalization, along with privatization, encourage international firms to increase investment and operation. Major agribusiness enterprises indicate that recent liberalization measures are positive factors contributing to their decisions to invest greater amounts into new or existing enterprises in the region. Commodity traders are particularly interested in the opportunities created by South Africa's market liberalization.

- Appearances count. Traders/buyers of agricultural products usually make visits before beginning to source from regional producers. They look for established offices, cleanliness, cement floors, and other indicators that reflect the solidity of the firm with which they are dealing. They want to see reliable sources of fresh water to be used for washing products, and sanitary facilities and good hygiene practices for laborers.

Principal Constraints

The survey asked firms to rate barriers to international business activity in the Southern African region, using a scale of 1 to 5, (1 being the lowest barrier, 5 being the highest or most serious). The results indicate that international agribusiness firms perceive many of the same constraints as those indicated by the companies interviewed in the region. However, some differences do present themselves, as described in the following summary and table:

- Restrictions on capital/profit repatriation and general foreign exchange controls are ranked among the most serious constraints. Southern Africa (like most of Sub-Saharan Africa) is seen as having a history of overly restrictive controls. The progress made by several countries in loosening up such controls, greatly appreciated by in-country survey respondents, appears to be less recognized or appreciated among interviewed U.S. and European firms. It is not clear whether this is due to a difficulty in forgiving past problems, a lack of confidence in recently implemented reforms, or other factors such as poor publicity by the countries.

- Weak transport and telecommunications infrastructure also pose a serious obstacle. International firms agree with regionally-based companies that transportation and telecommunications infrastructure continues to be seriously deficient in the lower income countries of the region. They suggest that unless increased investment is made in ports, roads, telephone systems, and other physical infrastructure, trade, investment, and general agribusiness development will be held back.

- Policy uncertainty continues to be one of the region's most serious problems. Respondents cite unstable exchange rate policies as a major deterrent to increased agribusiness investment and trade in the region. Other perceived sources of uncertainty include policy changes on duties and import bans, which make planning difficult for new projects.

- Investors are more sensitive to problematic legal systems. Companies with investments in the region perceive weak legal systems to be more of a problem than do traders or other types of companies or institutions. This is due primarily to weak enforceability of contracts, upon which traders depend much less than established investor/producers.

Table 8: Principal Constraints to International Business Activity in Southern Africa, as Perceived by Country and Type of Firm (Average Scores)

Factor	Average Score*	Producers and Investors	Traders
Capital/Profit Repatriation Restrictions	3.58	3.88	5.00
Weak Infrastructure	3.57	3.81	3.67
Availability of Raw Materials	3.57	3.81	3.67
Transport Cost/Quality/Regulations	3.35	3.13	4.83
Policy Environment Uncertainty	3.27	3.43	3.67
Foreign Exchange Regulations	3.11	3.31	4.00
Labor Cost/Quality/Regulations	2.96	2.63	3.25
Inconsistency in Corporate Law	2.71	3.07	2.50
Customs Law Harmonization	2.65	2.63	--
Business Formation Requirements	2.29	2.56	4.00
Weak Markets	2.19	1.86	2.17

* Average scores calculated based on Producers and Investors, Traders, along with other categories of respondents (e.g. institutions).
Note: Factors rated using scale of 1 to 5, with 1 representing little or no constraint, and 5 representing the most serious constraint.
Source: TSG Survey

Five-Year Outlook

Respondents were asked to make projections regarding the performance of agribusiness in the Southern African region in the near future. Specifically, the survey asked the following question:

What is your five-year outlook regarding the potential of these (Southern African) countries as commodity suppliers, sites for investment, or market outlets for the goods of your firm?

Responses varied, but several common themes emerged, as presented in the following summary.

- Interviewed companies anticipate increased investment and slow but steady growth in the region. A majority expressed positive outlooks or at least guarded optimism regarding investment and economic growth. Several specifically mentioned privatization efforts as spurring investment and growth.

- Many anticipate RSA will lead in attracting investment and growth, and will pull the rest of the region along. Thirty five percent of respondents mention that some form of the so-called "growth engine" model will likely drive trade and investment patterns during the next five years. However, several indicate that they would like to further monitor the process of political and economic development in the country before they commit major investments.

- Large spice and essential oil traders see the region as a relatively insignificant player. In the next five years, they do not anticipate African suppliers will improve their currently low percentage of world market trading volumes. Lack of competitiveness, standardized qualities, and reliability are cited as main reasons, although some individual firms may be able to achieve a breakthrough. In contrast, more outsourcing of fresh and canned vegetables (by French firms) is expected. A French interviewee pointed out that higher competition among producers and processors of horticultural products will drive several firms to continue outsourcing and investing overseas during the next five years. Eastern Europe and Africa are likely targets. Southern Africa may receive attention, although many firms are unaware of sourcing opportunities in this region.

Survey Findings: South Africa

The South African component of the investor/operator survey differed from both the European/U.S. survey and that carried out in the four lower-income countries of the Southern African region. Although a wide variety of questions were asked, firms and institutions were queried with two main goals: (1) to determine the impact of recent trade and marketing liberalization measures on agribusiness strategies and performance in South Africa; and (2) to gather information relevant to RSA firm investment in and trade with other countries of the Southern African region.

Profile of Interviewed Firms/Institutions

A wide variety of firms and institutions were interviewed. Most were concentrated in the Johannesburg/Pretoria areas, along with neighboring Eastern Transvaal and Orange Free State. Table 5.1 presents the basic breakdown according to firm/institution type and activity.

Table 9: Firm Profiles, South African Survey

4	Traders of cereal, grain, pulses, and other agricultural products
3	Large agribusiness conglomerates
3	Farm equipment, irrigation, and other input suppliers (fertilizer)
3	Large commercial farming groups
2	Large cooperatives (seed production/marketing, food processing/input supply to farmers)
1	Farmers' union organization
Total: 16 interviews	

Source: TSG Survey

It should be pointed out that the majority of firms interviewed for the South African segment of the survey were comparatively large, seen in the regional context. Part of this was intentional, as the larger firms tend to be more active in seeking cross border investment and trade, which is a primary focal point of the present study. In addition, large firms currently dominate agribusiness in South Africa. Industry structure has been historically characterized by high levels of concentration among large agribusiness conglomerates, making it difficult to find smaller agribusiness concerns with relevance to intraregional trade and investment dynamics.

Responses to the New Environment

As noted earlier, South Africa is passing through a historic period of political and economic transition which is profoundly affecting agribusiness development, both domestically and regionally. The end of apartheid has enabled trade and investment to expand considerably, as sanctions and economic blockades have been largely eliminated. The agriculture sector, historically characterized by high concentration and heavy protection and market regulation, is now being liberalized. Reforms include the removal of price controls on most agricultural products. Competition has increased dramatically, particularly as a result of increased imports facilitated by lower tariff levels mandated by GATT[8] . The large conglomerates have already begun to make adjustments, selling off livestock and basic grain production holdings, downsizing operations, and re-configuring for the more competitive environment.

The cooperative sector is undergoing an especially dramatic transformation. Although they continue with ownership of several strategic assets (e.g., grain silo storage capacity), at the same time, they have lost guaranteed participation in marketing and other privileges. Many are changing ownership structures, becoming private companies in the face of the new political and economic reality. Even smaller companies are re-positioning within the sector-wide restructuring, establishing new alliances, building new production and storage facilities, and trying to take advantage of lower overhead and more efficient locations. Greater competition on the home front is causing many companies to expand both sales and sourcing efforts in other countries of Africa, particularly in nearby areas. Many believe that current changes portend the emergence of new structures of investment and trade at both the domestic and regional level.

The present survey was conducted at a crucial time during this transition. Several new trends and important issues are already visible. On the other hand, the transition is still at an early stage, leaving a certain level of uncertainty among companies and individuals involved in agribusiness, as well as in other sectors of the economy. The following presents a summary of some of the most salient issues and trends as conveyed by interviewed firms and institutions:

Responses to the New Environment

- Agroindustry restructuring. South Africa's highly concentrated agro-industrial structure, dominated by large conglomerates, has begun to restructure in the face of liberalization of trade and marketing mechanisms. Groups are selling off livestock and maize production holdings, downsizing corporate headquarters staff, and generally moving toward leaner structures focused on higher value added, brand-name products. Several mills and processors have found in the wake of liberalization that their production structures are inefficient. Specifically, their mills and processing facilities are located close to urban centers instead of near production areas. This necessitates transporting unprocessed maize and other grains long distances, expensive compared

[8] South Africa's negotiation to re-join the General Agreement on Tariff and Trade allows for moderate protection to continue for many products, through maximum ceiling tariff levels. However, the Board of Tariff and Trade has shown a preference for fixing tariff levels well below these maximum levels, a policy intended to benefit consumers by lowering costs for basic food and other items.

to moving finished product, particularly considering prevailing high rail freight costs. Some predict that smaller companies with leaner administrative structures and lower overhead costs will continue to start-up and cut into larger millers' market share.

- Collaboration and joint ventures with international agribusiness concerns have become common responses among firms faced with a more competitive environment. South African firms acknowledge the inferiority of their product and process technology compared to European and U.S. firms. As a response to increased competition, the South Africans are forming strategic alliances with foreign counterparts, offering market channels and on-the-ground experience in exchange for investment, technology, and new brand names.

Box 2: A Joint Venture in South Africa

The political change in South Africa has catalyzed new investments and strategic moves by multinational commodity traders and other agribusiness concerns. These are attempting to position themselves and take advantage of the liberalization and new trading structures emerging in this country, as well as in others of the region. Some of the biggest players have already initiated activities in South Africa, including André, Cargill, Continental, Dreyfuss, Richco, and Toepffer. At the same time, companies in South Africa are faced with the dual challenges of adjusting to a deregulated market and engaging in more activities on the marketing and procurement side, while simultaneously facing increased competition from imports entering with lower tariff rates. A typical response is for companies to seek relations with foreign counterparts, with many companies seeking to form joint ventures and other types of strategic alliances with international concerns.

One multinational commodity trading company has recently entered into a joint venture with a South African milling/agro-processing corporation, and has been actively developing trading activities within nearby countries. The following details some of the most illuminating aspects of this relation and the associated strategies as seen from the multinational's perspective.

Evolution of the Joint Venture. During sanctions, direct equity participation was not possible for this particular trader. It worked instead through an agent in RSA, a common structure employed by companies unwilling to completely forego the opportunities in this market. With the demise of the apartheid regime, and with the liberalization of RSA's agricultural sector, the trader was prompted to form the joint venture, as having a local, direct presence was seen as essential.

The joint venture was established on a 50/50 percent shared equity basis, and binds the agroprocessor/miller to give the joint venture a right of first refusal for any grain tenders it puts out. Hence, the joint venture has a preferential position, although it is still forced to offer competitive prices for the commodities it provides to its milling partner. In general, the relation between the trader and the agro-processing entities has developed naturally along amiable lines, even though the joint venture often deals with the processor's own competitors. The fact that the processor is making 50 percent of realized profits makes it easier to bear. The joint venture now employs 15 people, who work in offices within the same complex occupied by the agroprocessor's corporate headquarters. Executives assert that this number will increase soon, due to success and expanding business.

Distinct Aspects of the RSA Market. As in other countries with liberalizing or recently deregulated agricultural sectors, millers in RSA have little experience dealing with the global market for the commodities previously sourced through state-controlled marketing boards. They are, in the words of the interviewee, "problem adverse"--they do not want, and probably could not deal with some of the market monitoring and logistics required to bring the commodities from international sources to their milling facilities. As a result, the joint venture is required to provide additional services not typical in other countries with more developed private sector commodity exchange and marketing structures. For example, instead of only providing quotes on CIF prices and leaving the milling company to deal with the logistics of customs and delivery, they actually coordinate all of this, contracting private transporters to bring product to the miller's door. The also engage in various re-packaging, labeling, and other kinds of services according to client needs.

Branching into Other Countries of the Region. The joint venture is serving as a springboard for activities and planned investments in nearby countries. This is facilitated by the decentralized, autonomous organizational structure employed by the parent multinational trading company of the joint venture. The most important target at

the moment is Angola, where it is anticipated that a similar evolution will take place in establishing a local presence: first an agent, then the formation of a joint venture with a local partner. Angola is perceived as becoming an important exporter in the future. The multinational already has offices in Zimbabwe, and has tried some activities in Zambia as well. However, Malawi and Mozambique are seen as lower priorities, which could perhaps better be served from neighboring countries.

Financing its Suppliers. The multinational trader is one of a small but critical number of traders who are filling the financing gap in Southern Africa, providing inputs to selected farmers on a contractual basis, and providing finance to crops already planted. It has been doing this for a short time in Zambia and Zimbabwe, in a type of "learning process" stage. It works with larger commercial farmers who are believed to be reliable, and who can provide "the kind of quantity that makes it worthwhile to bother"-- typically in the thousands of tons. Each contract costs money to initiate and administer, thus a multitude of smaller farmers does not make sense. Crops include maize, soy beans, and cotton seed. A Zambian producer of this latter crop recently came up short by 2,500 tons on its contractual commitment to re-pay for financed inputs, ostensibly because of drought.

Main Constraints. In Zimbabwe, the executive of the joint venture complains of general administrative inefficiency-- in customs, import procedures, export procedures, etc. Traders reportedly are treated worse than producers, since they are not perceived as the kind of desired foreign investors that public officials believe would be most beneficial to the country. Problems of not being able to move products because of export bans were noted. In RSA, interviewee points out pilferage in Durban of up to 3 percent of throughput, and again, general bureaucracy and administrative red tape. Another bothersome limitation has been the exchange controls and lending restrictions to foreigners-- as a 50 percent joint venture, they have not been able to borrow working capital from local banks. They have instead had to provide own funds.

- Firms are expanding exports to the rest of Africa. Increasingly, firms are pushing into markets in other African countries. Normalization of political relations makes this possible; internal trade and market liberalization are making it necessary, since home market competition has increased. Agribusiness products being exported include fertilizer, stock feed, farm machinery, agro-chemicals, seeds and genetic breeding material, and various processed food items.

- Imports surge as trade policies becoming more favorable to consumers. In spite of achieving relatively high upper ceilings on tariffs negotiated for GATT membership, the Board of Tariff and Trade (BTT) is setting import tariffs below these maximum limits, and in general appears to favor policies that will reduce prices to consumers. Imports have surged recently, but thus far, most are coming from outside the region.

- The power shift implied by the post-apartheid government is driving new business strategies by agribusiness firms. Many companies are strengthening the presence or visibility of black staff, and are supporting programs seen as socially and economically benefiting the black population. Affirmative action policies have become a possibility in the new political context. Some suppliers have adjusted marketing strategies to include black emerging farmers. This is commonly done by forming networks of rural stockists who themselves already have established client bases among the black farming population. Other producers are aggressively pursuing investments in other countries, so as to have available alternatives to local production, and hence greater bargaining power with the new government.

- South African labor relations are of particular relevance to emerging investment trends. The power of labor unions, already high by regional standards before the political change, appears to be growing. Agribusiness firms are faced with increasing wage pressures at the same time import competition is rising. Deteriorating labor relations in South Africa may drive a certain amount of expansion and/or relocation investment into neighboring countries. However, South African labor unions are unlikely to sit quietly while companies close down factories and begin importing into South Africa from these sites. Their ability to influence relevant policies (e.g.'s: outward investment restrictions, tariff protection, etc.) will be a key factor in the future.

- Cooperatives occupy a strategic position, but are undergoing dramatic transformations in the new context. In the past, cooperatives acted as buying sole agents for the Maize Marketing Board. This exclusivity, and their access to subsidized credit, encouraged them to construct some eighteen million tons of maize storage capacity, even though the country's current requirements run around seven million tons, and production has only exceeded 10 million tons in five of the past 25 years. Cooperatives continue on as the effective controllers of national grain storage capacity, giving them a strategic position in the evolving market transformation. However, several have either already changed their cooperative structures to become private capital businesses, or are in the process of doing so. This is due to several factors, including the difficulty they have had in raising capital for new investment, and the weakening of their political position as cooperatives.

South African Perceptions of Opportunities in Other Countries

South African agribusiness firms have mixed perceptions regarding the other countries of the region. Many see them as overshadowed by other regions of the world, such as South America, the U.S., and Asia, whose large markets and strong agribusiness production bases make the smaller, lower-income neighboring countries pale by comparison. Some have little hope that the region will develop internationally competitive, sophisticated structures relevant to large scale agricultural commodity production. On the other hand, many see opportunities being created by intraregional trade, and interactions with nearby markets such as India and Eastern Africa. Some have already established sales and/or production activities in nearby countries, or are actively seeking to do so. The following presents a summary of some of the more relevant perceptions brought out by the survey:

- Perceived agro-ecological and other sources of comparative advantage. Firms are attractive to the comparatively better climate, soils, wage rates, and labor relations found in Angola, Mozambique, and Zambia. Zimbabwe is perceived more as a potential market outlet for South African goods, or as a site for agroindustrial operations--particularly for dairy and meat products. In the medium to long term, RSA agriculture is likely to move away from maize, wheat, and other lower value commodities, increasing specialize in horticultural production and in processed food products.

- Firms in various sectors are expanding investment activity into Southern African countries. At the time of the survey, three major retail groups were implementing plans to open stores in Zambia, Mozambique, Namibia, Zimbabwe, and Botswana. The operations would start by pulling with them RSA-produced food products and merchandise. Efforts would then be made to source products and commodities locally. Other sectors attracting investment include mining, tourism, brewing, banking, and telecommunications/energy. Although many of these are not directly related to agribusiness, the increased economic activity they generate is likely to have spillover effects.

- RSA farmers are increasingly resettling and investing in neighboring countries. The push and pull factors vary, yet these include: (i) disillusionment by some with the new political regime; (ii) the spreading of risk outside of RSA in case government policies become more adverse to commercial farm interests; (iii) younger farmers being drawn to apparent economic opportunities and the prospects of becoming 'pioneers' in other countries; (iv) perceived opportunities to obtain low cost land concessions; and (v) personal bankruptcy or economic hardship within RSA. As a result of these (and other) factors, not all South Africans arriving in nearby countries represent serious investment potential. Officials in neighboring countries have become cautious in dealing with north-bound farmers/investors.

- Angola and Mozambique are both seen as high potential countries for agricultural production, but infrastructure and human resource weaknesses lead many RSA firms to adopt a wait-and-see attitude. One trader anticipates going into Angola first, saying that Mozambique's limited human resource skills, inefficient ports, stipulations about required local partners, and the fact that it can be effectively served from RSA or Zimbabwe make it less of a priority than Angola. Other companies, including commercial farming operations, are developing plans for horticultural production in Mozambique.

- Liberalization of currency controls has improved the investment environment in Zambia and Zimbabwe. One firm points out that Zambia's progress on currency and capital controls puts it ahead of South Africa. Zimbabwe's recent reform has resulted in a complete halt of over-invoicing requests from this country. In both cases, the ability to access foreign exchange in a free, transparent manner makes investment and production easier and more likely. However, several firms still complain administrative inefficiencies in Zimbabwe, especially in customs controls.

Malawi overlooked by most. South African firms do not generally consider Malawi among strategic countries for investment, operations, or trading. Traders and suppliers typically anticipate being able to serve Malawi's smaller market from other countries, such as Zimbabwe or Zambia. Being a small, land-locked country reduces its attraction to South African firms. Smaller traders report unreliability among Malawian merchants-- one trader avoids selling Malawian sourced products until they are loaded and across the border into other countries.

- Multinational decentralization strategies give more autonomy to RSA-based subsidiaries. Subsidiaries of international traders and equipment suppliers report that corporate decentralization is giving locally-based subsidiaries more autonomy and control. In the future, offices/operations in nearby Southern African countries are more likely to report to bases in South Africa, rather than in Europe/North America.

Conclusions and Steps Forward

Taken together, the survey results from each of the different focal groups (Southern African countries, European-based firms, and U.S. companies) allow several general conclusions to be drawn.

Malawi, Mozambique, Zambia, Zimbabwe

Agricultural product and input trade among these countries is currently very small, but most agribusiness enterprises share a great interest in expanding it. Highlighted constraints to greater intra-regional trade include:

- weak marketing capabilities among agribusiness enterprises (particularly smaller ones);
- inferior product and process technologies which put regionally produced products at a disadvantage compared to those produced in industrialized countries (South Africa included)
- payment systems and reliability
- lack of information regarding market opportunities
- infrastructure deficiencies (particularly telecommunications and transport)
- lack of access to affordable finance, reducing the ability to upgrade or better target products, packaging, etc.

Several of these constraints are also perceived as combining with industrialized country subsidies and dumping practices to create an 'unlevel playing field'.

Agribusiness enterprises in these countries are generally ill-prepared to invest in neighboring countries. Most consider intra-regional activity only in terms of export or import transactions, and not investment in primary production or processing. Market opportunities are seen to be increasing in Zambia, and, over the medium-term, in Mozambique. Significant cross-border investment is most likely to occur from South Africa, and to a lesser extent from Zimbabwe. The outward investment controls, still in place during the mid-1990s, were seen to be restricting cross-border investments as well as intra-regional trade.

Respondents are very concerned about ineffective customs control and public research and extension services. Local firms have more to gain, as well as more to lose depending on the strength of customs control and state-run research and extension efforts. The lack of effective customs control is so serious in Zambia and Mozambique that locally based agro-processors are finding it difficult to compete. Unless custom controls are improved, there is fear that many firms will have to downscale substantially or cease operations altogether.

Land tenure policies limit agribusiness performance and potential for increased investment. According to interviewees, Mozambique and Zambia suffer from convoluted land leasing procedures. Zimbabwean producers cite insecurity caused by the government's uncertain land re-distribution policy as a factor holding back certain types of investment.

South Africa

South Africa's political transformation is one of the most important changes in the regional context for agribusiness development. Trade and investment ties between South Africa and the rest of Africa, particularly nearby countries in the Southern region, are being strengthened at an unprecedented pace. Countries in the region which once officially closed themselves off to economic relations with South Africa are now widely importing RSA-produced products, seeking to expand exports to its large and relatively developed market, and attracting investment from farmers and agro-industrial enterprises. According to interviewed South African firms, the peaceful political transition has stimulated European and U.S. firms to step up investments in the South African market, and to look at this country as a base from which to serve others of the region.

New opportunities have already begun to attract investors, including traders interested in the emerging new structure for agricultural marketing, suppliers offering new product and process technologies, and international agro-industrial concerns looking to expand production and market base. At the same time, the restructuring process occurring in South Africa is likely to create negative effects for certain groups. With greater pressure from imports, many farmers of grains and other commodities are unable to compete given their comparatively poorer agro-ecological conditions. In order to survive, cooperatives are downsizing their operations and altering their structures of ownership and management.

Interviewed firms overwhelmingly agree that South African agroindustry is restructuring in the face of increased competitive pressures. Companies are hurriedly attempting to develop marketing and procurement capabilities that were previously unnecessary due to the regulated marketing structure. Many are forming alliances with foreign counterparts. Another common response in the newly liberalized environment is to shed off uncompetitive or threatened activities. Companies have already begun to sell off livestock and commercial farming holdings dedicated to lower-value products. A regional perspective has become more common, and in some cases essential in this new context. Exports of South African goods to the region have already climbed; firms

anticipate that South Africa's lowered trade barriers, including lower import duties on agricultural products, will eventually encourage greater quantities of sourcing in nearby countries, and hence trade in both directions.

South African agribusiness enterprises have their own perceptions of constraints in the region. At present, one of the most significant of these is the restriction placed by the government on outward investment. Fear of capital flight may cause a short- to medium-term continuation of this policy, but there are hopes that increased levels of inward investment, and a general trend toward economic liberalization, could lead to relaxation of controls sooner rather than later. Another constraint seen from the perspective of South Africans is difficulty in securing lease or title to suitable land in neighboring countries.

European and U.S. Firm Perspectives

Enterprises from Europe and the U.S. agree with locally based firms on several of the principal constraints to increased levels of agribusiness investment, trade, and development. These include:

- weak transportation and infrastructure,
- uncertainty in the policy environment, and
- inefficient/inadequate land leasing systems

These problems are perceived as particularly acute in the less developed yet high-potential countries of Zambia, Angola, and Mozambique.

Another factor which may continue to pose problems in the facilitation of business between European/U.S. importers and African suppliers is the increasing stringency of quality standards. Industrialized nations companies require suppliers to be more and more in tune with best practices related to environment, health, and safety. European and U.S. firms perceive that high standards of quality control are not retained in many Southern African supply chains.

Related to this is a perception that business management skills, especially within small and medium-scale companies, are weak throughout much of the region. The firms perceive that Southern African efforts to expand exports and add value to exported products will continue to be constrained until more attention is given to comprehensive business administration training.

Foreign firms with potential to invest and trade in Africa are not as hampered by finance-related constraints, but there is wide recognition that agribusiness development will be held back in the region unless financing conditions are improved in each country. Several firms indicate lack of local financing as inconvenient; typically, their subsidiaries would like to access local financing for both working capital and investment, but are prevented by doing so, either by inavailability, high costs, or regulations (e.g., lending restrictions in RSA).

European and U.S. firms indicate foreign exchange regulations, profit and capital repatriation controls as primary obstacles, while in-country respondents express satisfaction with recently implemented reforms. Past negative experiences with foreign exchange controls and profit/capital repatriation continue to influence the perspectives of extra-regional businesses. Most acknowledge recent reforms in Zambia and Zimbabwe as positive, but in-country firms appear to be much more optimistic. Countries with recently liberalized exchange and capital controls might benefit from publicizing these reforms and incorporating them into investment promotion strategies.

Another area where there is a lag between actual reforms and overseas perceptions relates to import procedures and restrictions. European and U.S. firms perceive raw material availability to be a problem in Southern Africa, primarily due to problems in ensuring easy access to imported inputs. Although some in-country agribusiness enterprises still complain of bureaucratic procedures for imports, in general, most express satisfaction with recently implemented import procedures and tariff-based trade policy regimes.

Steps Forward

From the perspective of the interviewed firms, particular attention is needed in the following areas in order to facilitate agribusiness development and intra-regional linkages in Southern Africa:

Continue the process of economic liberalization, yet increase attention to outstanding constraints and "playing field" inequalities which put Southern African agribusiness enterprises at a disadvantage. Continuation of recently initiated reforms will help build greater confidence in policy among foreign investors. However, if constraints to local businesses are not addressed, instability could threaten the permanence of recently achieved progress. Regional producers and processors of agricultural products suffer from deficiencies in product and process technologies which make them inefficient and uncompetitive; lack of access to affordable finance, which makes it difficult to make necessary investments; lack of tariff protection enforcement; infrastructure deficiencies; and several other problems. Improvements in these areas will lead to direct benefits and improvements for regional agribusinesses, as well as increase the attractiveness of the region to international investors.

Strengthen intraregional transportation and telecommunication linkages. It will be difficult to achieve effective integration and increased levels of intraregional investment and trade unless transport and telecommunication linkages are improved. Current deficiencies cause delays, high costs, and problems of access to important agricultural production zones and both regional and external markets.

Strengthen financing arrangements for agribusiness development. At one level, this implies continued efforts to bring macroeconomic balance to each country, lowering inflation, and carrying out necessary financial sector reforms. At the micro-level, financial institutions need to strengthen staff capabilities in credit appraisal and loan monitoring. Financial institutions should explore opportunities for increased financing of cross-border investments and trade.

Form information networks and forums which permit greater awareness of agribusiness investment and trade opportunities and generate more contacts among regional and international players. Several countries are sitting on a wealth of investment and trade opportunities, which go undeveloped due only to the lack of awareness by potential counterparts. Current mechanisms for acquiring new information regarding agribusiness opportunities generally include site visits and the extended web of business contacts possessed by the typical enterprise. These mechanisms will continue to play an important role, but could be augmented substantially by increasing the opportunities for establishing contacts (conferences, forums, etc.) and carrying out more formal collection and dissemination of information (data bases with network/electronic access, etc.).

Improve customs control to stop the rampant flow of contraband, yet speeding the flow of legitimate trade. Each country needs to develop and implement strategies to reduce corruption and contraband flow across borders, yet without sacrificing efficiency in import and export procedures. Eventually, lower tariffs across the board will reduce incentives for smuggling.

Enhance agribusiness management skills to improve competitiveness and the capacity to respond to changing policy and market conditions. The decontrol of markets and other policy

changes present new opportunities, yet also new challenges to agribusiness managers in the region. Particularly weak are local skills in marketing management, encompassing such aspects as market research, pricing strategies, market segmentation and product promotion. There is scope for improved degree and short-term training programs within the region in agribusiness management. One or more regional 'centres of excellence' could be developed, combining public and private investment.

Promote regional investment opportunities at an international level. Policy reforms and natural resource strengths, together with the new political environment in Southern Africa, provide the basis for a potentially dynamic regional market. Funds are already being raised by multinationals to expand regional investment. Information about opportunities created by regional synergy will create spillover benefits for the entire region, suggesting that regionally organized promotional initiatives will be appropriate in many cases. Investment and export promotion efforts should emphasize recent reforms, and the new environment created for agribusiness. In several respects, the best promoters of investment and trade are on-the-ground enterprises whose presence and performance provide indicators of the investment environment.

Annex. Sources of Comparative and Competitive Advantage Selected Data

Table A.1: Land and Irrigation Resource and Usage

	Total Arable Land (million ha)	Land Cultivated (percent of total arable land)	Smallholder Share of Cultivated Land (percent)	Potential Irrigation Coverage (ha)	Actual Irrigated (percent)	Average Rainfall/ Year (mm)	Percent of Land Receiving Less Than 1000 mm/yr of Rainfall	Percent of Land Receiving Less Than 600 mm/yr of Rainfall
South Africa	15.4	69%	14%	1,500,000	84.7%	511	95%	65%
Mozambique	36.1	10.0%	90%	3,300,000	1.4%	1000	40%	
Malawi	5.7	80%	90%	290,000	8.5%	1037	63%	
Zimbabwe	4.8	26%	65%	450,000	32.2%	600	98%	65%
Zambia	9	5%	65%	400,000	10.0%	900	39%	

Source: TSG field data

Table A.2: Land and Facilities Costs, 1995

	Agricultural Land Purchase Price (US$/ha)	Construction Cost, Typical Warehouse (US$/sq.m.)	Construction Cost, Single Factory Building (US$/sq.m.)	Construction Cost, Small Cold Storage (US$/sq.m.)
South Africa	$318	$200-280	$230	...
Malawi	$60-500	$200	$250	$600
Mozambique	No Freehold	$300	$350	$600
Zimbabwe (1994)	$200-400	$135-184	$184-245	$367-490
Zambia	$200 (lease only)	$150	$166	$277

Source: TSG field data

Table A.3: Prevailing Wage Levels, 1995

	Minimum Wage: Unskilled Agricultural Labor (US$/month)	Average Wage: Unskilled Agricultural Labor (US$/month)	Average Wage: Skilled Agricultural Labor (US$/month)	Average Wage for Consultant Agronomist (US$/month)	Average Wage for Farm Manage (US$/month)	Benefits, Percent of Base Wage (industrial sector)
South Africa	None	$84.5-113	$282.00	$560-8000	$560-2800	9-20
Malawi	$16.90	$18.00	$38.00	$1000	$180	15
Mozambique	$18.00	$17.00	$45.00	$1200-1500	171-243	30-50
Zimbabwe	$28.40	$28.40	$36.00	$1500	$1500	10
Zambia	None*	$25-50.00	$70.00	$1000	$200	75-300

*Despite reports of a minimum wage for agriculture, Zambian officials deny the existence of a statutory min. wage
Source: TSG field data. Definition of management varies, and wages may hence not be comparable.

Table A.4: Selected Utilities Rates & Installation Efficiency, 1995

	Commercial Electricity Rates (US$/kwh)	Commercial Water Rates (US$/m3)	Telecommunications (US$/minute to EC)	Installation
South Africa	0.06	0.30	2.00	Rapid
Mozambique	0.06	0.34	4.50	Delays
Malawi	0.03	0.31	2.00	Minimal Delays
Zimbabwe	0.05	0.34	2.69	Minimal Delays
Zambia	0.03	0.54	5.60	Delays

Source: TSG field data

Table A.5: Infrastructure Indicators

Countries	Electric Power		Telecommunications		Paved Roads		Water	Railways	
	Production (kwh per person) 1992	System Losses (percent of total output) 1992	Telephone Mainlines (per 1,000 persons) 1992	Faults (per 100 mainlines per year) 1992	Road Density (km per million persons) 1992	Roads in Good Condition (percent of paved roads) 1988	Population with Access to Safe Water (percent of total) 1991	Rail Traffic Units (per thousand $ GDP) 1992	Diesels in Use (percent of diesel inventory) 1992
Mozambique	24	24	3	10	343	12	22	--	--
Malawi	--	--	3	--	278	56	53	26	70
Zambia	900	11	9	33	795	40	59	169	44
Zimbabwe	790	7	12	215	1,406	27	36	523	83
South Africa	4,329	7	89	--	1,394	--	50-74 (est.)	804	82

Source: World Bank, World Development Report 1995

Table A.6: Southern Africa Inward Investment Policies, 1995/96

	South Africa Population: 40.3 million Per capita GDP: US $2,621	**Malawi** Population: 9.6 million Per capita GDP: US$188	**Mozambique** Population: 16.6 million Per capita GDP: US$82	**Zimbabwe** Population: 10.4 million Per capita GDP: US$479	**Zambia** Population: 8.6 million Per capita GDP: US$428
Business Establishment Procedures	Straightforward company registration, approx. 1-2 weeks	Multiple institutions. Can take up to a year. MIPA lacks needed autonomy.	Improved, but still lengthy (up to 1 year)	Registration & project application; Min. of Finance approval required for investment > US $40m	Straightforward registration; little to no company complaints
Repatriation of Profits/Capital	Repatriation of investment capital unrestricted; restrictions on profits, dividends, mgmt fees/royalties	Procedural hurdles for profit and capital repatriation; remittance of only 2/3 ex-pat salary	Procedural hurdles for profit and capital repatriation	Unrestricted for new foreign investment	Unrestricted for foreign investors
Expatriate Personnel	Straightforward work visa application (low as 3 days)	Renewal of work visas problematic	Renewal of work visas problematic	1-2 month work visa application, delays up to 7 months	Occasional work visas delays 2 - 3 months
Foreign Investment Restrictions	Some restrictions on insurance and banking sectors only	No restrictions	26% minimum local participation in fishing	FDI restrictions for ag. and related sectors (primary ag., grain milling, bakery products, sugar, tobacco)	No restrictions
Profit Tax Rate	40% (48% if distributed)	35%	Agriculture 35% Industry 40% Other 45%	37.5%	Farming 15% NTEs 15% Others 35%
Tax Incentives	Accelerated depreciation for approved projects; tax incentives in growth points; R&D exemptions	10-year tax holiday for pioneer status & Enterprise Zone-located firms; various R&D, training, other tax deductions	Tax incentives in growth points; allowances for training	Tax incentives in growth points; special initial allowance for capital costs; 50% investment allowance on training and capital expenditures	15% profit tax for non-traditional exporters; Incentives for rural enterprises; 5-year dividend tax exemption for ag. activities
Duty Exemptions, Drawbacks, etc.	Most capital goods duty free, but 5% surcharge applies; bureaucratic & discretionary exemption and drawback	Deferred duties on machinery and equipment; duty drawback delays up to 6 months	Exemptions on capital goods for new investment; also for inputs used for exported goods	Surtax & import tax exempted on capital goods, 10% customs duties; drawback delay up to 7 mos	Machinery & equip. exempt from duties & sales tax; drawback & MUB systems used infrequently
Agro-Industrial Development Incentives	No difference	Eligible for pioneer status, allowances for agricultural reinvestment and R&D.	Lower profit tax for ag. activities (35%)	Pre- & post-shipment finance scheme for exports	Tax allowances for land dev. costs; accelerated farm machinery depreciation; specified crop incentives
Multilateral Investment Conventions	MIGA, OPIC, Paris & Berne Conventions;	Paris Convention; MIGA, ICSID, OPIC	MIGA, OPIC	MIGA, OPIC, ICSID, N.Y., Paris, & Berne Conventions	MIGA, OPIC, ICSID, Paris & Berne Conventions
Intellectual Property Protection, Plant/Animal Varieties, Food	20 years	16 years	No patent protection	16 years	20 years
Other	Low interest term loans for export projects; relocation grants for foreign firms	Reserve Bank approval required for technology transfer, licensing, etc.	Investment application fee 0.5% of investment (maximum of $50,000)	Investment Application fee 0.5 % of share capital	

Note: Shading indicates comparative disadvantage.
Source: TSG Survey

Profits from Petals: The Development of Cut Flower Exports in Southern Africa

Alan J. Malter, Ard Reijtenbagh, and Steven Jaffee[1]

Executive Summary

This study examines the development of floriculture exports in Southern Africa, which exceeded US$100 million (f.o.b.) in 1997. Topics covered include the present situation and constraints to further development, prospects for the future, and possible roles for international donor organizations, governments, and the private sector in advancing the industry. The study focuses on the region's largest exporters -- Zimbabwe and Zambia -- as well as on Malawi and South Africa, and pays particular attention to the dominant floriculture export crop in the region, roses.

Floriculture has attracted considerable attention in Southern Africa and worldwide due to the phenomenal sustained growth in the demand for cut flowers in recent decades. Global retail sales of cut flowers exceeded US$25 billion in 1990. However, ever since the early 1970's demand for cut flowers and potted plants in the leading import market, Western Europe, has been *growing at a decreasing rate.* Meanwhile, producers around the world have been responding to the same positive long-term market trend and targeting the same export opportunities in floriculture as growers in Southern Africa. The resulting development of new production and expansion by existing growers has been so large that it has created a structural change in the market; growth in world supply is now greater than growth in world demand. A corresponding increase in competition has led to demand for higher quality products coupled with continuous downward pressure on prices. One growing market for producers in Southern Africa has been the local market, both domestic and regional, but it remains relatively small and cannot completely offset the trends in the European export market.

The successful development of cut flower exports from Southern Africa, beginning in the mid-1980's, was facilitated by an unusual combination of factors which may provide lessons for developing other commodities in the region. First, cut flowers were a non-traditional, high-value commodity line that enjoyed access to a rapidly expanding international market. Second, the initial producers in the region were able to tap into international linkages and gain access to overseas sources of technology and capital. A key facilitating factor was that foreign firms with essential know-how were permitted to come to the region and provide the crucial missing ingredients that allowed the industry to take-off and become competitive in a world market dominated by producers from developed countries. Third, growth in intra-regional linkages involving technology transfers, cross-border 'learning', and the physical movement of people further contributed to the development of floriculture exports. Fourth, there has been very little government involvement in the floriculture industry; governments have neither instituted heavy regulation of floriculture nor provided extensive services to it. Instead, floriculture represents an interesting case of a private sector organizing itself and making its own arrangements to meet international standards.

Certain pre-conditions were necessary for the successful development of floriculture in Southern Africa. These included the basic market opportunity to supply "off-season" cut flowers to Europe, the availability of abundant cheap labor and risk-taking entrepreneurs, a minimal level of infrastructure, and some arrangements for financing. Actual production of cut flowers for export required a number of

---

[1] Shiraz Limbaba also contributed to this study, especially during the field work.

catalysts, both positive and negative. In Southern Africa, these included the existence of foreign exchange controls, the desire of commercial farmers to diversify their product mix and achieve an "off-season" cash flow, and initially low air freight rates and the availability of northbound freight capacity. For production and exports to take-off, a number of constraints had to be overcome, including an initial lack of such key ingredients as technical knowledge, access to capital, many essential inputs, and storage and transport facilities. Many of these were overcome with the help of interested overseas firms, or "honeybees". Some enduring constraints on a regional basis include a lack of strategic market intelligence, difficulty in accessing affordable capital, limited northbound freight capacity at relatively high freight rates, less-than-ideal climatic conditions, and a relatively low-quality image of African flowers in Europe. Specifically, development of the sector in Malawi is constrained by a lack of entrepreneurship while South Africa is burdened by such factors as high import tariffs in the European Union and labor unrest. However, floriculture is still quite attractive to many potential investors, whose entry should lead to further expansion of this sector in Southern Africa.

The economics of growing cut flowers in Southern Africa generally appears to be quite favorable, which leads many existing growers to expand and continues to attract new entrants to the sector. However, financial results may vary greatly among individual growers and countries in the region due to the nature of producing and marketing cut flowers. As overseas markets become more competitive, growers need to pay more attention to choosing a marketing strategy. Channel selection and other strategic choices must be made as early as possible because they will affect decisions regarding initial investment levels, technology options, and crop varieties. New growers will have to invest larger sums to be competitive, which will raise the already high entry barrier to smallholders. Therefore, the most likely sources for future expansion of the industry are existing growers, commercial farmers who have not yet entered floriculture, and local business people seeking investment opportunities.

The possibility of other agricultural sectors in Southern Africa emulating the success of floriculture exports will most likely be limited to specialized commodity sectors possessing similar characteristics to floriculture. These would include non-traditional crops from outside the region which are making a fresh start, such as medicinal plants and essential oils. These and other candidate commodities could be characterized as low-volume/high-value crops in which varietal selections and quality are important to success. Such products would need to be attractive to "honeybee" firms, who would come from abroad and shorten the 'learning curve', as well as to overseas buyers. Even so, it is unlikely that many other crops could be found which would have the large-scale, long-term growth record exhibited by cut flowers in the 1980's; this unique market opportunity served as the "supercatalyst" for the development of the floriculture sector.

Finally, this study proposes a number of possible initiatives for furthering the development of floriculture exports from Southern Africa. For example, international donor organizations could strengthen linkages in the region and encourage greater openness, cooperation, and flows of information. Donors could also help educate lenders about the financial requirements and commercial potential of floriculture and other non-traditional commodities, and work with governments to address country-specific constraints. Local governments could create and improve the necessary pre-conditions for floriculture development, particularly in the areas of financing, infrastructure, and telecommunications. Private sector organizations need to foster a cooperative spirit among growers, encourage a greater flow of information within each industry and across the region, and add value to information flows. They can conduct market analyses, organize production and marketing seminars, and disseminate information through local or regional industry publications. A joint effort will be needed to meet the rising environmental standards for the industry at the international level.

Introduction

The primary objectives of this study are to examine the development of export floriculture in Southern Africa, its present situation and constraints, its prospects for future development, and the roles that international donor organizations, governments in the region, and the private sector can play in advancing the industry. The study focuses on the recent experience and current status of floriculture exports in Zimbabwe, Zambia, and Malawi and the differential circumstances of the sector in South Africa. This study also examines whether the case of floriculture in Southern Africa can be used as a development model for other agricultural sectors in the region.

Why Study Floriculture in Southern Africa?

The successful development of cut flower exports from Southern Africa beginning in the mid-1980's was facilitated by an unusual combination of factors which may provide lessons for developing other commodities in the region. First, cut flowers were a *non-traditional, high-value commodity line* that enjoyed *access to a rapidly expanding international market.* Second, the initial producers in the region were able to tap into *international linkages* and gain *access to overseas sources of technology and capital.* This was essential for an industry that is so intensive in terms of technology, capital, knowledge, and management requirements. A key facilitating factor was that foreign sources of essential know-how were permitted to come to the region and provide crucial missing ingredients that allowed the industry to take-off and become competitive in a world market dominated by producers in developed countries. Third, impressive growth in *intra-regional linkages* involving technology transfers, cross-border 'learning', and the physical movement of people further contributed to the development of floriculture exports.

Fourth, in contrast to most other agricultural sectors in the region, there has been *very little government involvement* in the floriculture industry; governments have neither heavily regulated floriculture nor provided it with extensive services. Floriculture represents an interesting case of the *private sector organizing itself and making its own arrangements* to meet international standards. It also shows that local entrepreneurs do exist in the region and can be attracted to invest by a nonrestrictive market environment offering potentially profitable opportunities. These entrepreneurs have shown that they can motivate themselves to seek out sources of specialized knowledge and learn from them as needed. Overseas firms which offer such specialized knowledge, which we refer to as "honeybees," are naturally attracted to such promising opportunities, provided that they are not blocked or discouraged from linking up with local entrepreneurs. Though the firms which began the region's floriculture exports have made many beginners' mistakes in the process of "learning by doing," they have benefitted by avoiding many of the problems inherent in government intervention. In the case of floriculture in Southern Africa, private sector initiative has been especially effective given the absence of previous institutional arrangements in the sector. The prominent role of the private sector has given the industry a 'business-like' character. One implication, though, has been that entry so far has generally been limited to those with relatively deep pockets who could afford the costly learning curve experienced by the initial participants.

The successful development of cut flower exports from Southern Africa since the 1980's was made possible by a number of coincidental factors. The combination of a set of existing preconditions, the emergence of a number of catalysts within the region, and freedom for foreign intermediary parties to enter the region and bridge critical knowledge gaps has been instrumental to the rapid development of cut flower exports. However, not all countries in the region have made equal

progress in developing this sector; this report will highlight some factors which may account for the uneven growth.

What is Different About Flowers?

It should be pointed out to readers who are familiar with the major agricultural commodities but unfamiliar with floriculture that cut flowers are a very different type of agricultural product in terms of production and marketing. The production of most cut flowers is *extremely capital and knowledge-intensive* and, due to high yields per square meter and high prices per stem, production units of two hectares of greenhouses are considered to be quite substantial. Due to the extremely high sensitivity of the crop, as well as the fact that external visual appearance is absolutely essential to its value as a final product, cut flower production *requires expert technical knowledge, professional management, and constant vigilance* during all phases of growing, packing, and shipping.

Cut flowers are among the most highly perishable of all agricultural products and so must be harvested, handled, and transported with both extreme care and maximum speed and efficiency. Furthermore, because fresh cut flowers do not undergo any processing between harvesting and reaching the final consumer, growers are essentially producing a finished consumer product. Unlike most farmers, cut flower growers are similar to industrial producers of consumer products in that they must be aware of trends in consumer behavior. The market structure for cut flowers is one of monopolistic competition - in contrast to the nearly perfectly competitive market for most agricultural commodities. Cut flowers sold in international markets often retain the identity of the individual grower, and so growers who can successfully differentiate their products and better satisfy their customers have the potential to achieve a level of profits far beyond what is common in other agricultural sectors.

Flowers Covered in This Study

The products examined in this study are fresh cut flowers. Since *roses* are the dominant floriculture export product from Southern African countries - often being viewed as synonymous with "floriculture" in this region - and are the leading floral product in the European market, this study focuses mainly on roses. Types of cut flowers which are also exported in significant quantities from Southern Africa include greenhouse crops such as asters and chrysanthemums, open field "summer flower" crops such as ammi majus and buplerum, and open field perennial crops of South African origin, such as proteas (see Box 2). Crops such as gladiolas - which were one of the first commercial export crops in Zimbabwe and Zambia - and carnations, alstromeria, and statice - which are all major crops exported by Kenya - are not of major commercial importance in the region today and so were not considered in this study. Since other types of commercial floriculture products such as potted plants, garden plants, and flower bulbs constitute separate industries and are also not exported in significant quantities from Southern Africa, they are also not covered in this report. Readers who are interested in learning more about general aspects of marketing cut flowers and other ornamental horticulture products, as well as statistics on specific markets and products, should see the selected references appearing in the Appendix.

Markets: Northern Hemisphere

The primary reason that floriculture has attracted so much interest from farmers, investors, and development planners in Southern Africa (and worldwide) has been the development of large-scale market demand for floriculture products and its sustained high rates of growth. Worldwide retail sales of cut flowers were estimated by the Flower Council of Holland to be over $25 billion in 1990. The

largest single market was Western Europe, with sales of $12.5 billion, followed by the U.S. and Japan with $6 billion each.

However, it is important to note that, since the early 1970's, the West European market for cut flowers and potted plants has been growing *at a decreasing rate*, based on sales figures from the Dutch flower auctions. Table 1 presents the average annual growth rates in sales turnover at the Dutch flower and plant auctions from 1958 until the present, in 5-year periods. Following the 25-year period from 1958 to 1983, in which nominal sales turnover increased at the phenomenal average annual rate of 15.3% (peaking at 19.2% per year during 1968 to 1973), sales growth has slowed considerably and was only 5.4% per year during the period from 1988 to 1993. Moreover, for the first time in four decades of uninterrupted growth, in 1992 the sales turnover of the Dutch auctions actually *decreased* from the previous year. This unexpected development shocked the European flower trade and its overseas suppliers, who had based their investment decisions on an assumption that the market would continue to grow indefinitely. Though the market returned to positive growth in 1993 and 1994, another decrease in sales turnover (-1.4%) occurred in 1995 and a further and even steeper decline (-5.2%) has taken place in January and February of 1996.

Table 1: Changing Rates of Growth in Sales Turnover of Flowers and Plants in the Dutch Auctions, 1958-1995

Period	Average annual growth rate, in nominal Dfl.
1958-63	13.5%
1963-68	16.8%
1968-73	19.2%
1973-78	16.0%
1978-83	11.1%
1983-88	8.1%
1988-93	5.4%
1993-95	1.4%

Source: PVS (Commodity Board for Ornamental Horticultural Products), VBN (Association of Dutch Flower Auctions), The Netherlands.

Even though there has been a slowdown in the growth rate of the overall European market, certain product submarkets have outperformed the market average and have attracted disproportionate interest from suppliers. The most prominent such submarket -- and the focus of efforts to develop floriculture exports in Southern Africa -- has been roses. Roses have been the leading cut flower crop in Europe for many decades and today account for about one quarter of the total volume of over 10 billion cut flower stems sold annually in the Dutch auctions (see Table 2). Consumers appear to regard roses as a product with few, if any, substitutes for many important floral consumption occasions; such behavior solidifies the status of roses as the perennial market leader. This strength is reflected in the fact that, since the late 1980's, while other major flower types (e.g., carnations and chysanthemums) have suffered both volume and price declines, roses have continued to grow in sales volume *and* price. However, the trend for roses in the European market has been dramatically different for Dutch roses and for imports (e.g., from Southern Africa). While the Dutch (who are still the dominant source of supply) have enjoyed the overall positive trend for roses described above, imported roses have

generally experienced much larger percentage increases in volume accompanied by substantial *decreases* in price.

The situation is complicated further by the fact that the rose market is composed of three major subtypes (hybrid tea roses, sweetheart roses, and spray roses) with a total of nearly 300 varieties that are traded under separate names and priced individually (at least at the auction level). Also, there is tremendous dynamism in the assortment of varieties offered in the market, placing great demands on growers and traders to keep up-to-date with the constant changes. For example, of the 287 varieties of roses sold in the Dutch auctions in 1994, 81 varieties (28%) were new varieties introduced to the market in the two previous years. Few, if any, of the dozens of new varieties introduced every year will ever achieve sustained large-scale success in the market, so growers take considerable risks in growing new varieties. Such risks, however, are often necessitated by the demands of European buyers for the latest varieties. Since a rose bush is a perennial plant that is generally used to produce a commercial crop for five to ten years and since growers are supplying such a complex and dynamic market, varietal selection becomes of critical importance. In this report, the discussion of roses will necessarily remain at the aggregate or subtype levels, but readers should be aware that yields, costs, prices, and market trends can vary substantially for individual rose varieties.

Markets: Southern Hemisphere

Another market which is of growing importance for cut flower growers in Southern Africa is the local market, both domestic and regional. Though domestic commercial demand for fresh cut flowers in countries such as Zimbabwe and Zambia is considered to be relatively small, it is a significant supplemental source of income for a few growers who have made special efforts to develop local sales. Domestic demand has increased along with the development of local production, and these markets have become more competitive and quality-conscious. An especially significant factor in the current floriculture economy of Southern Africa is the large and growing domestic market in South Africa. Though precise figures are not available, it is known that the local demand for cut flowers in South Africa is substantial enough to discourage most of the approximately 900 local producers from directing their efforts toward exporting. The demand for cut flowers in South Africa has even begun to attract considerable imports, from Zambia and Zimbabwe and as far away as Kenya. "Off-season" demand in the South African winter complements European demand for flower imports in the European winter (in terms of seasonality, not quantity), allowing some producers in Southern Africa to keep producing and selling flowers all year round.

Table 2: Leading Cut Flowers in the Dutch Auctions (1994)

Type	Total Sales (US$ Million)*	Quantity (Million Stems)	Average Price (US cents/stem)**
Rose	546.1	2637	21
Chrysanthemum	318.4	1285	25
Tulip	147.7	925	16
Carnation	143.7	1037	14
Lilly	134.3	334	40
Gerbera	82.4	390	21
Freesia	75.9	517	15
Cymbidium Orchid	60.6	51	118
Alstromeria	44.4	214	21
Limonium	39.4	190	21
Gypsophila	39.1	146	27
Anthurium	27.5	33	85
Lisianthus	26.4	97	27
Iris	25.9	224	12
Aster	23.2	97	24

* Values converted from Dutch Guilders at the average exchange rate of US$ 1= Dfl 1.8193
**Prices shown are average gross sales prices for all varieties, all suppliers, over the entire year.
Source: Statistiekboek 1994, VBN (Association of Dutch Flower Auctions), Leiden, Netherlands.

Leading Producers

Cut flowers are produced commercially in nearly every country in the world for sale to both local domestic markets and other countries. The supply of most types of cut flowers to the European market is still dominated by European producers, especially Holland, during most of the year (and even year-round for some types of flowers). But the spectacular growth of this market, the development of "off-season" demand, and the climatic limitations on the European production of many types of flowers in the winter has attracted substantial imports from producing regions around the world, including South America, Israel, Africa, Southeast Asia, and India.

The production and export of cut flowers has begun in almost every country with a more favorable climate and cheaper labor than the major northern hemisphere consumption centers. The development of new production and expansion by existing producers has been so extensive that growth in world supply now appears to be greater than growth in world demand. This has resulted in increasingly competitive markets, characterized by higher quality standards and continuous downward pressure on prices. Despite the relative attractiveness of cut flower exports compared to other crops, and the apparent perception by nearly every Mediterranean, equatorial, or southern hemisphere developing country that they possess some degree of competitive advantage in "off-season" fresh produce exports, *potential investors should realize that producers world-wide are acting on the same market information and targeting the same opportunities.* Importers caution new and unproven suppliers that they will be reluctant to make any special efforts to help them enter and succeed in the present oversupplied market.

Southern Africa: Emergence Of A New Player

This study focuses on the development of cut flower exports in four Southern African countries: Zimbabwe, Zambia, Malawi, and South Africa. The flower production regions in all four countries are located in the area known as the "high tropics", where relatively high elevation combined with tropical and sub-tropical latitudes produces a relatively mild, year-round climate that is generally favorable for floriculture production.

Cut flower exports from Southern Africa are a relatively recent phenomenon, beginning in the 1980's and reaching significant quantities only in the early 1990's. Of the former members of the Rhodesian federation, Zimbabwe began exporting in the early 1980's, before experiencing a major take-off in the 1989-1991 period (see Box 1 detailing the development of floriculture exports from Zimbabwe). This take-off propelled Zimbabwe into the role of leading regional producer and exporter and engine for floriculture development in the region. Though Zambia's initial cut flower exports began slightly after Zimbabwe's, it was not until the late 1980's that the first rose projects were established. The take-off of Zambian exports occurred only in 1994 and was facilitated by the influx of investment financing made available through the European Investment Bank. In Malawi, floriculture exports began with a single large investment in 1987, but since then there has been very limited further development.

Box 1: Zimbabwe: Incidental Development Of A Major Exporter

The origins of the floriculture industry in Zimbabwe date back to the early 1980's, though the antecedents to its development can be found in the efforts of the UDI government to overcome international economic sanctions in the mid-1960's. At that time, the government bought two DC-8 aircraft and began its own "sanction-busting" cargo airline, Affretair, to facilitate meat exports and arms imports. Lacking a solid commercial basis for continuing the operation of Affretair after independence in 1980, the new government invited a Dutch meat importer to Zimbabwe to explore possible agricultural development projects which could utilize this airfreight capacity. Initial suggestions included producing impala meat, but export development efforts eventually centered on vegetables. In addition to vegetables, the Dutch importer later suggested that Zimbabwe begin producing fresh cut flowers for export, and this same importer has since become one of the key figures in the development of floriculture exports from Zimbabwe.

Zimbabwe's first major floriculture crop was gladiolas, grown in the open field and sold as cut flowers. Gladiola exports reached a peak of 1.2 million stems in 1986, which at that time was larger than either chrysanthemums (800,000 stems) or roses (500,000 stems). But gladiolas are a relatively bulky, heavy, and low-value product which became uneconomical when air freight rates from Zimbabwe to Europe began to increase in the late 1980's. At that time, the floriculture sector in Zimbabwe began to develop in three directions: (1) an expansion of low-value "summer flowers" grown outdoors without cover; (2) development of higher value perennial flowers originating in South Africa (e.g., proteas), grown outdoors without cover; and (3) large-scale development and expansion of higher value floriculture crops such as chrysanthemums, roses, and asters, grown under plastic cover in wood, and later steel, greenhouses.

The development of Zimbabwe's cut flower exports since the mid-1980's is presented in Table 3 Total flower exports increased dramatically between 1987 and 1989, as rose production doubled each year from a small initial base. Exports really began to take off in 1989 after the arrival in Zimbabwe of an aggressive sales representative from the French rose breeder, Meilland. Within two years, rose acreage in Zimbabwe increased from 20 ha to 100 ha and Zimbabwe's rose exports to Holland grew from 9.5 million stems to 53.4 million stems. Development was further aided by the subsequent arrival of Israeli advisors, who brought higher yielding sweetheart rose varieties and new production inputs and techniques. Meanwhile, Dutch companies were coming and offering Zimbabwean growers a marketing channel to the Dutch auctions. More recent expansion has been stimulated by the establishment of many new floriculture consultancies with Zimbabwean, Israeli, and Dutch floriculture experts.

As a result, Zimbabwe's rose acreage grew to 120 ha in 1992, 160 ha in 1993, 180 ha in 1994 and 220 ha in 1995. With these increases in growing area and as existing hectares began achieving higher yields, Zimbabwe's cut flower exports again experienced a huge increase in the 1994/95 season, both in terms of volume and value (see Table 4). An additional increase in Zimbabwe's rose growing area, to more than 260 ha, was reported to be under way for the 1995/96 season, *which would make the Zimbabwean rose production area more than one-fourth the size of the entire covered rose production area in Holland.* In addition, Zimbabwe's production area for open-field summer flowers is estimated to be about 450 ha, two-thirds of which belong to three very large growers. These "summer flowers" consist mostly of buplerum and ammi majus, which are low-priced, commodity "filler" products used in bouquets and floral arrangements in Europe.

Box Table 1: Development of Cut Flower Exports from Zimbabwe, 1985-1995

Season	Tons	Gross Value (Million US$)
1985/86	338	1.6
1986/87	593	2.7
1987/88	1,326	6.1
1988/89	2,411	11.1
1989/90	2,872	13.2
1990/91	3,722	17.1
1991/92	4,758	21.9
1992/93	5,206	24.0
1993/94	5,770	26.5
1994/95	9,095	41.8
1995/96	11,630	54.5
1996/97	13,832	61.3
1997/98	13,625	71.3*

* Through April. May/June exports likely to exceed 1,500 tons.
Source: Horticultural Promotion Council, Harare.

In 1997/98, the value of Zimbabwean flowers exported to Europe exceeded $71 million. This magnitude of sales makes Zimbabwe one of the largest overseas suppliers of cut flowers to northern hemisphere markets, though Zimbabwe is still far behind Colombia and Israel, whose combined exports exceed $500 million.

The case of South Africa is somewhat different. A flower auction in Johannesburg (now called "Multiflora") was established as long ago as 1945, and a local industry grew up around it. This industry has been dominated by a few large, decades-old producers who have been oriented almost exclusively toward supplying the local South African market. Exports were confined largely to the specialty protea flowers (see Box 2). Following the lifting of economic sanctions on South Africa, the last two years have seen the entry of a few new export-oriented growers. However, these growers have tended to favor sales to the rapidly expanding local market and have exported only a negligible percent of their production, to the dismay of the export agents who helped them get established and still provide them with technical advice. Table 4 presents some recent summary data for floriculture production and exports in Southern Africa. Most of the data are estimates based on interviews in mid-1995 with floriculture industry leaders in the region.

Table 3: Floriculture in Southern Africa: Summary Statistics 1994/95

Country	Number of flower growers	Number of export rose growers	Rose area for export in hectares	Value of cut flower sales in NL auctions (m. US$ million)[a]
Zimbabwe[b]	275[c]	125[c]	220	42.5
Zambia	16	14	30	10
Malawi	2	2	10	3
South Africa	935[d]	25	40[e]	2.5[f]
TOTAL	1,230	165	300	60

a. Source: Association of Dutch Flower Auctions (VBN).
b. Zimbabwe also has a considerable growing area of flowers other than roses.
c. Licensed grower/members of Horticultural Promotion Council (HPC).
d. Includes 660 suppliers to Multiflora auction and an estimated 275 additional producers, including protea growers in the Cape region (there may be some overlap between these two groups).
e. In 1994/95, these growers reportedly exported only about 20% of their production.
f. Data on exports to Holland in 1991.

Clearly, floriculture has become a significant industry in Southern Africa: there are more than 1,200 cut flower growers and exports to the Dutch auctions alone (estimated to be about 65% of total exports) are valued at about US$60 million (c.i.f.). The total f.o.b. value of cut flower exports from Southern Africa (including non-auction sales in Europe and "off-season" exports within the region, mainly to South Africa) may be approaching US$60 million per year. In the 1995/96 season, both Zimbabwe and Zambia are expecting a significant additional increase of 40 ha. and 20 ha., respectively, in the acreage of roses for export.

Some Southern African cut flower growers have reached higher levels of technological sophistication, advancing beyond the relatively simple (i.e. in terms of floriculture) production of cut flowers for export. Some growers have progressed by increasing their scale of production from the introductory one or two hectares of greenhouse roses to as many as five or more hectares, which is considered a relatively large nursery in international terms, and also a significant managerial challenge. A few, more enterprising growers have recently begun propagating young plants for their own use, for sale to other local growers, and even for export to other countries in the region and beyond. Some of these start-up propagators have been granted a local or regional agency by European breeders. A small number of growers have also begun offering crop consulting and marketing services to their fellow producers, selling their experience and marketing contacts.

Box 2: Going Native: Proteas

Besides roses, there are other flowers grown in Southern Africa for export. One of these--proteas-- is native to the region and was the focus of floriculture exports dating to the early 1970s. Protea flowers belong to a distinct botanical family which is native to some parts of the southern hemisphere having a Mediterranean-type climate. The most prominent such area is the Cape region of South Africa, along with Western Australia. There are some 1,500 species of proteas, though only a small number are cultivated as cut flowers and traded commercially. All the various types of proteas are woody perennial shrubs which require very high light intensity.

While roses are familiar to northern hemisphere consumers, considered irreplaceable for certain occasions, and were brought to Africa specifically for export, proteas are a native product, unknown to most northern hemisphere consumers. It is estimated that proteas account for less than 0.5% of total cut flower sales in Europe. In general, proteas do not appear to have mass-market potential: they will mostly likely remain a specialty product and appeal to a relatively narrow market segment. Nevertheless, even a fraction of a percent of the European cut flower market represents annual retail sales of several million U.S. dollars. This market opportunity has attracted export-oriented growers in South Africa, Zimbabwe, Australia and several other countries. Proteas are grown as an open-field cropa and require less investment than roses and many other cut flowers. Proteas are also less labor intensive than roses. There is also less direct competition since climatic conditions preclude the cultivation of proteas in most northern hemispheric countries.

South Africa is by far the world's largest producer, exporter and consumer of proteas. In the early 1990s, total sales of the South African protea industry were estimated at U.S. $12-15 million, of which 25% were from exports and 75% from the domestic market. In 1995, South Africa exported some 2,900 tons of fresh proteas and other native flora. The protea is the national floral symbol of South Africa and for many South African consumers represents the wild landscapes of the Cape region. Proteas are often planted in home gardens, used in floral arrangements in hotels, and sold as souvenirs to visitors. In South Africa, proteas are an inexpensive commodity product, available in abundance during the spring and summer seasons. In contrast, its image in Europe is one of an expensive, exotic product, associated with autumn.

The South African protea industry is highly organized with a complete network of growers, specialized export companies, technical advisors, a research and development station, a commercial propagation nursery, and an industry association, the South African Protea Producers and Exporters (SAPPEX), which sets standards, supports research and promotional activities, and collects and disseminates information. In 1995, there were more than 275 farmers who either harvested native flowers from the wild or cultivated them specifically for sale. In terms of growing area, these farmers have access to 600,000 hectares of wild flora veld, cultivate 2,500 hectares on hillsides and cultivate an additional 400 hectares in orchard-style plantations. Many of the wild flowers are dried and processed in some way, including through dying.

The European trade in proteas and other 'exotics' is dominated by a small number of specialized importers and wholesalers in Germany and the Netherlands. In contrast with the pattern for most other conventional flowers, less than half of the proteas imported into the Netherlands are sold in the Dutch auctions. Of those sold in the auctions, some two-thirds come from Southern Africa (South Africa and Zimbabwe) and most of the remaining one-third from Israel.

Factors in the Development of Floriculture in Southern Africa

The development of export-oriented cut flower production in Southern Africa was facilitated by the interaction of a number of factors acting as both catalysts and constraints, which existed for nearly all export projects in the region. Though not all of these catalysts are still active, they had a major impact on the decisions of the first entrepreneurs to enter floriculture. This section will focus primarily on Zimbabwe and Zambia, since these two countries pioneered cut flower exports in the region and continue to be the largest exporters.

Pre-Conditions Necessary for Development

A certain set of pre-conditions were necessary for the development of successful cut flower exports from Southern Africa. First, there needed to be a *basic market opportunity* for overseas producers to supply cut flowers to Europe, without which it is difficult to imagine the successful developments which followed. The opportunity which emerged was to supply fresh cut flowers in the European winter "off-season" from October through May, when the flower auctions in Holland generally welcomed import supplies and prices reached peak annual levels.

Second, in order to take advantage of this market opportunity there needed to be sufficient *availability of suitable human capital* in the form of *abundant cheap labor* and *risk-taking entrepreneurs* who had sufficient managerial skills and motivation to succeed in a sophisticated and competitive business. Countries such as Zimbabwe and Zambia benefitted from having a number of local entrepreneurs who had already gained valuable and relevant experience in successful agribusinesses such as tobacco, vegetables, citrus, sugar, coffee, and other commercial crops. The initiative, drive, and managerial skills of the entrepreneurs who began floriculture exports in Zimbabwe and Zambia were key factors in overcoming the many constraints to the development of the industry, and will continue to be important in sustaining its growth in the future.

Third, each country needed some *minimal initial level of infrastructure* (e.g., freight availability, roads, telecommunications) and some type of *financing arrangements*, though the latter were not always available to the first projects. It is important to note that the existence of infrastructure and financing cannot, by itself, lead to the successful development of an export industry such as floriculture. In fact, the existence of the first two factors (above), a solid market opportunity and a suitable base of human capital, can allow an export floriculture industry to start even if infrastructure and financing arrangements are suboptimal.

Catalysts Sparked Take-Off

Given the existence in Southern Africa of the necessary preconditions for development, a number of catalysts were also needed to initiate the establishment of a floriculture export industry. The existence of *foreign exchange controls* in the 1980's is the first and most frequently cited factor which led farmers in Zimbabwe and Zambia to begin producing cut flowers for export. Large commercial farmers searched for export products that would allow them to earn the foreign currency needed to import spare parts and equipment for their commercial farming operations. Though these controls have since been removed or eased throughout the region, the timing of their liberalization in each country played at least some role in the spread of floriculture in the region. For example, the fact that controls were dismantled in Zambia before Zimbabwe played a role in the decision of at least one Zimbabwean grower to establish a second farm in Zambia in order to circumvent the restrictive policies in Zimbabwe.

Second, commercial farmers became interested in cut flowers as a means of *product diversification* to spread risk from traditional commodity crops to ones free from government controls and the uncertainty of the local market. In particular, Zimbabwean tobacco growers have sought to diversify since they began fearing an imminent decline in the demand for tobacco (which so far has not materialized). South African commercial farmers have similarly begun looking for potentially profitable crops to replace the commodities which have struggled following the removal of protective

policies from the boycott period. The drive toward diversification has also been motivated by the droughts which have plagued Southern Africa in recent years: commercial farmers are now seeking "off-season" crops which bring higher returns per unit of water than traditional crops such as wheat.

A third major catalyst was farmers' desire to have an *off-season cash flow* to complement the cash flow from such primary crops as tobacco. Since the tobacco auction floors in Harare are open from April until September and the peak export season for cut flowers runs from October through March, the sales and work schedules for the two crops complement each other perfectly. Also, a general lack of other promising investment opportunities led farmers with large tobacco profits and other investors with capital to decide to enter floriculture.

A fourth factor which facilitated the growth of floriculture in Southern Africa was an *initial imbalance between southbound and northbound air freight.* Due to various non-economic decisions, e.g., Rhodesia operating a national cargo airline to import arms by air during UDI, and Zambia importing mining equipment by air during its boycott of South Africa, there was considerable unused northbound air freight capacity, which was originally offered at attractive rates to help establish fresh produce exports.

It must be noted, however, that the existence of all the above factors was, in itself, not sufficient to actually launch the initial production and export of cut flowers in Southern Africa. As was the case in Kenya, the spark which activated these catalysts and directed them toward beginning a floriculture industry in countries such as Zimbabwe was an unplanned and basically coincidental combination of factors initially unrelated to floriculture (see Box 1.1 for details on the development of floriculture in Zimbabwe).

Overcoming Initial Constraints

Floriculture managed to develop in Southern Africa despite a number of serious initial constraints, some of which still apply today. A key factor which helped growers overcome many of the constraints was the assistance provided by foreign intermediaries, who were allowed relative freedom to operate in Southern Africa. These facilitators served as "honeybees" since they initiated a type of cross-fertilization which diffused essential technical know-how from overseas sources to the region and between countries within the region. These facilitators included marketing agents, technical advisors, input suppliers, airline and freight agents, representatives of the Dutch auctions, and European importers. In many cases, a single firm filled more than one of these roles. These "honeybees" were motivated to come to the region because they sensed an opportunity to develop a successful and profitable business in partnership with local entrepreneurs.

Perhaps the largest initial constraint to be overcome in developing floriculture in Southern Africa was the almost complete *lack of knowledge* about the industry. Lacking experienced producers and exporters and with no local base of expertise for this branch of horticulture, industry pioneers needed to learn nearly everything from scratch. This is where the "honeybee" firms played such a crucial role in helping some of the first growers succeed. The first producers also *lacked access to capital*: no dedicated funds were available for this previously non-existent industry, local bankers and policy makers had no knowledge of the capital requirements or the commercial potential of floriculture, and there was little access to foreign exchange needed for importing inputs. As a result, many of the first cut flower growers had to finance their own investments and be creative in sourcing inputs. In a few cases, foreign-based agents actually loaned money to producers to help them keep

their operations going until they entered full production and could earn enough revenue to cover their costs.

Once growers learned what was needed to produce and export cut flowers and located sources of capital, they still *lacked local access to many essential inputs*. Most items had to be imported or supplied by the growers themselves. Local infrastructure was also a problem. There was a *lack of transport and storage facilities* for handling highly perishable fresh produce and telecommunications (local and international) were often inadequate for supporting the needs of such an information-intensive industry. Though air freight capacity was initially available and affordable, most Southern African countries did not have the necessary frequency or reliability of flights for their flowers to be competitive in overseas markets.

Initially, new growers in Southern Africa *lacked access to alternative marketing channels*, in part because of a lack of knowledge about the existence of various marketing options. In their rush to the market, most Southern African growers simply chose the first marketing agent they encountered, which was usually a firm based in Holland that provided access to the Dutch auctions and start-up technical advise. Five to ten years after entering floriculture, many growers have only now accumulated enough experience to learn that there are other viable marketing options besides the few familiar Dutch agents and the Dutch flower auctions. These alternative marketing options are referred to here as the "direct" channel, in contrast to the "indirect" channel of selling via the auctions.

Regardless of whether Southern African growers sell directly or indirectly, they are liable to confront the *relatively negative image of African flowers in Europe*. Industry leaders in Southern Africa assert that this reputation applies only to corporate mass-producers in East Africa and not to themselves, but this argument does not seem to be supported by aggregate market data (examined below).

The new floriculture industry in Southern Africa was also initially constrained by elements of the *policy environment*. The first growers were burdened by foreign exchange controls, restrictions on foreign investment and repatriation of profits, high taxes, and tariffs or even outright bans on certain imported inputs. Land ownership issues complicated entry into floriculture for some, particularly in Zimbabwe where land resettlement programs restricted the purchase of agricultural land by certain groups and created insecurity about the future, making commercial farmers hesitant to invest in new ventures. Of the Zimbabweans who were unable to find land to begin growing flowers, some emigrated and established operations in Zambia and Kenya.

Finally, *climatic conditions* in Southern Africa have limited the potential quality of cut flowers grown in the region, especially those produced in simple greenhouses without proper climate controls. Though the climate in Southern Africa is considered to be generally favorable, it is *often too hot* for many floriculture crops in the southern hemisphere summer (particularly in Zambia) *and too cold* in the winter (particularly in South Africa). In addition, rains in the southern summer (i.e. during the peak export season) can damage outdoor crops and cause disease problems in greenhouse crops.

Major Features of Floriculture in Southern Africa

The general structure of the export floriculture industry in each country in the region consists of cut flower growers, grower-based sector organizations, and a network of local and foreign firms supplying production inputs, technical advice, and export marketing services. This section will focus on the major sector institutions in the region and the different types of growers involved in the

industry. This section also discusses the role of large corporate investors in developing floriculture in the region.

Growers

The profile of cut flower growers varies throughout Southern Africa. In Zimbabwe, most cut flower growers are family or commercial farmers (of white European origin) with experience growing tobacco and other irrigated crops. Tobacco farmers make a relatively smooth transition to floriculture because they are already accustomed to a complicated horticultural crop which requires great attention to detail, selective hand-harvesting, and complex post-harvest sorting, grading, and treatment. Also, such growers already have experience with auction sales of dozens of quality grades and know the importance of maintaining a strong individual reputation with buyers. An increasing number of Zimbabwean cut flower growers are urban professionals and business people of both white European and black African origin (including many women). Most cut flower growers in Zimbabwe are either in Harare or within 150 kilometers of Harare, though a few growers are located much farther away.

In contrast to Zimbabwe, most investors in the floriculture sector in Zambia are urban business people with experience in the industrial sector, accountants, other professionals, and politicians. A minority of such investors have a farming background. Most have invested in floriculture strictly as a business venture, which has given the sector in Zambia (and it sector organization - ZEGA) a more business-like character. Of the 16 floriculture projects in Zambia in 1995, only two were owned by black African businessmen and a third had a black African as a partner; all the rest were owned by entrepreneurs of European or Asian (i.e., Indian) descent, most of whom were either natives or long-time residents of Zambia or immigrants from Zimbabwe, South Africa, Kenya, or Europe (e.g., Holland and Ireland). Some larger growers who also pack bouquets of flowers are considering outgrower schemes involving smaller-scale black African farmers, but such schemes are considered more promising for vegetables than for flowers. All of the existing floriculture projects are located in the general area of Lusaka. In Malawi, the two exporting cut flower projects were initiated by business people, and the largest one is backed by overseas investors. Both cut flower projects are near Lilongwe, even though other areas of Malawi have better climatic conditions for floriculture production. A third floricultural investment in Malawi, producing exotic plants, is located on the southern tip of Lake Malawi.

The floriculture sector in South Africa has many times more growers than the rest of the region combined (see Table 4). Most growers are located within 300 kilometers of Johannesburg and supply the Multiflora auction. The sector in South Africa is dominated by large growers who supply the local market and who have been involved with floriculture for many decades. In the Cape region, there are also a few hundred export-oriented protea growers. As noted earlier, this latter group ranges from "growers" who pick from wild tracts of veld to modern growers who cultivate irrigated, orchard-style plantations of selected varieties. Many protea growers are retired urban professionals engaging in a second career as hobby-farmers in the hills around Cape Town. As in Zimbabwe, South Africa also has a small but increasing number of commercial farmers who are beginning to diversify into floriculture. Despite these farmers' stated intention of exporting, most of their production so far has been directed toward the local market.

Contrary to the claim that cut flower growers in Southern Africa are primarily family farmers - in contrast to the large-scale corporate farms in East Africa - it must be noted that the industry in Southern Africa has already attracted some large corporate investors both from within and outside the region. For example, one of the largest diversified concerns in Southern Africa, Tabex, was

among the first major participants in the production and export of cut flowers from Zimbabwe (though they have since withdrawn from floriculture). Also, Royal Dutch Shell is a joint venture partner in one of the largest and most successful floriculture operations in Zimbabwe and TATA (an industrial giant in India) has added roses and summer flowers to its agribusiness operations in Zambia. Large overseas public institutions are also investing in Southern African floriculture: the Commonwealth Development Corporation is buying one of the largest cut flower (and vegetable) farms in Zambia and EDESA (the Swiss development bank) is a major backer of the largest rose farm in Malawi. Finally, the world's leading cut flower trading company, German-based Florimex (owned by Dibrell Brothers, an American tobacco company), has had export offices in Johannesburg and Cape Town for many years and has been very active in organizing floriculture exports from Southern Africa.

Technology

The level of technology used in floriculture projects in Southern Africa is extremely variable among individual growers, depending on their level of investment and the age of the investment. In general, growers in all countries in the region have access to similar technology and can choose from options such as high, medium, or low technology and local or imported inputs. Due to the mild climate, growers can often make due with minimum level technology; it is believed that a larger investment will produce better results, but there is not necessarily a one-to-one correspondence. Producers tend to prefer the cheapest possible technology options, especially on their first hectare and even more so if they are not relying on outside financing. This usually means a wooden structure with sawtooth construction and permanent ventilation, which provides some protection from the rain but no real climate control. Such an option costs only about US$6.50 per m^2 versus US$22 per m^2 for the most deluxe option (imported steel structure with double-sided ridge ventilation). Ultimate choices of technology and growing techniques often depend on the preferences of a grower's principal technical advisor and the particular market they are targeting.

Nearly every necessary and desired input for floriculture production is available today in Southern Africa. Most growers tend to choose locally supplied inputs, including: wood and steel for greenhouse structures, plastic for greenhouse coverings, irrigation equipment, chemicals and fertilizers, planting material, packing materials, refrigeration units, and bricks for building packing sheds and other structures. The main sources of supply within the region are South Africa, Zimbabwe, and to some extent Zambia. The principal suppliers from outside the region are Holland, Israel, France, and Germany. With a plentiful supply of low-wage but hard-working laborers and abundant on-farm natural resources, Southern African growers can be very self-sufficient, often supplying a great deal of inputs for themselves. These include everything from wood for greenhouses and buildings to self-design, construction and assembly of greenhouses, packing sheds and refrigeration units, and self-construction of tools, ladders, and sorting tables.

Knowledge Infrastructure

Floriculture is a very knowledge- and information-intensive industry in which access to technical know-how and up-to-date market information are important to success. Since floriculture is such a new industry in Southern Africa, there was virtually no existing knowledge infrastructure in the early 1980's. Fortunately for the region, though, knowledge is a mobile asset and the fact that *foreign-based "honeybee" intermediaries* were allowed to enter and operate in the region helped overcome the initial knowledge deficit. These honeybee firms were not merely used as reference sources, but formed the key link in actively directing growers to everything from sources of inputs to

decisions on varietal selections and marketing channels. Though Southern African growers have developed an overdependence on a small number of sources of information (particularly market information), they have done remarkably well despite such limitations.

A new phenomenon in Southern Africa is that some cut flower growers have also become *propagators of young plants* for themselves and for other growers. For some of these producers, this step constitutes a significant advance in technological sophistication and an overall expansion of the local industry's knowledge infrastructure. Some of these propagators, however, operate with very simple technology and their commercial ambition surpasses their level of technology and quality. Nevertheless, the emergence of a group of local propagators in Southern Africa shows that the region's floriculture is now large enough to support such locally based specialists. These firms have made a significant commitment to the local industry and have enhanced local self-sufficiency for important inputs.

Nearly every export-oriented floriculture project in Southern Africa begins with a foreign *manager*, from whom the local entrepreneur hopes to learn the business of growing and exporting flowers. After a season or two of learning experience, many projects shift to local managers (both whites and black Africans), who are considerably cheaper. Some of these managers have studied horticulture or even floriculture overseas. Within the region, universities offer programs in general agriculture and economics, while South Africa is the only country with specific programs in horticulture and marketing. In general, though, floriculture workers and managers in Southern Africa receive their training "on-the-job".

Nearly every project is consulted by a *technical advisor,* usually provided through the marketing agent or plant supplier and usually a foreigner of Dutch, Israeli, or other European origin. Some growers are now consulted by multiple advisors. However, some technical advisors and marketing agents insist on exclusivity, resulting in the insulation and isolation of the grower from alternative sources of information.

In general, there is *limited interaction among growers* in the region, who tend to be independent-minded and are not used to the cooperative type of multi-tier sector institutions found in countries such as Holland and Israel. Even though Southern Africa is a relatively small supplier to the market and some countries have fewer than a dozen growers, growers still tend to view their colleagues as competitors rather than partners. Interaction among growers is mostly limited to within the same marketing or technical advising group (i.e., among growers who share the same agent or advisor). These groups occasionally sponsor a "field day" for the purpose of demonstrating new crops and techniques. Interaction also takes place among cliques of friends and neighbors or along ethnic lines. For example, there may be groups of Asian (Indian) growers (e.g., in Zambia), Dutch expatriates, or tobacco farmers (e.g., in Zimbabwe). Many growers have now visited Holland or some other market, though they usually travel individually and are accompanied in the market by their Dutch marketing agent.

Local *research and development* in floriculture is virtually nonexistent in Southern Africa. Producers in the region are not considered to be innovators, and the general feeling is that it is sufficient for technical solutions to be imported and adapted by local advisors and individual growers. In Zimbabwe, Tabex used to perform some R&D work before they withdrew from floriculture. However, Tabex's former R&D staff (both Zimbabweans and an Israeli) stayed in the region and have now established their own technical advisory services. The only academic institution conducting floriculture research in the region is Potchefstroom University (South Africa), located about 110 kilometers west of Johannesburg. For analysis of soil and plant samples, some local technical

advisors contract with the laboratory at Potchefstroom. Alternatives include using the laboratory at one of the large Zimbabwean sugar estates or sending samples to labs in Holland. Southern Africa does have a history of research on general agriculture and, as a result, general climate and soil data has been collected in Zimbabwe and South Africa for many decades and is used by some local floriculture advisors.

Associations

Each country in the region has at least one grower-based sector institution which was organized for the purpose of coordinating or actually providing certain essential services to the floriculture industry. Many of these organizations were initially established to serve all fresh produce exports, which until the late 1980's were mainly fresh vegetables (e.g., the Zambia Export Growers Association - ZEGA) or citrus fruit (e.g., the Horticultural Promotion Council - HPC - in Zimbabwe). But with the rapid, large-scale development of cut flower exports, these organizations now allocate much of their resources and efforts to floriculture. These sector organizations serve different types of functions; some are more multidimensional and more commercial (e.g., ZEGA) while some tend more toward the informational (e.g., the South African Protea Producers and Exporters - SAPPEX). In Zimbabwe and Zambia, new groups have organized to specifically represent cut flower growers (e.g., the Export Flower Growers Association of Zimbabwe - EFGAZ) or even crop-specific subgroups of cut flower growers (e.g., the Zimbabwe Protea Growers Association). There are also independent statutory organizations, such as Zimtrade in Zimbabwe, which conduct trade promotion activities (e.g., participating in trade fairs) for floriculture and other export industries and coordinate their efforts with floriculture sector institutions such as the HPC.

In Zimbabwe, the HPC is an independent body established by growers in 1986 for the purpose of organizing air freight and expanding the horticultural industry. The HPC is funded by a "voluntary" 0.5% levy on the value of horticultural exports by its members. Though HPC membership is not mandatory, growers must become members in order to receive a farming license that entitles them to an exemption from the 12.5% sales tax on purchased inputs. The HPC's charter gives it broad responsibilities for providing many essential support services to the industry, but its limited resources can only support a staff of two professionals (a chief executive and one assistant) who direct most of their efforts toward organizing air freight and collecting basic industry statistics. Under the HPC, a committee of growers, export agents, freight forwarders, and airlines meets weekly to allocate Affretair's capacity and to find outlets on other airlines for surplus flowers. The committee also engages in education and lobbying activities with agricultural institutions and the government on issues affecting the industry. EFGAZ was formed in 1991 as a separate and more specialized association of cut flower growers within the HPC. EFGAZ aims to provide greater structure and organization for the floriculture industry - one that is initiated and established by growers for growers - to discourage the government from attempting to impose an industry structure on the growers, e.g., previous proposals (since withdrawn) for parastatals such as the Horticulture Promotion Authority or the Horticulture Promotion Board.

In Zambia, the floriculture industry is much smaller and less developed than in Zimbabwe, and so a single sector institution - ZEGA - was created to serve a more active role than that of similar Zimbabwean institutions. ZEGA was founded in 1988 to help promote the development of fresh horticultural exports from Zambia (at the time there were only two hectares of rose production, but significant vegetable exports) and consists of two parts: the ZEGA association (of growers) and ZEGA Limited, an organization which engages in commercial activities on behalf of the growers. The two primary areas of ZEGA Ltd.'s commercial activity are importing bulk production inputs (e.g., chemicals and packaging materials) for the growers and, since 1990, operating the cold-storage

facility at the airport (which was financed by the European Investment Bank). At the beginning of each export season, ZEGA also negotiates an air freight agreement on behalf of the growers with the various airlines serving Zambia. Though ZEGA Ltd.'s shares are distributed among the ZEGA association, former growers (who were growers when ZEGA was founded), current grower/exporters, the National Farmers Union, the Zambia Farmers Coop, and the government, the organization is chaired by a prominent rose grower and controlled by current flower grower/exporters.

Though ZEGA Ltd.'s commercial activities were seen as necessary to jump-start an infant industry (e.g., by procuring bulk discounts on key production inputs), they have also involved ZEGA's grower-members in financial responsibilities that go beyond simply organizing and representing the industry, such as operating a cold-storage facility which is many times the size needed by the industry (today or in the foreseeable future) and other related commercial ventures. Also, as the industry has expanded, it has become more difficult to reach sector agreements on input purchases and the booking of charter flights which satisfy everyone. Some prefer to make independent bookings on regularly scheduled flights and have refused to cooperate with ZEGA in committing to the reservation of pallets on charters, leaving it to others to make this commitment for the industry. As a result, some growers aspire to grow large enough to be able to book their own charter flights and not be dependent on ZEGA for freight arrangements. In the summer of 1995 the ZEGA association hired a chief executive who is a professional marketing consultant with roots in Zambia and business experience in the U.K. and Zimbabwe. This development may encourage smaller growers to view ZEGA as a more impartial organization working in the interests of the entire industry.

Floriculture sector institutions in South Africa differ somewhat from those in Zimbabwe and Zambia due to the local market orientation of most South African producers and the prominence of a subsector devoted exclusively to native South African flora. Many South African growers in Johannesburg and surrounding regions are members of the Multiflora auction, as well as the South African Flower Growers Association. Both are largely Afrikaner organizations that concentrate on serving growers who primarily supply the domestic market. The South African Protea Producers and Exporters (SAPPEX) is based in the Cape region and is the grower- and exporter-based sector organization for the export-oriented protea industry. SAPPEX sponsors research, disseminates information, and conducts trade promotion activities on behalf of the floriculture subsector specializing in proteas and other native flora of the Cape region.

Marketing

As the principal northern hemisphere markets become more competitive, growers in Southern Africa need to pay more attention to the finer points of marketing if they wish to continue to export profitably. Ordinarily, new producers' first concern and biggest challenge is just to learn how to grow the flowers and get them to the airport, from which point on they prefer to leave all the work to their marketing agent. However, there is an increasing realization among growers that marketing options do exist, that the choice of a marketing strategy has important implications for profits, and that this choice must be made as early as possible because it affects decisions on initial investment levels, technology options, crop varieties, and cultural practices.

Since the first commercial exports over a decade ago, cut flowers from Southern Africa have been sent primarily to Europe for sale through the Dutch flower auctions (see Box 3 for details about the Dutch auction system). For example, as much as 99% of Zimbabwe's flower exports to Europe were sent to Holland in 1988, though this figure dropped to 88% in 1992 and is estimated to be about 80% in 1995. In 1992, other important markets included Germany (7%), the U.K. (3%), and

Switzerland. A trend in recent seasons has been to sell increasing amounts of flowers directly to importers and wholesale customers in Holland and other markets, bypassing the auctions. The U.K. is by far the largest export destination for fresh vegetables from Southern Africa and a growing destination for direct sales of cut flowers.

Some flower growers are building on the connections they already have with British supermarket chains and using their experience prepackaging vegetables to sell flowers to the same customers. There are also some direct flower exports from Southern Africa to other northern hemisphere markets such as Russia, the Persian Gulf countries, Japan, and East Asia. Nevertheless, the overwhelming proportion of Southern African cut flower exports are still sold via the Dutch auctions, with recent estimates ranging from 60% for Zimbabwe, to slightly more for Zambia, and nearly 100% for Malawi.

While many Southern African growers are satisfied with their sales results in the Dutch auctions, others have expressed dissatisfaction, believing they receive lower prices (especially when they send second quality flowers) and pay higher marketing costs. Growers began selling through the Dutch auctions because, at first, it was the only marketing option they knew about. But after gaining a few years' experience and exposure to the world floriculture trade, many have developed direct contacts with overseas buyers. In addition, many rose growers in Zimbabwe and Zambia now have year-round production which is not compatible with the seasonal import restrictions of the Dutch auctions, and they are large enough (i.e., 2 hectares or more) to deal directly with overseas buyers. Some growers say they now sell only 25% of their production through the Dutch auctions and the other 75% direct to European customers. These growers are planning their future variety selections around this shift in distribution channels and market destinations.

Box 3: The Dutch Auction System

The Dutch auction system refers to the unique auction method of selling highly perishable fresh produce (e.g., fish, vegetables, flowers) developed over a century ago in the Netherlands. A sophisticated, modern electronic version of this sales method is still used today in the flower and plant auctions in the Netherlands, which are the most important entry point into Europe for floriculture products from Southern Africa. The Dutch auctions are also the dominant factor in the trade of floriculture products both in Europe (80%) and world-wide (59%). The Dutch flower auctions have a combined annual sales turnover of approximately US$3.4 billion, about 82% of which are Dutch products and about 18% imports. The percentage of imports is much larger in the northern hemisphere winter season (October through April) and much less in the summer, though this may vary greatly for different products. Nearly all flowers and most plants produced in the Netherlands are sold in the auctions, and about 75% to 80% of the products which pass through the auctions (including imports) are exported (or re-exported) to markets outside the Netherlands. Holland's largest customer for these exports is Germany (48%), followed by France (12%), the U.K. (8%), and Italy (5%). The leading product sold in the Dutch auctions is roses, with sales turnover in 1994 of about US$600 million. As a result of the large concentration of supply and information at one point in the trading system, prices from the Dutch auctions are often used as a barometer of international prices and of changes in world supply and demand.

Today there are seven flower auctions in the Netherlands, each of which is a cooperative organization owned by its Dutch grower-members. Each auction is managed by a professional staff that implements the policies set by the members. The auctions belong to an umbrella organization, the VBN (Association of Dutch Flower Auctions), which sets general policies for the industry, collects and disseminates information, and represents the Dutch floriculture industry. Though the Dutch auctions are often discussed as if they were a single entity, there are significant differences between the various auctions. Of the seven Dutch auctions, two are huge (VBA and BVH, each having about a 40% share of total VBN sales in 1994), one is large (Flora, with a 14% share), and four others are relatively very small. The buyers at the small auctions tend to be local Dutch florists and small Dutch wholesalers serving the domestic market, while the buyers at the large auctions tend to be large Dutch export companies and wholesalers who export the vast majority of the products they purchase at the auctions. These large

buyers are looking for much larger quantities and are often willing to pay higher prices. In addition, though all three larger auctions handle a full range of products, they are each known for their specialization in certain types of flowers, based on the growing region in which they are located. For example, the VBA is known as the rose auction (and also has the oldest and largest import department), BVH specializes in flowers such as chrysanthemums and carnations, and Flora specializes in field grown bulbflowers (e.g., tulips) and summer flowers. Overseas suppliers may choose either a strategy of supplying these types of flowers to these auctions in order to be consistent with a specific auction's specialty, or a strategy of supplying other types of flowers which are relatively scarce at these particular auctions.

Until about 25 years ago, the Dutch flower auctions only handled flowers and plants produced by Dutch growers. Since the early 1970's, the auctions have allowed imports, though overseas growers do *not* become members of the auction. Over the years, imports became increasingly accepted, particularly as a complement to supplies in the low-season of Dutch production (i.e., the winter months) and as a source of supply for products which were not produced in Holland. Despite a trend of gradual liberalization of imports, there has always been a policy of carefully controlling the growth of imports. The import departments at the various auctions are selective in choosing /accepting overseas growers. They allocate quotas to each supplier for a given import season and control the rate of growth of imports from one year to the next. As the trade has become more competitive in recent years, many Dutch growers have pressured the managers of their auction organizations to place more stringent controls on imports. As a result of the growing anti-import sentiment of a vocal and influential segment of Dutch growers, many overseas suppliers have begun looking for alternative channels of distribution.

One response to the uncertainty about the future receptiveness of the VBN auctions to imports was that the largest exporter from Kenya (who is also the largest importer in Holland), East Africa Flowers, established a new import auction in its own warehouse near Amsterdam in March 1995. This new auction, called Tele Flower Auction (TFA), is the only Dutch auction outside the VBN system. So far, it has handled mostly carnations and other products from Kenya. Since it is owned by a private company which does not publish any statistics (in contrast to the VBN), it is not possible to judge the progress or prospects of the TFA, other than to observe that it was still in operation one year after it was established.

Despite the many disadvantages of being a foreign guest supplier to the Dutch flower auctions (i.e., VBN), many growers around the world still feel that the advantages of supplying the auctions far outweigh the disadvantages. The Dutch auction system provides a solution to some of the most serious and intractable problems of selling directly to importers and wholesale customers by providing growers with simple accounting (i.e., one shipment to a single destination, no need to negotiate separately with individual customers, and a financial relationship with one entity - the auction) and, most importantly, *fast, guaranteed payment*. When selling through the auctions, there are no collection problems (since buyers must pay for the flowers before leaving the auction building), no concessions on payment terms, and no bogus and unverifiable quality claims (since the auctions provide professional and objective quality inspection). By offering growers access to hundreds of potential buyers at once, all of whom are looking to buy only a single type of flower at a time from any given supplier, selling flowers through the auctions allows growers to specialize in a narrower range of flowers and varieties. Finally, supplying the auctions also provides growers with access to a large quantity of detailed information about their own sales and trends in the market.

The Dutch auction system was designed to facilitate rapid transactions; each transaction involves only a single bid, which usually takes about two seconds. Since in the sale of huge volumes of highly perishable fresh produce there is no time for buyers to progressively bid up the price from low to high, the Dutch auction starts with a very high price, which is lowered until the first (and only) bid is made. In the modern Dutch auction, carts of flowers pass before a gallery of buyers. The price and other information about the lot for sale is displayed on a large auction "clock" directly above the flowers, whose single hand begins at a high price range and is moved (counter-clockwise) progressively lower. The flowers are purchased when one of the buyers stops the clock by pushing a button on a panel by his or her seat in the gallery. Since a buyer can never be sure at what price rivals will bid for a particular lot of flowers, the system (in theory) encourages higher bids than would otherwise occur, in order to ensure the successful procurement of the lot desired. This system worked well for the many decades in which the demand for flowers was increasing and buyers actively competed with each other to purchase available supply. However, the system does not work as well (for the growers) when buyers are not competing so actively to purchase

the product (e.g., because it's a small niche product that appeals to fewer buyers, or it's an expensive product, or the market is oversupplied at the moment, etc.), since there is unlimited downside price risk. When the price drops to zero (or below some predetermined minimum), the flowers are withdrawn from the market and destroyed, at a loss to the grower.

Some recent developments in the Dutch auction system were intended to address some of its imperfections. For example, to further increase the speed of transactions and to ease the logistical burden on the auctions, special incentives are given to sellers of large lots, known by their Dutch acronym of "GP." GP sales involve a single grower supplying entire carts (i.e., at least a few thousand stems, depending on the type of flower) of completely uniform quality (e.g., in terms of stem length, opening stage of the bud, etc.) of the same flower variety, which are sold in a single transaction, usually to a buyer who is one of the larger wholesaler/exporters. Another important development is the sale of potted plants and cut flowers through the auction organization but *not* through the clock system. Instead, these sales are made through a mediation bureau, known by its Dutch acronym of "BB," in which an auction staff member helps to match up individual buyers and sellers, who agree on a price and quantity for a future transaction (or multiple transactions). This system is often used for cut flowers when the buyer has unusual specifications that would not ordinarily be available on the clock, such as when a supermarket chain needs 1 million red roses, individually packed, and delivered on the day before Mother's Day. The auctions are also trying to work with groups of selected growers to begin producing special kinds of flowers for specific market segments, such as organically grown flowers or flowers with natural fragrance. The auction's role is to coordinate the supply of such new products and to help promote them to retailers and consumers. Though these initiatives still represent only a small (but growing) segment of the market, anyone becoming involved with the Dutch auctions should be aware that this represents the innovative edge of the industry and may hold the biggest future profit potential.

Some Southern African growers have voiced frustration at what they perceive to be their agents' failure to gain access for them to the VBA or other large auction in Holland. Moreover, many growers fear the increasing anti-import sentiment among the Dutch grower-members of the auctions, which in June 1995 reversed a long-term trend of import-liberalization and banned most summer imports. This policy change shocked the industry and sent many overseas suppliers and European traders scrambling to establish alternative distribution channels for the summer of 1995 and the 1995/96 import season.

Growers generally make contact with overseas marketing agents during the latter's frequent visits to Southern Africa or through agents' local representatives. Independent agents and representatives of the import departments of the Dutch auctions visit the region many times throughout the year to recruit new suppliers and to report to their existing suppliers on the latest trade developments. Since most Southern African growers arrange in advance to export their flowers to the Dutch auctions for the entire season, their primary marketing activity during the season involves daily or weekly coordination with local parties to fill pallets and find enough cargo space to meet their actual needs. Some local export agents have a daily morning radio conference with their growers in order to assess the day's freight requirements and coordinate shipments. Depending on their marketing agent and distribution channel, growers receive regular reports by fax or mail on their actual sales results. Also, many growers occasionally visit the markets in Europe in order to learn more about their functioning and to see first-hand how their flowers are received and handled there.

Figure 1 shows one possible representation of the *distribution channel for fresh cut flowers* from overseas suppliers to Europe, including estimates of the price level at various points in the system. Once again, since transport and handling are a large part of the costs between the grower and the auction and, since these are largely fixed costs, any improvement in quality that would raise the auction price (or equivalent in a direct channel) would have a large impact on the price received by the grower. Since growers typically receive only about 10% to 15% of the final retail price, the price level at the auction (or equivalent) becomes a key factor in determining a grower's income.

Another increasingly important export destination for Zimbabwean, Zambian, and Kenyan growers is other southern hemisphere countries - mainly *South Africa and Australia* - during the off-peak season to Europe. The relatively mild winter temperatures in Zimbabwe and Zambia allow growers there to continue producing from May through September and supply the increasing demand in South Africa and Australia, where freezing winter temperatures halt most cut-flower production (most greenhouses in these countries are unheated). Zimbabwean and Zambian growers can transport their flowers by truck or air to Johannesburg, where they then have access to flights to Australia.

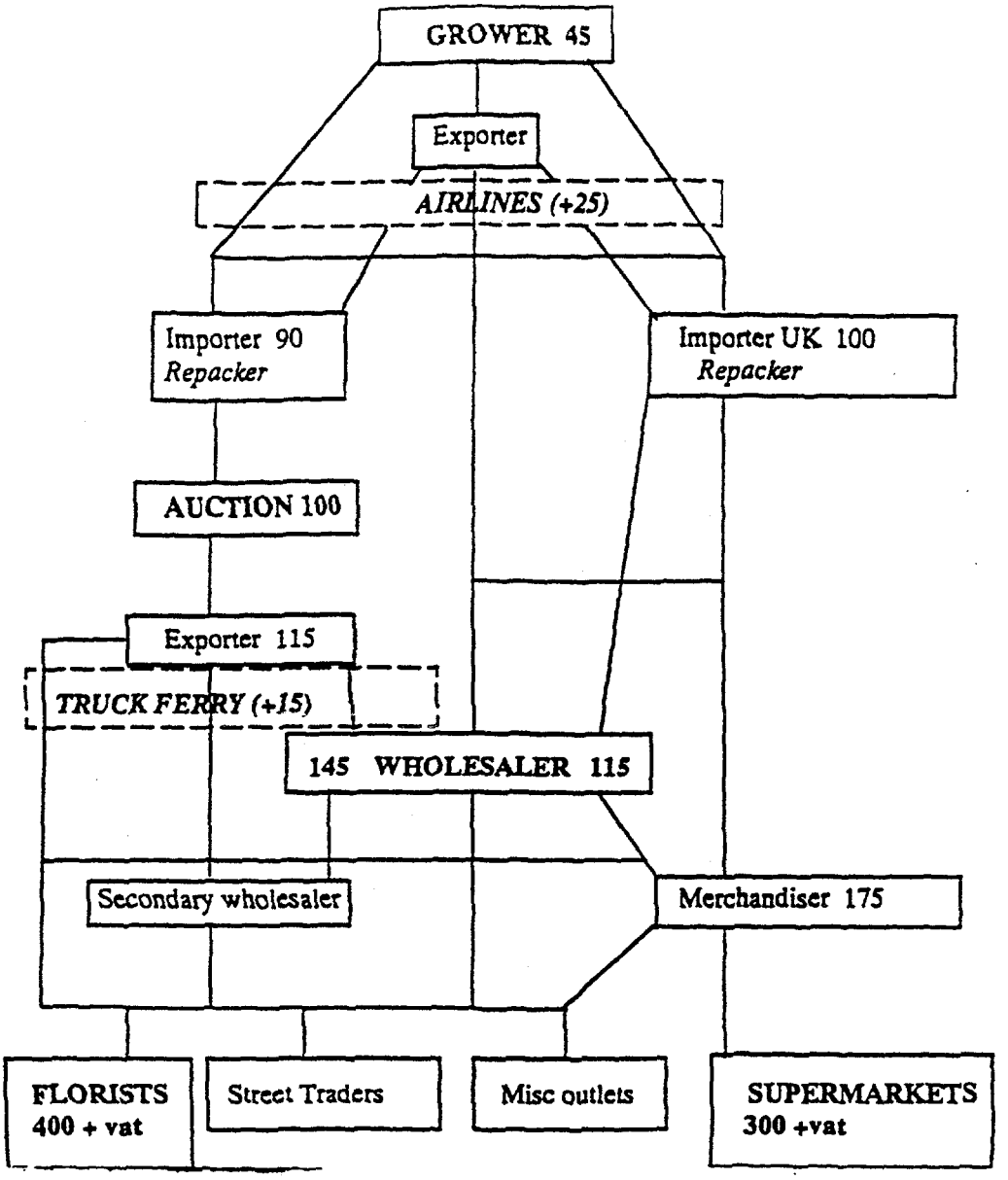
Many *Dutch and other European marketing agents* have come to Southern Africa to organize the rapidly expanding cut-flower exports and, at least in Zimbabwe and South Africa, have since been joined by a few *local export agents* as well. In Zimbabwe, for example, there are four principal Holland-based marketing organizations which are now active, as well as three locally based export companies and three other *marketing groups* organized by large local growers. These latter three groups have either very close Dutch connections or are themselves of Dutch origin. Their primary role is to coordinate the booking of airfreight pallets and the sharing of technical advisory services. Despite the continued rapid growth of the industry, the set of ten marketing groups in Zimbabwe has been rather stable over the past 2 to 3 years. The newest groups actually splintered off from existing groups, so no really new groups have entered the industry in the past few years.

Marketing agents in Southern Africa initially provided growers with a complete package of services, from input supplies and in-house technical advice to export arrangements and access to the Dutch auctions. However, as the regional industry has grown and matured, a trend has developed toward *increasing functional specialization* in the provision of services to growers. In Zimbabwe, for instance, there is now a large enough base of growers to support firms specializing only in technical consulting for rose growers or sales to European supermarket chains. Except for perhaps the most inexperienced growers, most producers in Zimbabwe now seem to prefer the flexibility of choosing their own combination of input suppliers, technical advisers, and marketing agents and the option of shifting from one to another. As a result, at least one marketing agent recently closed its in-house technical department and now refers its growers to one of the local consultants.

Financial Parameters of Individual Investments

The financial results of growing cut flowers in Southern Africa generally appears to be quite favorable, which is one of the major factors driving the expansion of existing growers and attracting new entrants to the sector. According to figures collected in the course of this study, growers who are both competent producers and good managers should be profitable. Successful growers have begun to concentrate exclusively on cut flowers, as it is estimated by one source in Zimbabwe that a farmer can generate the same level of profits from one hectare of roses as from 25 hectares of tobacco or 150 hectares of maize. However, due to the individual nature of marketing cut flowers, prices and financial results may vary tremendously among individual growers. Even in the best of circumstances, success is by no means guaranteed. Many growers have already failed; most of these have already been replaced by other operators, though some still struggle on with losing operations. Many existing farms appear undercapitalized and ill-prepared for serving a market which is becoming increasingly quality-oriented. As a result, new entrants to the sector will have to invest increasingly large sums just to be competitive, and they may still receive smaller returns. The requirement to invest greater amounts of capital will raise the already high entry barrier to smallholders, and the fact that local banks are still conservative in their lending to floriculture projects will not ease the burden.

Figure 1 **Distribution Channel for Fresh Cut Flowers in the European Union**



Note: The numbers shown in the boxes are the approximate price at any point in the system indexed to the Dutch auction price for those flowers (set equal to 100).

Source: Pertwee, Jeremy (1992), *The Production and Marketing of Roses 1992*, Frinton-on-Sea, U.K.: Pathfast Publishing, p. 49.

Though many rose projects in Southern Africa appear to be doing well and report that they are profitable, many of the figures that are frequently mentioned for yields, prices, expenses, and other variables (which are used as key assumptions in feasibility studies) are often overly optimistic, at least for beginning growers. For example, though a few growers may obtain rose yields in excess of 200 stems per m^2, yields of 150 to 180 stems would be considered very respectable and some new growers may have difficulty reaching even 100 stems at first (of course, yields may vary tremendously depending on the variety grown and cultural practices). Many studies use a benchmark average sales price for hybrid tea roses of Dfl. 0.45 per stem, but average prices for African roses are usually lower than this and the trend of decreasing prices should be factored into the calculations of expected future returns. Expenses will also vary considerably depending on the investor's preference for choosing a farm manager: Some prefer to hire a local person with local horticultural training and no previous experience for as little as US$12,000 per year, while others (especially in Kenya) are willing to pay as much as US$70,000 per year for a top grade manager from overseas.

In Southern Africa, the minimum feasible project size is considered to be one to two hectares. This is relatively large on an international scale, but Southern African growers need to have large enough production and sales units to justify an operation for which they must provide many services for themselves (e.g., local transport to the airport, booking freight space by the pallet, etc.) that are often provided by specialist intermediary firms in more developed countries. Once the operation becomes large, however, they will also need to hire their own farm manager, technical advisor, etc. Initial investment costs will also depend greatly on whether the investor is starting with some existing facilities on developed land or completely from scratch: for the first two hectares, initial costs can range anywhere from US$500,000 to US$1.2 million. Even if the grower seeks to economize by beginning with only one hectare, they will have to build enough infrastructure for an anticipated future expansion to a more economically viable size of two or more hectares.

Growers interviewed for this study reported that typical operating costs as a percent of revenue are about *17% for production costs, 35% to 45% for transport* (depending on the sales price of the flowers), and *23% for marketing costs* (slightly less for direct channel, slightly more for auction channel), leaving a *net revenue of about 15% to 25%, or US$60,000 to US$100,000 per hectare*. Growers report that at this rate they may be able to repay loans in about three years, though the higher technology type of investment will take longer to repay. Also, new growers' revenue stream is often delayed (while costs are already being incurred) by as much as a complete season as they wait for approval for financing or for plant material and other essential inputs to arrive. Results will also depend on a grower's learning curve: the first two years are critical, though experienced growers caution that the learning curve in the flower business never completely ends.

A "Typical Rose Project"

Table 4 presents the typical investment and operating costs for establishing a hypothetical two hectare rose project of above-average technical sophistication in either Zimbabwe or Zambia. The figures do not represent any one specific project, due to the large differences which may exist between projects. Overall, Zimbabwe and Zambia have similar costs and expenses. Figures are not presented for Malawi or South Africa, since the former does not have a large enough number of projects (only two, at present) to determine what would be typical and the latter does not have enough comparable projects that concentrate on exports.

We start by assuming that the project begins with two hectares, but the infrastructure budget covers an eventual expansion to a total of four hectares. Above-average technical sophistication

means that the project includes a steel structure greenhouse with permanent roof ventilation (about US$10.50 per m^2), top quality locally propagated plant material, isowall cold storage, and high quality irrigation equipment. A grower could save about 40% on the cost of the polyhouse (the largest initial investment cost) by using a wooden structure polyhouse with permanent ventilation (about US$6.50 per m^2). Conversely, a grower could spend about 50% more for an imported steel structure with one-sided gutter ventilation (about US$16 per m^2) or over 100% more for an imported steel structure with double-sided top ventilation (about US$22 per m^2). Investment costs would need to be adjusted accordingly.

A two hectare project with the specifications described above is expected to earn a net profit of US$ 127,600 per year. However, a number of comments and caveats are in order. First, the figures show that the dominant operating cost is freight (38%), followed by marketing costs (26.4%). In the Southern African context, labor costs (6.3%) are negligible, as is nearly every other category of operating cost. Therefore, *costs beyond the farm are by far the largest cost factors and controlling such downstream costs will be critical to profitability.* At the same time, growers must be careful not to reduce, say, marketing costs (e.g., by selling directly to wholesalers instead of through the auctions) only to replace them with other hidden (and perhaps even higher) costs, such as higher packaging and transport costs due to making a larger number of smaller shipments to more destinations, or extra expenses involved in trying to collect payments.

Second, and perhaps of greatest importance, the sales price used in the above example (24 U.S. cents per stem) is merely an estimated average price based on typical market conditions for some of the major rose varieties. The actual sales price per stem may vary considerably, depending on each individual grower's average quality throughout the season and the reputation for quality and consistency which they develop over the course of many seasons. Also, international market prices fluctuate constantly and prices between traders are rarely set far in advance. The actual sales price attained will be absolutely critical to a grower's profitability: Since the investment costs and most of the operating costs are fixed, and given the relatively narrow profit margins, *there is a tremendous multiplier effect that will produce large differences in financial results based on small changes in price.* To illustrate, consider the effect on profitability of changing the average sales price per stem by just 2 U.S. cents (8.3%) in either direction (all else held constant): At 26 cents per stem (instead of 24 cents), turnover per m^2 increases to $45.50 (versus $42.00) and net profit per m^2 rises to $9.88, a *55% increase*! Conversely, a sales price of 22 cents per stem results in a *55% decrease* in net profit per m^2. Therefore, the importance of product quality and any other marketing strategy which can increase the sales price per stem cannot be overemphasized.

Finally, it must be noted that in a young and rapidly developing industry, it is very difficult to calculate precise cost and income figures because most growers are in a state of continuous expansion. Such growers may never go through an entire season with a fixed acreage in full production, so there is no way to accurately compute their annual returns per hectare (and these growers themselves do not have such data).

Table 4: Economics of a Typical Rose Project in Zimbabwe/Zambia

(a) Initial Investment Costs:

Description	Investment in US$
Land	20,000
Infrastructure	25,000
Polyhouses	210,000
Irrigation System	70,000
Packing Shed	50,000
Cold Storage	40,000
Equipment & Machines	40,000
Truck	45,000
Office & Equipment	15,000
Housing	50,000
Plant Material	175,000
Contingencies	75,000
Total	$815,000

(b) Operating Costs:

Description	Costs/m^2 in USD	Percent of Total Costs	Costs/Stem in USD
Chemicals/ferts.	1.18	3.3	0.007
Tech. Advising	0.41	1.2	0.002
Electricity + Fuel	0.44	1.2	0.003
Labor	2.26	6.3	0.013
Packaging	0.74	2.1	0.004
Freight	13.53	38.0	0.077
Marketing	9.41	26.4	0.054
Depreciation	4.71	13.2	0.027
Interest	0.88	2.5	0.005
Miscellaneous	2.06	5.8	0.012
Total	$35.62	100.0%	$0.204

(c) Financial Results:

Production:	175 stems per m^2
Sales price per stem:	Dfl. 0.40 = US$ 0.24 per stem
Turnover per m^2:	175*0.24 = US$ 42 per m^2
Total costs per m^2:	US$ 35.62 per m^2
Net profit margin : (before taxes)	US$ 6.38 per m^2

Source: Authors' estimates based on field interviews.

Sales Performance

Any evaluation of sales performance based on marketing data aggregated on a national level must be subject to the qualification stated earlier that there is tremendous variability in sales totals, average prices, and variety mix between individual producers in each country. In fact, there may be greater differences in results among growers in the same country than between national averages. Buyers in Holland stress that they generally evaluate each supplier as an independent entity without regard to their specific country of origin. Nearly every country in Africa has at least some outstanding growers who receive very high prices on an international level, as well as large numbers of medium to very poor growers who often receive very low prices. Therefore, the average price data presented and discussed below should in no way be construed to represent the actual or potential performance of top quality growers in any particular Southern African country. Nevertheless, the only data publicly available for comparing growers in different countries is auction sales data aggregated at the national level. Despite the limitations of such data, they may still inform us about the relative performance of the bulk of growers in each country and the perceived quality of logistics from each country, which may be quite useful to policy makers and industry participants. Still, each country's floriculture sector will need to gather its own data on growers' performance in terms of key indicators, in order to properly assess the state of the sector.

The sales performance in the Dutch auctions of flowers from Southern Africa and other leading suppliers for the past three seasons can be seen in Table 6. These figures indicate that the marketing performance of Southern African flowers has been mixed. While African roses are generally perceived in Europe as "supermarket roses" (i.e., having shorter stems, lower quality, and a correspondingly low price, making them suitable for selling in supermarkets), many Southern African growers and their agents claim that they are aiming for a higher-quality market segment. They say that the region's quality-conscious family farmers produce a very different product from the commodity-type flowers produced on huge-scale corporate farms in East Africa.

However, the sales statistics from the Dutch auctions in Table 6 show that roses from Southern Africa's largest supplier, Zimbabwe, generally received mediocre to below-average prices, which were often less than Kenya's (and this despite the fact that Zimbabwean growers say they send only their best-quality stems to the auctions). Though Zimbabwe is now the fourth largest overseas supplier of cut flowers to the Dutch auctions, with about 9% of the annual import supply (following Israel - 37%, Kenya - 22%, and Spain - 16%, and leading Zambia - 2%, Tanzania - 1%, Uganda - 1%, and Malawi - 0.5%), typical Zimbabwean roses are still seen by Dutch buyers as having similar or even lower quality than those of Kenya and some other African suppliers. One reason for this may be buyers' knowledge that Zimbabwe is more distant from the market and has fewer direct flights than Kenya, so all Zimbabwean flowers -- even from Zimbabwe's best growers -- may not be as fresh, on average, or of as *consistent* high quality as flowers from Kenya and some other suppliers.

In other words, *even the best growers in any country will be influenced to some degree by the general quality reputation of their country of origin*, which is justified by the fact that all growers in a certain country share the same climatic conditions and are limited by the same schedule and routes of flights from that country. Also, at the VBA auction (which is generally perceived to be the highest quality auction for roses), import managers point out that it is a mistake to assume that large Kenyan growers cannot produce top-quality flowers: the aggregate data in Table 6 reflect the fact that, while Zimbabwe and Zambia may have a larger *number* of high quality growers than Kenya, some of Kenya's very large growers are also regarded as top-quality producers. These growers have a considerable positive impact on Kenya's average aggregate price.

Table 4 shows a number of remarkable developments in the past three seasons for specific products which are most important to Southern African growers. For *hybrid tea roses*, the table shows *a very different trend for Dutch tea roses* - stable quantities and a significant rise in average prices - than for imported tea roses - which more than doubled in quantity but suffered a drop in prices. Since most of the Dutch production is sold in the northern summer when prices are lower, Dutch tea roses received an even larger price premium over imported tea roses in the northern winter months than is indicated in this table. Again, Dutch growers' ability to supply a *fresher product on a consistent basis* appears to be one factor which gives them an advantage in this increasingly competitive market. The table also shows that the price of Zimbabwean tea roses is falling farther below the average price for all imported tea roses and is losing its edge over the price of Zambian tea roses. Finally, other producers are increasing their supply of tea roses much faster than Zimbabwe, causing Zimbabwe's share of imported tea roses to drop from 45% to 31% between 1992/93 and 1994/95.

For *sweetheart roses*, Table 6 shows that the quantity of imports more than doubled in the past three seasons. More significantly, however, *Holland increased its production by an even greater quantity than all of the imports combined* (more than 200 million stems in two years), producing 1.65 billion stems. This growth in supply put tremendous downward pressure on prices, but the Dutch suffered less of a drop in price than most foreign suppliers. Zimbabwe was one of the only suppliers whose prices remained stable over this period, but its average prices in 1994/95 were still less than Kenya's and Zambia's.

Regarding the differences in average aggregate prices for both types of roses between suppliers from Southern African countries, one reason that Zambia has been able to close the gap and even surpass Zimbabwe (in sweetheart roses) may be that Zambia still has a very small number (only about one dozen) of conscientious rose growers. In contrast, Zimbabwe already has about 125 rose growers, dozens of whom may be relatively poor-quality growers who have a large enough negative impact on Zimbabwe's average aggregate price to offset the performance of Zimbabwe's better-quality growers. Meanwhile, according to VBA managers, Malawi has the lowest prices of roses from Africa due to the relatively unsuitable climate of the growing area around Lilongwe and the strategy of growers there to produce large volumes of lower quality roses for supermarkets.

In addition to roses, another crop which has been important for Zimbabwe has been *asters*, also shown in the Table 5. Unlike roses, however, asters are a crop which may have peaked and entered a general decline, as reflected in Holland's decreased production and the decline in the prices of all major suppliers. Zimbabwe's steep fall in average price is due to the crash of prices for Zimbabwe's major aster variety - Monte Cassino. Other varieties were not so affected and some Zimbabwean growers were able to achieve much better performance for selected new varieties, which is not apparent in Table 6.

Finally, Table 5 shows that a niche product in which Zimbabwe has been able to be a market leader (in terms of price) has been *liatris*. However, this is a relatively mature product with a small market in which little future demand growth is expected. Large seasonal fluctuations in quantity and price have occurred in recent years as a result of unusual weather in the various growing regions, but this should not be interpreted as a change in market demand. As was the case with asters, Zambian growers have also tried to follow their counterparts in Zimbabwe in growing liatris (though on a smaller scale), but without convincing results.

Table 5: Sales of Major Cut Flowers in the Dutch Auctions, by Supplier, 1992-1995

Product	Supplier	Quantity (mil. stems) 92/93*	Quantity (mil. stems) 94/95	Price in (Dfl. ct/stem) 92/93*	Price in (Dfl. ct/stem) 94/95
Tea Roses	Holland	536.6	543.0	48.0	55.5
(Large	Total Imports	72.9	169.0	51.0	49.0
Flower)	Israel	3.0	22.0	62.0	N/A
	Kenya	13.8	41.8	52.0	N/A
	Zimbabwe	32.7	52.3	50.0	47.3
	Zambia	10.7	19.5	41.0	46.6
	Malawi	3.2	5.4	42.0	43.0
	Ecuador	4.8	6.7	82.0	72.9
	Uganda*	1.2	5.6	67.4	54.5
	Tanzania*	8.5	9.0	55.8	53.6
Sweetheart	Holland	1,448.9	1,649.6	31.0	29.9
Roses	Total Imports	140.5	269.6	40.0	33.8
(Small	Israel	79.3	120.9	43.0	33.7
Flower)	Kenya	25.3	90.6	40.0	35.7
	Zimbabwe	16.5	19.0	35.0	35.0
	Zambia	8.4	8.8	37.0	35.7
	Malawi	4.8	8.4	32.0	22.8
	Ecuador	0.4	1.5	56.0	32.2
	Uganda*	2.3	9.6	29.4	26.7
	Tanzania*	3.5	4.9	29.4	32.7
Asters	Holland	71.0	63.0	46.0	43.6
	Israel	11.2	15.2	46.0	41.9
	Zimbabwe	12.1	16.1	43.0	30.1
	Zambia	0.7	0.9	32.0	30.1
Liatris	Zimbabwe	19.7	13.4	26.0	25.9
	Israel	12.3	11.3	23.0	23.8
	Zambia	0.9	0.2	21.0	21.0
	Holland	15.7	12.0	21.0	17.8

*: 1993/94 season was first season reported for Uganda and Tanzania.
**: "Season" runs from July through June.
N/A: Data not reported by VBN.
Source: Association of Dutch Flower Auctions (VBN), as printed in *Vakblad voor de Bloemisterij*, July 1995.

Necessary Conditions for Developing Cut Flower Exports

As was discussed earlier in Section 2.1, a number of preconditions were necessary for the successful development of floriculture exports in Southern Africa, including the existence of a basic market opportunity, a base of local entrepreneurs, and infrastructure. What was not mentioned, though, were the significant differences in these factors among the different countries of the region, which may account for the differential success of exports from these countries. In general terms, Zimbabwe had relatively superior preconditions for development of floriculture exports, and so it is no surprise that Zimbabwe has emerged as the leading producer and exporter in the region. Zambia had fair to good preconditions, and has also emerged as an increasingly significant exporter. In contrast, both Malawi and South Africa had relatively poor preconditions for export development, and have subsequently lagged behind in entering the take-off stage. The following brief subsections attempt a more detailed comparison of these countries in terms of each type of precondition.

Market Opportunity

In general, all countries in Southern Africa face the same basic market opportunity to export cut flowers to Europe and other northern hemisphere countries, which allows all of the other factors to become relevant. South Africa, though, was relatively handicapped by the existence of economic sanctions against apartheid which denied its growers access to the Dutch auctions and to some national markets altogether during the crucial years in the late 1980's when other Southern African countries laid the groundwork for a take-off in exports. Furthermore, South Africa's growers still pay costly customs duties (15% to 20%) on cut flowers in European Union (EU) countries while their Southern African neighbors enjoy duty-free access. Finally, the relative attractiveness of distant export markets is diminished for South African growers due to the existence of a domestic market which is large enough to purchase all of their production at reasonable prices and without the competition and complications encountered in export sales.

Local Entrepreneurship

This factor varies greatly between the region's countries and may account for a large part of the differences in export development success. Zimbabwe had a relatively large pool of skillful and experienced agro-entrepreneurs and other potential investors who had the resources and the motivation to enter floriculture and succeed. Zambia had somewhat similar conditions, though on a far smaller scale. In contrast, the most recurring theme during the research team's visit to Malawi was that country's glaring lack of entrepreneurs. The present atmosphere in Malawi is simply one in which it seems that none of the few potential investors has the motivation to make such an investment and help expand the floriculture industry beyond the three existing growers. Until this situation changes, none of the other factors will be especially relevant. Similarly, long-time flower growers in South Africa have been spoiled for many years by having, until very recently, an insulated domestic market. They seem to lack the motivation to modernize and take other steps necessary to develop successful exports. Many potential growers do not consider floriculture due to the many other promising investment opportunities in the South African economy.

Financing and Investment Policies

The availability of financing at reasonable terms is a critical factor for such a capital- and technology-intensive industry as floriculture. *Lack of availability of affordable financing is perhaps one factor that could slow the growth of floriculture in Southern Africa.* Though the first few growers in Zimbabwe and Zambia had to finance themselves (before the local banks learned that floriculture was a promising business), the larger scale takeoff of these countries' cut flower exports was facilitated with the availability of some type of financing. In particular, nearly every producer in Zambia has financed a significant part of their investment with funds made available from either the European Investment Bank (EIB), the World Bank's Coffee II fund, or Japanese development funds. The star asset of Zambia's floriculture industry, the large modern cold-store at the airport, was also made possible through EIB funds. The Swiss development bank EDESA played a role in backing floriculture in Malawi. Without such funding, there is an even higher barrier to entry in the industry.

There are still numerous reported problems with obtaining financing in these countries. Many banks require rather extreme collateral (e.g., one-to-one equity) to obtain a loan, and commercial banks used to dealing with industrial customers do not offer small-scale loans needed by either smaller growers or growers seeking to finance a smaller scale expansion or improvement of existing facilities. Some investors have expressed frustration at delays in the approval of loans caused by bureaucracy, bankers' lack of familiarity with the capital requirements of floriculture, and lack of sensitivity to the seasonal requirements of cut flower production (i.e., to receive financing by a certain date in order to plant rose bushes at the proper time to reach full commercial production in time for the peak export season). A few months delay could cost a grower nearly an entire season's revenue. Greater problems of this nature were mentioned in relation to development funds, though investors seemed content to tolerate these deficiencies due to the prohibitive interest rates required by local commercial banks. Currently, only the wealthiest commercial farmers and businessmen, who can finance new investments with their own capital or attract corporate investment partners, are not constrained by this factor.

Since current investment policies in the Southern African countries examined are quite similar, this factor no longer accounts for major national differences in export success. All the countries encourage foreign investment and offer similar packages of incentives. Investors are offered tax breaks and general freedom to repatriate capital and dividends, all largely unburdened by exchange controls. A relatively problematic issue for foreign investors throughout the region remains restrictive policies on land ownership, but such major national policies are unlikely to be changed for the sake of a few potential flower growers.

Logistics and Freight

Logistics and freight play a crucial role in the export of such highly perishable, high value products as fresh cut flowers. Though producing countries such as those in Southern Africa comprise only a small part of the marketing chain, any damage to the product which may occur between the farm and local airport cannot be corrected later; the internal quality of the product will be irreparably harmed. All Southern African countries face a common set of concerns in this regard, such as growers' generally inadequate transport of their flowers to the airport (e.g., due to making infrequent trips to the airport, transport in open-bed or unrefrigerated trucks, and traveling long distances over unpaved roads). Cold-storage facilities at the airport are also crucial and vary greatly from country to country: Zambia has excellent (though grossly underutilized) facilities, while Malawi has none. In Zimbabwe, some freight companies have cold-storage at or near the airport, though none are large

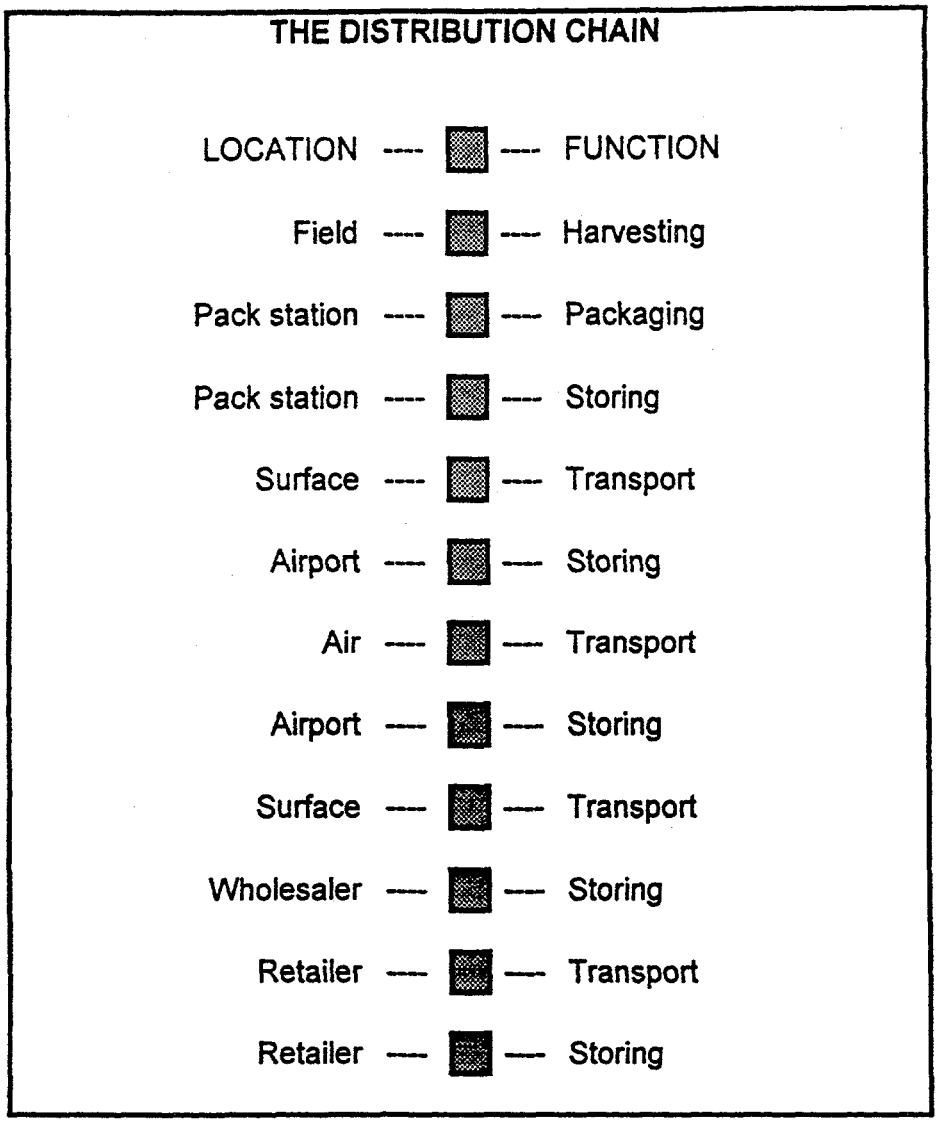
enough to allow the maximally efficient loading of the Boeing 747 freighters that some companies are attempting to operate from there.

Figure 2 shows the importance of these logistical concerns and how they will impact the competitiveness of various suppliers. For example, Dutch producers in the Netherlands essentially eliminate four stages in the middle of the distribution chain (as depicted in Figure 2), i.e., the portions involving transfer to the airport, shipment by air, and associated storage and handling. For Dutch growers selling in the European market, this effectively shortens the distribution chain and allows Dutch flowers to arrive at their destination fresher and with less damage from handling. Also, various overseas suppliers will have a relative advantage or disadvantage depending on whether they have direct flights from their country to the intended market destination. For instance, Figure 2 shows a relatively direct distribution chain with only one air link, e.g., a non-stop flight from Harare to Amsterdam. However, a charter flight from Harare to Amsterdam which involves the transfer of the cargo to another aircraft in Nairobi, adds two links to the chain. Alternatively, a direct flight from Harare that lands in a European destination other than Amsterdam, e.g., Paris or Luxembourg, and involves additional surface transport from that destination to Amsterdam, also adds two links to the chain. Many worse scenarios which add still more links to the chain can easily be envisioned.

With regard to air freight, the *key factors affecting competitiveness* among Southern African countries are the *cost, frequency, reliability, and routing of flights*. Highly perishable fresh produce clearly requires the most frequent and direct flights possible, the availability of which is often dependent on other factors that attract southbound cargo, such as a country's fresh vegetable exports and its general level of economic development. South Africa leads the region with international service by 54 airlines and nearly 10 international flights per day, many direct to markets in Europe. Zimbabwe's situation has improved considerably in recent years and Harare now has usually two or three international flights per day, though many do not go directly to Holland. In contrast, Zambia has only four to five flights per week, which are not evenly spaced throughout the week and go mostly to destinations other than Holland. Malawi has only three flights per week for flowers, but at least all of these go directly to Holland. The floriculture industries in these countries need either more frequent (i.e., daily) flights on smaller aircraft or more cost-efficient (e.g., Boeing 747) flights every other day in order for producers to appear regularly in the auctions with consistently high quality flowers.

There are also considerable *differences in air freight rates* among the different countries in the region and between different products and seasons. Table 6 shows recent guideline air freight rates to Europe from selected African countries during the peak export season. Rates are influenced by such factors as competition among carriers in a given market, utilization of southbound cargo capacity, and seasonality. Flowers generally cost more per kilogram than vegetables to transport by air because rates per kilo are really based on rates per pallet, and cut flowers are lighter by volume than fresh vegetables. Also, vegetable exports continue year-round, which allows vegetable exporters to receive lower rates and preferable access to flights from the airlines. Overall, we see that rates in the region are comparable, with Zimbabwe paying higher rates (due to Affretair's control of the market) and South Africa paying less (due to more competition among carriers, more southbound cargo, and larger off-season volume).

Figure 2: Links in the Supply Chain for Fresh Cut Flowers



Note: Each step in the chain introduces stress-inducing factors; stress accumulates as fresh flowers move through the chain, impacting their quality and life span.

Source: International Trade Centre UNCTAD/GATT (1993), *Manual on the Packaging of Cut Flowers and Plants,* Geneva, Switzerland: ITC, p. 5.

Table 6: Guideline Air Freight Rates from Africa to Europe
(U.S.$ per kilogram)

Type of Aircraft	Product	Zambia	Zimbabwe	South Africa	Kenya
Passenger	vegetables	1.50	1.60	1.35	1.50-1.60
Passenger	flowers	2.60	2.55	1.87	
Freighter	vegetables	1.45	1.83	1.35	
Freighter	roses	2.22	2.80	1.87	1.95-2.22
Freighter	summer flowers	1.81	2.29	1.87	1.60-1.80
Freighter - total cost (U.S.$)		56,000	70,000	55,000	50-55,000

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

Source: TDI/Landell Mills Ltd./Doxiadis Associates, *ZEGA - Development of Air Freight Strategy*, Zambia Export Development Programme, June 1995.

Also of concern is the expected future changes in factors affecting the freight situation from Southern Africa. For example, TDI/Landell Mills recently studied the short and medium term air freight requirements for fresh produce exports from Zambia. In 1995, Zambia was one of very few countries within the region to still be importing more freight by air from Europe than it exported. However, due to the large expected increase in cut flower exports, the study projected that exports would exceed imports by the 1996/97 season. ZEGA therefore needs to develop a forward-looking freight strategy, combining the arrangement for more charter flights and negotiations with new airlines to handle freight requirements. Also, due to considerations of operating efficiency and *new environmental regulations* (that will prohibit the landing of narrow-bodied aircraft at most European airports after 2002), Southern African exporters must plan a transition to wide-bodied aircraft. This will require improved forward planning of freight requirements.

Other Infrastructure Issues

Infrastructure is very important to the success of perishable exports, but infrastructure alone will not be sufficient for the development of fresh produce exports. The best example in Southern Africa is that the country with the best infrastructure, South Africa, has so far not been able to achieve a takeoff in cut flower exports. The next most developed country in the region, Zimbabwe, is the export leader, though they still have significant infrastructure deficiencies in telecommunications. Many Zimbabwean growers, even those just outside of Harare, still do not have access to a private telephone/fax line, which prevents them from communicating directly and easily with agents in Harare or buyers overseas. Each of the marketing groups in Zimbabwe has to rely on radio communications to contact growers, a less than ideal situation. Local industry organizations EFGAZ and HPC have discussed the possibility of linking growers with some type of electronic mail system, but this will also require that each grower have a private telephone line. This is a critical

issue, as it is impossible to respond to rapidly changing market conditions in a dynamic, information-intensive global industry without efficient and reliable communications.

Enabling Environment

The enabling environment in all of the countries in Southern Africa has been generally favorable to the establishment and growth of floriculture exports. In no country in the region has a government imposed an institutional arrangement for organizing the floriculture sector (though such a body is occasionally proposed in Zimbabwe), leaving the private sector free to decide how to organize the essential functions of the industry (e.g., air freight). In every country in the region at least one grower-initiated and grower-run sector organization has formed, and so far these organizations have served their industries well. Also, unlike many other agricultural commodities in these same countries, floriculture has been free from government price controls and other interventions, which has allowed entrepreneurs to respond to relatively undistorted market signals.

As described earlier, many restrictive government policies which existed at the time these industries were first being established have been removed in recent years as part of general programs of economic reform. Remaining problematic policies include restrictions on issuing work permits for foreign farm managers and technical floriculture specialists in Malawi and Zambia, and government intervention in setting air freight rates in Zimbabwe. The fact, though, that intermediary "honeybees" have been relatively free to enter and move around the region has been crucial to overcoming many of the constraints mentioned throughout this report.

Regional Flows and Cooperation

Though there is some rivalry and sense of competition between the countries of the region, which have led in some cases to unnecessary duplication of efforts, floriculture in Southern Africa is characterized by a remarkable degree of intra-regional trade and cooperation. Examples of cross-border flows abound, though most of them originate in either South Africa or Zimbabwe. Production inputs are traded frequently, with most being supplied by South Africa (e.g., steel, plastic, chemicals, refrigeration units, etc.). Some production inputs traded regionally are also supplied by firms in Zimbabwe (e.g., greenhouses, chemicals, young plant material). Products - in the form of cut flowers - mostly flow in the reverse direction, i.e., to the South African market. Other flows are primarily of services. Technical advisors serving the region are mostly based in Zimbabwe, though some also work out of South Africa.

Some Zambian and Zimbabwean growers transport flowers by truck or by air to Johannesburg to meet flights to more distant markets. Investors based in Zimbabwe have entered floriculture in Zambia and Malawi. Floriculture industry personnel from throughout the region come to South Africa for specialized professional education. Marketing information is circulated throughout the region by way of marketing groups which span across borders. Finally, people in the region are also a mobile resource, providing a source of entrepreneurial energy where it may have otherwise been absent. For example, a number of Zambia's rose growers originally came there from South Africa (some via Zimbabwe), from Zimbabwe (some via South Africa), and even from Kenya.

Competitiveness

As of the mid-1990's, the general competitiveness of the cut flower export industries in Southern Africa can be summarized as follows:

- **Zimbabwe** has become the largest, strongest, and most complete floriculture export industry in the region. The sector has now reached a critical mass which will lead to self-sustaining growth in the future. Of all Southern African countries, Zimbabwe has the most export growers, the widest dispersion of growers, the largest assortment of products, and the greatest concentration of firms offering support services to growers in Zimbabwe and throughout the region. In this way Zimbabwe has become the engine of regional growth in floriculture and a model for imitation by neighboring countries.

- **Zambia** has been a somewhat later entrant to floriculture, beginning its takeoff only in the past two to three years, but has been able to begin on a relatively high and sophisticated level. Zambia is trying to emulate Zimbabwe's success, but will lag somewhat behind in the foreseeable future. Zambia's floriculture sector is much less diversified than Zimbabwe's, being almost exclusively oriented toward roses and marketing almost exclusively via the Dutch auctions, though some Zambian growers are trying to change this trend.

- **Malawi** appears to have few chances at present to develop floriculture exports beyond their current level. Malawi is missing too many necessary factors and will continue to lag far beyond their neighbors in the foreseeable future. The few existing producers seem resigned to supplying lower quality products to the lower-quality segment of the market.

- **South Africa** represents the extremes of the Southern Africa region. The country has tremendous advantages in the form of the region's most advanced economic infrastructure and perhaps the largest and most complete (domestic) floriculture industry and market. South African manufacturers can supply nearly any input needed for floriculture and the country has the best logistics and freight situation. However, South Africa also faces numerous disadvantages that are unique in the region, including high import tariffs in the European Union, less favorable climatic conditions for floriculture production, higher labor costs, increasing labor unrest, difficulty organizing growers scattered over such a large geographic area, a lack of motivation to export, and a good local market, but one with low standards that do not prepare growers to compete overseas. So far, the balance of these factors has not stimulated large-scale development of cut flowers exports and, absent a major new catalyst, such development does not appear likely in the near future.

Future Prospects for Floriculture In Southern Africa

This section examines some of the major questions regarding the future prospects for sustaining the development of floriculture exports from Southern Africa.

Are Catalysts Still Active?

Some of the major catalysts which sparked the rapid development of Southern African floriculture exports in the 1980's are no longer active, prompting some growers to comment that they would no longer be likely to enter the industry today if they were not already involved. Other catalysts, though, are still active and continue to attract existing growers to expand production and new growers to enter the sector.

First, the primary reason many farmers began growing flowers in the 1980's no longer exists now that *foreign exchange controls have largely been removed* by Southern African countries. While commercial farmers no longer need to find export crops such as cut flowers in order to maintain their primary farming operation, the removal of exchange controls has also simplified the business of producing and exporting cut flowers. This has eased the managerial burden on those already in the industry as well as on those contemplating entering.

Second, *the interest of commercial farmers in diversifying their product mix still exists*. The recent downturn and/or fluctuations in tobacco, cotton, and other commodity prices is leading additional farmers explore alternative crops and investment opportunities. For those with superior management and relatively deep pockets, floriculture could prove a viable investment, especially in light of the continued dimension of the third original catalyst--that of *providing an off-season cash flow.*

The fourth major catalyst, the initial surplus northbound air freight capacity at attractive rates, already ceased to exist several years ago. *Today the freight situation has become a constraint:* due to a shortage of southbound cargoes, *northbound cargo space is tight and rates are high.* In places where there is plenty of southbound freight such as South Africa, there is also a lot of competition from other high value cargoes for the return northbound capacity.

In sum, it would appear that some of the original catalysts are still active in the region, though others have since become either neutral forces or even constraints. On balance, though, there are still sufficient incentives for many potential investors to enter floriculture, which should help maintain the positive growth of the industry.

Likely Future Participants

The likely future participants in floriculture may include individuals from a number of groups: existing growers, commercial farmers, investors, experienced farm managers, and small holders or emergent farmers. Most *existing cut flower growers* will likely continue in the business in the foreseeable future. Many report that they are earning profits - some of significant magnitude - and have become very personally involved in the industry. Many flower growers are either in the process of expansion or planning to expand, and many are encouraging others to enter the industry.

Many future participants are likely to come from the same source as many of the pioneers in the industry: the large pool of *commercial farmers* (most of white European origin). Most of Zimbabwe's approximately 250 cut flower growers are white commercial farmers with experience growing tobacco or other commercial crops grown under (supplemental) irrigation. Since there are about 2,300 tobacco growers in Zimbabwe alone, there is a potentially large pool of new entrants into floriculture production. As noted above in section 4.1, the primary catalysts for entering floriculture which do still apply offer strong reasons for tobacco growers to start producing cut

flowers. If even a small percentage of tobacco growers enter floriculture each year, it can go a long way toward sustaining the momentum of industry expansion.

Local business people looking for attractive investment opportunities have also become increasingly interested in floriculture, based partly on the publicity about the success of the industry and partly on exposure to it through their friends who are already growers. This group includes a number of indigenous black African professionals and business people. So far some members of this group have successfully entered the business, though often in partnership with an existing grower. In order to succeed in the floriculture business, investors will need to get more personally involved with their projects, i.e., to become more "hands on" than they might normally be with some of their other investments.

Of the two additional groups with potential to enter the industry - *experienced farm managers* and *emergent farmers* - both face considerable capital constraints while the latter also face a large knowledge constraint. Thus, neither group is likely to become a large source of future growers. The first group refers to the project managers or supervisors, most of local origin (either white Europeans or black Africans), who have gained valuable experience running someone else's project and now would like to run their own. This group of *"second generation" growers* has perhaps as good or a better chance to succeed technically as any prospective group of entrants, due to their direct experience managing the production of sophisticated crops. However, most have earned only modest salaries and lack the necessary capital to establish a new production unit of viable size. They will remain on the outside unless bankers recognize their unique potential and offer them affordable credit, or unless they can find alternative strategic partners to help them finance a new investment.

Emergent farmers, on the other hand, lack both the investment capital and the necessary floriculture/managerial experience. Unless conditions change, emergent farmers are not likely to qualify for funding. Even if they did receive financing, these farmers are unlikely to succeed in exporting flowers on their own in the absence of the type of support institutions (e.g., extension service, sector institutions, specialist intermediary firms offering low-cost assistance, etc.) which exist in the floriculture sectors in Holland and Israel. These two countries are among the only floriculture sectors in the world composed mainly of small family farms of less than one hectare under flowers. A sector consisting of many small growers does not offer the short-term potential that will attract overseas "honeybee" firms to come and form strategic partnerships, creating a need for alternative institutional arrangements. However, it must be noted that even in wealthy countries like Holland and Israel, public institutions providing support for agriculture are difficult to maintain and have recently been subject to severe cutbacks that have greatly reduced their effectiveness.

Product and Market Diversification

As was noted earlier in the report, Southern African floriculture is extremely concentrated in terms of product mix (mostly roses) and market destination (primarily Holland). It is still not clear what form product or market diversification would take and whether the region's growers will, or even should diversify.

First, some background is in order. *Very few of the leading floriculture export countries have a truly diversified product assortment or customer base.* While they may supply a wide range of products to their domestic market, most specialize in a particularly narrow range of products for export. Examples include Ecuador (roses and gypsophila), Costa Rica (leatherleaf fern), Thailand (dendrobium orchids), and Spain (carnations). The only major export countries with a truly

diversified assortment are Holland and Israel, and perhaps Colombia. Such diversification may spread risk, but it also involves innovation (recall that it was mentioned earlier that Southern Africa is not regarded as an innovator) and a substantial sector level investment in research, development, and extension. The Israeli experience shows that, beyond the top few products in the market (e.g., roses, chrysanthemums, carnations), investing in new crops requires greater efforts (because less is known about these crops, since they have not previously been produced or heavily researched) for potentially smaller payoffs, because these small crops are usually high-value niche products that do not have mass-market potential. Even with a diverse assortment of products, *market diversification is difficult to achieve.* For instance, Holland is still extremely dependent on sales to Germany, the U.K, and France; Israel exports to the Dutch and German auctions at the same rate as most African countries, and Colombia still sends 80% of its cut flowers to the United States.

The prospects for product diversification hinge largely on those for market diversification: the desirability of changing the product mix depends on what type of market the grower is targeting. As long as Southern African growers remain committed to selling via the Dutch auctions, it may be best for them to specialize in only a few varieties of a single crop such as roses. In this way the grower develops expertise and a positive reputation in the market, as well as vital economies of scale. Markets are becoming more quality-oriented and growers will need to be able to produce large quantities of high-quality flowers in order to be competitive. Moreover, roses are the leading crop in the market and are not likely to lose favor with consumers. For all the same reasons, however, producers all over the world are also specializing in roses and targeting the same Dutch auctions. While roses have generally performed well in the market, competition has increased significantly in recent years and prices have been subject to constant downward pressure.

In contrast, growers who plan to sell directly to wholesalers in Europe and other markets will generally need to offer a wider assortment of varieties (e.g., of roses) and types of flowers (e.g., summer flowers and cut greens in addition to roses). Growers who market independently will have to think more about achieving greater volume from a freight point of view (to fill their own pallets) and, possibly, to have sufficient variety (from their own farm or through outgrowers) to make bouquets for supermarkets. But without sector-level R&D and extension services, growers will largely have to learn about new crops and solve any problems which may arise on their own.

Growers who market independently have far more autonomy and potential to implement a real marketing strategy than those selling through a single agent to Dutch auction buyers. Direct marketers often claim that they have the potential to earn higher prices and that they pay lower marketing margins. However, they also take on a whole new set of responsibilities and risks (e.g., conducting separate negotiations with each customer, coordinating smaller shipments to many more customers, collecting payments, etc.). Significant profits or losses could be made in either channel and neither channel is clearly superior to the other. Each offers a different set of challenges, requiring a different type of strategy. Whichever option they choose, growers will have to adjust their strategy and find a product mix which matches the requirements of the selected target market.

Prospects for Removal of Constraints

Reference has previously been made to a number of factors which have constrained the potential growth of floriculture in Southern Africa. As was the case with catalysts which are no longer active, *many of the initial constraints in the region have also been removed and no longer pose a problem.* In Zimbabwe, for example, constraining factors which were problematic only two years ago included access to foreign sources of technology and know-how, foreign exchange controls,

and concern over possible land reform. It is difficult, though, to predict which constraints may remain and which are likely to be removed in the future since many of them are political in origin and their removal hinges on political decisions.

Furthermore, before discussing constraints which are still active, it is important to note that floriculture exports from Southern Africa, especially from Zimbabwe and Zambia, have continued to expand rapidly *despite* the existence of many constraints. As long as European market demand continues its gradual long-term expansion, it is likely that Southern African exports of cut flowers will also continue to increase, even if many of the present constraints remain in place. Moreover, if some of these constraints are removed, the pace of growth in the industry could actually accelerate (though perhaps not in percentage growth terms). Even if the overseas market begins to decline, it is still likely that some entrepreneurs would continue entering floriculture in Southern Africa, since many strong reasons still exist for them to do so.

Summary of Constraints and Possible Remedies

Some of the constraints discussed here affect the entire region and could be addressed on either a collaborative basis within the region or by the individual countries affected. These common constraints tend to be more general in nature; their resolution may only be partial, at best, and will involve an ongoing process. Other constraints are more country specific. These require particular actions to remove the constraint, either by the specific country, third parties which may be involved, or outside agencies. In such cases, the possible remedy may be more apparent, but considerable political will may be needed to address the problem.

Regional Constraints

One of the most serious constraints affecting the region as a whole is the general *lack of strategic marketing intelligence* or capability of monitoring and analyzing important changes in the market. This reflects the fact that *the most critical long-term constraint facing floriculture in Southern Africa is the factor that was originally the "supercatalyst" making this whole development story possible: the basic market opportunity to supply fresh cut flowers to Europe and other northern hemisphere markets*. The industry in Southern Africa lacks the power to directly influence distant markets. What can be done, though, and must be done urgently in order to not be caught unaware by sudden and potentially threatening market developments is to initiate greater and more systematic efforts to monitor the market and disseminate information to the parties in the region who need to be informed on a timely basis.

Such action could be done in each individual country, but may not be cost-effective. Since everyone in the region is essentially trying to follow the same market, it makes more sense to combine resources and gather, analyze, and disseminate market intelligence on a cooperative regional basis. This, however, will require a change in the mentality of growers: they must begin viewing their neighbors more as strategic partners than as direct competitors. One possible use for pooled information is to collectively educate the region's bankers about the capital requirements and market potential of intensive, high technology floriculture. A concerted effort is needed to inform lenders about the complex needs of the industry.

Another type of constraint which affects every country in the region to some degree is *infrastructure, logistics, and freight*. With the possible exception of South Africa, each country

needs to improve its telecommunications system and upgrade local transport and storage facilities. Logistics and freight issues could be addressed on a more regional basis. More charter flights need to be encouraged in the region, and that might require the collaboration of growers in neighboring countries to jointly sell cargo space on shared flights. By jointly operating charter flights, even smaller countries could gain access to daily direct flights. The freight situation could also be improved if growers became year-round suppliers and if economic growth in the region, particularly tourism, increased.

Country-Specific Constraints

Examples of country-specific constraints which need to be addressed focus on the two countries which lag behind in cut flower exports - Malawi and South Africa. *The main problem preventing the expansion of floriculture in Malawi - lack of entrepreneurship* - is more of a general national malaise than a specific policy which needs to be changed. Potential investors in Malawi need to be encouraged, but authorities there should not push floriculture too strongly nor should floriculture be seen as having wide potential to contribute to poverty alleviation and rural development in that country.

Particular constraints in *South Africa* range from the more specific to the extremely general and perhaps unresolvable. Regarding trade barriers, other countries in Southern Africa would benefit if South Africa liberalized its imports of plant material, which could be done with proper phytosanitary supervision. At the same time, South Africa's floriculture exports would benefit greatly from "leveling the playing field" by achieving *duty-free access to the European Union. Labor activism* is also regarded as a significant but more general problem in South Africa, and it is not clear what could be done at this time to improve the situation. The final "constraint" in South Africa is really a blessing: Since there are so many attractive alternative investment opportunities, investors are not especially motivated to develop the export floriculture sector. No action is required on this point because this does not constitute a problem for the South African economy.

Prospects for Enhanced Regional Cooperation

In addition to possible cooperative actions for addressing the regional constraints described above, another important issue which will demand greater attention in Southern Africa is the emergence of *environmental concerns in Europe* and their implications for marketing fresh produce (Box 4). This issue constitutes a probable future constraint and will also be of interest to Southern African vegetable growers and exporters. A growing number of Europeans are not only concerned that production in Europe be environmentally friendly, but that products imported into Europe be produced in environmentally friendly ways, regardless of where they are grown. Overseas suppliers urgently need to begin studying this issue in order to be prepared for future changes in market requirements.

A second possibility for enhanced regional cooperation is for *horizontal consultation and cooperation* among, say, governments in the region on issues regarding floriculture. Similar contacts are needed between grower organizations in the region, as well as bankers and donors who are active in Southern Africa.

Box 4: Poisoning the Well? Floriculture's Threat to the Environment and to Itself

A lurking threat to the continued development and future success of the floriculture export industry is Southern Africa is the potential danger the industry poses to the environment. Commercial agriculture in general has often been criticized for the environmental damage caused by chemical runoff and these concerns have been raised regarding large-scale farming in Africa. Though commercial floriculture operations are relatively small in scale, cut flower cultivation is extremely intensive. Typically, heavy applications of chemicals are made to soil and plants in an effort to produce the visually perfect (i.e. disease- and insect-free) flowers demanded by the market. Unless some precautionary measures are taken, floriculture production poses a potential long-term threat to the environment as well as endangering the health of workers who handle hazardous chemicals.

Until very recently, most floriculture producers around the world tended to ignore these environmental concerns. However, in countries with the largest production and unfavorable geography (i.e. Holland and Colombia where there are many producers concentrated in a small area with high ground water and near urban centers), severe pollution problems and pressure from environmentalists have forced the floriculture industry to become more environmentally responsible. Since cleaning up previous environmental damage requires significant investments, these countries aim to recoup these costs by using their 'clean' image and high standards as another source of competititive advantage.

Holland has initiated a strict environmental program, mandating reductions in the use of pesticides and fertilizers, the use of energy, and the generation of waste materials (i.e. packaging materials, polyethylene films). Dutch horticultural research has begun to focus on technologies to satisfy the environmental standards by certain target dates. The new regulations have required Dutch flower growers to make large investments at a time when the flower market is characterized by increased competition and lower prices. This has resulted in some erosion of the competitiveness of the Dutch industry and is expected to force upwards of 20% of Dutch growers out of the market over the next few years.

The Dutch floriculture industry is trying to convert this threat into an opportunity. The floriculture auctions have decided to introduce their own -- and even stricter-- environmental program. Dutch producers are in the process of receiving environmental certification from major European consumer organizations. Some European supermarket chains, particularly in Switzerland and Scandinavia, have already initiated their own environmental programs which require producers to supply flowers that are cultivated using 'environmentally friendly' methods. Though few consumers at present demand such flowers, the Dutch floriculture industry is working to develop such market preferences. Other countries which supply cut flowers to the European market, e.g., Israel and Kenya, have begun to express interest in joining the Dutch environmental program. So far, however, the Dutch initiative remains primarily a domestic program. The Dutch auctions are willing, in principle, to open their environmental program to foreign producers but would require conditions that few other countries could meet; namely, year-round supply of flowers produced with environmentally friendly methods on a substantial scale.

Since less energy is required to produce flowers in Africa (since little or no heating is required), growing conditions there are actually more amenable to environmentally friendly production than in Holland. However, African growers tend to use more pesticides and somewhat more fertilizers than Dutch growers and considerable energy is required to transport African flowers to the European market. A leading Dutch research institute calculates that the same amount of energy is needed to produce a rose in Holland as to fly a rose from East Africa to Holland.

Until now, environmental concerns have not been an issue in the development of cut flower exports from Southern Africa and growers in that region have shown little interest in the environmental programs begun in Holland and Colombia. As the industry grows, however, it will become increasingly important to follow these international developments in order to not be taken by suprise by future changes in the environmental requirements of supplying overseas markets. The experience of other countries shows that meeting environmental standards is not a simple matter and cannot be attained in a short period of time; it requires years of planning, research, and investment.

Conclusions

In conclusion, this report addresses two questions: (1) Can the case of floriculture in Southern Africa serve as a model for others to emulate? and (2) What possible role can international development agencies, local governments and the private sector play in furthering the development of floriculture in Southern Africa? A number of possible initiatives are suggested for each, though this list is by no means exhaustive.

Can Floriculture in Southern Africa Be a Model for Others?

There are a number of reasons why the development of floriculture exports from Southern Africa could and could not serve as a model for other agricultural sectors. First, we will briefly examine the set of factors which were key determinants of the successful development of floriculture, which would necessarily be part of any subsequent attempt to duplicate this success.

Key Determinants of Success in Southern Africa

The successful development of floriculture in Southern Africa was made possible by a set of factors which provided *an attractive initial opportunity and an enabling environment that allowed interested parties to pursue it.* More specifically, these factors included: a positive, long-term market opportunity, without which all the subsequent development would not have been possible or profitable; a sufficiently large number of suitably qualified entrepreneurs who were willing to take a chance on a new and unproven industry; a minimum level of necessary infrastructure for growing flowers and implementing exports; catalysts to stimulate the actual take-off of the industry; and relatively noninterventionist government policies which allowed the whole process to unfold in response to market signals.

The specific government policies which played a key role in facilitating the development of floriculture exports are more a list of what governments did *not* do, rather than specific things they did do. In particular, governments in the region did not intervene directly in the marketing of cut flowers. Instead, governments allowed the formation of bottom-up sector institutions which were initiated, operated, and supported by growers. Governments generally did not distort the market price signals that informed growers which crops to grow and which qualities were needed to compete in the world market. In turn, this allowed entrepreneurs to make more efficient investment decisions in response to real market opportunities, in contrast to non-market based government programs and incentives. Finally, governments allowed the entry and operation of key foreign intermediary firms ("honeybees") which moved freely within countries and around the region, disseminating vital knowledge and information and establishing intra-regional channels of communication and cooperation.

Together, these factors constituted a package of essential ingredients which would have to be recreated in some form for other sectors to duplicate the success of floriculture. However, it must be emphasized that many of these key factors are *not* under the control of parties in the region: The basic market opportunity, the willingness of "honeybee" firms to come to the region, and the emergence of some set of catalysts (which, ironically, in the case of floriculture emerged from a set of otherwise restrictive government policies) may or may not be present. If they are absent, then all the best efforts of local parties to launch a new industry may not lead to success. Therefore, before becoming overly optimistic and investing efforts and money in a potentially unproductive direction, careful analysis is needed to determine if all the necessary factors are in place and, if they are not, what could be done to establish them.

A Model for Other Agriculture Sectors in Southern Africa?

It appears that the successful development of floriculture exports in Southern Africa may be somewhat limited in its scope for application to other agricultural sectors in the region. As stated earlier, the "supercatalyst" driving the takeoff of the cut flower sector was a unique market opportunity, the likes of which do not exist for many other crops. Even other horticultural crops with multi-billion dollar export markets did not exhibit the kind of continuous double-digit annual growth over the previous 25 years that floriculture offered in the mid-1980's. Furthermore, floriculture is a very specialized agro-*industry* which is capital- and knowledge-intensive and, in many respects, more similar to an industrial sector than an agricultural sector. Basically, floriculture was a non-traditional and nonessential sector when it began, for which few preexisting government policies specifically applied. In other words, floriculture had the opportunity to make a fresh start with a clean slate. In contrast, more established commodity sectors with long histories of government intervention and market distortion would require governments to dismantle many existing commodity policies in order to even partially duplicate the noninterventionist policy environment which benefitted floriculture. This development would seem unlikely.

Therefore, the possibility of other agricultural sectors in Southern Africa copying the success of floriculture exports *will most likely be limited to other specialized commodity sectors possessing similar characteristics to floriculture.* These would include *non-traditional crops* from outside the region that could make a fresh start, such as medicinal plants, certain spices, essential oils, and other 'minor' industrial crops. These and other candidate commodities would be characterized as *low-volume/high-value crops* in which varietal selections and quality are important to success. Such products would need to be attractive to "honeybee" firms, who would come from abroad and shorten the 'learning curve,' as well as to overseas buyers.

Putting the Economic Impact of Floriculture in Perspective

Finally, while the surprising success of cut flower exports from a region that is not generally viewed as likely to succeed in this type of industry has received a great deal of favorable publicity, it would be useful to view this development in some sort of perspective. Though the gross (c.i.f.) sales presented in the introductory section of this report seem impressive, we can take a brief look at Zambia, the region's second leading cut flower exporter, as an example of the direct economic impact of floriculture in a developing Southern African country. After a full decade since the first Zambian floriculture project, in the 1994/95 season there were still only 11 commercial growers cultivating 30 hectares of greenhouse roses and about 100 hectares of open-field summer flowers. All together, these generated about US$5.61 million in exports. Even at this admirable level, floriculture accounted for less than 1% of Zambia's exports and only 6% of Zambia's "non-traditional" exports in 1994. So far, floriculture has provided about 1,100 jobs, though employment is expected to grow as the production area expands. Since a number of new projects are now being established in Zambia, perhaps these modest figures reflect the relatively immature present stage of development of Zambia's floriculture industry. Even if floriculture exports in a country like Zambia were to double or triple in the next few years, the direct economic impact in terms of production value and employment generation would remain relatively limited. On the other hand, the establishment of any new export *industry* that created 1,100 jobs and earned nearly US$6 million in foreign currency would be a most welcome economic development in any country in the region. Furthermore, managers and workers in floriculture receive valuable on-the-job training in a successful, sophisticated, and extremely dynamic industry.

As a floriculture industry matures and reaches a certain critical size, e.g., in Zimbabwe, a multiplier effect leads to a much greater overall economic impact. Zimbabwe's floriculture exports had direct earnings of over US$41 million in 1994/95 and generated approximately 10,000 production jobs. This level of exports represents about 3% of Zimbabwe's total exports and exceeds the value of manufactured exports of important industries such as chemicals, metal products, and iron and steel. In addition, floriculture has had an even broader impact on Zimbabwe's economic development than these figures would indicate, due to business generated for local input suppliers (e.g., of greenhouses, chemicals, plant material, technical advice, etc.) and the high proportion of local value-added in these exports. Though most countries in the region do not appear to have the potential to develop floriculture exports on the scale of Zimbabwe, the Zimbabwean experience shows how floriculture can contribute to broader economic development.

Agenda of Possible Initiatives

The following is a short inventory of possible initiatives to further advance floriculture exports from Southern Africa. These actions could be undertaken by various parties with a stake in the economic development of the region. There is necessarily some overlap among these proposals, and many of the suggested initiatives may be actionable by more than one party. Despite the considerable success to date, much work remains to be done if the sector is to maintain its share of the market and approach its full potential.

Role for the Floriculture Industry

Floriculture industry institutions must play a leading role in *fostering a cooperative spirit among growers* within their national industries, beginning with the *encouragement of increased flows of information*. These institutions need to take advantage of their access to the large pool of market information and production experience of their member growers by collecting as much information as possible on their own industry. In order to convince their members that sharing such information would be worthwhile, *sector institutions need to transform the raw data into useful information, combine it with market analyses, and disseminate it to all parties in a timely manner.*

Of course, in order to gain the trust and cooperation of member growers in this enterprise, they must demonstrate their ability to safeguard the confidentiality of proprietary information and to act as an impartial agent working on behalf of the entire industry. Each country in the region would first need to possess some sort of information capability before there could be a meaningful *exchange of information* between countries in the region. Such intra-regional efforts could be stimulated by establishing *a regional information center for floriculture*. A center of this type could produce a regional floriculture publication, conduct production and marketing seminars, and offer a series of short-courses to improve the knowledge level of both new and existing participants in the industry. The keys to winning acceptance for such an initiative from member growers would be to create truly useful information, maximize members' access to such information, monitor members' satisfaction with the program, and continuously improve the system in order to better serve the industry. These types of steps should promote greater openness among industry members in the future which, in turn, will further enhance the success of the program.

Role for Governments

Besides a general policy of non-intervention in the affairs of the floriculture sector, governments in the region can act to *create the necessary pre-conditions for the general development of the industry, or improve them* if they already exist in some form. Such actions could take the form of general *infrastructure improvements, especially of the telecommunications system.*

Governments can also work toward *enhancing the enabling environment* for the floriculture industry, knowing that other sectors would also benefit from such policies. The *support of general economic growth* will increase southbound airfreight, providing more needed return capacity in the northbound direction. Governments could also take more direct steps to *ensure that competition exists between air carriers*, which should result in lower freight rates and improved service for growers.

Role for Development Institutions

Possible roles for development institutions in facilitating the further development of floriculture in Southern Africa include working with governments and industry institutions in the region to *encourage greater openness and cooperation* both within each country and between countries. These institutions can greatly assist in *promoting the flow of information* about the floriculture industry between parties in each country and throughout the region. They can also *encourage all parties to view the industry from a more regional perspective.* Such activities can serve to *strengthen linkages* within the region and to forge new ones. An example of an area for regional cooperation which can be promoted by development institutions is the initial mobilization and coordination of efforts to deal with the types of *environmental issues* discused in Box 4. This effort could take the form of sponsoring an environmental impact study for floriculture in the region. Such a step could place this important issue on the industry agenda and establish a baseline for measuring the effectiveness of future environmental actions.

Another region-wide constraint which could be addressed by development institutions is the lack of knowledge about the floriculture industry among bankers and other officials overseeing the financing of new investments. Development institutions could take the lead in organizing a seminar to *educate the region's bankers about the financial requirements and commercial potential of floriculture and other non-traditional export sectors* so that loan approval decisions could be expedited and made on a more informed basis. Such action would assist qualified loan applicants in obtaining urgently needed financing and also force future applicants to provide more realistic figures and projections in their applications.

Development institutions can also play a role in addressing country-specific constraints. They can *encourage the continuation of non-intervention by governments in the floriculture sector, promote the removal of existing country-specific constraints, and support general improvements in each country's infrastructure, freight policies, and arrangements for financing new floriculture investments*. Finally, development institutions can remind all parties that the *timing* of assistance to the floriculture sector is critical in achieving maximum impact, i.e., policies will have a greater chance for impact once the necessary pre-conditions exist and the industry is operational on at least a small scale. If policies attempt to push the development of floriculture before reaching that point, money and effort will likely be wasted. If conditions are not yet ready, parties should first work on creating them, or on analyzing why they do not yet exist.

Appendix: Selected References on Floriculture Marketing

Descriptions and analyses of markets for floriculture products:

Haak, M., H. Tap, and A.M. Heybroek (1992), *A View of International Competitiveness in the Floristry Industry*, Utrecht, The Netherlands: Rabobank Nederland, International Agribusiness Research.

International Trade Centre UNCTAD/GATT (1987), *Floricultural Products: A Study of Major Markets,* Geneva, Switzerland: ITC UNCTAD/GATT.

JETRO (Japan External Trade Resources Organization) (1992), "The Japanese Market for Cut Flowers," *Tradescope*, (April) 7-18.

Malter, Alan J. (1994), *Zimbabwe's Cut Flower Industry: Developments and Future Prospects*, The World Bank.

Malter, Alan J. (1995), "Annex: Marketing and Distribution of Protected Crops," in *Protected Agriculture: A Global Review*, Merle H. Jensen and Alan J. Malter, World Bank Technical Paper Number 253, Washington, D.C.: The World Bank, 127-154.

Malter, A.J. (1995), "The Economic Importance of Ornamentals," in *Virus and Virus-like Diseases of Bulb and Flower Crops*, (eds.) Gad Loebenstein, Roger H. Lawson, and Alan A. Brunt, Chichester, U.K.: John Wiley & Sons, 1-13.

Pertwee, Jeremy (1995), *The Production and Marketing of Roses 1995*, Frinton-on-Sea, U.K.: Pathfast Publishing.

Smith, J. (1993), *The Changing Floriculture Industry: A Statistical Overview by the Society of American Florists Statistics Committee.* Society of American Florists.

U.S. International Trade Commission (1994), *Industry & Trade Summary: Cut Flowers*, USITC Publication 2737, Washington, D.C.: USITC Office of Industries.

Sources of statistics on markets for floriculture products:

AIPH (International Association of Horticultural Producers) (1994), *Yearbook of the International Horticultural Statistics*, Institut fur Gartenbauokonomie der Universitat Hannover (Germany). Published annually, available through national member associations.

Flower Council of Holland (1995), "Facts and Figures About the Dutch Horticultural Industry 1994," Leiden, The Netherlands.

Johnson, Doyle C. (1990), *Floriculture and Environmental Horticultural Products: A Production and Marketing Statistical Review, 1960-1988*, Statistical Bulletin Number 817, Washington, D.C.: USDA Economic Research Service.

Johnson, Doyle C. (1993), "Financial Performance Trends and Economic Outlook for the U.S. Greenhouse, Turfgrass and Nursery Industries," *Agricultural Outlook '94: Conference Proceedings*, Washington, D.C.: USDA.

Market News Service (1996), "Cut Flowers: European Markets," International Trade Centre UNCTAD/WTO, Division of Product and Market Development, Geneva, Switzerland. Published weekly.

PVS (Commodity Board for Ornamental Horticultural Products) (1993) *Tuinbouw Statistiek 1992: Teelt, Handel, Industrie*, The Hague, The Netherlands.

PVS (Commodity Board for Ornamental Horticultural Products) (1992) *Jaarverslag*, The Hague, The Netherlands. Published annually.

USDA (1995), "Federal-State Market News: Ornamental Crops National Market Trends," San Francisco, CA: USDA Agricultural Marketing Service. Published bi-weekly.

USDA (1995), *Floriculture Crops*, Washington, D.C.: USDA National Agricultural Statistics Service/Agricultural Statistics Board. Published annually.

VBN (Association of Dutch Flower Auctions) (1995), *Statistiekboek*, Leiden, The Netherlands: VBN. Published annually.

English-language periodicals with coverage of floriculture markets:

Floriculture International, Batavia, Illinois, USA: International Horticulture Publications. Published monthly.

Grower Talks, Batavia, Illinois, USA: Ball Publishing. Published 14 times per year.

The International Floriculture Quarterly Report, Frinton-on-Sea, U.K.: Pathfast Publishing. Published four times per year.

Summer Citrus: The Role and Prospects for Southern Africa

Grahame Dixie

Southern Africa is a major force in the international trade of fresh fruit. The region supplies deciduous, citrus and sub-tropical fruit on a counter-seasonal basis to the northern hemisphere, especially to the markets of Western Europe and the Middle East. The region has proven itself to be a competitive, well-organized and innovative player in the horticultural trade over a number of years. The focus of this study is on the fresh citrus export systems of Southern Africa. The analysis centers on the citrus subsectors of South Africa, Zimbabwe, Swaziland and Mozambique, and the interlinkages among them through technology dissemination, logistics, and marketing.

As a region, Southern Africa is the world's leading, and indeed dominant, supplier of counter-season fresh citrus. The volume of the region's citrus exports is expected to at least double over the next decade as a result of recent new plantings. While these exports are currently dominated by South Africa, the relative importance of some of the other regional suppliers, especially Zimbabwe, will increase. Based on its projected growth, the citrus subsector will become an increasingly important source of foreign exchange and employment. This subsector will also be one in which an exceptional degree of intra-regional collaboration is likely to take place. Such collaboration has already begun in earnest, through the provision of technical and managerial advice by *Outspan* to growers in other countries, and through joint marketing and investments in infrastructure. The experience of intra-regional collaboration in this sub-sector may offer lessons and insights for other agribusiness sub-sectors.

This study is comprised of three sections. The first section provides an overview of the international market for citrus fruits, highlighting the niche in global citrus trade occupied by Southern Africa. This section also highlights the differences and changes in consumer demand, describes the impact of new distribution channels and retailing, summarizes relevant recent international trade legislation, and denotes several critical factors that affect profitability in this trade.

The subsequent section focuses on the Southern African citrus subsector. It provides a brief review of historical developments and then highlights major features of the structure of production, R&D, and marketing on a regional and individual country basis. Of the four countries covered, relatively greater attention is given to the South African citrus subsector, given its dominance in the region.[1] As the fresh export trade is the dominant source of revenue for the subsector, primary attention is given to this dimension. The final section summarizes the strengths, weaknesses, and opportunities of the regional industry and provides recommendations for achieving its full potential for growth and development impact.

The International Market for Citrus Fruits

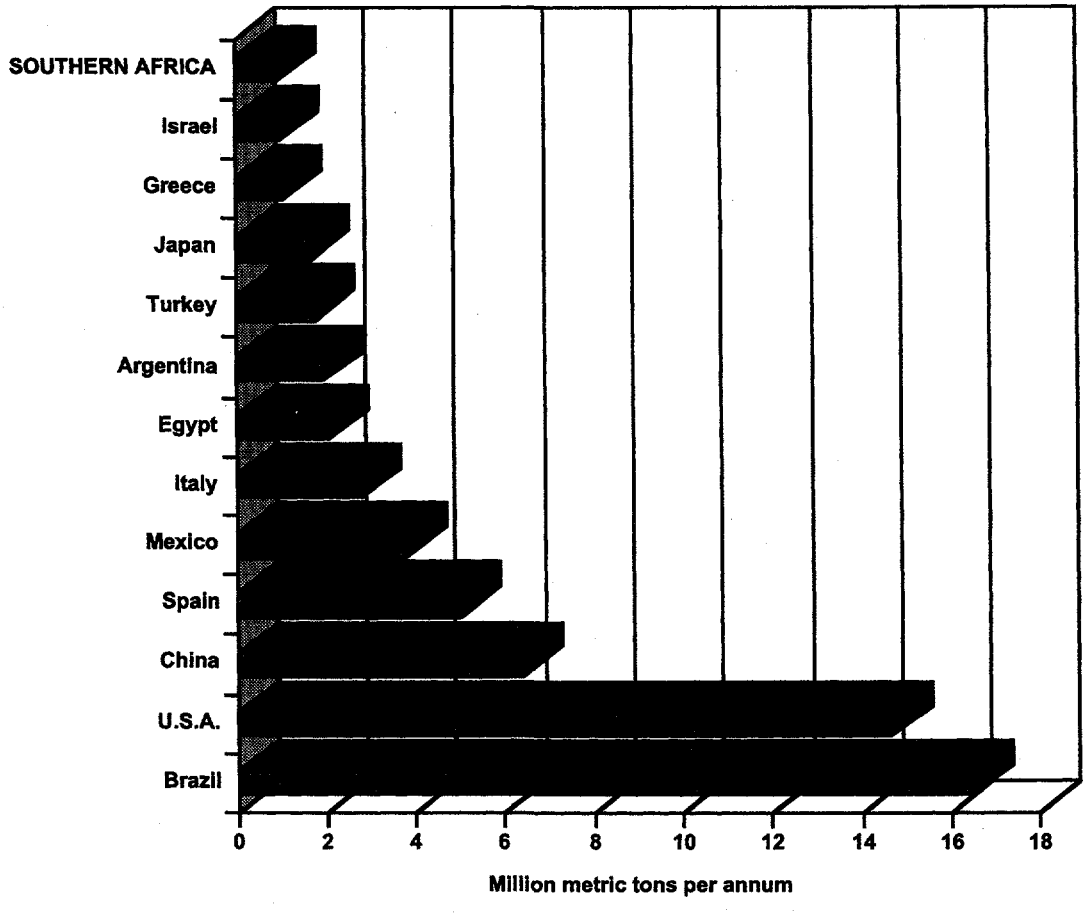
Production and Utilization

World production of citrus fruit totals some 60 million tons. Brazil and the United States are the leading producers, accounting, respectively, for 16.4 and 14.6 million tons. Spain and

[1] The citrus subsectors of Malawi and Zambia were not included in this study, as their production is relatively small, of comparatively low quality, and not traded internationally.

China are the next largest producers at about 5-6 million tons each. Southern Africa as a region produces some 950,000 tons, accounting for only 1.5% of the world citrus crop (Figure 1). Countries in the Northern Hemisphere account for two-thirds of global production; the remaining one-third being accounted for by a small number of Southern Hemispheric countries.

Figure 1: Leading World Citrus Producers, 1994

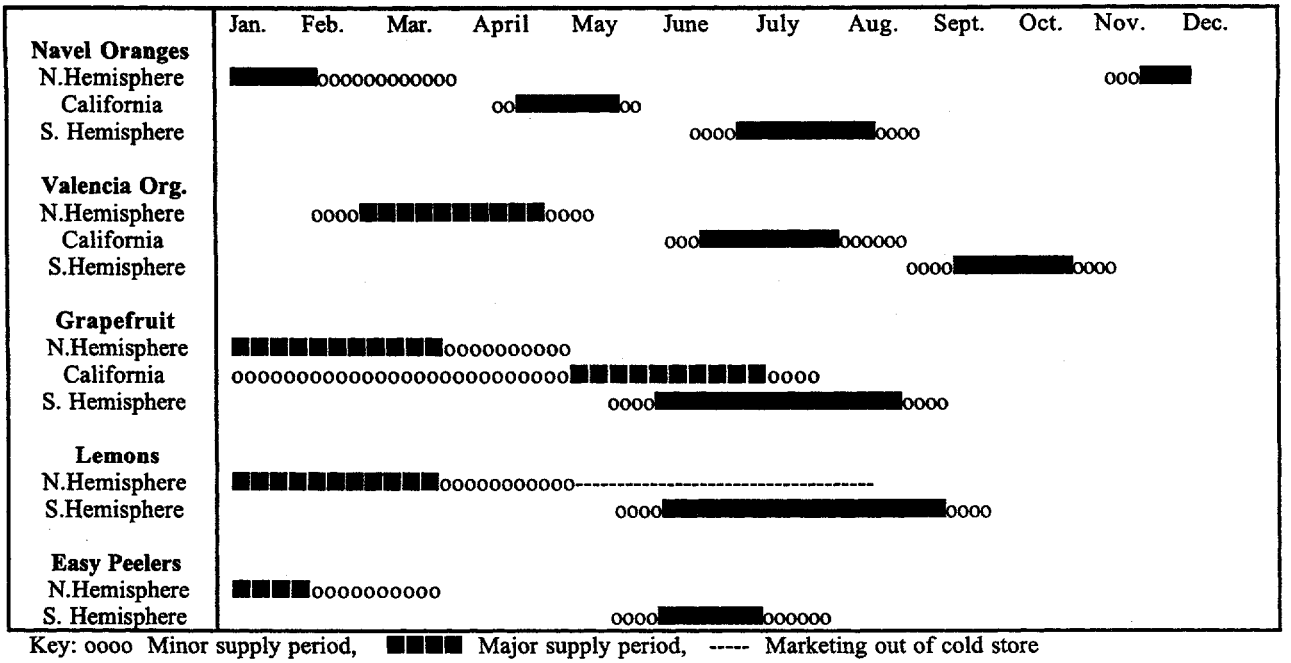


Source: World Horticultural Trade & US Export Opportunities, July 1995

The harvests of different varieties of citrus fruit is highly season. Citrus is typically a winter crop. In the Northern Hemisphere the harvesting season normally extends from about October to April.[2] In contrast, the main period of citrus harvesting in the Southern Hemisphere is from June to October. The seasonality of supply is illustrated in the diagram below.

[2] Although in California the fruit can be held on the tree for harvesting during the summer.

Figure 2: Typical Supply Patterns for Citrus Products



Key: oooo Minor supply period, ■■■■ Major supply period, ----- Marketing out of cold store

On a global basis, the bulk of citrus production is used for processing (40%) or is consumed fresh in the producing country (49%). Exports of fresh fruit account for only around 11% of global production. There are, of course, variations in these patterns. Table 1 compares the utilization patterns among major Southern Hemisphere producers, with all of Southern Africa clustered together. While Brazil and Australia process the majority of production, and the largest quantities of fruit are consumed fresh in Argentina and Uruguay, more than half of Southern African production is exported as fresh fruit.

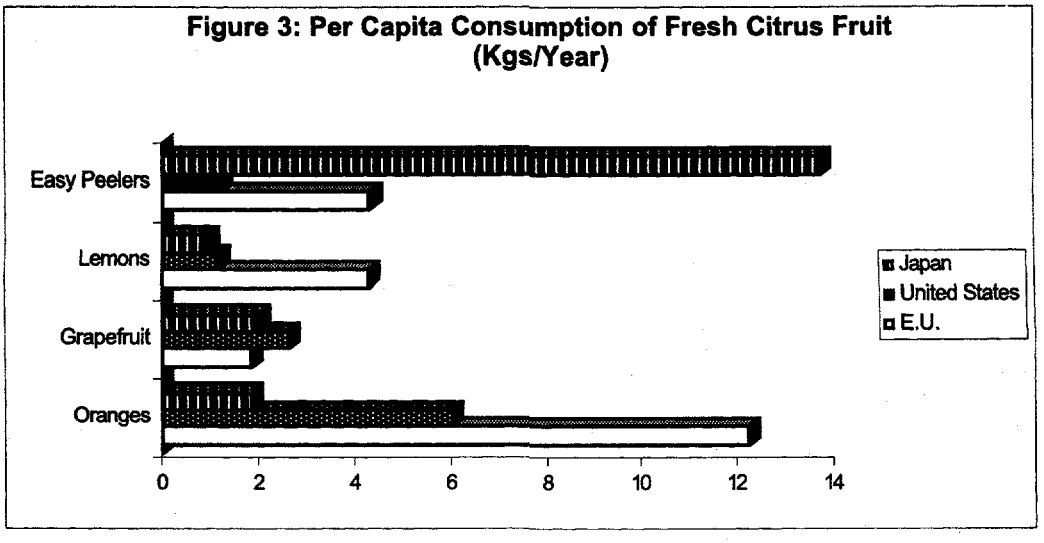
Table 1: Utilization of Citrus Fruit Among Major Southern Hemisphere Producers (1991-95 Average)

Country/Region	Total Production (000 MT)	Processing (percent)	Local Fresh Market (percent)	Export Fresh Market (percent)
Brazil	15,808	68	31	1
Argentina	1,834	37	51	12
Southern Africa	942	24	20	56
Australia	606	57	28	15
Uruguay	259	17	49	34

Source: Data from World Horticultural Trade and U.S. Export Opportunities, July 1995

The International Citrus Market

Figure 3 below emphasizes the variation in fresh citrus consumption between markets and products. The European Union countries have the highest per capita consumption of oranges and lemons, the United States for grapefruit, and Japan for the so-called 'easy peeling' citrus (e.g. tangerines, manderin oranges).



Source: Author's calculations based on FAO data

The most important import market for fresh citrus fruit is Europe, and specifically northwest Europe (Table 2). In the early 1990s, Europe accounted for some 70% of global imports, with only two countries--Germany and France--accounting for nearly one-third of world imports. Next in importance is Asia. After experiencing a boom in demand and imports during the 1970s, the Middle Eastern market has largely been stagnant, while imports into Japan have also levelled off. The fastest growing markets have been those in Eastern Europe and South East Asia, albeit from a small base.

The most important fresh citrus product traded internationally is **oranges**, amounting to four million tons or 53% of all citrus exports. The two most important product groups are the Navel and Valencia oranges. Navels are generally considered premium eating oranges. While Valencias are grown primarily as an industrial raw material, because of their later harvesting season they are also exported as a fresh fruit. The demand for oranges in the major markets of Western Europe, North America and Japan has been static as consumers have shown preference for more convenient orange products such as juice or easy-peeling citrus. Eastern Europe has experienced a 20% per annum growth in imports in recent years, and now imports over 800,000 tons of oranges, largely from Mediterranean producers. The Middle East orange market is broadly static at approximately 420,000 tons, of which about one-third is supplied during the counter season, primarily from Southern Africa. Further growth is expected in South East Asian markets such as Hong Kong, Singapore, Indonesia and possibly, in the longer term, South Korea and China. The United States is self- sufficient in oranges, while Canada and Japan are primarily supplied from the USA. The northwestern European market imports oranges mainly from the Mediterranean region, primarily Spain, and from the southern hemisphere during the counter season. Southern Europe is self sufficient in oranges during the winter and imports insignificant volumes during the off season.

Table 2: Imports of Fresh Citrus Fruit in the Early 1990s
(000 Mt)

Country/Region	Oranges*	Grapefruit	Lemon	Total
Germany	1037	586	664	1261
France	883	87	137	1164
United Kingdom	527	90	60	677
Netherlands	527	73	46	646
Other Europe				
Total Europe	**4203**	**586**	**664**	**5453**
Japan	133	221	95	449
Saudi Arabia	238		46	284
Other Asia	370	40	44	454
Total Asia	**913**	**260**	**186**	**1359**
North + Central America	**324**	**81**	**114**	**519**
Africa	**27**			**27**
Other Countries	240	88	40	368
Total	**5707**	**1015**	**1005**	**7731**

*Includes easy peeling citrus.
Source: FAO Trade Data

The world trade in fresh **grapefruit** amounts to 1 million tons per year. The hot humid-agro-climatic requirements of the crop preclude high quality production on the European mainland and in Japan. Both markets are largely reliant on imports. The USA is the world's largest grower and exporter of grapefruit and can market the product throughout the year. The major cultivar is the white Marsh Seedless grapefruit. Recently demand and supply has expanded for the pigmented grapefruits, because of their attractive appearance and less bitter taste. Demand is highly variable between individual markets.

The European Union is the major import market for grapefruit. During the counter season, imports stand at about one-third those of the Northern hemisphere supply period. Demand has been depressed, particularly for the white Marsh seedless variety. The major suppliers are the United States, Israel and Cyprus from the northern hemisphere, and South Africa, Argentina and Swaziland during the counter season. The Japanese market currently imports around 240,000 tons of grapefruits, almost entirely from the US, but this has been declining at a rate of 3% per annum. Demand is expanding for pigmented varieties of grapefruit. Up until the late 1980s, Eastern Europe (particularly Poland) and Russia were major markets for grapefruit, importing some 170,000 tons per annum. While demand has been down in recent years, it is expected to be revitalize. Conversely, there is little demand for grapefruit in much of the Middle East.

The world trade in **lemons** also amounts to approximately 1 million tons, of which two-thirds is imported into western and eastern Europe. Lemons can be marketed out of cold store so Northern hemisphere supplies can be marketed (almost) throughout the year. Southern hemisphere supplies, however, do have quality advantages during the counter season. The major Southern hemisphere suppliers are Argentina, South Africa and Uruguay. In recent years, there has been a small increase in EU demand. There is a strong and unsatisfied demand for lemons in Eastern Europe with imports currently standing at 170,000 tons. The Japanese lemon market is dependent on imports, of which 85% are sourced from the USA, but this market has declined by nearly 15% per annum from 1989 to 1993. Demand and prices are highest in July and August, which would be the peak supply period from Southern Africa.

Easy-peeling citrus is the most important citrus import product in Japan, and the fastest growing citrus production sector in Europe. In Europe, total supply has increased by 4% per annum in recent years, and unit prices are nearly twice those of oranges. Three broad categories are distinguished, Satsumas, Clementines, and Mandarins (which are considered as low-volume luxury products). Supply is almost exclusively from northern hemisphere suppliers, particularly Spain and Morocco from October to late March. There is currently a strong market opportunity for Southern hemisphere suppliers such as South Africa, Uruguay and Argentina to deliver easy-peeling citrus from March through to September.

Canada is the largest North American market for easy peelers imported from Morocco and South Africa. Seedless, easy-peeling citrus is not yet a distinct and appreciated product in the USA. Japan produces Satsumas from October to January, and preliminary market research suggests that counter-season supply from the southern hemisphere would be well-received provided the strict phytosanitary standards can be met. Monthly supply of easy peelers during the counter season amounts to only 2% of that during the main season. There are a number of reasons why the southern hemisphere has reacted slowly to this opportunity: easy-peeling citrus fruit is more difficult to grow and transport. There has been a significant time lag between market identification, the development of appropriate production techniques, and commercial plantings reaching maturity.

Table 3 illustrates the large differences in European imports of fresh citrus between the main October-April season and the remaining 'counter-season'. For Europe as a whole, counter season imports as a proportion of main season imports are only 13% for oranges, 33% for grapefruit, and 2% for easy peelers.

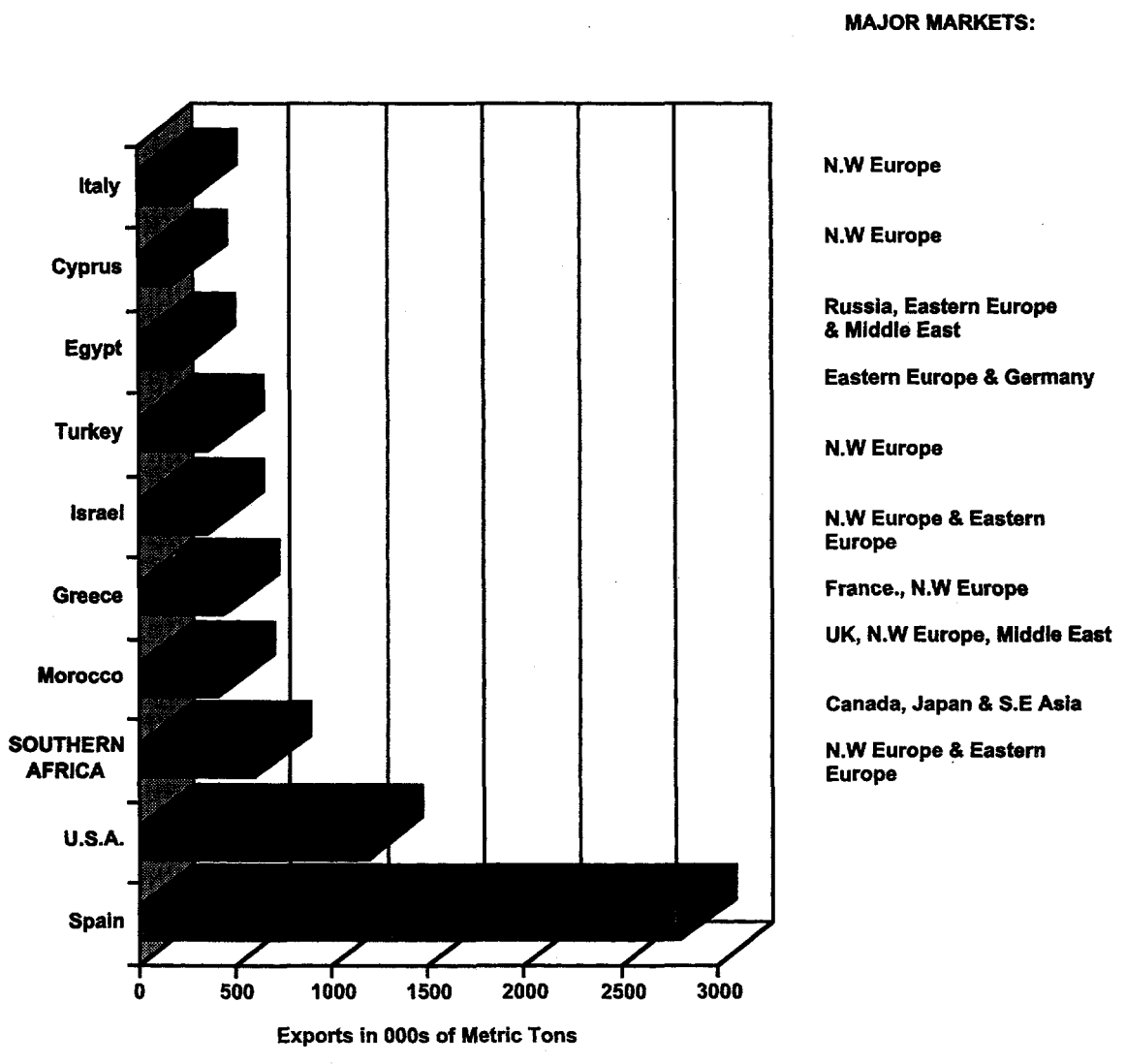
Table 3: Main and Counter-season Supply of Citrus in Europe

	Main Season		Counter-season	
	(000 mt)	(kg/per capita)	(000 mt)	(kg/per capita)
Oranges				
Northern Europe	1450	5.8kg	450	2kg
Southern Europe	2750	23kg	30	0.25kg
Grapefruits				
Northern Europe	385	1.75kg	85	0.38kg
Southern Europe	43	0.28kg	17	0.14kg
Easy-peeling citrus				
Northern Europe	880	3.5kg	40	0.18kg
Southern Europe	660	5.5kg	-	-

Note: Main season is 7 months, counter season is 5 months for oranges/grapefruits, and 6 months for easy peelers.
Source: Author's calculations based on FAO and Eurostat data

The leading exporters of fresh citrus are depicted in Figure 4. Spain is by far the largest exporter at nearly 2.4 million tons, followed by the United States at 1.1 million tons. Spain exports predominantly to the markets of northwest Europe, while U.S. exports are directed largely to Canada, Japan and South East Asia. Despite its relatively small share of total world production (i.e. 1.5%), Southern Africa is the third most important exporter. With exports of some 600,000 tons, Southern Africa accounts for about 7% of world exports with the bulk of sales to northwest Europe and the Middle East. Countries in the Northern Hemisphere account for some 86% of total fresh citrus exports. Southern Africa accounts for some 60% of the exports from the Southern Hemisphere.

Figure 4: World Citrus Exports by Country



Source: World Horticultural Trade & US Export Opportunities, July 1995

Distribution Channels for Imported Fresh Citrus Products

The distribution channels in Europe have radically changed in the last two decades and further changes can be expected. Traditionally, imported fruit was distributed via wholesale markets, with onward distribution, often through distributive wholesalers, to numerous, small, independent, specialist retailers or greengrocers. The process sometimes involved six changes of ownership. In the last twenty years, the roles of wholesale markets and independent retailers have declined, with large supermarket chains purchasing directly from the importer, and retailing directly to the consumer. This distribution system is dominated by a relatively small number of major supermarket chains. Some supermarket chains will attempt to take

even greater control over the marketing chain and aim to source product directly from exporters and, ultimately, from growers using their own brand labeling and packaging.

In **Europe,** the power of the supermarket chains is enormous (more so in northern Europe, less so in southern Europe) and accounts for 55% of all fresh produce sold. The figure is even higher for more expensive products such as counter-season fruit. The consolidation of supply into the hands of fewer exporters, importers, and retail groups is universal across Europe. The chains are demanding competitively priced products in order to maintain profits and share values. Margins for fresh fruit are normally around 35%, but can be in the range of 15% to 50%. Produce must be of consistently high quality, be safe, and be supplied with continuity.

The domination of supermarkets will increase throughout Europe and is set to grow fastest in the Mediterranean, where fresh produce consumption levels are much higher than in Northern Europe. Rapid growth is expected in the discount sector: supermarket chains who purchase a limited range of products in bulk and sell for low prices with margins of around 15%. Most citrus products are likely to be included in their fruit range. In addition, the food service and multiple catering sector in Europe is expected to expand, as it now accounts for approximately 10% of fresh produce sales, as compared with 25% in North America. This will have a particularly positive impact on bulk prepared and minimally processed products. Within Eastern Europe, new distribution systems and import companies are rapidly developing, often through investment from Western European companies.

The **Middle East** market is dominated by a few major importers in Saudi Arabia, and a number of medium-size companies in the UAE and Kuwait. The product then follows a relatively complex system of wholesale markets, auctions and distributive wholesalers with most product still being sold by stalls at open markets, and by semi-wholesalers (who sell produce by the carton to large households). The produce distribution systems in the newer markets of **South East Asia** are similar to the Middle East with increasingly sophisticated importers distributing produce to the traditional shops.

The food distribution system in **Japan** consists at present of a large number of small distributors supplying a greater number of even smaller food outlets. It is a complicated and, in many ways, outdated system and often depends on the traditional practices of *keiretsuka,* or tied relationships between wholesalers, retailers and distributors. The traditional route for large volume imported fruit is via the trading houses, or *sogo shoshas*. The situation is changing. Deregulation of the Large Scale Retail Store Law will benefit the supermarket sector. The food service sector has grown enormously, and is currently looking to source produce direct from overseas suppliers.

International Trade Legislation

Under the Lome convention, ACP countries such as Zimbabwe, Swaziland and Mozambique have duty-free access for citrus products into the EU, at least up until the end of the current agreement in 2000. For imports from other countries, including South Africa, the European Union has in place an *ad valorum* system of tariffs, designed to offer protection to the European growers during their marketing season. An *ad valorum* tariff on imported oranges is 20% from mid-October until March, yet this falls during the counter season to 4% from mid-May until mid-October. The tariff on grapefruit and lemons is held constant throughout the year at 3% and 8% respectively, reflecting the absence of a European grapefruit industry in the case of the former, and the scale of lemon production in Europe and its year-round supply pattern. The tariffs charged on easy-peeling citrus are constant at 20%

throughout the year, despite the fact that there is no European easy peeling product on the market from April through October.

Under the Uruguay Round of the General Agreement on Tariffs and Trade (GATT), these *ad valorum* tariffs will be reduced by 20% over the next six years. The new rules also allow the EU to apply a minimum import price system (known as minimum entry prices, or EP) for specific products at particular times of the year. If the import prices of a particular consignment is below the EP, then a countervailing charge will be levied, called the Maximum Tariff Equivalent (MTE). These are sufficiently high to make the venture unprofitable for exporting any but the highest quality products. The level of entry price for some products has been set high above typical wholesale prices, and threatens the development of a number of markets, including the market for freshly squeezed orange juice.

Phytosanitary regulations have also been effective barriers to horticultural trade. Typically they have been deceptive and hard to challenge. The final act of the Uruguay Round of GATT included an important new agreement on sanitary and phytosanitary measures (SPS) which aims to check their unjustified use for trade protection. The SPS agreement maintains the sovereign right to provide for an appropriate level of health protection but aims to ensure that these rights are not misused and do not result in unnecessary barriers to trade. The aim of the SPS agreement is to increase transparency, reduce arbitrariness, harmonize international standards and prevent unjustified discrimination. If disputes cannot be settled bilaterally, using the GATT agreement as a framework, then the dispute can be taken to a World Trade Organization panel.

Already the legislation is proving beneficial. Both South Korea and Japan previously insisted on stationary cold sterilization for fruit fly control even though this process could be equally well accomplished in transit on a refrigerated vessel. Now the Japanese are accepting in transit sterilization, provided strict protocols are observed by the exporter. Southern Europe and in particular Spain, Italy and Greece previously would not allow citrus imports, with the exception of grapefruit, for fear of spreading the fruit fly. Now that Spain is allowing citrus imports, it is likely that Italy and Greece will soon follow suit.

The Southern Africa Citrus Sector

History

South Africa

The first citrus tree was introduced from St. Helena to Western Cape as early as the 1650s, about 100 years before the earliest plantings in California. Commercial volumes were exported to the UK via refrigerated vessels from the 1920's. Exports were carried out independently with fragmented supply and primitive marketing. The South Africa Cooperative Citrus Exchange, better known as the Citrus Exchange, or SACCE, was established by citrus growers in 1926, along with the Perishable Produce Export Control Board (PPECB), in order to control the export of perishable products from South Africa. Membership of this cooperative was voluntary and the organization was owned, directed and funded by growers. Initially the primary objective of the Citrus exchange was to help coordinate marketing and achieve economies of scale through collective buying. At the start of the Second World War, shipping space was severely restricted, and government intervention was necessary to fairly allocate cargo space to citrus exports. The South African Citrus Board was established in 1940 to enforce single-channel marketing, and the Citrus Exchange was appointed by the Board as the sole export sales agency for citrus.

After the war, the citrus export industry prospered with strong demand and high prices. Individual growers responded by increasing planted areas, ultimately resulting in over-supply in the early 1960s. Fruit continued to be marketed exclusively to the United Kingdom. The Citrus Exchange's primary role continued to be control over logistics. No long term planning or promotion was carried out. Fruit was still marketed under the individual exporters' own brands, and they would select their own importers and agents. All forty exporters were represented on the Board and decision making was slow and complex. In 1960, export volumes doubled, glutting the UK market. Prices tumbled and growers had to pay into the Citrus Exchange to cover expenses.

In response to this situation, a team of consultants recommended that the industry strive for much greater control over production, marketing and forward planning. An Executive Committee was formed with 14 members to meet monthly to facilitate management decision making. Offices were opened on continental Europe with the specific objective of opening new markets. The Chief Overseas Executive recommended that the Citrus Exchange develop a brand name. '*Outspan*' was chosen and registered. A dual system was operated for a few years, whereby the exporter could market under his own brand or use the *Outspan* name for premium product. The decision was taken in 1966 that all South African citrus exports would be marketed under the *Outspan* brand name with uniform standards and packaging.

As the citrus industry began to prosper, and new markets in Europe developed, new planting was begun. The Citrus Exchange took on a more strategic view of the industry, monitored planting programs and was able to anticipate the next surge in supply in the early 1970s. Forewarned, the Citrus Exchange decided to expand into the Middle East market and the additional volumes were absorbed without negative impact on grower returns.

In the late 1980s, South America began to export larger volumes of counter-season fruit, creating additional competition on the European market. From 1986 until 1990, protectionary measures increased in these markets, as did the deleterious impact of international sanctions against South Africa. The Citrus Exchange reacted by developing alternative distribution systems, improving quality and taking a more critical view of its organization and strategic future. The industry became more cohesive and cooperative-minded. In practice, all the fruit delivered was sold, albeit by more expensive and circuitous routes. Individual branding of fruit was abandoned, as a consequence of which the consumer awareness of the '*Outspan*' brand name declined. In 1994 the Citrus Exchange changed its status from a central cooperative to a public company, *Outspan International Limited.*

Zimbabwe

Export-oriented citrus production in Zimbabwe dates to the 1950s. The initial participants were two large estates owned by the Anglo-American Corporation. With the onset of UDI sanctions in the mid-1960s, one of these estates withdrew from citrus totally while the other concentrated on supplying raw material to its own processing factory. During the 1970s, five family farms near Zimbabwe's southern border with South Africa developed orchards for Valencia oranges and exported this fruit via *Outspan*. Exports reached some 8000 tons in 1979. Exports declined thereafter, partly due to the breakdown of transport routes and infrastructure in Mozambique. Zimbabwean fruit needed to be transported at high cost to either Durban or Cape Town for subsequent export, resulting in relatively low returns for growers. In the mid-1980s two farms attempted to market their citrus directly, using *Oceanic*, a Hamburg-based shipping company, to organize international distribution. Returns were initially disappointing, but *Oceanic* offered to carry out the marketing on behalf of the growers. This

proved to be a satisfactory arrangement, and set an example for a subsequent expansion of plantings.

Between the late 1980s and mid-1990s there has been a rapid expansion in citrus plantings among commercial farmers, particularly in the northern part of the country. By 1994 there were some 230 registered growers, although only about 60 have production focused on exports. Farmers were attracted to citrus at it provided access to badly needed foreign exchange and provided one kind of hedge against inflation. Grower returns were higher than for major field crops (ie. maize, cotton) whose prices and marketing channels were controlled by government. Other contributing factors to the major expansion in plantings included: the availability of low cost financing for irrigation development, farmer perceptions that orchard development would provide a hedge against government designation of farms for resettlement, and the energetic promotion of citrus by representatives of Oceanic and Outspan.

Mozambique

Prior to independence in 1975, Mozambique was a significant producer of citrus fruit, particularly grapefruit. European settlers managed small and medium-scale orchards, with total national plantings of some 3,500 hectares and exports (in the early 1970s) averaging nearly 20,000 tons per year. After independence, many European farm owners fled the country and abandoned their orchards. As an emergency measure the government took over the management of these orchards. Over time, however, these arrangements were formalized with most of the orchards being clustered together under two parastatal companies--Citrinos de Maputo and Citrinos de Manica.

With the onset of hostilities in Mozambique--and the associated problems of personal safety, insecurity of property, destruction of physical infrastructure, decay of market neglects--the citrus industry went into decline. The established orchards fell into poor condition, with increasingly outdated and inappropriate cultivars, breakdowns in irrigation facilities, shortages of intermediate inputs, and management problems. No new plantings were made during the 1980s. In the past few years a modest revival has begun, with the initiation of new plantings on the parastatal estates, with two additional private or joint venture orchard investments, and with the rehabilitation of port and other transport infrastructure.

Swaziland

The first citrus trees were planted in Ngonini Estates in the middle veld in the early 1950s, and production expanded in the Malkerns Valley. In the late 1950s, as a result of several new irrigation schemes, citrus production began in the low veld area. When greening disease decimated citrus production in the middle veld, production has been greatly limited there. Early in the development of their industry, citrus growers formed the Swaziland Citrus Board. During the period of sanctions against South Africa, some South African produce was marketed as Swazi produce, but this did not serve as a boost to either investment or production in Swaziland.

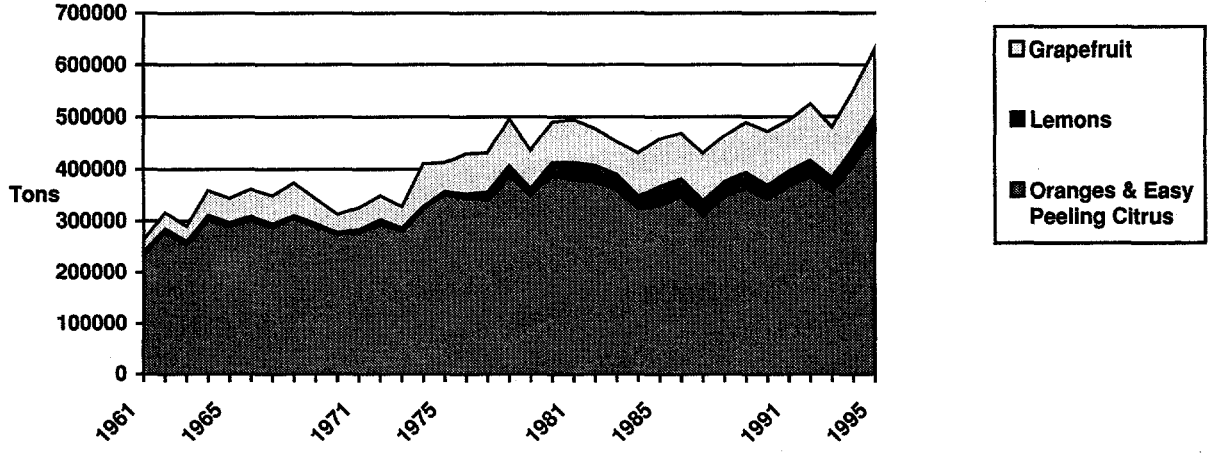
Swaziland's production is now centered on eight plantations, mostly located in the low veld. These farms are amongst the largest citrus farms in Southern Africa, with ten times the average planted area as farms in South Africa. The two largest estates are owned by United Plantations. Private South African investors own two others. Lonrho owns the fastest expanding estate while the Commonwealth Development Corporation runs another estate as a joint venture with Tibiyo, an investment company set up by the King of Swaziland. A private South African company is poised to invest in the expansion of one of the smaller plantations.

Although alternative marketing arrangements have been discussed, all eight growers voluntarily market through *Outspan*.

Swaziland is primarily a top quality grapefruit producer, but also grows Valencia oranges and a range of easy peeling citrus. It has the largest lime plantation in the region. The area under citrus peaked in the late 1970s before falling back in the 1980s. It is now expanding again, especially for red grapefruit. Total exports have risen from some 40,000 tons throughout the 1980s to reach 53,000 tons in 1994 (of which about half comprise grapefruit and 40% are Valencias). The lime is processed into cordial at a small on-farm processing plant while a local pineapple cannery utilizes around 25,000 tons of out-of-grade citrus per year.

Figure 5 traces the long-term development of citrus exports from Southern Africa since the early 1960s. It shows that after experiencing significant growth during the 1970s, exports stagnated during the 1980s. In recent years, there has been a new surge in exports.

Figure 5: Citrus Exports from Southern Africa



Note: Some modifications have been made to the data due to suspected under-recording during the period 1969-73, and over-recording in 1986.
Source: FAO Trade data

Citrus Production in Southern Africa

Table 4 depicts the structure of citrus production and post-harvest management in the four focal countries. The data reflect only commercial production linked in some way to the export trade. In each country there is additional small-scale production undertaken for household consumption and local sale.

The citrus industry of South Africa features nearly 1,200 growers, each averaging 37 hectares of citrus orchards. More than 43,000 people have full or part-time employment in citrus production and packing (and many thousands more in citrus processing and market logistics). At about 44,000 hectares, citrus production accounts for about 4% of the land under irrigation in South Africa. In terms of plantings and number of growers, the Zimbabwe citrus subsector is next in size, although due to the immaturity of much of Zimbabwe's plantings, its export production still trails that of Swaziland. This will change dramatically in the latter half of the 1990s. While there are some 70 growers with considerable citrus plantings, only about half of these harvested enough fruit in 1994 to participate in export channels. In that year, citrus production generated 2,700 jobs and occupied about 4% of Zimbabwe's irrigated land.

The structure of citrus production is very different in both Swaziland and Mozambique. In the former, there are only nine citrus growing companies, whose average plantings are some ten times the norm in South Africa. Citrus accounts for some 5% of the cultivated area in Swaziland and employes nearly 3,000 people at the farm level. Mozambique currently has only five farms producing for the export market. Three of these are parastatal operations whose productive orchards cover only a small proportion of the potential developed land. There are two private operations. One is a joint venture between the government and a multinational company and the other was established by a former high ranking government official. These private farms account for about one-third of Mozambique's commercial plantings of 1000 hectares.

Looking at regional aggregates, citrus is planted on 52,000 hectares, mostly on high quality, irrigated land. This represents less than 0.7% of the cultivated land area. Although there are believed to be nearly 4,000 farms in the region growing citrus, only 1,270 farms grow citrus for export. These will account for approximately 90% of the region's citrus production. Most of these farms are large, white-owned, commercial family farms. Corporate farming is strongest in Swaziland, and is developing in South Africa.

Climate, Land and Water

The majority of citrus is planted in three provinces in South Africa, Northern Province, Eastern Transvaal, and the Eastern Cape. These three areas each account for 25% of all the citrus trees planted. The choice of cultivar is largely determined by climate as set out below, and the fact that a whole range of citrus varieties can be grown in this region, means that the region can market a diversified basket of fruit overseas. There are large areas of land in the low veld classified as warm to hot and intermediate temperatures. These are particularly suitable for the production of Valencia oranges and grapefruit. There are very few cold areas, particularly frost-free areas, that provide suitable growing conditions for easy-peeling citrus types.

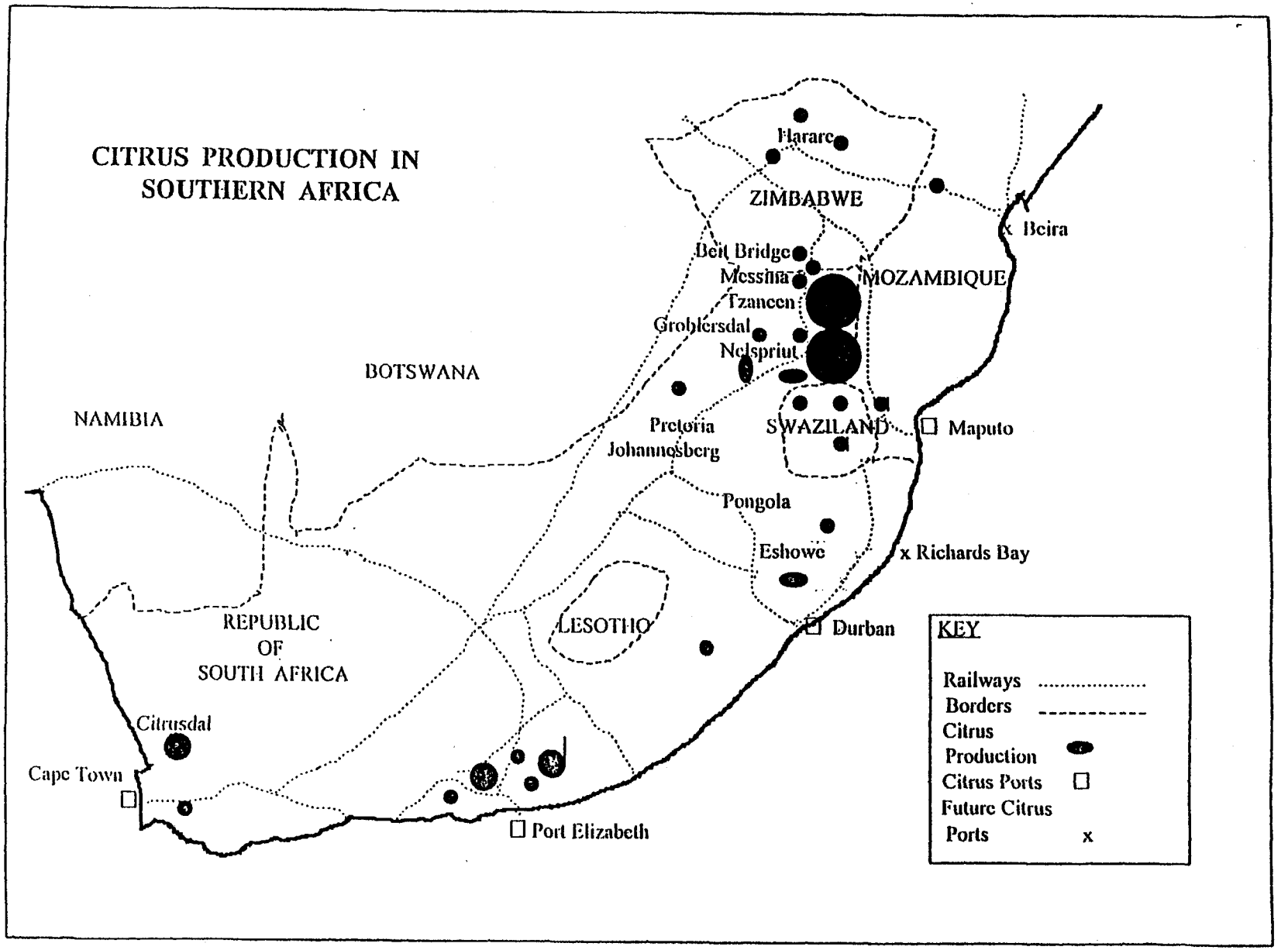
Cultivar Suitability According to Climate

Citrus Group	**Warm to Hot**	**Intermediate**	**Cool**	**Cold**
Navel oranges			******	******
Valencia oranges	******	******	******	******
Mid-Season oranges		******		
Grapefruit	******			
Lemons	******	******	******	******
Easy Peelers				******

Table 4: Southern African Citrus Industry

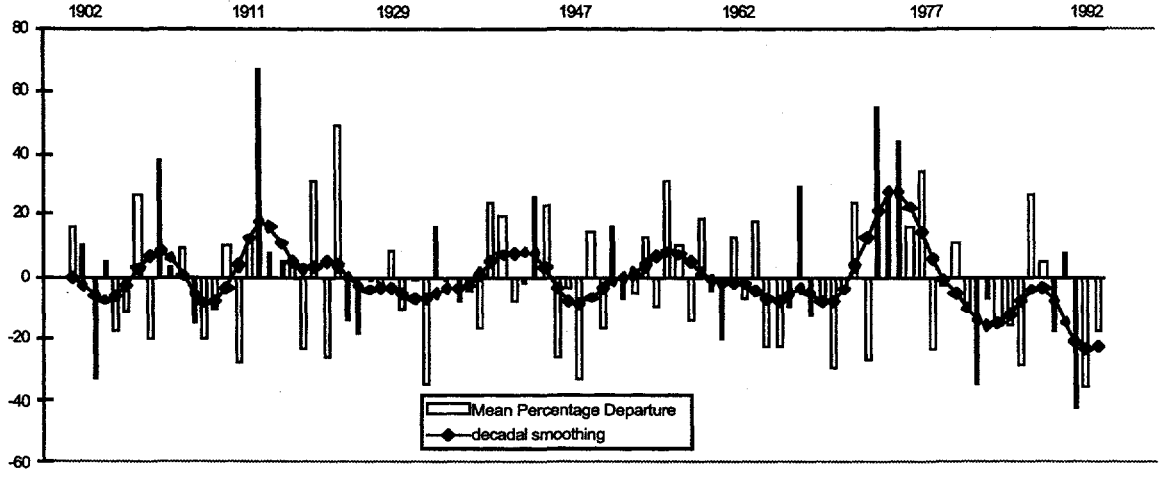
	Eastern Transvaal	Northern Province	North West	West Cape	East Cape	Kwazulu Natal	South Africa TOTAL	Swaziland	Mozam-bique	Zimbabwe	REGION TOTAL
Area in Citrus (000 ha)	8.15	17.06	0.82	5.45	9.44	2.93	43.84	2.93	1.04	3.96	51.78
Citrus Exports in 1994 (million 15kg cartons)	5.98	12.8	0.10	6.09	7.97	2.61	35.6	3.45	0.35	1.02	40.42
Export Growers	110	305	24	357	319	75	1,190	9	4	69 3/	1,272
Pack houses	28	105	2	28	20	43	226	7	4	27	264
Processing Plants	3	2	1	2	1	1	10	2	1	1	14
Full-time employees 1/	4080	8530	408	2726	4720	1464	21,948	1464	520	1980	25,912
Part-time employees 2/	4000	8500	400	2700	4700	1450	21,750	1400	520	680	24,350
Average cartons/farm (thousands)	54.5	42.1	4.17	17.1	25.0	34.8	29.9	431.3	87.5	24.8	29.9
Average ha/farm	74	56	34	15	30	39	37	366	260	50	41

1/ Estimate of 2 hectares per full-time employee based on farmer interviews
2/ Estimated based on farmer interviews, regarding labor numbers employed for picking and packing.
3/ Estimated number of actual farms exporting in 1994 was 27. In 1995, the number increased to 36, other farms have young orchards not yet in production.
Source: *Outspan International Ltd.* & *Oceanic* Zimbabwe


CITRUS PRODUCTION IN
SOUTHERN AFRICA
Harare
ZIMBABWE
Beira
Beit Bridge
Messina
MOZAMBIQUE
Tzaneen
Groblersdal
Nelspruit
BOTSWANA
NAMIBIA
Pretoria
Johannesberg
SWAZILAND
Maputo
Pongola
Eshowe
Richards Bay
REPUBLIC
OF
SOUTH AFRICA
LESOTHO
Durban
Citrusdal
Cape Town
Port Elizabeth
KEY
Railways
Borders
Citrus
Production
Citrus Ports
Future Citrus
Ports
x

All citrus production has to be irrigated, and water availability is the key constraint on production. To irrigate a hectare of citrus requires between 8,600 and 9,700 cubic meters per year. The region is greatly affected by periodic droughts. Limited water availability has resulted in many Swazi growers shifting production out of sugar cane, and into citrus, since citrus yields a higher return per cubic meter water consumed, and has lower overall water usage. Longer-range expansion of citrus in Swaziland will depend on the industry's ability to utilize the Usuthu and other rivers, or tap into planned irrigation schemes such as that for the Kumati Basin. In 1994/95, Zimbabwe experienced its third drought of the 1990s. Water shortages were so severe that the largest citrus plantation in northern Zimbabwe discontinued irrigation in many of its orchards. Income per cubic meter of irrigation water has become a key performance indicator, and investment in new irrigation and water storage dams will be vital to maintaining or increasing citrus production.

Figure 6: Annual Rainfall in Southern Africa Departing from the Mean, with Decadal Smoothing 1900-93



Source: M Hulme, Climatic Research Unit University of East Anglia, UK

The graph above suggests that Southern Africa is experiencing its worst drought of the last 90 years. Within the region there is not only a fear that the long term water supply is in decline but the expanding demand of local populations and industry will put greater pressure on the limited water resources. Currently South Africa's total demand for water stands at around 20,000 million cubic meters a year. In South Africa, the citrus industry will use around 420 million cubic meters a year of water or about 2.1% of the country's total demand and probably about 4% of the irrigation water. With the population set to double in fifteen years, and with increased consumption amongst South Africa's black and colored populations, up from 10 liters per day to a target of 25 liters, the demand for water is likely to reach 50,000 million cubic meters by 2010.

It is precisely for these reasons that *Outspan* and others are expecting to source more fruit from the surrounding countries such as Swaziland, Zimbabwe and Mozambique. Although droughts have been equally severe in each country, in the longer term it is believed that pressure on water supplies for non-irrigation usage in the region will be lower in the rest of the region, than in South Africa.

Management and Labor

There has been considerable consolidation of farms into larger units in South Africa since the early 1980s and the number of farms has declined 2.8% per annum. South Africa has a top management strata that compares favorably with management found anywhere in the world. Sophisticated and well-educated professionals, the younger generation are returning after college to their family's farms bringing with them confidence, enthusiasm and the skills to adopt new technologies. Most growers are bullish about the future, in general satisfied with *Outspan* and their net returns. This is reflected in the new planting programs undertaken. However, the legacy of apartheid is presently working against the industry in South Africa.

The South African industry needs to take note of the best practices in the region for professional development and put greater emphasis on staff training and development. The agricultural colleges are not, as yet, delivering young black graduates with appropriate skills. Black staff that have made it to management positions often lack the requisite training and experience. In Swaziland, by contrast, although the corporate citrus farms have white, mainly expatriate, salaried senior managers, black staff hold a significant proportion of middle management positions. Most of the large estates take job training seriously and often give specific section managers areas of planted citrus to manage. Similarly, Zimbabwean white farm managers are dynamic, innovative and keen to take on new technologies, and work alongside with black management whose skills and qualifications are exceptionally high.

There is an enormous gap between this level of management and the basic labor force. Salaries are far higher in industry than in agriculture. A worker in a packaging factory will earn three or four times the wages of an agricultural worker. Farm workers live in artificial communities, akin to rural ghettos, tied to the farm and with insufficient surplus income to provide opportunities for their children. Amongst the older workers this is accepted practice, but it is not attractive for a young, intelligent and increasingly educated workforce.

The actual salary paid to basic farm workers varied considerably between districts, ranging from around US$ 1.70/day in Zimbabwe, US$ 2-2.85 in Northern Transvaal, US$ 5.65 in Nelspruit, to US$ 6.50 to $ 8.50 a day in the Western Cape. These figures do not include housing, medical costs and some food which is normally part of the package. The ratio of hectares to full-time employees ranged from 1.25 ha per full-time employee in the lower-paying regions, to 4 ha per employee in the higher-paying areas. Figures elsewhere in the world normally range between 10 to even 20 hectares per full time staff. During the harvesting and packing season, additional labor is taken on, usually at piece-work rates.

Technical Knowledge

The maturity of the citrus export sector, the relative affluence of the citrus farmers themselves, and the international perspective of the senior citrus researchers are all factors that have created an exceptionally strong knowledge base in Southern Africa. While no major technological breakthroughs have transformed production, many minor improvements and management techniques have contributed to increases in productivity. The largest citrus estates generally have their own specialized managers who are highly qualified in the technical aspects of the industry. Within the farming communities of the region, citrus export growers are considered to be amongst the most dynamic and progressive. Farmers meet regularly for technical discussions. The Citrus Journal, a bimonthly magazine, is distributed by *Outspan* to growers providing news, market briefs, farmer interviews and research findings. Most growers have traveled widely and are aware of both the market and of alternative approaches to citrus production around the world. *Outspan* also provides short courses to growers and farm managers as well as videos for staff training.

In total, the region has about 30 specialized citrus advisors. Their work is financed mainly by the marketing companies themselves or by the farmers employing them directly as consultants.

Outspan provides an extension service to all its growers, with advice covering production, post-harvest handling, and packhouse design and operation. This service secures the supply of export quality products and is critical in ensuring that future supplies are estimated accurately for future market planning. *Outspan* currently has some 25 extension officers operating from 7 locations that cover the entire region, including Swaziland, Zimbabwe and Mozambique. Around 20% of the extension staff are specialists in the post-harvest system, and provide advice on the layout and design of the packhouse, quality control, maintenance of grading standards, post-harvest fungicide and wax treatments.

Table 5: *Outspan* Extension Officers by Area and in Relation to Farms and Citrus Area

Area	Extension Officers	Farms per Extension Officer	Hectares per Extension Officer
Northern Transvaal and South Zimbabwe	5	62	3500
EasternTransvaal and Swaziland &Mozambique	4	30	2770
Central Transvaal	1	24	820
Kwazulu Natal	4	19	760
Eastern Cape	6	53	1570
Western Cape	4	89	1360
Central and Northern Zimbabwe	1	50	n.a.
Total	25	47	2000

Note: Northern & Central Zimbabwe will have an extra extension officer in place by 1996
Source: Outspan

Outspan has a strong research program. Its priorities are set in consultation with growers and the marketing staff. The program covers new cultivar development, improved production techniques, integrated pest management (IPM), and improvements in the packing and distribution of fruit. Resources for *Outspan's* research and development program are divided, 80% to near-market research, and 20% to basic strategic research. The focus of the research is based on the farmers' needs and communicated through area farmer forums. These fora address each of the products (i.e. orange, grapefruit, lemon and easy peelers), as well as market and logistical matters.

Some thirty research staff are employed (mostly with PhDs), and the research program is run from Nelspruit, with field trials being carried out on *Outspan* growers' own farms in South Africa, Zimbabwe and Swaziland. The production research program can be conveniently divided into five areas, including horticulture, pathology, entomology, soil and water resources, and a citrus improvement program. The major objectives of the research include: (a) increasing productivity of citrus to enable Southern Africa to become the lowest unit cost producer in the Southern Hemisphere; ((b) improving water use efficiency, (c) developing integrated pest and disease management applications, and (d) developing methods of transporting and distributing fruit which will extend shelf life and reduce the unit costs of transport.

The expanding Zimbabwean citrus industry has been heavily reliant upon South African, and specifically Outspan's technology and technical know how. *Oceanic* has employed, on a part-time contract basis, two horticulturists to provide advisory services to their growers in Zimbabwe. Their nursery industry has been provided with elite budwood and rootstocks out of *Outspan*'s Citrus Improvement Program (CIP). The fact that the bulk of technical know-how

and citrus technology originates from South Africa has resulted in some mistakes being made concerning the suitability of specific cultivars for specific areas. For example, the industry was keen to plant easy peeling cultivars and plantings were attempted in inappropriate areas. Nonetheless, new technologies and specialized inputs are imported by Swaziland from South Africa. More research by *Outspan*, as well as other private extension organizations, should be oriented to farm trials in Zimbabwe and Mozambique.

Specialized Equipment and Chemicals

Specialized inputs such as machinery and agro-chemicals are widely available. Air blast sprayers and bottom opening trailers for transporting fruit from the orchard to the packhouse are manufactured locally, as are micro-jet and drip irrigation systems. Some specialized agro-chemicals have to be imported, a circumstance that presents a cost increase to Zimbabwean growers who must pay a duty of 30% on such inputs. The production for sale of predator insects for use in integrated pest management programs (IPM) will soon help boost the application of new technologies in the region's citrus industry.

Box 1: New Techniques and Technologies on the Farm

As a result of *Outspan*'s research program, combined with the impact of input suppliers, the Southern African citrus sector has adopted a number of new techniques, technologies and varieties. These include:

- the use of high-density planting systems, up from around 250 trees per hectare to 400 to 1000 trees per hectare;
- the use of drip and micro-jet irrigation systems on over 70% of the citrus area in South Africa and Swaziland, and about half the citrus area in Zimbabwe;
- the commercial plantings of improved cultivars;
- the control of citrus diseases and pests such as Greening disease through the control of the Psyllia vector, phytophora, bud mite and the prevention of serious Tristeza virus disease;
- the use of neutron probes to monitor irrigation application and water usage;
- the use of variable temperature regimes in refrigerated vessels to deliver a superior quality fruit;
- the use of controlled stress, pruning, hormone sprays and block planting to ensure the production of higher quality, seedless easy-peeling citrus;
- the development of hot air curtains to dry fruit in the packing line;
- precise fertilizer recommendations based on leaf analysis;
- nematode control recommendations based on analysis of soil infection levels; and
- the development of pre-cooling tunnels to accelerate temperature draw down times and improve cool storage utilization at ports.

Finance and Credit

Citrus growers in each country have had access to local sources of finance and credit. Traditionally, however, South African citrus farmers have been reluctant to borrow money, and

instead have financed expansion of their citrus enterprise out of farm profits. However, the roles of different financing sources are rapidly changing. The Land Bank, which was the traditional source of commercial farmer credit, will become the primary source of agricultural development finance for the black farm sector. Citrus farmers are increasingly looking toward the commercial banking sector for agricultural finance at interest rates of 18% per annum and, for larger projects, to the Industrial Development Corporation (IDC). IDC provides loans at about 1 to 1.5% below prime (i.e. 16.5% to 17.25% in 1995).

In Swaziland, most of the international agricultural corporations will seek funding from their own resources and commercial bankers. The Commonwealth Development Corporation (CDC) and the Swaziland Industrial Development Corporation (SIDC) can provide local currency loans at 18% and foreign exchange loans at approximately 10%. In Zimbabwe, local borrowing is considered extremely expensive at 33% interest rates (1995). Commercial farmers can obtain foreign exchange loans from commercial banks for export oriented projects at interest rates of btween 8 and 15 percent.

Citrus Production

Currently Southern Africa produces nearly 1 million tons of citrus fruit, with South Africa responsible for 88% of production. The three other countries all are planning significant increases in production, but are currently producing just 12% of the region's total output.

Table 6: Estimated Total Production of Citrus in Southern Africa in the Early 1990s (000 metric tons)

	Orange	Grapefruit	Lemon	Easy Peel	Totals
South Africa	645.5	116.5	58.0	30.0	850.0
Swaziland	24.0	41.0	-	4.0	69.0
Zimbabwe	19.5	2.5	0.5	0.5	23.0
Mozambique	7.0	10.0	1.5	ns	19.0
Totals	696.0	170.0	60.0	34.5	961.0

Source: *Outspan*, SADB study of the South African Citrus Industry, Swaziland Citrus Board, Private information

Oranges are the most important citrus crop in Southern Africa, accounting for around 75% of total production. South Africa produces approximately 650,000 tons, of which 18% is sold into local markets as fresh fruit, 25% is processed, mainly into fruit juices, and 56% is exported, these being roughly the same percentages as for the region overall.

The main varieties of navel oranges grown in the region are Washington and Palmer. Navels require cool growing conditions, and thus production of Navels is mainly based in the Eastern and Western Cape and the high veld of Central Transvaal. Valencia oranges continue to be the main orange variety produced, because of their greater yields, relatively long shelf life, and cheaper shipping season. Although Navel oranges have traditionally provided growers with 16% higher net return per carton than Valencias, the advantages of Valencias more than offset their lower average sales prices. Yields of Navels are about 10 ton/ha., this being 20% lower than for Valencias. Despite much encouragement from the market, the lower total returns from Navels have prevented export volumes from rising above half those of the Valencia orange. In order to fill in the weakness in the supply season between the Navels and the Valencia types, mid-season varieties such as Shamouti have been planted. These amount to about 4% of the crop area.

Valencia oranges make up over 60% of total citrus production. In addition to the Valencia variety, significant plantings have been made of two other cultivars, Midnight and Delta Seedless. Both cultivars are local selections with low seed counts. Under Southern African conditions the export marketing season extends from August through to October, although some marketing into the local fresh market is possible into the new year from cooler areas (i.e. Natal Midlands). Valencias can be grown in all the climatic zones of Southern Africa but production mainly occurs in the warmer climate of the low veld.

Grapefruit is a crop requiring warm to hot climatic conditions and is mainly grown in the low veld of Eastern Transvaal, Swaziland and Mozambique. South Africa produces 69% of this crop, and Swaziland 24%. The dominant variety has been Marsh Seedless, a traditional white grapefruit. More recently, the pigmented types have been planted such as Star Ruby and, to a lesser extent, Rose. The pigmented types now account for around half the planted area. Currently, the Marsh Seedless varieties account for around two-thirds of the total volume of grapefruit exported. This proportion will decrease as the extensive plantings of young pigmented grapefruit trees come into full production. The pigmented types have the marketing benefits of an attractive internal appearance and less bitter taste. The grapefruit export season extends from late April through to late August.

Grapefruit in Southern Africa is expected to expand at 11% per annum, with production in South Africa alone due to reach 198,000 tons by the year 2000. The crop has little demand amongst the African population and non-exported fruit is primarily processed into juice or exported as canned segments. Total export volumes have fluctuated markedly in recent years, due to climatic variations and the effect of hail and wind damage, but total grapefruit export volumes increased significantly in 1994.

Lemons can be produced in a wide range of climates, yet the crop is primarily grown in cooler areas such as the Eastern and Western Cape. Harvesting is extended from March through to September, peaking in mid-April until early June, and again in July and August. Output is expected to increase at 2.1% per annum. Fifty-one percent of the production of lemons goes to exports, 37% to processing, and 11% to local fresh markets. South Africa produces 97% of the regions crop.

Easy-peeling citrus is a relatively new crop to Southern Africa, requiring very specific growing conditions, including cool to cold climates. Production is chiefly centered in the Western Cape, Eastern Cape and to a lesser extent Central Transvaal, with 79% of the crop produced by South Africa, and 20% by Swaziland. The season starts with Satsuma varieties, mainly the Miho Wase Satsuma, harvested from mid-March until mid-April, followed by harvests of a series of Clementine varieties such as Marisol, Oroval, Nules, SRA63 and Clemlate, that runs from late April until mid-July. Some Minneolas are also grown and harvested in June and early July. Production of the easy-peeling citrus types has rapidly expanded at nearly 10% per annum over the last decade, and is set to expand by over 50% per annum, to over 150,000 tons by 2005.

Easy-peeling citrus are a more technically demanding crop to grow than other citrus crops. In order to produce the seedless fruits that the market demands, the orchard layout needs to be carefully planned to reduce cross pollination. Mild water stress is induced to improve flavor. The trees need to be pruned and sometimes sprayed with plant hormones to promote fruit set. The fruit has a shelf life of around 6 weeks as compared with 10 weeks for grapefruit and Valencia oranges. The easy-peeling citrus is often found on soft deciduous and grape farms in the Western Cape because of the similarity in growing techniques, the complimentary nature of the labor requirements, and the agro-climatic conditions that the crops need. The future planting program of easy-peeling citrus is on hold, as returns in the last two years have been below expectations.

Processing. Outgraded produce that is not suitable for marketing in local fresh markets is sold for processing. There are ten processing plants in the South Africa, some of which are associated with large cooperatively-owned packhouses. Most will produce orange juice for the local market. Juice concentrate is sometimes exported, but only when the local market is saturated. Some canning, mainly of white grapefruit segments, is undertaken, both for the local and export markets, and recently Japan has been importing canned citrus segments, prepared by hand, for use in its confectionery industry. The first plant in the region to introduce enzymic peeling of citrus is located in Kwazulu Natal, producing peeled oranges for sale to South African supermarkets.

There are two processing plants in Swaziland, one a small plant operated by an estate to process its own limes into cordial and lime oil, and the main processing plant, *Swazican*. The heart of *Swazican*'s production has traditionally been pineapple processing, but with the sharp decline of international prices for all pineapple products, the factory has had to expand its citrus processing activities. The factory purchases around two-thirds of the outgraded citrus produced in Swaziland, and exports the remainder to processing plants in Eastern Transvaal. The most profitable activity is the canning of citrus segments, especially Marsh seedless grapefruit. The market could probably absorb twice the volume of canned grapefruit, but the existing factory is unable to produce this volume, due to the difficulties of managing a labor intensive operation during a relatively short season.

The only processing facility in Zimbabwe is on the Mazoe Citrus Estate, and it produces mainly orange concentrate for the local juice market. Outgraded oranges are purchased at US$ 23 per ton, as compared with US$ 43 per ton in Swaziland and US$ 58 in South Africa. As a result, outgrades in southern Zimbabwe are typically transported across the border to South African processing plants. At current prices, a processing facility could turn over around US$ 3 million in sales of orange concentrate and US$ 1.5 million in canned grapefruit by 2005. By international standards, this would be a small-scale processing plant, and its long-term viability will depend on its ability to sell orange concentrate to the regional markets to the north of Zimbabwe.

There is a fruit squash factory in Maputo that has operated since 1968, and currently runs at about one-eighth of its capacity due to production constraints and limited domestic demand. A juice factory, SUMOVIT, has recently been sold by the Government to local entrepreneurs and, following significant updating and rehabilitation, production began in 1995. Because of the country's clear advantage in the production of grapefruit, and the strong international demand for canned grapefruit, there is definite potential for a grapefruit canning plant.

Packhouses. Packhouses throughout the region operate similarly, as the fruit is washed, treated with approved fungicides, waxed, and dried before being selected, graded, and packed for export. Strict protocols are laid down on quality standards and packing patterns for different sized grades. Export cartons all conform to *Outspan*'s or *Oceanic*'s specifications. Inspections for quality assurance and quality control are carried out by both the export company's own staff and by the PPECB.

There are some 226 packhouses in South Africa. Cooperative packhouses were a feature of the early days of citrus production, and are still strong in Eastern Transvaal and in the Eastern and Western Cape. Recently, larger-scale growers have been investing in their own packhouses as a method of offsetting taxes, creating their own asset value and as a strategy for

reaping the benefits of value added. In Swaziland all the major farms have their own packhouses.

There are currently only some 15 citrus packhouses in Zimbabwe. Zimbabwean growers are fiercely independent and will, in the main, want to make investments in their own packhouses. Locally fabricated packing and grading equipment is being developed. Experts predict that over the next five years, there will be sizeable investments made in 50 to 60 packhouses. While recent studies have been carried out on the minimum size of a citrus farm that would justify its own citrus packhouse, industry opinion suggests that approximately 40 to 45 hectares in citrus are required as a minimum. The packhouse will need to have a capacity to pack 30 tons per 8 hour day (i.e. 2000 cartons per day or about 100,000 cartons per season). The capital requirements at 1995 prices in South Africa are estimated at around US$ 274,000, while those in Zimbabwe are expected to be around 30% less.

Packaging. Packaging is purchased directly from private-sector packaging companies, from *Outspan,* and from farmer-owned enterprises, and prices are relatively uniform across the region. The total material cost of packaging is about US$ 84/ton, 80% of which is the cost of the carton. *Outspan* has recently begun to individually label and brand each fruit with a blue sticker, and some diversification in packaging design is used for high-value markets such as grapefruits for Japan or easy-peeling citrus for the Western European and Canadian markets.

Local Transport. Palletized fruit is generally transported to the nearest railway station, where the pallets are loaded into specialized railway carriages called O-trucks. Railways have traditionally been used to transport about 40% of citrus produce from farm to port, and takes an average of 2-3 days to do so. Increasingly, the produce is being transported by truck. While this service is faster, it is also marginally more expensive.

South Africa has an impressive infrastructure when compared with other countries in the region. It has an excellent network of modern roads, as well as a railway service designed to collect produce from the main growing areas, and deliver the produce within two to three days to a major port. The ports are all equipped with cold storage facilities, and are being outfitted with port-side pre-cooling facilities.

Outspan organizes local transport and generally negotiates the prices the farmer pays for local transport to his nearest natural port, deducting this from the farmer's account with *Outspan*. If produce has to be delivered to a more distant port, then the additional costs are charged against the pool. Zimbabwean citrus is almost exclusively being transported by South African trucks who want backhauls into South Africa. *Outspan* charges their Northern Zimbabwean growers for the cost of transport to the nearest natural port, Beira, at 3.15 Rand per carton, or US$ 57 per ton. In practice, the exports are being made via Durban at an actual cost of approximately US$ 65.50 per ton. The additional cost of US$ 8.50 per ton is effectively being subsidized by the pool.

Oceanic uses reefer lorries for transportation of produce to Cape Town. This route is chosen because they have their office in Cape Town, the port charges are cheaper, and because of difficulties faced in using the Citrus Terminal in Durban, which is run by Outspan. This route, however, is significantly more expensive at US$ 120 per tons. If Beira port were operational for citrus, then road transport rates of about US$ 48.50 per ton might be achieved, at considerable savings to *Oceanic* and the growers supplying it (see Table 7). The development of Beira port could improve *Oceanic* exporters' returns by about US$ 15 per ton (US 22 cents/carton), but this will depend on successful negotiations for reduced port charges, as well as on producer confidence regarding other risks associated with using Beira port.

Zimbabwean growers are at a substantial cost disadvantage to South African growers in internal transport costs as well. These differences will be significant in the future, as profit margins are likely to narrow in the future.

Table 7: Comparative Internal Transport and Port Charges
(US$ Per Ton)

Company and Port	Internal Transport	Port Charges	Total Costs
Oceanic's Current Costs- Zimbabwe via Cape Town	120	24	144
Outspan's Grower Costs after Subsidy- Zimbabwe via Durban	57	29	86
Outspan's Actual Costs- Zimbabwe via Durban	65.5	29	94.5
Current Costs- Zimbabwe via Beira	57	60	117
Expected Costs after Negotiations- Zimbabwe via Beira	48.5	40	88.5
Outspan's South African Average Grower Costs—Production Area to Port	29	30	59

Source: Outspan and *Oceanic*

Port Facilities. On arrival at the port, the product is re-inspected. If the produce is deemed below export standard, it can be repacked at the farmers expense. Citrus pallets are pre-cooled, and the product is held in cold storage until the time it is loaded on board ship. Typically a 3,600 pallet vessel can be loaded in two days. Durban is the main port, loading 30% to 50% of all citrus exports of the region, with other exports being made from Port Elizabeth, Cape Town and Maputo in Mozambique. *Outspan* has taken over control of the citrus terminal at Maputo in a joint venture with Manica Freight and CFM. The aim is for the port to handle some 8 million cartons, or about 20% of the region's exports. Exports from Maputo of non-*Outspan* citrus producers are only allowed if *Outspan* gives permission. Two other port developments are being considered at Richards Bay in Kwazulu Natal and Beira port in Mozambique.

Zimbabwe, a land-locked country, exports chiefly via Durban, through *Outspan*, and Cape Town, through *Oceanic*. Maputo port is the natural port for southern Zimbabwean growers, and Beira for exports from the northern half of the country, but many obstacles to this development still exist. Telephone communications in Zimbabwe are difficult, and the roads are still primarily used for transport, as growers are reluctant to entrust perishable products to Zimbabwean railways.

Plans were in place for a joint venture between *CFM*, a group of Zimbabwean exporters collectively called *Watertight Investments*, along with *Cool Carriers* with funding from SWEDEFUND) to develop Beira port. This fell through because Outspan would not provide Cool Carriers with a long-term shipping contract. The scheme is now being revitalized by CFM and Watertight in a joint venture, known as the Beira Citrus Cold Stores (BCCS). BCCS has leased the cold stories on Quay 6 and will be responsible for all operations and development of the terminal over the next twenty-five years. The existing citrus terminal has cold storage capacity for around 50,000 cartons (715 pallets) Currently the facilities are being repaired and modified to increase the capacity to 1,000 pallets. During the 1996 season some 7,000 tons of Zimbabwean citrus and a further 1,000 tons of citrus exports from Mozambique should be shipped. The next phase of development will be to increase the cold storage capacity by a

further 1,500 pallets. Utimately, it is planned that BCCS will have a cold storage facility of 7,000 pallets, sufficient for two refrigerated vessels.

Maputo Port's citrus terminal exports about 5 million cartons a year, and has the highest port charges in the region (63 US cents per carton, as compared with 43.5 cents in Durban). *Outspan* has brought in their own managers to run the citrus terminal in Maputo, and are planning to make significant improvements and expand the facilities substantially. No citrus exports are currently leaving Beira Port, although negotiations are underway for bringing the port charges down to a competitive rate. Private investors are expressing interest in developing Beira further (for instance, increasing the capacity of the cool rooms), and export volumes from northern Zimbabwe could reach as much as 110,000 tons by the year 2005, given the infrastructural improvements and increased security of investment.

International Logistics and Freight. *Outspan* presently contracts international freight transport with *Serva Ships*, and through most of the season, all ships are fully utilized. The minimum critical mass for a shipload is some 3,000 pallets or 3,000 tons of product, although the average shipment size is 3,600 pallets. A round trip to Europe takes some 39 days, loading in one or two ports, and unloading in two ports in Europe, generally Sheerness in the UK, and either Hamburg or Antwerp on continental Europe. Separate vessels service Eastern Europe, the Middle East and South East Asian markets. Containers are used to supply small markets but are considerably more expensive than chartering complete reefer vessels. South Africa's negotiating strength, and the fact that transport is not considered to be a profit center has ensured that export growers enjoy highly competitive sea freight rates as compared with other Southern hemisphere exporters.

Institutions

Citrus Boards

With the exception of *Outspan*, no single organization oversees the whole Southern African citrus industry, but three of the four producing countries do have national organizations. The South Africa Citrus Board has no staff or offices of its own. Initially the Citrus Exchange acted as secretary and sole marketing agent to the Citrus Board. Directors were common to both The Citrus Exchange and the Citrus Board. Now, so as to ensure independence of the Citrus Board from *Outspan*, the majority of the directors of the Citrus Board are distinct from those of *Outspan*.

The Swaziland Citrus Board has a part-time general manager who helps coordinate transport, organize customer visits, consolidate statistics for, and convene regular meetings of, the citrus growers of Swaziland. In 1994 the Zimbabwe Citrus and Sub-Tropical Growers Association was formed, with support from the Horticultural Promotion Council, to promote fruit exports and to encourage a more unified approach in overcoming constraints. The Association is funded by membership fees and a small levy per carton of export produce. Its current Director is paid by *Oceanic*. The funding structure and organization is likely to change as the industry starts to become more established. There is currently no citrus board or growers' association in Mozambique, although *the Instituto de Promocao das Exportacoes* (*Ipex*) does provide limited information on export markets to growers.

Outspan International Limited

With the formation of *Outspan International Ltd.* in 1994, all citrus export growers in Southern Africa have become shareholders of the company in proportion to their export

volumes, each with their own voting rights. The individual export growers have a share in the assets of the company, and considerable efforts are being made to ensure that growers have a greater say in how the industry is being managed. The Directors on the Board of *Outspan* are growers representing production areas in South Africa, Swaziland and Zimbabwe.

One of the key changes undertaken by *Outspan* was the appointment of a Chief Executive from outside the industry. This has triggered changes in the company's morale, style and strategy. By means of a series of farmer meetings, the message that 'the customer is king, and the customer is the grower' has been communicated. In order to facilitate feedback from the industry, *Outspan* has organized its shareholders into seven district committees covering the principal production regions. The committees provide representatives for each of the specialized committees that meet annually in Pretoria so that specific production, logistical or marketing issues can be addressed.

All citrus exports from South Africa must be made via *Outspan*. Swaziland growers have consistently and voluntarily marketed their export crop via *Outspan*. While *Oceanic* is predominant in Zimbabwe, *Outspan* nevertheless commands about 30% of Zimbabwean citrus exports, and has recently appointed a full-time field officer there, with plans to expand to two full-time extension officers in 1995/96. All citrus exports from Mozambique are currently made through *Outspan*, although *Oceanic* could provide a suitable alternative, provided they also could make available some technical support.

The primary services that *Outspan* provides to its members are marketing, promotion, market development, sales and pricing, accounting services, buying services, extension and research. Farmer confidence in the *Outspan* organization is currently strong, especially because of the company's efforts to develop new markets. Some of the changes that have improved the organization and cohesiveness of *Outspan* include:

- ⇒ instead of having quality inspection carried out at the port, it is now carried out at the packhouses, thereby significantly reducing the volume of fruit that is rejected or that would have to be repacked at the port;
- ⇒ *Outspan* now markets a lower grade of fruit under a separate brand name, a change that has resulted in significant increases in the volume of sales over the last two seasons.
- ⇒ *Outspan* is now charging a 6.25% commission on FOB value, with a long-term target of reducing this percentage; and
- ⇒ the company is planning to put into place an independent system for monitoring export performance and comparing prices of Southern African produce with those of her competitors, notably from South America.

Outspan operates a single-channel distribution system to 58 countries. The company is involved at each link in the distribution chain, from the packhouse to the overseas importer. Control is exerted over the packaging used, the local port destination, port facilities, shipping arrangements, and the storage and dispatch of fruit to overseas customers. Charges for transport, cooling, storage, shipping and port facilities are set at cost.

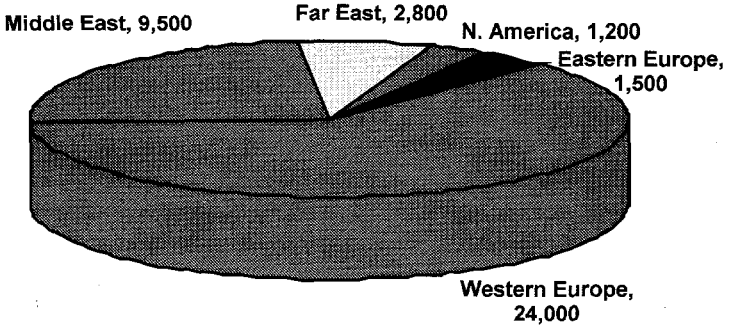
Western Europe is currently *Outspan*'s main market, absorbing approximately 62% of the export tonnage from the region. The single most important market within Europe remains the UK. The Middle East imports around 23% of the export tonnage, and smaller

volumes are being delivered to the developing markets of the Far East, principally Hong Kong, Singapore and Japan, Eastern Europe and North America (mainly Canada). Exports by *Oceanic* are destined mainly for the German and UK markets, although *Oceanic* is likely to develop sales in the Middle East.

Eastern Europe, 1,500

Outspan is responsible for advertising and promotional campaigns, funded out of a levy on exports. Most advertising is targeted on trade, but support is provided for in-store promotions, as well. The company has been improving its trade with Japan, and the lifting of sanctions has enabled the company to open new markets in Scandinavia, Ireland and Canada. A long-term strategic approach has been adopted to develop the Eastern European market, and preliminary steps are being taken to develop South Korea and the USA.

Figure 7: Export destinations in thousands of cartons in 1994



Total exports 39 million cartons

Source: *Outspan*

In addition to the *Capespan* organization which markets into Europe (see below), *Outspan* has its own office in Hong Kong, an agent in Singapore, a sole importer in Japan, a master agent in Canada, and services the Middle East from headquarters in Pretoria. Whenever possible, *Outspan* tries to set prices, rather than be a price taker. Pricing policy has to be precise, taking into account the supply, demand and the volume of produce to be sold in relation to the product's shelf life. *Outspan* has extended its policy of fixed prices to importers on about one-third of all sales.

Outspan operates a pool system for redistributing returns to growers, according to variety, size and quality of the produce. A 60% advance is paid on approval of the product at the port, and the balance is paid in monthly payments. Within six weeks after the end of the season, the grower will have received 95% of his total return. Growers are provided with reconciliation statements that show the amount of money owed to them, and the delivered-in-port prices (DIP) (these are FOB prices minus Southern African port charges and *Outspan*'s commission).

Outspan negotiates and buys, in bulk, packaging material, internal transport services and farm production inputs. It also organizes, on behalf of its growers, the hiring of specialty items like fork lift trucks so that the producers can benefit from economies of scale. Farmers are also free to purchase inputs and services independently. The sources and uses of funds by *Outspan* are set out below for 1995. Research and extension amounts to 1.75%, and advertising and promotion 2.2%, of FOB income.

Table 8: Source and Use of Funds by *Outspan International Ltd.* (based on 1995 budget)

Source of Income	Million US $	Million US $	Use
Commission	17.80	3.10	Research
		1.90	Extension
		6.00	*Outspan* overheads and HQ costs
		6.80	*Capespan* commission/charges
Levy per carton	6.30	6.30	Advertising and promotion
Pool costs	14.00	14.00	Port charges, overheads for chartering, pre-cooling, storage, loading, inspection
Totals	38.10	38.10	

Source: *Outspan International*

Capespan

In September 1994, *Unifruco*, the single-channel marketing agent for the deciduous fruit sector, and *Outspan* formed a joint marketing company called *Capespan* based in the United Kingdom with each agent holding an equal share. *Capespan* is responsible for marketing and distributing all of *Unifruco* and *Outspan*'s products in Europe on a fixed-commission basis. *Capespan* is responsible for the marketing and distribution of all the deciduous and citrus fruits marketed into Europe under the brand names of "*Cape*" and "*Outspan*" respectively, plus a range of Southern African sub-tropical fruit marketed under the brand name "*Bella Nova*", as well as wine and deciduous fruit juices. Total sales for *Capespan* stood at US$ 825 million in 1995, of which citrus accounted for 25%. *Capespan* is paid for its services from *Outspan*'s own commission. This amounts to about 3% of CIF values and will be worth about US$ 6.8 million in 1995.

The formation of *Capespan* should provide significant benefits by lowering unit costs and through the marketing strength of being able to deliver most major fruit products during the northern hemisphere's counter season. Since *Unifruco*'s marketing season (November through August) differs from that of *Outspan* (April through October), the combined marketing season lasts 50 weeks. As a result, sales staff are fully employed throughout the year, and should be able to provide more cost-effective support services to the Southern African fresh fruit export businesses. For example, *Serva Ships*, a *Capespan* joint venture responsible for all sea freight chartering, is able to charter around 250 vessels a year. Each ship is capable of carrying over 3000 tons, for a 10-month season, thereby providing Southern Africa with significant negotiating strength, and ensuring highly-competitive sea freight costs.

Capespan has been positioning itself to supply supermarkets directly. The elimination of the importer/distributor will save approximately 6% commission. With the consolidation of the chartering operations into one company, their position vis South American competitors should improve. Both *Outspan* and *Unifruco* have an international reputation as suppliers of consistent, high-quality and well-packaged fruit. With their high packhouse standards, emphasis on safe spray products, professional farm mangers, network of field officers, independent quality control, and emphasis on the development of IPM, *Capespan* has the necessary systems for ensuring the supply of safe products.

In the longer term, *Capespan* has the potential to become the first African-owned, or indeed farmer-owned, intercontinental fresh fruit trading company on a scale similar to the giants of world trade such as Dole, Del Monte or United Fruit. *Capespan* is in a strong international position because of its counter-season supply pattern, the integrated nature of its production/marketing chain, and the quality of its production base. In addition, the company

can guarantee an extended supply season, as well as a supply of easy-peeling citrus, grapes and soft deciduous and tropical fruits.

Oceanic

The *Oceanic* Fruit, Shipping and Trading Company, or *Oceanic*, first established offices in Zimbabwe because they were unable to source produce directly from South Africa due to *Outspan*'s monopoly. A consortium of Zimbabwean citrus growers approached *Oceanic*, a Hamburg-based shipping company, to provide shipping, and subsequently marketing, services on their behalf. *Oceanic* became involved in the mid-1980s exporting on behalf of two major citrus growers in Beit Bridge. Subsequently, they have developed an office in Harare with one full-time manager and accounting and administrative staff. Although *Oceanic* is primarily a shipping agent, two horticulturists are contracted to provide advisory services to growers on a part-time basis.

Marketing and shipping are coordinated by the Hamburg office, and port services are coordinated from an office in Cape Town. *Oceanic*, which currently handles 70% of Zimbabwe's citrus exports, mainly markets into Germany and the UK through exclusive import companies. Through one of its principal shareholders, the company has close contacts in the Middle East. The main activity of the company is refrigerated transport of fresh produce out of Southern Africa.

Perishable Produce Export control Board (PPECB)

The PPECB has a formidable reputation as an independent, impartial and well-structured organization that imposes quality control and quality assurance programs on the Southern African horticultural export industry. It already operates in Swaziland and in Zimbabwe, and inspects *Oceanic*'s exports in Cape Town. The PPECB's function is to ensure systematic and efficient logistics for the export of agricultural and marine products from South Africa. Its main objectives are to impartially verify, where applicable, that export products conform to specified standards, to ensure that the standards are maintained during handling, storage and transport, to coordinate the logistical needs of export products to ensure optimum use of available resources, and to provide technical support services. These activities are carried out within three main Departments.

The Agricultural Products Standards Department carries out inspections of products prior to export to ensure compliance to prescribed grading, packing and marketing specifications. They issue export certificates and carry out random analysis on samples to ensure that products adhere to local and international agro-chemical residue standards. The Operations Department ensures that standards are maintained during post-harvest handling and distribution, and that facilities and transport systems are suitable for perishable cargoes. They verify that produce is correctly stowed, and advise vessels on correct temperature and handling procedures. They can also accept bookings for shipping space and allocate space in proportion to demand. The Technical Department maintains a database on post-harvest transport, advises on areas that require further research, evaluates performance of equipment and procedures, and formulates internationally accepted standards and procedures.

The existence of PPECB is vital to achieving credibility for exporting produce to markets where phytosanitary, hygiene and agro-chemical residue standards are critical to gaining entry. This will be necessary if Southern Africa is going to make inroads into the US market, and probably will be important for the development of the Korean, Italian and Greek markets as well.

Other National Institutions

Opposition to the single-channel export marketing system that is operated in the citrus sector is centered in the South African Independent Fruit Exporters Association (*SAIFEA*). *SAIFEA* argues that single-channel marketing restricts the development of new products and niche markets, prevents top-quality growers from obtaining premium prices, and suppresses the growth of independent horticultural export companies. They also argue that in particular, *Outspan* is autocratic, has unnecessarily high overhead costs, and is strongly biased in favor of Valencia producers and producers in South Africa's Northern Province. They argue in favor of open competition, in order to force both *Outspan* and *Unifruco* to revise their overhead cost structure, and to become more dynamic, innovative and efficient. Their arguments are as much about economic and political freedoms as they are about growers taking greater responsibility for their own marketing.

The Zimbabwean Horticultural Promotion Council (*HPC*) was established in 1986 by the Commercial Farmers' Union as an independent organization to support the horticultural export trade, of which citrus has been one part. *HPC* has been responsible for coordinating and educating within the industry, as well as representing growers' views to Government by, among other things, identifying and lobbying against export constraints (recently, *Zimtrade* was formed with the specific responsibility of facilitating and promoting trade on behalf of Zimbabwean growers). *HPC* is funded by a levy of approximately 0.5% on the CIF value of exports, and conducts training activities, provides workshops on strategic issues, helps coordinate freight and transport, provides market information, and acts as a conduit for international aid. The Zimbabwe Citrus and Sub-Tropical Growers Association was formed in 1994, with support from *HPC,* to specifically promote citrus and sub-tropical exports.

Financial Performance of the Citrus Sub-Sector

Industry Income

Table 9 below sets out the citrus industry's income, at conservative FOB prices and at the farm level in Southern Africa. The export industry alone contributes over US$ 175 million per year to the rural economy and, including sales to the fresh and processing markets, the industry generates nearly US$ 205 million. The export sector accounts for approximately 85% of citrus farm income, even though only about 55% of the crop yield is exported. The farmgate value of raw material for processing can be as low as one-tenth of the value of export quality fruit. The processing sector's role is mainly as a recipient of outgraded product, and provides only a minor portion of the total income of citrus growers in the region (in contrast to Brazil or Florida, where processing is the lead force in the industry).

Table 9: Income of the Southern African Citrus Industry in 1994

	Citrus Group				
	Oranges	**Grape-fruit**	**Lemons**	**Soft Citrus**	**Total**
	US$ million				
FOB Values	163.8	26.2	13.1	15.3	218.5
Farm Gate Incomes:					
Export produce	130.8	24.3	10.9	9.8	175.8
Local fresh produce markets	15.8	.7	1.7	4.0	21.6
Processed produce	5.8	.5	.7	.04	7.2
GROSS FARM CITRUS INCOME	152.3	25.5	13.3	13.9	204.6
Export income as percentage of total gross income (%)	86	95	82	70	85
Relative contribution of Citrus Groups to gross income of citrus industry	75	12	6	7	100

Source: Own calculations based on SADB information

Unit Costs

Table 10 illustrates the costs of delivering a carton of oranges to an EU export market. In view of the long-term decline in export prices, and the future exploitation of newer, low-priced markets, continued profitability of the industry will depend on controlling unit costs. The total costs add up to US$ 7.67 per carton, or 51 US cents per kilo.

The production cost of a 15 kilogram carton of export quality citrus is around US$ 1.31, before packing, and accounts for about 17% of total costs. These figures are based on a typical yield of 50 tons/ha and an export percentage of 60% (i.e. 30 tons). *Outspan*'s target is for growers to achieve 70 tons/ha with an export percentage of 70%. If obtained, the unit costs per carton of export quality citrus would fall to 90 US cents. This is equivalent to more than one-third saving in total costs. Total labor costs (up to the packhouse) amount to 28 US cents per carton, while the cost of agro-chemical sprays are 52 US cents per kilo. These figures emphasize that farm labor costs are relatively unimportant in terms of total costs, but that the development of IPM and more efficient delivery techniques for agro-chemicals is likely to yield more significant savings on production costs.

The costs incurred in the packhouse amount to US$ 1.93 per carton, and account for over 25% of total costs. The largest component of these costs is that of packaging materials (US$ 1.21/carton), in particular the cost of the carton itself (US$ 1.01). These figures suggest the need for research into bulk distribution systems. One can visualize a system in the future whereby product for specific retail chains would be pre-packed in consumer net packs in Southern Africa. and shipped in recyclable bulk bins. In the import market, the product would be transferred into the plastic crates used by supermarket chains in their distribution systems, and the bulk bin shipped back to Southern Africa. Potential savings would be in the order of 45 to 60 US cents per carton.

Commission charges are paid to *Outspan*, and through them to *Capespan*, as well as to the European distributor. It is likely that *Capespan* will develop direct sales to the major retail chains for up to about 70% of produce. This could reduce the commissions paid to European distributors, resulting in a savings of around 80 US cents per carton.

Table 10: Illustrative Unit Costs Per Carton in US$ /15 kg. Carton of Valencia Oranges

	US $	Percent of Total
Overseas Costs		
Overseas Marketing Commissions	0.50	6.5
Duties	0.26	3.4
Advertising and Promotion	0.14	1.8
Port Charges, Storage, and Distribution	0.89	11.6
Sea Freight	1.03	13.5
Sub-Total	**2.82**	**36.9**
Ex Farm Costs		
Port Charges, Storage, and so on	0.54	7.1
PPECB Inspection Charges	0.04	0.5
Transport to Port	0.44	5.7
Outspan Commission – Excluding R&D	0.30	3.9
Research, Development and Extension	0.09	1.2
Sub-Total	**1.41**	**18.4**
Post-harvest Costs		
Packaging Materials	1.21	15.8
Packaging Chemicals	0.08	1.0
Pack-House Labor	0.32	4.2
Pack-House Overheads and Other Costs	0.32	4.2
Sub-Total	**1.93**	**25.2**
Production Costs		
Establishment Costs	0.03	0.4
Agro-Chemicals	0.52	6.8
Production Labor	0.14	1.8
Irrigation	0.16	2.1
Mechanization	0.09	1.2
Harvesting Labor	0.14	1.8
Other Harvesting and Transport	0.23	3.0
Sub-Total	**1.31**	**17.1**
Fixed Farm Costs	**0.18**	**2.3**
Total	**7.65**	**100**

Source: Own calculations based on figures provided by *Outspan*, growers and packhouses.

Costs and Grower Returns

Outspan operates a pooling system of pricing. Separate "pools" are maintained for each cultivar, grade and size. Net income for each category is pooled, whether the product is sold in the high-priced markets of Japan or Western Europe, or the lower-priced markets of the Middle East or Eastern Europe. All costs are allocated to each respective pool. These costs include importer commissions, damaged fruit, duties (where applicable), distribution costs, international freight, port charges in South Africa, and *Outspan*'s commission of 6.25% of the FOB price. Pool costs are deducted from total pool income to give a delivered-in-port price (DIP). From this the grower must deduct the transport costs from his farm to the nearest port.

This system has the advantage of eliminating any possible dispute between growers that might arise as a result of the disparity of prices among different markets. However, the

pooling system eliminates the price advantages that the best quality growers or regions can obtain, and results in lower quality regions being, in effect, subsidized. This is a disadvantage of the system, since this phenomenon weakens the price signals to growers that might otherwise compel them to shift production to preferred varieties, or to adopt improved technologies and post-harvest methods.

Table 11 provides illustrative costs per ton of Valencia oranges in 1994 marketed by *Outspan* and *Oceanic,* and of Navel oranges marketed by *Oceanic*. *Outspan* may be obtaining higher sales prices than *Oceanic* due to the high proportion of *Oceanic's* crop that is sold in the Middle East and Eastern European markets where prices are lower. There are a number of possible explanations for the higher prices of Zimbabwean Navel oranges as compared to Valencias, including the possibility that the small volumes marketed facilitate niche marketing, and that the early harvest in Zimbabwe is an advantage in a season when northern hemisphere producers' supplies finish early. The comparison of Navel to Valencia prices and costs is also illustrative of the fact that a change in sales price has proportionately much greater effect on farmer price in the fresh citrus exporting business than in other commodities. Note that the gross sale price for Valencia was one-third lower than for Navels, but that the farm gate price is less than half.

Table 11: Comparison of Unit Costs and Returns Between Valencia Oranges Exported by *Outspan* and *Oceanic* in 1994 (US $ /ton)

Company:	*OUTSPAN*	*OCEANIC*	*OCEANIC*
Product:	VALENCIA	VALENCIA	NAVEL
Gross Sale Price	**584** [1/]	**557**	**844**
Commission	19	56	84
Duty	8	0	-
Discharge	19	20	22
Storage	8	10	4
Transport	8	29	5
Other	-	1	7
Sea freight & Insurance	72 [1/]	74	87
FOB	**450**	**367**	**636**
Loading & Pre-cooling	40	24	24
Commission	30	-	-
R&D & Extension	9	-	-
Promotion & Advertising	9	-	-
Other Costs	21	1	-
Delivered in Port	**341**	**342**	**612**
Inland Transport	44	80	120
Farm Gate Price	**297**	**262**	**492**

1/ The majority of Valencia's are sold FOB. Thus, in order to be able to make comparisons, full seafreight charges have been added to the costs and adjustments made to the wholesale prices, but some understating of unit costs in overseas markets still exists.
Source: *Outspan International, Oceanic Export Growers*

Table 12 illustrates the differences in grower price between cultivar and size grade. For example, Navel oranges typically obtain 10% higher returns than Valencia oranges. The attractive red-pigmented Star Ruby Grapefruit achieves over 60% higher returns than the white Marsh Seedless cultivar. This reflects the strong demand for the Star Ruby and the relatively short supply. The highest priced products are the easy-peeling varieties of Clementine, at over US$ 700/tons DIP, and Satsuma at approximately US$ 620/tons DIP.

Even among the limited number of size grades shown, price differences of over 10% are common. Much greater differences are apparent between the least and most popular sizes. For example, the smallest size of Valencia (125) will return the grower approximately 40% less than the premium size grade (072). These differences emphasize the importance of a grower selecting suitable crops for the local micro-climate, and of having sufficient long-term market information to enable one to make a rational choice concerning variety at planting. Subsequently, production must be focused on maximizing the export percentage and growing fruit to match specific size and quality criteria.

Table 12 *Outspan*'s Average Grower DIP Prices for the Years 1992 to 1994 in Rand per Carton and US $ per tons

Cultivar	Grade	Annual Average– Rd/carton	Annual Average– US$ /ton
Navel	072	20.70	428
	105	15.92	330
Valencia	072	18.97	393
	105	14.14	293
Marsh	036	19.65	407
	048	19.18	397
Star Ruby	036	33.25	688
	048	29.93	620
Lemon	100	20.44	423
	138	20.77	430
Clementine	084	22.43	697
	144	25.77	800
Satsuma	084	18.12	563
	144	25.47	791

Note: Average exchange rate 1992-94 Rand/US$ 3.22.
Carton sizes: 15 kg for Oranges, Grapefruit and Lemon, and 10 kg for Clementines and Satsumas.
Grade denotes the number of fruit packed per carton.
Source: *Outspan*

International Competitiveness

Detailed comparisons of the net returns of Southern African citrus growers with those of South American competitors within the European summer citrus market are not available. The key indicators are sales prices and international transport costs. Outspan performs well on both indicators.

Gross wholesale prices are available. In the U.K. market, Outspan's sale prices for oranges were approximately 5.5% higher than Uruguayan oranges and 10% above Argentine produce in 1994. Similarly, in the German market in 1993, Outspan's oranges obtained 8% premiums over the Argentine product. International shipping costs are lower with Outspan which charges its growers around $80 per pallet for delivery to northern European ports, compared with South American pallet rates of $110 to $120 for transportation. These

figures imply that South African growers are returned DIP prices some $60 to 90 per pallet higher than Argentine growers.

In 1995 the Austrailian Horticultural Corporation carried out a benchmark study to compare the returns of their own growers with those from California and South Africa. The study demonstrated that in terms of price, Californian Sunkist oranges attain the highest prices, followed by Austrailia, and then South Africa. The study then attempted to calculate net grower returns using average prices in the Singapore market. The unit cost analysis demonstrated that Outspan has a significantly lower cost structure than its competitors, particularly in international transport, exporter commissions, and in-packhouse costs. Combining the effects of the differential market prices and unit marketing costs, it eas estimated that South African packhouse gate prices are approximately $80/ton higher than those in Austrailia yet $80/ton lower than those in California.

Gross Margins by Crop and Estimates of Economies of Scale

Table 13 below sets out typical gross margins for various export citrus crops in 1995. The author has constructed a theoretical farming model in order to obtain estimates of profitability in each citrus product. The model is based on the assumption that the farm is an independent family farm. The expected economic life for the different citrus types was estimated at 33 years for the Navel and Valencia oranges, 20 years for the Marsh and Star Ruby grapefruit, and 25 years for the easy peeling citrus. To arrive at these estimates, it has been assumed that the farm had a balanced age distribution among the trees, and that three percent of the trees would be replanted annually. A fifty-percent debt ratio has also been assumed, and installments based on this ratio.

Table 13: Average Yields (metric tons/hectare) and Expected Gross Margins
(US$ /Hectare)

Crop	**Navel**	**Easy Peelers**	**Navel**	**Valencia**	**Star Ruby**	**Marsh**
Location	East Cape	East Cape	Transvaal	Transvaal	Transvaal	Transvaal
Performance:						
Average						
Total Yield	50	45	45	50	50	50
Export Yield	34	32	23	30	27.5	27.5
Peak GM	$ 3,799	$ 11,148	$ 3,274	$ 3,534	$ 11,508	$ 4,727
Average GM	**$ 2,228**	**$ 5,312**	**$ 2,100**	**$ 2,229**	**$ 7,039**	**$ 2,662**

Source: Author's calculations

The gross margin analysis reveals that the typical gross margin averaged over the life span of the citrus crop is in the range of US$ 2100 to $ 2600 per hectare per year. Two products achieve significantly higher returns, Star Ruby grapefruit, which have been in short supply, and easy-peeling citrus, which are a premium-priced product. In the long run, Star Ruby gross margins are likely to fall into line with other citrus crops, but the gross margin for easy-peeling citrus is likely to remain higher. This is to be expected, due to the likelihood of a long-term expansion in demand for "off-season" easy-peeling citrus.

The average size of a citrus export farm is about 40 hectares, although estates of 400 hectares are found, mainly in Swaziland and southern Zimbabwe. Citrus farmers in South Africa seldom specialize in citrus alone. Key investment costs include land at US$ 2,190/ha, irrigation equipment at $ 2,740/ha, and a tree planting program up to the commencement of commercial production, at $ 3,965/ha. When agricultural equipment and vehicles are included, the total investment cost per hectare ranged from $ 12,600 for a 40-hectare citrus farm, up to $ 16,200 for a 15-hectare orchard. The net cash flow, after overheads and installments, increases from US$ 2,930 on a 15-hectare citrus farm, to $ 37,750 on a 40-hectare unit. A minimum-size, viable independent family farm would be approximately 25 to 30 hectares.

These calculations demonstrate the benefits of economies of scale. In practice, farm size has been increasing, and some of the most successful farmers have purchased a number of farms that are administered by one central office. Viable unit sizes can be reduced, in suitable climatic locations, by growing easy-peeling citrus and by relying on centralized services, thereby reducing unit equipment costs per hectare so as to be more in line with those of estate citrus operations.

Projections of the Southern African Citrus Industry

Currently the Southern African citrus industry exports around 37 million 15-kg cartons (557,000 tons) that have an FOB value of US$ 216.5 million. Projections of future citrus export volumes from Southern Africa are presented in Table 14. These figures are based on the existing planted areas. They do not take into account the possibility of adding to the area planted. The fastest expanding export product will be easy-peeling citrus, growing at 56% per annum, followed by grapefruits, growing at 11% per annum. Exports of oranges and lemons will increase at 6.5% and 6% per annum respectively. One of the projected new opportunities will be continued expansion in Valencia orange production, for use as an entry product in new markets, and as raw material for a range of fresh-squeezed juice products.

The total farmgate value of the citrus crop is $ 205 million, of which around $ 37 million will be spent on local packaging, $ 22.6 million for farm labor and $ 16.5 million to the regional transport sector. As a result of the expansion of production, and the resulting expansion in export volumes, labor costs can be expected to double, to US$ 46 million, as can the cost of packaging and local transport (to $ 75.7 million and $ 33.9 million respectively). Assuming a 2% per annum fall in real values, to take into account lower-priced markets and the impact of additional supplies on the existing markets, we project citrus exports in 2005 to be worth $ 362.6 million at FOB values, generating US$ 351.9 million at the farm gate.

Projections indicate that the total volume of exports is expected to increase to 60 million cartons by the year 2000, and 75 million by 2005, a 100% increase during that period. The annual growth in export volume of over 9% per annum is over three times the average annual increase in exports over the last 35 years. South Africa's share of the region's exports of citrus is expected to fall roughly ten percent, as is Swaziland's by proportionally a bit more, while Zimbabwe will likely gain the lost shares of these two countries. Citrus production in Zimbabwe is project to grow at an average 29% per annum over the next decade. Two-thirds of production is likely to be oranges, most of which will be Valencia type. In spite of its considerable potential, Mozambique is not anticipated to gain or lose much of its relatively small share.

By 2003, the expanded supply of citrus product will be sold in new markets, while the traditional markets of Western Europe and the Middle East will experience little growth. In the Far East, continued growth is expected in Singapore and Hong Kong, with re-exports to

China, and Japan now offers the potential for significant long-term growth. New markets that have been targeted for development include Malaysia, Indonesia and South Korea. Growth in these Asian markets is projected at 27% per annum.

Table 14: Projected Export Sales of Fresh Citrus from Southern Africa (Metric Tons)

	1994	2000	2005
Mozambique			
Grapefruit	3000	4800	7200
Orange	700	1120	1680
Lemon	50	80	120
Easy Peelers	-	-	-
Sub Total	3750	6000	9000
Zimbabwe			
Grapefruit	2500	17000	23000
Orange	15000	69000	135000
Lemon	-	4000	8000
Easy Peelers	500	5000	10000
Sub Total	18000	95000	176000
Swaziland			
Grapefruit	37000	50500	58000
Orange	19250	26000	30000
Lemon	-	-	-
Easy Peelers	5800	6500	7150
Sub Total	62050	83000	95150
South Africa			
Grapefruit	70000	128500	161000
Orange	360000	465500	511000
Lemon	28000	35000	39000
Easy Peelers	15500	87000	139000
Sub Total	473500	716000	850000
Total by Product			
Grapefruit	112500	200800	249200
Orange	394950	561620	677680
Lemon	28500	39080	47120
Easy Peelers	21800	98500	156150
Regional Total	**557300**	**900000**	**1130000**

Source: *Outspan*, SADB study of the South African Citrus Industry, Swaziland Citrus Board, private information

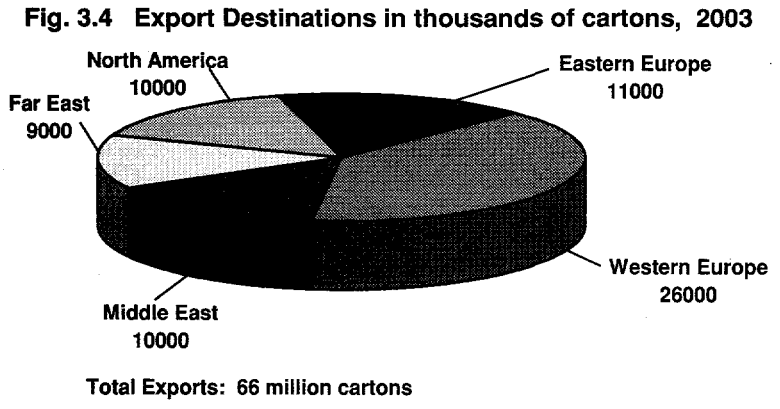
The Eastern European markets are projected to expand at 80% per annum, reaching 11 million cartons by 2003. This is an ambitious program, but increases in exports in 1995 prove that very significant increases are achievable. The most controversial projected sales increase is to the North American market. *Outspan* is confident that by adhering to the strictest phytosanitary and agro-chemical standards, Southern Africa can gain entry to the US market through the summer supply season. Ambitious growth rates are projected at 90% per annum, with sales projected to reach 10 million cartons by 2003.

Table 15: Projected Income for Southern African Citrus Industry
(Constant 1994 US$ 000)

	1994	2000	2005
Mozambique			
FOB value of exports [1/]	1,470	2,106	2,889
Farmgate value of exports [2/]	1,166	1,620	2,160
Local sales [3/]	196	275	365
Zimbabwe			
FOB value of exports[1]	7,056	33,345	56,496
Farmgate value of exports[2]	5,598	25,650	42,240
Local sales[3]	940	4,360	7,128
Swaziland			
FOB value of exports	24,323	29,133	30,543
Farmgate value of exports	19,298	22,409	22,829
Local sales	3,239	3,809	3,852
South Africa			
FOB value of exports	185,612	251,316	272,850
Farmgate value of exports	145,703	193,104	203,874
Local sales	24,457	32,828	34,403
Total for Southern Africa Region			
FOB value of exports	218,461	315,618	362,600
Farmgate Value of Exports + Local Sales	204,597	305,345	351,963
Packaging[4]	37,000	60,246	75,683
Local Transport[5]	16,569	26,975	33,888
Rural Labor[6]	22,644	36,867	46,313

1/ For each of the four countries, estimated in US$ /ton: $392 in 1994, $351 in 2000, and $321 in 2005.
2/ For each of the four countries, estimated in US$ /ton: $ 311 in 1994, $ 270 in 2000, and $ 240 in 2005.
3/ For each of the four countries, estimated in US$ /ton: $ 58 in 1994, $ 51 in 2000, and $ 45 in 2005.
4/ $67/ton
5/ $30/ton
6/ $41/ton
Source: Author's estimates

Figure 8: Export Destinations in Thousands of Cartons, 2003



Source: Outspan

Recommendations for the Southern African Citrus Industry

The final chapter of this report is divided into two sections. The first analyzes the regional structure of the citrus industry in terms of its strengths, weaknesses, and opportunities. The second section sets out how the industry needs to prepare itself for the future, and gives recommendations for practical action.

Strengths

The Southern African region dominates the supply of counter-season fruit, providing 50% of its summer supply to the Northern hemisphere, a proportion which is expected to reach well over 60% by 2005. Any expansion in the demand and utilization of counter-season fresh citrus products by the Northern hemisphere will largely benefit developing countries, particularly Southern Africa. Southern Africa, encompassing a broad spectrum of agro-climatic conditions, is able to produce the entire range of citrus products. By comparison with its competition from South America, most farms are medium-scale, family-owned and capable of providing the intensive management required to produce high quality citrus products.

The four main regional suppliers of citrus have been actively involved and integrated in an essentially regional industry for almost 40 years. This collaboration, spanning research, technology transfer, logistics, and marketing can be strengthened further in the future. This will be increasingly important as the relative share of South African production declines vis-a-vis that of the other major producers, most especially Zimbabwe.

Current wisdom is that monopoly agricultural marketing is prone to inefficiency, incompetence and potential corruption. The South African Citrus Exchange, or *Outspan International* as it is currently called, has proven, in many ways, to be an exception to the broader pattern. The industry has had to be efficient to maintain competitiveness in the international market, especially in the face of the international trade sanctions placed on South Africa. Financial information, such as prices, costs and returns, have been relatively transparent, and export growers from throughout the region are actively involved as Directors of both *Outspan* and members of the various Citrus Boards. Hence, the organization has been held accountable by its members.

Outspan has adopted a strategic view about the future and is continuing to adapt to a rapidly changing international market. It has grasped the need for even greater economies of scale and for vertical integration through investment in export markets. Through the formation of *Capespan*, *Outspan* has positioned itself to be able to directly service the ever expanding supermarket sector in Western Europe, and to create a foundation for growth into the markets of Eastern Europe. This approach parallels those of industry giants like Dole and United Fruits. *Outspan* has also effectively privatized itself so that it is now wholly owned by the export growers themselves, setting in motion a process of improving efficiency and enhancing communication between the company and its growers. The company's long-term research strategy is designed to lower unit costs, both in production and distribution, reduce irrigation water usage, minimize pesticide application and further the development of new varieties.

This is not to say that there are not deficiencies in the Outspan system nor that exclusivity in export marketing arrangements is necessary to achieve economies of scale and effective coordination of production and marketing. As with other one-channel marketing systems featuring pooled pricing, Outspan's system has been criticized for having built-in biases toward the lead product (i.e. Valencias) and lead production area (i.e. Northern Province, South Africa), for failing to pass on correct price signals to producers of premium and sub-quality fruit (effectively having the former subsidize the latter), and paying inadequate attention to the development of new products and niche markets. Some parties in South Africa--specifically the South African Independent Fruit Exporters Association--would like to see export marketing liberalized with the expectation that new competition would put pressure on Outspan (and Capespan) to further reduce costs and improve services to growers.

Weaknesses

Perhaps the single greatest weakness of citrus production in Southern Africa is that it is heavily dependent on irrigation. Irrigation allows for greater control over fruit quality, and the dry conditions that require irrigation also result in lower incidents of fungal diseases. The disadvantage, however, is that because the region is subject to endemic and increasing drought, the citrus crops are more susceptible to the vagaries of weather. The future security of water supplies, particularly in South Africa, is also threatened by the expansion of industrial demand, and especially the increased demand resulting from a broad-based development of hitherto remote or rural areas.

By international standards, the citrus production sector is both overstaffed and under-skilled. Fresh produce exporting will become increasingly complex and skill-dependant. Education of the majority black population was long neglected in South Africa and the black middle managers in this industry are mostly found in Zimbabwe and Swaziland. As yet, the agricultural colleges are not providing graduates with appropriate skills for the citrus industry. The industry's lag in effectively integrating the black population in management also places it in a potentially difficult political position.

The Southern African crop mix is heavily dominated by white grapefruit and Valencia oranges, two fruits that have experienced a decline in consumption levels in the mature export markets of Europe. Zimbabwe, with its heavy reliance on Valencia orange production, is particularly susceptible. Projections indicate that while the increase in orange production is likely to be absorbed, it will be in new and lower-priced markets. Since most of the costs incurred from farm to import market are fixed, any fall in import price has a disproportionate effect on grower returns. Additional dangers to the international market include the cultural

resistance in importing countries to consuming citrus in the summer, and the strict, sometimes unjustified, phytosanitary regulations that inhibit trade.

The monopoly marketing position of *Outspan* in South Africa will be dropped under the new Marketing of Agricultural Products Act. In each of the affected industries (including citrus) here will be a twelve month period of transition, starting from mid-1996 during which time the single channel marketing companies will attempt to consolidate their position. Under the new legislation, a National Agricultural Marketing Council will be established with ten members representing different segments in the production/marketing chain, including customers. The council's function will be to review existing statutory measures and advise the Minister of Agriculture on agricultural marketing policy and its coordination. The council itself will be advised by a specialist committee on exports. Ultimately the Minister will have the power to grant export licenses to new exporters, with particular preference given to companies which will market the produce of small growers, create rural jobs, and open up new markets.

The industry could therefore be headed for a period of considerable change. Such changes could endanger the integrated structure of the citrus sector and weaken the economies of scale which have been achieved in certain post-harvest and logistical operations. Major challenges for the restructured industry will be to develop effective arrangements for maintaining the funding and cooperation in research, for coordinating logistics, and for minimizing direct competition in overseas markets.

Southern Africa's major competitors in the European markets are Brazil, Argentina and Uruguay, countries whose market share in the EU has doubled between 1988 and 1993. Argentina in particular could become a more serious threat as its macroeconomic situation improves and investment expands. Brazil could also become a greater threat in newly-developing markets that have lower price and quality demands.

Opportunities

Although the existing markets are not expected to expand significantly, newer markets will provide the strongest opportunities for growth. *Outspan* has anticipated this potential, having targeted Eastern Europe, Southeast Asia and Japan for development. The development of the supermarket trade in Southern Europe is expected to counter the cultural associations in these markets of citrus as a winter fruit.

The sanitary and phytosanitary regulations included in the GATT agreement provide the scope and the mechanism for challenging unjustified phytosanitary restrictions to trade. If unscientific phytosanitary regulations are not dropped, Southern Africa should be prepared to take cases to a WTO arbitration panel. Japan's acceptance of in-transit sterilization of Southern African citrus in 1995 provides the foundation for expansion in this market. Excellent opportunities exist in all markets for expanded exports of seedless, easy-peeling citrus products as a summer fruit.

The Southern African citrus industry is well-positioned to supply the expanding discount supermarket sector in the European market. The industry needs to attune itself to the further development of lower-volume, higher-value products, including not only easy-peeling citrus but also products like kumquats, organically- or biologically-grown citrus, freshly-squeezed juices, and citrus segments for use in wet fruit salads.

Opportunities in Mozambique are many, albeit subject to overcoming some fairly daunting obstacles. Increased pressure on the existing water supplies in South Africa may

provide the spur for developing production in Mozambique, where there is still surplus water capacity. In addition, central Mozambique's natural port, Beira is not being used for citrus exports, but could, with investment, proper management and a competitive cost structure, become operational and economical, for both Mozambique and Zimbabwe.

There is considerable interest in new black farmer schemes using citrus export crops as the core of the farming system. Potential schemes are planned in South Africa, Zimbabwe and Swaziland. Fresh citrus, however, is far from an ideal starter crop for new farmers, and the chances for success will be much improved through the integration of regional best practices, and the development of appropriate technologies and higher-value products. Although there is unlikely to be any significant increase in the total number of jobs in the production sector, there is both a need and an opportunity for creating a more professional work force, a career structure, and a cadre of black middle managers.

A number of farmers have expressed interest in worker shareholding schemes and the development of small citrus farms on undeveloped land within the boundaries of existing farms. Some farmers have established on-farm development activities, including adult education and sports and social clubs. Governments and international aid organizations have an opportunity to harness and assist these local development efforts.

The greatest opportunities for new jobs will be in developing value-added in the post-harvest system, for example in pre-packing or semi-processed products. While these businesses will likely be white-owned, the industry can and should provide significant opportunities for black-owned enterprise that would provide services to the citrus industry.

Recommendations

The major issues facing the Southern African citrus sector are in the general areas of production, marketing, economic development and closer regional integration.

Agricultural Production

Water. Irrigation water will become scarce and more costly. As this resource becomes more scarce, the debate will intensify as to who should receive priority for water usage. *Outspan* is currently carrying out research aimed at reducing water usage, and should expand its scope so as not only to be able to set targets for income generation per cubic meter, but also be able to compare the economic benefits of irrigation water for export citrus relative to other agricultural crops and industry. In certain locations it may be necessary for citrus production to relocate from drought areas to regions where surplus water is still available, the most obvious and immediate choice being Mozambique. In terms of market demand the most appropriate investment would be investment in water storage and irrigation facilities in cool and cold climatic zones suitable for the production of navel oranges, easy-peeling citrus and lemons.

Post-harvest System. The diversification of markets, products and outlets will lead to investment needs in the post-harvest system that will in turn create new jobs within the industry. The next decade will see a proliferation of methods of presenting a packaged product. Investment will be required in new packhouses that will be increasingly sophisticated and flexible, so as to quickly switch between product lines, and deliver product packed to various and stricter specifications. Skill levels amongst packhouse staff and management will

need to be increased. Local commercial banks providing foreign exchange loans at competitive interest rates need to be alert to this requirement and capable of mobilizing funds for these relatively small projects.

Marketing

The top priority of the Southern African citrus industry for the next decade is to maintain grower returns while increasing exports by an additional half million tons of product. Although competitiveness can be improved through cost savings, the critical factor will be maximizing prices. The fresh produce market is highly sensitive to supply and demand, and even a small over-supply has a disproportionate effect on import prices, resulting in an even greater drop in grower returns and profit.

The challenge for the future is to maintain and improve economies of scale, while diversifying the market destinations, types of sales outlets, the varieties of produce exported, and processed products. Citrus marketing needs to combine highly-organized bulk distribution systems with greater specialization. An even more creative, dynamic and aggressive approach to marketing and sales should be combined with the objective of strengthening control over the marketing chain.

Table16: Impact of Changes in Sale Prices and Unit Costs on Returns and Gross Profits
(US$ /metric ton)

	Typical Prices	10% Lower Price	10% Lower Price Plus Cost Savings	10% Increase in Price
Sale Price	600	540	540	660
Overseas cost	135	130	124[1/]	140
S.A. costs	110	105	105	115
DIP	355	305	311	405
Transport	44	44	44	44
Production and Packaging costs	228	228	203[2/]	228
Gross Profit	83	33	64	133

1/ Assuming 10% saving in distribution costs through *Capespan*
2/ Assuming export tonnage increased from 30 tons to 40 tons
Source: Own calculations

Control over the marketing chain. In the international fresh produce industries there is a struggle for control over the marketing chain. Many supermarket chains are looking to take control by backward vertical integration, and ultimately aim to source directly from large-scale growers who would pack under the supermarket's own brand name. In this situation the supermarkets' already powerful position will be further strengthened. The export growers would have little negotiating strength and be distanced from the actual consumer, leaving the supplier weak, exposed and failing to profit from the added value in the marketing chain. For example, selling at the packhouse to a supermarket buying organization might circulate US$ 350 per ton through the Southern African economy, as compared to the $ 450 per ton the exporting agent might earn, or the $ 800 per ton an importing agent receives from the retailer.

Vertical integration by the exporting region, for instance through *Capespan*, would enable the Southern African economy to maintain greater control and benefit from the added value of product up to the point of sale to the retailer. It also provides options for investment and employment in a diversified industry through wholesale, processing, or food service contracting.

Diversification in Products and Marketing. The future must involve diversification and expansion into those markets where the Southern African industry currently only has a toehold. Outspan International has sensibly targeted Eastern Europe, Russia, Japan, southeast Asia and North America. In the longer term, and in order to provide markets for additional plantings, the industry may want to develop opportunities in mainland China and the Indian subcontinent.

In the existing markets, consumption levels need to be stimulated, particularly for grapefruits and Valencia oranges. This will require repackaging and repositioning products, and developing new outlets, for example through the promotion of home squeezing of Valencia oranges. Home squeezed juices could in turn be linked to the promotion of juicing machines, or the development of franchises for the sale of fresh-squeezed citrus in the summer months.

A better understanding is needed of the global export opportunities for easy-peeling citrus marketed during the months of April to September. The production and post-harvest research program needs to be accelerated in order to identify suitable production locations. The search for new cultivars that will extend the supply season must be continued, broadening the range of agro-climates that might be utilized, so as to provide a product that the consumer wants. It is especially important that the eating quality of the Southern African product matches that of the northern hemisphere's own winter crop.

Products like easy-peeling citrus might be presented in small consumer packs for sales specifically as a snack product or take-away snack food. Easy-peeling citrus appears to be well-positioned to become the citrus product of the future. Unit prices are nearly twice those of the bulk citrus products and yields are broadly in line with other products. The product will increasingly replace eating oranges and could ultimately have even higher per capita consumption levels because it is more "user friendly". Projecting future demand levels is problematic, but roughly four million tons of easy-peeling citrus might be in demand from the combined markets of the EU and Japan by the year 2005.

The Japanese market for Satsumas needs to be properly researched and tested. The financial viability of exporting should be assessed in view of the considerable investments that will be required for port-side pre-cooling (presently a stipulation by the Japanese). In addition, there is a strong case for negotiating a lower duty for the summer supply of easy-peeling citrus into the EU, since growers are dissatisfied with their current returns, particularly when seen in comparison with European wholesale prices.

The market for minimally-processed fresh fruit products has been expanding at a rate of around 20% per year in the major markets of Japan, North America and Western Europe, but most of this added value is created within the importing country. As new technologies develop, 'minimal processing' should increasingly be carried out in the country of origin. In view of the long-term potential of this sector, regional research efforts ought to be broadened to incorporate minimal processing technologies, especially techniques for prolonging shelf-life. The very nature of these investments, built on new technology and supplying rapidly expanding and changing markets, makes them high-risk, but potentially very lucrative. This work could create the foundation for developing a modern processing sector in South Africa.

Possible products in the minimally-processed market include:

- hand-peeled citrus segments for use by the Japanese confectionery and bakery industry;
- enzymically-peeled and segmented citrus for use in wet fruit salads;
- halved and segmented grapefruit for use as an instant dessert or breakfast fruit;
- flash-pasteurized single-strength citrus juice; and
- freshly-squeezed juice held in modified atmospheres to extend shelf life.

Advertising and Promotion. Traditionally the fresh produce industry has been lax about product promotion and advertising. In the main it has relied on nutritionists to promote fresh produce on its behalf. In the battle for stomach-share, fresh produce is losing ground to the processed food industry that spends around 8% of its turnover on advertising and promotion. This compares with the 2% spent by Outspan, which is itself high as compared to the fresh produce industry overall. The advertising and promotion budget should be increased to 4% of FOB, to create a campaign for developing and encouraging the consumption of summer citrus in general, and, products where Southern Africa has a specific advantage.

There is considerable scope for creativity and increased expenditures on advertising and promotion. Innovative campaigns in the food industry do not necessarily use consumer advertising, but concentrate on the subtler techniques of press campaigns, public relations and introducing references to the product in popular television shows in order to stimulate fruit consumption by placing the product in the context of lifestyle. Fresh produce exporters have been reluctant to invest their relatively low margins on stimulating consumption through this type of advertising as it tends to have a generic effect promoting sales of their competitor's product as well. As the dominant supplier of counter-season citrus, *Outspan* would receive the lion's share of benefits from advertising and promotion, even though some collateral benefits would accrue to Argentina, Brazil and Uruguay. Other promotional initiatives might include the promotion of high-sugar seedless Navel oranges as a premium-priced orange, and specific targeting of sales of raw and minimally-processed citrus products to the expanding food service and catering sector.

South Africa's Marketing Act. The aim of South Africa's new Marketing Act should be to provide competition within South Africa for product, thereby encouraging efficiencies within the region, but limiting intra-regional competition in overseas markets. A system needs to be in place that provides for continued funding of research, advertising and promotion, and international trade litigation. It should attempt to accommodate, where feasible and desirable, independent growers and small farmers. Above all, the Marketing Act should have the objectives of ensuring orderly marketing, within an overall strategy marketing Southern African produce, and forward planning, whilst maintaining efficient use of the existing export infrastructure.

The new Marketing Act provides for a period of transition and offers flexibility to adjust the implementation of the Act in the light of performance and market conditions. As it stands, the Marketing Act provides the Minister and the National Marketing Council with very significant powers with which to grant licenses to exporters and to control grades, seasonality, and destinations. As currently worded, the bill makes no mention of controlling volumes, which are frequently a major mechanism for maintaining prices in international markets. The Minister can insist that the exporter reveals his costs and returns. The key objectives of the Act are to: increase market access for all participants, promote efficiency, optimize export earnings, and enhance the viability of the agricultural sector. In particular, the Act will encourage some diversity of marketing channels and in the classes of product which can be

exported. Preference will be given to potential exporters who can demonstrate that they will add value, develop new markets, and facilitate market access for small farmers.

In practice, the existing single marketing companies will remain the dominant export channel by virtue of their existing market linkages and logistics economies of scale. It is not yet clear if the Marketing Act will enable to industry to retain a strategic overview, maintain orderly marketing, and continue to fund research programs. It is essential that the National Council, or its export committee function as an effective watch dog over the industry and in a position to ensure that:

- it has sufficient knowledge of the global citrus market to be able to make sound commercial judgments;
- exporters are granted licenses for specific territories, outlets, volumes or products so that competition in the overseas markets is minimized;
- some control is exercised over volumes delivered to individual markets to prevent oversupply and price collapse;
- new exporters are provided with genuine and significant opportunities;
- those exporters who return the highest income per unit to South Africa are rewarded with additional licenses granting further opportunities and access to export markets; and
- research funding is maintained and targeted on emerging opportunities and problems.

Whatever export licensing rules are established, it is important that South Africa maintains its highly efficient ship chartering system, ensuring, among other things, that port facilities and joint chartering is available to independent exporters. The role of the PPECB would become more important in ensuring that quality standards are maintained and that exporters do not contravene licensing agreements.

Development Issues

There is both a need and an opportunity for the Southern African citrus sector to assume an active role in rural and regional development. Associated with this, the region's governments are also interested in improving the education and skill levels of the industry's workforce, encouraging worker equity schemes and joint ventures, and encouraging new farmers to enter into investment and production schemes.

Some of the major activities of rural development have been outlined earlier. What is needed is a mechanism for establishing priorities, a source of funding, and manpower to implement the development program. Discussions with senior management at *Outspan* have shown that they would be supportive of such a program and will be holding discussions with the Chairman of the regional forums to discuss how this could be implemented. The prioritization and focus of the development program that is envisioned would use the same approach as that applied to the development of individual products.

A levy of 0.25% of FOB value could raise $ 1 million per year for this development program by the year 2005. Matching contributions should also be made by the national governments of the region. International funding should be sought during the expensive start-up phase. In order to implement the program, a small number of staff with specialty skills would be required. Much of the work could be contracted out to development agencies and nongovernmental organizations.

The Citrus Work Force. Opportunities for career development are especially limited in South Africa, which is by far the largest consumer and producer market for citrus in the region. Skill levels available to production, the packhouse and post-harvest processing must be improved. A long-term objective of the industry should be to develop a more skilled and professional work force, and to create a career structure that fosters the development of black middle managers. Students should be able to graduate from agricultural college with a good basic understanding of the citrus industry. Modules for certified staff training courses need to be developed, and regular training programs established in the main citrus production regions.

The industry could award certificates of competence in topics such as agricultural machinery operation and maintenance, spraying techniques, pest identification, packhouse management, irrigation management and orchard plantation. A number of innovative farmers in the region are introducing modern management techniques whereby staff are given specific responsibilities and performance targets linked to bonus schemes. Ultimately the industry should prepare itself for a future where a better paid work force will be achieving higher outputs, and staff who exhibit aptitude, training and perseverance can rise to senior management positions within the industry.

Equity Schemes. There is interest among some farmers in selling equity in their fruit farms to their staff. The schemes have the combined benefits of raising capital, involving staff with the business, and protecting the integrity of the farming unit. At existing commercial interest rates, the likelihood of workers being able to secure loan finance is slim. Farmers are interested in the possibility of obtaining international finance, but there is insufficient knowledge and imperfect information in the industry about the availability of such funds, how they can be accessed, by what criteria projects are judged, the different funding sources available, and the dangers associated with foreign exchange risk. International financial institutions are willing to support this kind of initiative, but are concerned about providing foreign exchange loans to farm workers. These issues are not insurmountable, but creative solutions do need to be developed. Models of worker equity schemes exist in other commercial sectors in South Africa. Typically the schemes are designed to place a low value on the shares themselves whose primary value is the dividend they deliver.

Some wealthier farmers have been considering providing land to their workers so that they can develop their own farms. The workers would farm their own plots during their off-duty time, and centralized services, if required, would be contracted from the main farm. It is not known how many farmers are seriously interested in such schemes, and a number of issues need to be clarified regarding land ownership, conflict of interest between the staff's own part-time farms and that of the main farm, and the disposition of the assets of these plots should the worker want to leave the employ of the landowner.

New Farmer Development Schemes. Citrus farming has been forwarded as the means to develop the indigenous farming sector and a more equitable distribution of land and capital, but this will be difficult to achieve in practice. The economies of scale in citrus production, the capital costs of establishing citrus orchards, the long lead times before economic production commences, the skills required for growing orchard crops, and the demands of the import market for scientifically-grown fruit within pesticide residue limits, all militate against the use of new small farms. Nevertheless, governments in the region, and the private sector, are determined to develop this sector. In South Africa, for example, the New Farmer Development Company Ltd., consisting of thirty private-sector shareholders (including *Unifruco*, *Outspan*, a commercial bank and a life assurance company), has a share capital of nearly 10 million Rand. A number of projects in Zimbabwe, Swaziland, and South Africa are also being developed,

mainly through the New Farmer Development Corporation and the South Africa Development Bank (SADB). [3]

It is important that the best practices of the region are understood and disseminated in order to avoid the repetition of mistakes. Key issues include farmer selection criteria, the justification of probationary periods, land ownership issues, and the optimum size of plot needed for financial viability. Production techniques will need some adaptation to be made more appropriate for small farmers, and training and support for new farmers, particularly during the initial phases, should be provided. As indicated earlier, easy-peeling citrus, along with kumquats, organic and biological citrus, and Pomelos, may be particularly appropriate for small farmers, not only because they are more labor-intensive, but also because gross margin levels are over twice those of the traditional orange varieties. Ongoing training, support and extension will be required to assist new farmers with difficulties they may face on a day-to-day basis.

Service Enterprises. As the citrus industry expands, jobs and business opportunities will develop in the service sector, creating opportunities for black-owned enterprises. The projections of sales and costs indicate that citrus exports will provide significant additional income to the packaging and local transport industries. Black business opportunities may include the provision of contract labor, machinery servicing contracts, contract services such as soil cultivation, spraying, packing and grading for small farmers, and the manufacture of wooden field crates and pallets. During the start-up phase of these pioneer enterprises, some business guidance and assistance in creating the necessary linkages between black business and the white farm sector will significantly improve their chances of success.

Given a future industry with a lower level of fixed staff at higher salaries, the problem of dealing with the labor peaks for picking, packing and pruning will become more critical. In other countries, and indeed to some extent in other industries in South Africa, the solution has been to increasingly use contract gang labor. While the current system does provide additional income and seasonal employment for the family of full-time employees, gang labor has had a checkered reputation, as it has been known to be exploitative. On the other hand, contract labor would address the needs of the fruit export industry, and would provide opportunities for black and minority rural businesses to develop without high levels of start-up capital. With training and support from some of the many NGOs already operating in the black business development sector, agricultural labor contracting has the chance of becoming a sensible and important service sector to the horticultural export industry. The important challenge is to identify these opportunities and to create the necessary linkages between citrus farmers and local enterprises. But only if the citrus industry can remain profitable can it also be used as an engine for economic development of the poor and rural populations of the region.

Regional Integration

Formation of a Southern African Citrus Council or Association. With the evolution of *Outspan* as a keenly competitive commercial organization, the possible changes brought about by the new Agricultural Marketing Act, and the increasing importance of independent producers, the citrus industry is in danger of losing its regional outlook at precisely the time it is most needed. The Citrus Board in South Africa is in the process of being separated from

[3] Another example of a successful small-farmer citrus scheme is the Saringwa Estates project in the Eastern Transvaal. The scheme is fifteen years old and has twenty citrus holdings of eight hectares each. The growers are provided with centralized services, and packing is carried out at a neighboring packhouse.

Outspan, thus becoming a more independent organization, and grower associations in Swaziland and Zimbabwe are gaining strength.

These facts suggest a need for a strong Southern Africa Citrus Grower Association. Such an organization could ensure that the commercial interests of exporters did not conflict with those of the region's growers, and that contributions are made by all the exporters for research, and for advertising and promotion. It could serve as the industry's representative to regional Governments, and coordinate with organizations like SADC and COMESA. It could help to forge alliances with other, complementary producing regions, with the objective of promoting a 12-month supply of premium quality citrus products.

Independent export companies do acknowledge the pivotal role that Outspan's research program has had in developing new technology. These companies are prepared to contribute to maintaining an on-going industry research program. A regional Citrus Board would serve to maintain and coordinate the region's research program.

A regional organization would also be stronger than any national organization in challenging discriminatory phytosanitary restrictions to trade, and Southern Africa is in an excellent position to do so. Winning one such case would provide an effective warning against other countries that maintain protectionist practices against Southern African citrus products. Above all, such a body could regulate exporters so as to minimize intra-regional competition in overseas markets, ensure that new markets and opportunities are sensibly and strategically developed, and ensure that all members would have equal access to facilities.

The Perishable Produce Export Control Board (PPECB). The PPECB should also become a regional organization, with inspectors from all the countries in the region and, as volumes develop and on-farm inspection becomes more pervasive, a sub-office in northern Zimbabwe would likely be required. If Southern Africa intends to take a more unified and regional approach to horticultural export marketing, a regional PPECB could play a key role. The PPECB can ensure that the region maintains its high quality standards and international reputation, and can charter vessels and aircraft. If the single-channel system is changed to allow independent exporters to operate, then the PPECB in South Africa will have the authority to coordinate joint chartering of vessels. This would enable the smaller independent exporters to take advantage of economies of scale in order to obtain competitive international transport freight rates.

Conclusion

The Southern African citrus industry is truly a regional industry. Althouth South Africa will remain the dominant player, the other producing countries will have a more significant role in the future. Mozambique's ports will become vital conduits for regional exports, particularly from Zimbabwe. The region is the dominant supplier of summer citrus to the global market. This dominance is projected to increase, based on recent and planned investments at the farm and post-harvest levels. Part of the past success can be attributed to the defactor regional integration of the industry, led by Outspan and the PPECB. Research findings, technology, and germplasm have flowed across borders, while economies of scale in post-harvest and logistical operations have resulted in relatively low unit marketing costs.

The next decade will bring enormous challenges. The key issues will be maintaining profitability in the face of a doubling of export volumes. This can be achieved only through orderly marketing, the development of new markets, and the promotion of consumption of

citrus as a summer fruit. Realizing the full economic benefits from citrus production and marketing will require a professionalization of the work force and the further integration of black farmers and black-owned enterprises into production and marketing services. It is vital that the industry continues to develop and spread new production and post-harvest technologies and maintains an independent and rigorous quality assurance program. With this vision in mind, and build upon the existing strong foundations, the citrus export industry can become a more powerful motor for rural development and an increasingly important component of the larger Southern Africa horticultural export industry.

Annex: Funding a Regional Program

This paper has outlined an ambitious program for the citrus industry's progress in the coming decade. The key elements of this development include:

- developing new markets, in particular easy-peeling citrus;
- diversifying product lines;
- international litigation to challenge unscientific phytosanitary restrictions to trade;
- advertising and promotion more in line with food industry standards;
- encouraging vertical integration in the marketing process;
- upgrading staff skills in the industry;
- fostering the development of a black enterprise service sector for the industry;
- ensuring that the best practices for new farmer schemes are introduced;
- mobilizing local farmer development initiatives;
- restricting intra-Southern Africa competition;
- deepening and widening the research program;
- encouraging the PPECB to develop a regional program;
- completing the net work of citrus ports around the fringe of Southern Africa; and
- forming a regional citrus board.

To be properly funded, these initiatives would probably require some start-up financing from outside the industry. Table 17 below illustrates two levels of industry funding. The first assumes levies and charges at current levels, projected to the years 2000 and 2005. The second shows a revised funding proposal in which it is assumed that the doubling of the advertising budget will reduce the rate of fall in real prices from 2% per annum to 1% per annum.

The assumed charges and levies are modified as follows:

- the research budget is increased from 1.05% of FOB values to 1.25%;
- the extension budget falls from 0.7% to 0.6% and 0.5% as volumes increase;
- PPECB levies stay the same;
- the advertising budget raised from around 2.2% of FOB values to 4%;
- a new budget to fund development initiatives from a levy of 0.25% of FOB values; and
- a new budget to cover the secretariat costs of a regional Citrus Board funded from a levy of 0.1% of FOB values.

Table 17: Funding of Regional Programs

Activity	1995 (actual)	2000 (proj.)	2005 (proj.)
Existing Levels of Allocation	$ million	$ million	$ million
PPECB	1.4	2.4	3
Research	3.10	3.30	3.7
Extension	1.90	2.20	2.46
Advertising	6.30	6.93	7.74
TOTAL	12.7	14.83	16.9
Revised Funding			
PPECB	1.4	2.4	3
Research	3.10	4.18	4.96
Extension	1.90	2.01	2.00
Advertising	6.3	13.4	15.88
Development		0.84	1.00
Citrus Board		0.34	0.54
TOTAL	12.7	23.17	27.38
Assumed Overall Increased Industry FOB Income		20	45

Source: Author's calculations based on Outspan

The Development and Prospects for Minor Industrial Crops in Selected Southern African Countries

Clinton Green with Jaspar Steele and Johan Willemse

The term 'minor industrial crops' (MICs) embraces a very diverse range of primary and further processed products of agriculture, agro-forestry and forestry. They variously find applications in the food sector, as ingredients in industrial non-food products or as raw material feedstock for the chemical industries. While global demand for many MICs is substantial, it does not compare with, for example, that for tea, rubber, oilseeds or timber; hence, the 'minor' categorization in trade statistics and the production reports of most countries.

Within Southern Africa, MICs can play a potentially significant role in the process of agricultural diversification due to several factors, including:

- Existing production is limited in both the range and scale of tropical and sub-tropical MICs. Moreover, the region is a net importer from overseas and demand levels are expected to grow, especially in South Africa. Therefore, benefits would accrue from import substitution.

- Scope is perceived for the entrance of new suppliers into the international market for a number of MICs in the short-term and for a wider range and greater volume in the longer-term.

- Many of the crops are suitable for smallholder cultivation and primary processing while others are more appropriate for commercial farming enterprises. Added-value, secondary processing of a number of MICs can be undertaken on-farm or by small-to-medium scale enterprises at a comparatively low investment cost in equipment and without the need for highly skilled staff.

- Many of the primary agricultural products and all of the added-value processed products possess a high unit value to volume ratio and good storage characteristics. Thus, they have comparative advantages for transport and export from the land-locked, northern countries in the region to South Africa and to international markets.

A review of MICs within the region is timely. Within the northern countries, interest in crop diversification is now high, yet awareness of the potential offered by MICs remains limited. South Africa's recent moves towards economic integration within the region as a whole, together with an expected contraction of its agricultural sector provides the necessary conditions for development of a substantial trade on an intra-regional basis.

This paper examines past, current and possible future developments with MICs in selected Southern African countries. Its attention is primarily focussed on the previously unattainable goal of import-substitution by intra-regional trade. Particular emphasis is devoted to production possibilities in Zimbabwe, Zambia and Malawi and to South Africa acting as a committed collaborator - rather than as a passive market place.

The balance of the paper is structured as follows. Section 2 reviews the techno-economic characteristics of a broad range of MICs, noting their implications for participation in production and processing activities by different types of economic actors. Section 3 examines international and regional

(import) demand for MICs. Section 4 traces patterns of past and current development of MICs in the focal countries, noting the primary obstacles to development. Section 5 summarizes the the potential for future growth and the elements of a strategy to achieve this growth potential in MIC production and trade.

Techno-Economic Characteristics of Minor Industrial Crops

In the following paragraphs, a brief description is provided of the uses and broad techno-economic characteristics of those categories of MICs which offer particular potential in the region. Examples are given of some individual products in Tables 1 and 2 for illustrative purposes.

Description and Uses

Spices and herbs are plant-derived materials which are added to food preparations in order to impart a specific, desired flavour. The term 'herb' is reserved for leaf material while 'spice' embraces the products of all other plant organs such as: seeds and seed capsules (coriander and cardamom), berries (pepper), fruit (chillies, paprika and vanilla), nuts (nutmeg and mace), bark (cinnamon), rhizomes (turmeric and ginger) and bulbs (onion and garlic). The bulk of farm-gate sales and of subsequent trade is made in the form of the dried material. Added-value processing is performed after farm sales and ranges in sophistication from simple cleaning and grading (for appearance and size); to grinding, blending and fancy-packaging for retail sales; and production of highly concentrated, standardized strength extracts for the processed food industry in the form of essential oils (see below) and of oleoresins. The manufacture of spice and herb oleoresins involves extraction with organic solvents.

Essential oils are the aromatic liquids, volatile-in-steam which are obtainable from spices, herbs and various parts of other aromatic plants. The majority are produced by passage of steam through a distillation vessel, containing the plant material and, after cooling of the vapours, the condensed oil and water phases separate by density differences. 'Distilled West Indian lime oil' excepted, citrus fruit oils are produced by mechanical abrasion of the peel as a by-product during fruit juicing operations. Individual essential oils variously find applications as food flavours, perfumes/fragrances, in other personal-care products, in medicines and as raw material feedstocks for the chemical industry.

Table 1: Illustrative Physical, Production and Processing Characteristics of Some Minor Industrial Crops

Commodity	Plant Type	Part Harvested	Form of Farm-Gate Sales	Harvesting Characteristics	Peak Bearing Years (perennials)	Suitability for Smallholders	Further Processing Operations	
							Type	Undertaken by (S: small; M: medium; L: large)
Annatto (colourant)	Tree	Seeds	Dried seeds	Up to 6 month season annually	3 to 12	Very	Cleaning, etc. Extraction	Trader (S/M) Dedicated co. (M/L)
Castor (ind. oil)	Perennial shrub	Seeds	Dried seeds	Treated as annual on plantations and as a perennial in less formal situations	1-3	Very	Cleaning, etc. Extraction	Trader (S/M) Dedicated co. (M/L)
Guar (gum source)	Annual shrub	Seeds	Dried seeds	Single, short	Not applicable	Very	Cleaning, etc. Extraction	Trader (S/M) Dedicated co. (M/L)
Turmeric, Ginger	Annual rhizome	Rhizome	Dried rhizomes	Single, short	Not applicable	Very	Cleaning, etc. Grinding, packing	Trader (S/M) Dedicated co. (M/L)
Paprika	Annual shrub	Fruit pod	Dried pods	Single but extended season	Not applicable	Yes but more demanding	Deseeding, etc. Grinding Oleoresin	Trader (M) Dedicated co. (M/L) Dedicated co. (L)
Vetiver Oil (essential oil)	Perennial grass	Roots (destructive)	Dried roots or oil	Treated as biennial crop; single short	Not applicable	Yes – as outgrower	Distillation	Commercial farmer or dedicated co. (M)
Lime Oil	Tree	Fruit	Fruit or oil	Up to 6 month season annually	5 to 15	Yes – as outgrower	Distillation	Commercial farmer or dedicated co. (M)
Medicinal Eucalyptus Oil	Tree	Leaf	Oil	12 to 15 month coppice regime	3 to 15	Poor	Distillation	Commercial farmer
Eucalyptus citriodora Oil	Tree	Leaf	Oil	6 to 12 month coppice regime	3 to 15	Poor	Distillation	Commercial farmer
Citronella Oil	Perennial grass	Leaf	Oil	3 or 4 annually	1 to 3	Poor	Distillation	Commercial farmer
Lemongrass Oil	Perennial grass	Leaf	Oil	3 or 4 annually	1 to 3	Poor	Distillation	Commercial farmer
Geranium Oil	Semi-perennial shrub	Leaf	Oil	2 to 4 annually	1 to 3	Poor	Distillation	Commercial farmer
Naval Stores (turpentine and rosin)	Pine trees	Gum tapped from live tree trunk	Not applicable	10 months annually	18 years(+) trees tapped for 4 years prior to felling as timber	Not applicable	Gum distillation Turpentine and rosin derivatives manufacture	Dedicated co. (L) } Dedicated co. (L) }

Natural colourants are derived from highly pigmented plant organs and today they are principally employed as food additives; their use in textile dyeing is now minor. Farm-gate sales are made of the dried material while end-use by the processed food industry is usually of concentrated extracts. Principal examples are the oleoresins of paprika (red), turmeric (yellow) and marigold flowers (tagete or 'khaki bush'; yellow) and the alkali extract of annatto seed (orange).

'Technical', fixed oils are related to the edible vegetable oils and are involatile-in-steam. Usage of 'technical oils' is largely restricted to special industrial, non-food applications (e.g. lubricants; 'drying oils' in paints, etc). The major item of trade is castor oil while tung oil is an example of a lower demand product. They are isolated from plant seeds by processes ranging in complexity from hydraulic pressing to solvent extraction or a combination of these methods.

Water-soluble gums include the natural trunk exudates of certain wild or informally cultivated trees ('gum arabic', karaya and tragacanth) and the extracted endosperm of some seeds (notably, guar). Usage of these gums - usually after further processing - spans the food industry, adhesive manufacture and, for guar, petroleum oil drilling and mineral ore processing.

Gum naval stores is a term (originating from the days of sailing ships) used to describe the crude gum exudate of live pine tree trunks, obtained by a manual tapping operation (similar to rubber), and its further processed products. Steam-distillation of the crude gum separates the liquid constituent, turpentine, from the solid rosin. Traditionally, turpentine has been employed as a solvent for paints but today its main application is as a feedstock for the chemical industries, including manufacture of the disinfectant/cleaning agent known as 'pine oil'. Rosin is used as a coating for paper and for further processing of a range of speciality products, including adhesives and resins. Gum tapping is carried out as an additional revenue-earning option in pine forests, established primarily for timber or pulpwood production.

Production and Processing Considerations

Climate and especially rainfall is the major agronomic constraint on the range of MICs which may be considered for the region. For example, the spices nutmeg and vanilla require rainfall patterns and humidity levels which would make cultivation difficult or marginally economic in most of Southern Africa. However, many MICs are adaptable within the region's varied agro-climatic zones, including fairly drought-tolerant crops - such as guar and castor. Moreover, the options span annuals with short cropping seasons to perennials with a longer interval to the first cash-flow but capable of sequential cropping for up to twenty years.

It is appropriate to stress at this juncture that *end-product quality is of critical importance for successful marketing and profitability and this is strongly influenced by the intrinsic (inherited) characteristics of the planting stock*. Great attention must be paid to this aspect from the outset since careful crop management and post-harvest processing cannot overcome any basic defects in the plants grown.

Cultivation skills for the majority of MICs are not particularly demanding but some, e.g. paprika, require an intensive, horticultural approach, both to ensure good yields and product quality. A similar situation applies to skills for harvesting and on-farm, primary processing operations; some operations are simple while, for example, production of top-grade, green-cured cardamom presents a particular challenge.

Labor input requirements for production of MICs operations range from the moderate to the substantial. With certain essential oil crops, it is both possible - and indeed advantageous in terms of maximizing utilization of installed equipment - to carry out semi-continuous harvesting and processing by

managed rotation of blocks; citronella, lemongrass and eucalyptus fall into this category. Associated challenges on labor availability and management can be ameliorated by adoption of mechanised harvesting with the first two examples cited whereas only one from amongst some twenty oil-bearing *Eucalyptus* species can be similarly treated.

Amongst the MIC options, *essential oil production has the greatest potential for on-farm, added-value processing*. Moderate, acquirable skill is sufficient with many oils whereas the higher unit-value of some perfumery oils reflects, in part, demands made on processing and quality control. Processing can be carried out on small-scale equipment and at a low investment cost if a seasonal surplus capacity exists with an available farm steam boiler. If, however, production is aimed at direct export on several occasions each year of the minimum normal shipment volumes for many oils (see Table 2), then an installed distillation vessel capacity equating to several tons of batch charge with herbaceous material would be necessary; investment costs in such a unit (not including buildings) would commence from approximately US$80,000 (f.o.b.) if manufactured from Europe but would be less if sourced regionally.[1]

Virtually all other MIC added-value processing operations are undertaken off-farm. Relatively simple cleaning and grading operations for many spices and items such as guar, annatto and castor seeds require low to moderate skill and low investment. The level of entry for spice grinding and retail packaging is determined by the smallest available size of commercial equipment, typically 500kg per hour throughput; such a machine would cost some US$50,000 (f.o.b.) from Europe. The sophistication levels now required by major supermarkets for pack presentation and quality control demand a much greater investment.

Many other MIC added-value processing activities, e.g. for guar gum and castor oil production, involve a substantial investment. Oleoresin production demands particular skill and a large investment in equipment (US$1 million upwards).Gum naval stores production requires moderate, acquirable skill but, importantly, the availability of a very large number of suitable pine trees and an investment of around US$0.5 million for a basic size factory.

[1] Options for regional sourcing include purchase of sound, second-hand distilleries from South Africa where many firms have ceased or contracted their operations in recent years.

Table 2: Illustrative Economic - Agronomic Variability for Some Minor Industrial Crops

Commodity	Int. Market (c.i.f.) Price Fluctuations 1990-1995 (US$/kg)	Annual Product Yield (kg/ha); Low Smallholder; High-Efficient Commercial Farmer	Planting to 1st Harvest	Subsequent Harvests Intervals (C – continuos cropping possible by planning)	Economic Lifetime for Perennials (years)	Labour Demands for Harvesting (M – mechanisation possible)	Normal Minimum Export Size	
							Tonnes (Cl – container load)	Cultivation Area (ha) Requirement for Single Annual Shipment
Annatto Seed	0.6 to 0.8	1,000 to 1,500	18 months	Annually	20	Moderate	12 (Cl)	8 to 12
Castor Seed	seed: not quoted (processed oil 0.75)	200 to 5,000	5 months	Annually	up to 10	Moderate	10 (Cl)	2 to 50
Guar Seed	Raw seed: not quoted (processed seed ~ 0.6-1.2)	500 to 1,500	6 months	None		Moderate	15 (Cl)	10 to 30
Turmeric and Ginger	0.5 to 0.7	1,000 to 2,000	9 months	None		Moderate	14 (Cl)	7 to 14
Paprika	1.4 to 2.0	1,000 to 6,000	4 months	None		Heavy	15 (Cl)	2.5 to 15
Vetiver Oil	27 to 70	~ 20	15 months	None		Heavy	1	50
Lime Oil	19 to 23	~ 90	3 years	Annually	20	Moderate	1	11
Med. Eucalyptus Oil	3 to 6	~150	15 months	12 to 15 months (C)	20	Heavy	10	66
Eucalyptus Citriodora Oil	4 to 11	~150	12 months	6 to 12 months (C)	20	Heavy	5	33
Citronella Oil	4 to 11	~150	4 to 6 months	3 to 4 months (C)	3 to 4	Heavy (M)	5	33
Lemongrass Oil	7 to 12	~ 90	4 to 6 months	3 to 4 months (C)	3 to 4	Heavy (M)	5	55
Geranium Oil	27 to 65	30 to 80	6 months	3 to 6 months	3 to 4	Heavy	1	13 to 33
Naval Stores (as co-products of timber operation)	Gum: not quoted Turps: 0.45 to 0.65 Rosin: 0.57 to 0.70	per tree:- Gum: 2.5 ↓ Turps: 0.38 + Rosin: 1.75	18 to 20 years	2 weeks (C)	4 years (prior to tree felling)	Moderate	Turps: 20 (bulk tank) Rosin: 20 (Cl)	Standard factory consumes 1,000 tonnes of gum annually and fed by 400,000 trees

Prospective Participants in Production, Processing and Trading

The above review of MIC techno-economic characteristics point to the opportunities open for added-value processing for commercial farmers/estates and to small-to-large-enterprises which are not directly engaged in crop production.

Skill and financial constraints preclude smallholder farmers from engaging in other than primary processing activities for a quality conscious market. However, this group has a fairly wide range of options for crop cultivation, including items likely to be economically unattractive to commercial farmers. This participation will depend upon the receptiveness of these farmers to new crops and an improvement in extension support and marketing systems. Smallholder outgrowing for processing operations is conceivable, provided that efficient logistical arrangements are made. The factors constraining this supply linkage between independent smallholders and a processing unit can be summarized as follows:

(a) land limitations (and its quality) and an understandable emphasis on food production in smallholder plots;

(b) high demands of horticultural management, even where adequate extension services are available;

(c) high risk of failure given quality demands; and

(d) the absence of irrigation facilities and the frequency of drought.

Crop selection, therefore, should focus on those for which management demands are low and compatible with existing, traditional agricultural activities. Crops where product quality is largely governed by the germplasm used rather than by skill in cultivation and post-harvest handling could also be advantageous. The possible form of participation by various players in production, processing and trading are summarized in Table 1, above.

The International and the Regional Market

The International Market

General Characteristics

Wide differences exist in the international markets for individual MICs. This makes it difficult and limits the usefulness of providing aggregate demand and trade figures for these commodities and depicting broad trends therein. For example, world trade in some MICs and related products (including pine gum rosin, guar seed, and castor oil) exceed 100,000 tons per year while that for certain essential oils-- with specialty applications in perfumery and flavors-- may be only several dozen kilograms per year. For some individual MICs there are a large number of production sources, while in other cases (for example: cloves, cardamon, and vanilla) only one or a few countries account for the bulk of world production and exports. One possible uniformity across the range of MICs is the common reliance of specialist dealers and brokers, who provide a valued intermediary service between producers and end-users.

The structure, size and trends of the markets in developed countries are fairly well defined, often covered by specialist trade journals and official trade statistics. This is not the case with developing countries and, consequently, their substantial consumption of many MICs is frequently overlooked or poorly appreciated by external market analysts.

For the majority of MICs, growth in demand within developed countries has been relatively static in recent years; these markets are mature with changes largely at the margins, reflecting prevailing fashions in consumer products or a substitution in the industrial sector of natural products with a record of erratic supply by synthetic materials. However, a clear growth in consumption of many MICs is evident in the developing countries as a result of population increases, urbanization and the emergence of consumer product markets. India and China are the flag-bearers but a progressive, if modest growth in demand from a low base-line is occurring in many smaller and less populous developing countries. In the future, the countries of Eastern Europe and the CIS can be expected not simply to resume their former consumption levels but, rather, to display a major growth along with the establishment of consumer market economies.

Allowing for the post-1990 decline in demand in Eastern Europe and the CIS countries and for the periodic swings in the global economy, market prices for most MICs have been more strongly influenced by supply-side variables than by those on the demand-side over the past two decades. International market price fluctuations have largely represented annual over- and short-supply conditions but the causes extend beyond those of the conventional cycles for agricultural products. Exports from some current major suppliers, e.g. high quality Madras turmeric from India, represent a small surplus over the domestic demand, and crop shortfalls constrain exports. Similar conflicts with other MICs are apparent with another major player, China, but here further complexities arise from the recent economic liberalization policies: continued aggressive exporter behaviour while agricultural production in some economic development zones has declined owing to the advent of alternative and more attractive means of income generation for the rural population (i.e. urban employment or new crops).

The geographical pattern of supply may be expected to alter in the future with the decline of some current major suppliers while others, including new sources, emerge to fill the demand gaps; possibly accompanied by a degree of price instability in the transition. This is far from a new situation in the history of MICs which has been regularly punctuated by geographical relocation of production in response to socio-economic changes in former important sources. Examples in the past few decades - where labour cost competitiveness applied - include the run-down in production of gum naval stores in the USA and southern Europe, paprika and eucalyptus oil in Spain and, even more significantly, some floral oils and extracts - which demand manual harvesting - in Egypt.

Spice and essential oil consumption globally is showing a growth trend but with a degree of regional variability, especially in added-value products. In Sub-Saharan Africa as a whole, demand for fragrance products (incorporating natural essential oils and synthetic aroma chemicals) is growing faster than that of flavors. World-wide, however, the converse situation applies with a particularly remarkable growth trend in soft beverages; for example, it is predicted that production of distilled lime oil must double over the next decade in order to match demand for the 'cola' family of drinks (Pepsi, Coke, etc.) in which it is a key flavour ingredient. Other specific and notable trends in mainstream markets include: (a) progressively tighter controls in developed country markets on health and safety aspects for spices (microbiological and pesticide contamination), which exporters can ignore at their peril; (b) continued high competition between suppliers of paprika, pepper, vanilla and of spice oleoresins; and (c) attempts by major importers to diversify their sourcing base for commodities where oligopolies currently exist. Niche markets are emerging for 'organic' spices and herbs and for 'green/rainforest' essential oils but demand levels will be very small and a risk exists of early oversupply with the entrance of many producers, attracted by the currently prevailing high prices.[2]

Natural colourants are generating renewed interest in the food industries of developed countries but individual prospects differ. Annatto buyers are seeking both to diversify sourcing and to encourage export of extracts rather than seed. By contrast, marigold meal demand is largely confined to chicken

[2] According to a recent ITC report, world imports of essential oils increased from some $989 million to $1.1 billion between 1989 and `1994.

feed in the US and Iberian markets and increasing competition is likely between suppliers of both meal and the oleoresin.

Water-soluble gums are expected to find increasing usage along with global expansion of the processed food sector. However, only the Sudan can meet the quality requirements for gum arabic; *Acacia* gums from other sources in Africa are of an intrinsically inferior quality. Guar gum's prospects are strongly governed by those of the petroleum drilling and mineral ore mining industries; moreover, new suppliers to the world market would encounter fierce competition on price from the Indian sub-continent and Brazil.

'Technical' fixed oils: Modest growth is likely within this category but new suppliers of castor oil face the same challenges as those of guar. Naval stores consumption and especially that of gum rosin is expected to grow progressively in developing countries while developed country markets are likely to be more selective on the quality of imported gum rosin and gum turpentine. Prospects for a substantial scale of market entrance will depend strongly on the future levels of China's exports.

At least in developed country markets the tariffs applied to many MICs are relatively low and these are frequently waived for supplies from ACP (for the EU market) and other developing countries. Table 3 indicates the tariffs on selected essential oils for the EU, the United States, and Japan.

Table 3: Tariffs on Selected Essential Oils

Product	European Union	United States	Japan
Lime Oil	6.9 to 11.0	0	20
Geranium	0.0 to 2.3	0	10
Jasmine	0.0 to 2.3	0	10
Vetiver	0.0 to 2.3	0	10
Peppermint	0.0 to 4.6	6.6	20

Source: Market Study on Selected Essential Oils and Markets, ITC (1996)

Opportunities for the Southern African Region:

It must be acknowledged that there are no international market opportunities which are unique to the Southern Africa region. There is a high degree of competition between existing suppliers of most MICs and many prospective new entrants are standing in the wings. However, these conditions do not preclude successful penetration of the international market by the region, if on a modest scale, in the short term for well targeted commodities. The size of the international market is such that it can absorb a new producer. There is enormous, nascent consumer market in Eastern Europe and the former USSR. In additional, many major consumers wish to encourage a diversification of their supply sources for strategic security reasons. Yet more favourable prospects exist for the medium-to longer-term for the reasons discussed earlier.

When selecting commodities for the export market, the approach should not be based simplistically on comparative unit-values. This can be very important with respect to transportation costs but, generally, the very high unit-value of some commodities reflects a requirement for considerable inputs or skills in their production and a highly quality conscious - often small - market. Returns, rather than unit-price, together with ease of market access are more important criteria for success. An acceptable return might be possible with a lowish unit-value commodity for the volume market which gives high yields and demands less in production skills.

Some promising export candidates for expansion of existing regional production or for new introduction are indicated in Table 4, together with suggested time frames for development. In certain cases, export development would best follow on satisfying the regional market demand (discussed below)

since this ensures a buffer market outlet and allows time to gain requisite experience in quality control (see 'Strategy' later).

Caveats must be applied to some commodities. Ginger and turmeric are best suited to the higher rainfall areas, north of the Zambesi but transport costs for export may marginalize profitability. Spice seeds and herbs have low bulk-densities and might similarly suffer from unacceptable transport costs for export to the international market. In the case of paprika, expansion should be geared carefully to shifts in the market while installation of further oleoresin processing capacity is unwise in the medium-term; those existing paprika oleoresin factories would best diversify their product range, and this could include other spice oleoresins. Owing to the international market demand and supply situation, no significant scale expansion is wise in the short-term with Birdseye chillies and the essential oils of orange, tagete and buchu; moreover, any gaps in demand for these items could be readily met by existing producers.

The Regional Market

Published data on demand, production and exports for MICs in the region are of poor quality. The following review is derived from a mid-1990s assessment of the regional market, based on the interpretation of trade statistics and interviews with selected end-users, traders and producers. The conclusions reached for many commodities are necessarily provisional estimates.

Demand patterns in individual countries differ according to population size, the level of economic development and the degree of urbanization. For example, South Africa's population (42.4 million) is greater than that of its neighbours combined and this is seasonally supplemented by immigrant workers. The European/Asian/Coloured communities account for 21 per cent of the population, possess a significant purchasing power, and display consumer tastes similar to developed countries.The majority black population currently has a very high unemployment rate and overall low incomes, yet has been exposed to the mass consumer market through its high level of urbanization. Also the industrial sector is the largest by far in the region.

In contrast, some three-quarters of Zimbabwe's population of 11 million are relatively low income rural dwellers. Significant disposable income is confined to a relatively small set of European, Asian and middle-class black communities. Zambia's population of 8 million is more or less even divided between rural and urban areas. Slow economic growth and a contraction in the mining industry has adversely affected disposable incomes. Consumer purchasing power is even smaller in Malawi, where more than 80% of the population consists of low income smallholder farmers or commercial farm workers. Malawi's industrial base is considerably smaller than those of Zimbabwe and Zambia. The other country covered in this survey-- Swaziland-- has a population of less than one million people, most of whom are small scale farmers with little disposable income.

The South African market will play a pivotal role in regional trade development for reasons which extend beyond the facts of its scale, expected growth rate and the recent moves to reduce trade barriers with its neighbours. The South African government's "White Paper on Agriculture" (1995) sets out the development of agriculture by its neighbours in the region as one of its policy goals. This policy is based on the premise of a decline in South Africa's own agricultural sector as a result of structural adjustment, combined with natural resource constraints, and that exports to its neighbours will be predominantly in the form of manufactured goods and services, for which a trade balance can be achieved only by import of raw and semi-processed agricultural commodities.

Table 4: Principal Candidates for Overseas Export Development and Import Substitution by the Region

Future Potential	Commodity	Average Annual World Trade (tonnes)	Region Data for 1994 (estimates)							
			Demand		Imports from Overseas		Production		Overseas Exports	
			Region Total	South Africa	Region Total	South Africa	Region Total	South Africa	Region Total	South Africa
Primarily for Export	Paprika	40,000	NA	NA	neg	neg	20,000	8,000	20,000	8,000
	Annatto seed	6,500	NAs	NAs	NAs	NAs	small	small	nil	nil
	Lime oil	1,000	NAs	NAs	NAs	NAs	10	nil	10	nil
	Med. eucalyptus	2,000	25	20	small	neg	100	80	75	50
	Geranium oil	200	NAs	NAs	NAs	NAs	nil	nil	nil	nil
	Vetiver oil	260	NAs	NAs	NAs	NAs	nil	nil	nil	nil
Import Substitution, Followed Later by Exports	Turmeric	18,000	*1,300	1,000	1,200	1,000	*120	nil	nil	nil
	Ginger	18,000	*700	600	550	500	*150	100	neg	neg
	Chillies (mild)	25,000	3,500	3,000	500	500	3,000	2,500	small	small
	Citronella oil	1,800	} 320	150	320	150	nil	nil	neg	neg
	E.citriodora oil	500	}							
	Lemongrass oil	400	60	40	60	40	nil	nil	neg	neg
	Gum rosin	384,000	**6,100	5,000	1,000	1,000	**4,500	**4,000	300	300
	Gum turps	25,000	170	70	nil	nil	1,100	1,000	900	900
For Import Substitution Only	Dried onion & garlic	NA	*5,000	4,800	5,000	4,800	small	small	neg	neg
	Coriander seed	35,000	2,600	2,000	1,000	1,000	*1,600	1,000	neg	neg
	Other spice seeds	100,000	1,400	1,300	1,400	1,300	small	small	neg	neg
	Dried herbs	25,000	*400	300	300	250	small	small	small	neg
	Castor oil	150,000	*2,000	1,500	2,000	1,500	small	small	nil	nil
	Guar seed	100,000	*10,000	*7,000	8,000	5,000+	2,000	small	nil	nil
	Pine oil	NA	600+	600	600+	600	nil	nil	nil	nil

Key:
* very provisional estimate
** includes tall oil rosin (TOR) from South African pulp factories
NA not available
NAs not available but small

1994 imports	US$ (mill.)
min. value	20

This view is supported by a large part of South African agribusiness and many firms are now actively seeking to source their raw material requirements within the region, some companies are offering production contracts and others are considering investment in agro-processing. Additionally, several multinationals have now designated their South Africa-based branches as the headquarters for operations in the whole of Sub-Saharan Africa. Manufacturing for export by these multinationals, for example of compounded flavours and fragrances, could draw on raw materials produced in the Southern African region and, thereby, further expand the level of intra-regional trade.

Would-be suppliers of MICs to South Africa must recognise that the South African market is no less sophisticated in its requirements than the international market. Competitiveness on product quality, continuity of supply and price with overseas suppliers is all-important. While exports to South Africa of a limited number of commodities can be made by means of the agricultural commodity exchange infrastructure, for many MICs direct trade will be necessary with individual South African companies. In some cases, there are a small number of buyers (eg. guar) but other sectors - notably the flavours and fragrance industry - are highly fragmented and call for a greater effort in marketing.

Spices and herbs: South Africa's consumption is substantial; equal to 1-2 per cent of annual world recorded trade. Current annual sales in the formal market are approximately US$42 million for retail packed herbs and spices, US$26 million for curry powders and US$26 million for industrial compounded flavours (dried spice mixes plus formulations of oleoresins and essential oils). Table 5 below provides a preliminary estimate of spice and herb consumption in the South African market, indicating significant domestic demand, but little domestic or regional sourcing. Demand in the Malawi, Swaziland, Zambia and Zimbabwe markets cannot be quantified so readily but in each case it is disproportionately smaller per capita than for South Africa.

The retail market in South Africa is dominated by a number of domestically-owned companies while the industrial flavor sector has been captured by multinationals. Products have been developed to meet the particular taste preferences of the different ethnic groups in the population.

In all of the neighbouring countries spice and herb consumption by the majority black populations is much less highly developed and is mainly for curry powders. With the notable exception of Zimbabwe, the small retail market for quality spices and herbs packs is dominated by South Africa products. The processed food sector in all four countries is also small and the flavour ingredients are supplied by multinationals, based in South Africa.

A progressive growth is expected in South Africa's consumption of spices, herbs and their extracts via the urban black population's adoption of new maize-based snack foods and meat substitutes and, also, from institutional food programs. However, the rate of growth will depend upon the performance of the overall South African economy and the disposable income of the predominantly poor, urban black population. Any growth in the spice and herb products markets in South Africa's neighbours is likely to be very small in the medium term.

Table 5: South Africa's Annual Consumption (Estimated) and Supply Sources for Spices, Herbs and Their Extracts (tonnes)

Item	Total Consumption	Sourcing		Import Sources (principal countries)	
		Domestic	Imports (value, US$ mill.) (a)	Regional	From Overseas
Pepper	1,400	Nil	1,400 (3.5)(b)	Nil	(Sing, Maly, Indon, India)
Chillies	>3,000	Major	500 (c)	140 (Mal,Zim,Zam)	(China, Sing, India)
Paprika	NA	Main			
Turmeric	1,000	Nil	1,000 (1.0)	Minor	Major (India)
Ginger	600	100	500 (0.4)	Nil	(India)
Cinnamon/Cassia	400	Nil	400 (0.8)	Nil	(Sey, Sing, China)
Nutmeg/Mace	200	Nil	200 (0.4)	Nil	(Sing, Indon)
Cloves	200	Nil	200 (0.3)	Nil	(Mad, Sing, Com)
Cardamom	50	Nil	50 (0.3)	Nil	(Guat, India, Sing)
Pimento/Allspice	50	Nil	50 (0.2)	Nil	(Mexico, WE)
Vanilla	<1	Nil	<1	Nil	(WE, Mad)
Coriander	2,000	1,000	1,500 (1.0)(c)	Minor (Zim)	Major (EE, India, Aust, Sing)
Anise	50	Nil	50	Nil	(Sing, WE, China)
Caraway	50	Nil	50	Nil	(WE)
Cumin	700	Nil	50 (1.2)	Nil	(Iran, Sing)
Other Spice Seeds	500	Minor	500 (d)	Nil	(WE)
Herbs and Garlic Flakes	500	Minor	500	Nil	(WE)
Onion Flakes	4,600	Minor	4,600 (1.6)	Nil	(WE)
Paprika Oleoresin	NA	Major (?)	Minor (?)	Minor	(Spain)
Coriander oleOresin	6 (min.)	Minor	Major	Nil	(WE)
Others Spice Oleoresins	NA	Minor	Major	Nil	(India, WE, NA)
Spice Oils	NA	Minor	Major	Nil	
Herb Oils	NA	Minor	Major	Minor	Major

Key:

NA - data not available EE - Eastern Europe Mad - Madagascar Sey - Seychelles

Aust - Australia Guat - Guatemala Maly - Malaysia Sing - Singapore

Com - Comores Indon - Indonesia Malw - Malawi WE - Western Europe (a) Import figures are estimated averages for 1992-1994

(b) White pepper is the most popular on the retail market while industrial users employ black or white according to food product type.

(c) High annual fluctuation.

(d) Contains large proportion of fennel and celery seeds.

South Africa is dependent upon imports from overseas for most of its requirements for herbs, spices, dried onion and garlic. The notable exceptions are coriander and mild chillies (for which domestic production is not adequate in all years) and for paprika. Small quantities of pungent chillies and coriander are purchased from Malawi and Zimbabwe. Imports of other items from neighbouring countries has been constrained by inadequacy of volume, deficiencies in quality and the unreliability of exporters. The bulk requirement for spice oils and oleoresins is imported, mainly from India.

Zimbabwe is self-sufficient in chillies and coriander and produces some of its requirements for herbs and various other spices. Malawi was formerly self-sufficient in mildly pungent chillies, coriander, turmeric and ginger but has now reached the stage where imports might be necessary, not through increased demand but rather from a contraction of production; volume demand for all other spices and herbs is met by imports. Zambia has no tradition of spice and herb production, yet the recent expansion of paprika production points to the potential there (see below). Demand on the small Swazi market is met largely by imports. Only limited production is undertaken of chillies and turmeric by smallholders.

Essential oils: South Africa's consumption is substantial but precise quantification of demand is not possible owing to the failure of trade statistics to distinguish natural and synthetic items. Many multinationals are involved in flavours while both multinationals and domestic companies cater for the fragrance sector. Flavor oils in the greatest demand are ready-to-use citrus and mint (respectively around 70 and 160 tons annually). A wide range of oils are used in the fragrance sector and the major items are citronella and lemongrass (respectively around 150 and 40 tons annually) for the soap, detergent and toiletries industries.

In neighbouring countries in the region, demand is dominated by fragrance oils while flavor oil usage is significant only with citrus in soft drinks and mint in toothpaste and other personal care products. For the region as a whole, citronella oil consumption (estimated at 320 tons and US$1.6 million annually) equates to a remarkable 15 per cent of world trade. This results from its incorporation in the inexpensive laundry soaps used for all purposes by low income consumers. Manufacturing of soap and detergents is undertaken in all countries by domestic and multinational companies.

Flavor oil usage in processed foods is expected to grow in South Africa while in neighbouring countries any significant increased demand is likely to be restricted to citrus in soft drinks and mint in personal care products. A much greater growth rate is predicted in the region for fragrance oils, particularly in toiletries and inexpensive perfumes.

With the exception of citrus and eucalyptus, the Southern Africa region is a net importer of essential oils. A very substantial proportion of imports are ready-to-use formulations composed of a mixture of naturals (with or without synthetics) which are tailored to the user's requirements. For example, the citronella oil used by a major multinational for laundry soaps contains 95 per cent of the natural oil and the remainder is aroma chemical additives.

Natural colourants: In the processed food sector, competition exists between synthetic and natural colourants. Annatto extract is employed by some multinationals but the scale of demand is not clear. Marigold meal or its extract may be employed as a food additive in the South African poultry industry but this is suffering severe competition from imported chicken meat following market deregulation. Usage of natural dyestuffs for textiles, etc. is minor, paralleling the world-wide trend for substitution by superior and less expensive synthetic dyes. Current sourcing of materials is both from the region and overseas.

Water-soluble gums: The most important by far is guar and the level of demand fluctuates with the international market for the region's mineral ores. Currently, annual demand is perhaps 10,000 tonnes in seed equivalents (around US$9 million), and South Africa accounts for the bulk. Malawi supplies several thousand tonnes of seed but the major volume is imported in semi-processed form from the Indian sub-

continent. No reliable data are available for consumption of other water-soluble gums but a modest growth in the South African food industry is possible in future. Apart from a very minór production in Zimbabwe of an inferior quality *Acacia* gum, all needs are met by imports from outside the region.

Castor: Demand in the region for castor oil is tentatively estimated at 2,000 tons. Regional production is minor and South Africa alone imports 1,500 tons (US$1.2 million) from overseas. A progressive growth in demand may be expected in the region along with economic and industrial development.

Gum naval stores: Regional demand for all types of rosin in 1995 was around 6,000 tons and the major market was South Africa. The rosin demand projection for the year 2000 is of the order of 10,000 tons as a result of usage growth in South Africa and the mooted commissioning of new paper plants in Zambia and Malawi. If adequate supplies of domestically produced gum rosin were available, additional sales might be possible to soap manufacturers in the northern countries as a partial substitute for imported palmsterine and tallow.

Demand for pine oil, a turpentine derivative, is currently 600 tonnes annually and largely by South Africa. This may be expected to grow modestly in future. Usage of turpentine is currently weak but will expand from 1996 with the commissioning of a pine oil plant in South Africa. Additionally, there is a possibility of new usage of several hundred tons of turpentine by paint manufacturers in Zambia and Malawi; subject to the availability of good quality, domestically produced material at a parity price to imported white spirit/mineral turpentine.

Production of naval stores is presently undertaken only in South Africa and in Zimbabwe. Moreover, output in Zimbabwe is entering a decline along with the supply of the pine tree resource. A regional production deficit of the order of 1,600 tons per annum presently exists for rosin and this requirement is met by imports, valued at US$1 million. If regional output of naval stores undergoes only a marginal change by the year 2000, the import requirement for rosin is expected to increase to some 5,600 tons (valued at US$3.6 million).

Hence, the mid-1990s market analysis pointed to the considerable potential of import-substitution on a national and (especially) regional level. At present there is a substantial deficit in the production of MICs in relation to demand in the region. The largest market in the region, South Africa, is highly dependent upon imports from overseas. Additionally, existing production of a number of MICs in South Africa is expected to decline in future along with the contraction of its agricultural sector. Many of the MICs imported by the region from overseas can be grown under the agro-ecological conditions existing in the northern countries of the region.

The import-substitution potential within the region is tentatively valued at around US$20 million annually. For agricultural products, this would require the planting of some 34,000 hectares, of which smallholders in the northern countries could account for some 24,000 hectares with appropriate crops (eg. guar and castor seed, turmeric, ginger, coriander). For the commercial sector, examples of significant scale opportunities include dried onion and garlic for the processed food industry, citronella oil for the soap industry and gum naval stores production. This import-substitution potential is almost twice as great in cash value as that seen for exports from the region over the short-to-medium terms.

Past and Current MIC Development Patterns in Southern Africa

Four phases of MIC development in Southern Africa can be depicted. The first, from 1900 to 1965, broadly corresponds with the colonial era. The second phase was from 1965 to 1980, the third covering the 1980s and early 1990s and the fourth phase occuring during the more recent period of economic liberalization.

1900 to 1965: This corresponds to the colonial era in the northern countries (the former Rhodesias and Nyasaland) and that before which South Africa's apartheid policy resulted in its political and partial economic isolation. Attitudes to MICs during this period in both political entities were broadly similar. The vast majority of commercial farmers focused on traditional field crops while Government Departments devoted little resources to MICs as they were considered of marginal potential to the overall agricultural economy. Individuals - both in the private and public sectors - with an interest in MICs were largely dependent for professional advice and information on correspondence from the precursors of today's Natural Resources Institute (sequentially: the Imperial Institute; the Colonial Plant and Animal Products Department, and then the Tropical Products Institute) in distant London.

Early initiatives were entirely the consequence of private sector enthusiasts with limited resources. These included trials as early as the 1930s with essential oils in Northern Rhodesia, which were prompted by concern over the dependence upon a limited range of crops and the perceived need to diversify into high value/low volume export commodities. In South Africa, production of MICs commenced with a limited range of spice crops by commercial farmers in response to a known domestic market demand. Malawi excepted, little effort appears to have been devoted during this period to encouraging smallholder production of appropriate MICs.

The success stories by the mid-1960s were few but, notably, included the establishment of citrus oil production in South Africa, Swaziland and Southern Rhodesia, plus the beginnings of eucalyptus oil production in the Transvaal and neighbouring Swaziland. Both industries were export oriented and arose 'piggy-back' on the creation of fruit juice and eucalyptus timber ventures, respectively.

In Malawi, smallholder production was undertaken of several spices and these entered the regional market via the Asian trading community. The early 1960s also featured a spurt of Government interest in essential oils and - with the assistance of the UK's Tropical Products Institute - development was undertaken of a perfumery oil, ninde, from an indigenous weed.

1965 to 1980: During this period, South Africa and Swaziland experienced a steady growth in citrus and eucalyptus oil production and, for the latter, exports rose at the end of this period to supply 13 per cent of recorded world trade in 'medicinal oil' and over 90 per cent of 'industrial oil'. Attitudes to MICs also underwent a major shift in the South African Government - along with the isolation created by the apartheid policy - and in parts of the commercial farming community. The government gave support (R & D; import tariff protection) to the development of MICs with strategic/import-substitution relevance, while farmers sought to diversify into higher value crops. New ventures included production of various essential oils and the promotion of guar cultivation. However, the overall success rate was low; commercial farmers found crops such as guar to be economically unattractive while the smallholder sector had little capacity to produce in volume.

In newly independent Malawi, the government also adopted an interventionist line and this seriously impacted on MICs. It took the form of allotting monopoly purchasing rights for smallholder crops to a parastatal marketing board (ADMARC), plus legislation specifically banning the traditional Asian traders from activities in rural areas. The inexperience of ADMARC in pricing led to mixed results: overproduction of some crops and a decline with others. The newly established production and export of ninde oil soon collapsed since marketing became the monopoly of ADMARC, which failed to respond effectively to buyers' orders. There was, however, one notable - if shortlived - success in which Admarc played a key role; namely the development of guar seed production by smallholders (see Box 1, below). Some of the commercial estates experimented with MICs during this period but the majority were both wary and preoccupied with mainstream crops, especially tobacco.

Newly independent Zambia displayed no great interest in MICs during the entire period and its smallholder production of castor dwindled, possibly as a result of parastatal marketing deficiencies. Neighbouring Rhodesia was then passing through the UDI phase and innovation in agriculture ceased.

However, UN sanctions on Rhodesia prompted the establishment of Africa's first gum naval stores industry factory to service the domestic market.

The 1980s and early 1990s marked a significant transition phase for MICs in the region. South Africa, followed by Zimbawe developed as major world suppliers of paprika (See Box 2) while Malawi, followed by Zimbabwe captured the lion's share of the world market for Birdseye chillies (see Box 3). Both developments arose from initiatives of the private sector in response to encouragement by overseas buyers.

Box 1: The Travails of Guar

Guar seed provides a gum with important uses in mineral ore refining and demand in the region is perhaps 10,000 tons annually. Several attempts have been made in the region to develop production; the stimulus involving strategic security considerations in South Africa and the encouragement of a U.S. processor elsewhere. In South Africa and Zimbabwe, commercial farmers found the crop insufficiently remunerative while attempts to promote smallholder production failed.

By contrast, smallholders in Malawi adopted the crop with alacrity in the mid-1970s under an initiative of the Ministry of Agriculture and the marketing parastatal, ADMARC. Output rose up to 5,000 tons per annum by 1980 and further expanded on the commissioning of an ADMARC-owned first stage processing factory in 1983. However, the quality of the factory's product was poor and it provided lower returns than sales of raw seed. Unsold stocks mounted to 15,000 tons in 1985 and ADMARC's interest in the crop began to wane. This situation prompted a private company, Transglobe Produce Exports, to purchase ADMARC's stock and to export to South Africa. Transglobe installed superior processing machinery (capacity of 8,000 tons annually) and developed collaborative links with traders and processors in Zimbabwe and South Africa. Recognizing the significant demand for guar splits in the region, Transglobe and its partners in Zimbabwe and South Africa have developed a strategy to acheive total import subsitution.

Transglobe was prepared to further expand its processing capacity and to manufacture fully refined gum. However, it faces a supply constraint. ADMARC's change in commitment to the crop led to a reduction in its purchase price, eventually to half that of other buyers. Since the majority of smallholders live in remote areas and the Asian community was forbidden by law to trade in the countryside, sales logistics problems, plus lack of awareness of alternative buyers to ADMARC led to a decline in annual production to 2,000 tons by 1994 (with growers reverting to cotton, which then commanded a good price and stable market). This is a classic case of buoyant demand and adequate supply capacity failing to link through fundamental flaws in the intermediary marketing chain.

Box 2: The Paprika Story

Paprika has enjoyed the fastest growth rate in demand among spices in developed country markets in the past few decades and this has been accompanied by decreased output from a major supplier, Spain. With encouragement of Spanish processors, paprika was developed in South Africa in the early 1980s and proved popular with commercial farmers. Shortly afterwards, but largely independently, paprika production took off in Zimbabwe where commercial farmers found that its production integrated rather than clashed with tobacco management, could utilize existing labor plus infrastructure (tobacco drying barns, etc.) and provided a return comparable to the tobacco bench-mark.

The rate and scale of adoption of paprika has exceeded that of all other newly introduced crops in Southern Africa for decades. The combined output of South Africa and Zimbabwe at 20,000 tonnes per annum represents a major share of world trade, equating to the total volume of Europe's imports.

Considerable problems, however, were encountered in the early phases of production with both agronomy and marketing. Even for experienced commercial farmers, there has been a major learning curve in changing from traditional, extensive crops to the more intensive, horticulture demands of paprika. For smallholder growers on communal land, the demanding management techniques, weak extension support and preference for food crops has limited their involvement. In addition, marketing paprika has met with some obstacles. Until recently, free-booting buyers from South Africa exploited inexperienced producers, paying poor prices and in some cases defaulting on payment. This has led to a sceptical view on the crop amongst a surprisingly large sector of the commercial community; this experience has tended to entrench prejudices about new crops and middlemen in general but the attitude reflects also the poor knowledge of markets and of the extant, proven marketing systems within the country. Recently, major advances have been achieved since dedicated major buyers have become established and provided selected seed and extension support services under contract production arrangements. These arrangements vary among the buyers from fixed price forward contracts based on color quality, to more comprehensive contracts with selected promising producers in which seed and extension support is provided in return for the entire crop purchase at a pre-arranged price per kilogram. South Africa and Zimbabwe are now producing oleoresin and, like farmers and pod exporters, these factories have gone through a learning curve from a zero knowledge base on production, quality control and marketing.

Since 1994, Zambia has resuscitated paprika production and a very large oleoresin plant was commissioned there in 1995. Malawi entered into the first production of paprika in 1994, stimulated in part by a new Zambian-Malawian joint venture which contracts out to growers. By the 1995/96 season, paprika plantings had grown to some 800 ha. in Zambia and 2000 ha. in Malawi. It has continued to expand since.

Smaller-scale successes included the creation of essential oil production in Zimbabwe and two seasoning enterprises, one in Zimbabwe and the other in Malawi, developing from import-substitution to niche exporting (see Box 4).

Box 3: Hot Stuff on the Move : Differing Development Patterns with Birdseye Chillies

Amongst the numerous commercial types of chillies, 'African Birdseye' commands a small but special niche on the basis of appearance, for which a premium is paid on the retail market, and for high pungency in the industrial flavour market. The historic major source, Uganda, dried up during the Idi Amin regime and the supply shortage was briefly filled by Papua New Guinea until smallholder incentives to grow the crop were undermined by the erratic pricing and procurement practices of that country's parastatal marketing board.

In the late 1970s, a large estate in Malawi recognized the market opportunity and developed production and exports. Smallholders very rapidly adopted the crop, selling in small quantities to Admarc or to private exporters via bicycle traders. The private sector bought only premium grade material; poor-quality crop could be sold to Admarc at significantly lower prices for domestic processing. Smallholder production eventually ousted the more costly production by the estate sector, and Malawi became the major world supplier (over 300 tons in some years).

Development in Zimbabwe commenced a few years later. Initial attempts to stimulate smallholder production failed and the crop has been produced subsequently by commercial tobacco farmers who market through a cooperative. Like paprika, Birdseye chillies integrates well with the tobacco regime and can share its infrastructure. Intensive treatment has been adopted to provide very high yields and returns are considered superior to tobacco with the lower investment. A market share of around 200 tonnes annually has been captured, largely at the expense of Malawi from the ability to harvest several months earlier and to respond first to orders from overseas buyers with depleted stocks of premium grade material. When possible, the chillies are exported direct to end-users in Europe. Smaller amounts are also sold through dealers. Additionally, the lower grades are sold to the grinding and oleoresin extraction sub-markets in Mexico and the USA. In contrast in Malawi, the major exporters in the black community purchase only premium-grade material and farmers must dispose of their lower grades at a poor price to Admarc which has not sought to supply the overseas industrial market.

In Malawi, Birdseye chillie production was initiated by some large estates but their production was rapidly supplanted by smallholders. However, smallholder production of most other MICs, including guar seed from the mid-1980s, declined as a result of the pricing policies of ADMARC. Birdseye chillies prospered since a new group of traders emerged from the black community in Blantyre and specialised in this item when ADMARC's monopsony rights were ended.[3]

Box 4: Small Enterprises Moving from Import Substitution to Export : More Hot Stuff

Towards the end of the 1970s, a small entrepreneur from Malawi's black community recognized an unsatisfied domestic market demand for a hot, Tabasco-type sauce. After experimentation in formulation and no little difficulty in procuring bottles and ingredients, the product - Nali Sauce - was successfully launched on the domestic market. Its fame spread through the region and orders followed. Through determined and well-targeted marketing, it later gained a place on the European market where the distinctive bottle-shape and the label, which proclaims 'the hottest of Africa' were contributing factors. In 1982, demand was estimated at 3 tons per month but production was constrained by shoratges of mild chillies and packaging materials. By 1988, the operation had developed to the export of one container per month to South Africa and smaller but growing sales in Western Europe. Today the operation is a major business with an export of three containers per month and continued signs of growth in demand. The firm has now diversified into a range of other spice products for the export market.

At a similar time, an entrepreneur in Zimbabwe bought a pizza restaurant and then found difficulty in purchasing the traditional herb ingredients. The search of the Harare market revealed an opportunity for import substitution of herbs and spices. After trials with a wide range of crops, commercial cultivation was initiated on the firm's own farm and later outgrowers were involved. Today, the company - Four Seasons Foods - has captured a major share of the domestic herb and spice market from South African spice houses. Also, success in exporting has been achieved by identifying niche markets for 'organic' herbs and herb oils; the latter are produced along with tagete oil.

Summary of Historic Constraints to MIC development

The longer term constraints on development of MICs in the region have varied in complexity and relative importance from country to country. However, any lack of financial resources appears to have been less important than other issues, except with regard to public R & D and extension services in the northern countries. For South Africa, the most significant constraints have been those of climate and rainfall in large areas of the country, unattractive remuneration levels for commercial farmers with many MICs and a reluctance of smallholder farmers to develop beyond garden scale cash crop production.

In the northern countries, the adoption of MICs has been constrained by a lack of information and knowledge about the risks and market potential for the crops as well as by a lack of technical support for their production. Commercial farmers were reluctant to diversify into crops for which the marketing infrastructure and channels were not well developed or understood. Farmers who experimented with the production of essential oils discovered that unless they could produce in sizable volumes they could not make direct sales to overseas buyers and instead needed to sell through brokers or other middlemen. Also, much experimentation was done without the use of high quality planting stock, reducing the quality of the product available for sale.

Within the context of no significant R & D services being available for some two decades, the agricultural policies of government - even that of tobacco bias in Malawi - appear to have been neutral in their effect on MICs. Commercial farmers have taken their own decisions and smallholders in individual countries has grasped or ignored market opportunities offered.

[3] Until 1995, many of the traditional traders of Birdseye chillies-- being from the local Asian community-- were banned from direct crop procurement activities in rural areas.

Perhaps most significantly, market awareness for most MICs was very poor amongst farmers and managers of foreign-owned estates and little better amongst many traders (especially in Zambia and Zimbabwe). This compounded the risk perceptions amongst farmers. A primary cause of this awareness problem is the lack of an obvious connection between many MICs and their content in consumer and durable products. For example, few people appreciate that lime oil is a major flavour ingredient in Pepsi and Coke, annatto is used to colour hard cheeses and the difference between blotting and writing paper is a coating of pine rosin. The connection of guar seed to petroleum drilling and uranium mining is even less apparent to the lay public. The absence of knowledgeable local traders and a commodity exchange floor also presented an obstacle to acquisition of knowledge either deliberately or by osmosis. Lastly, certain MICs - notably essential oils - are covered only in specialist trade journals and by specialist international traders.

There was a particular lack of awareness at the producer level of the market for MICs in South Africa. This, rather than any trade barriers, appears to have been an important factor in the development of MICs in the region. Additionally, smaller traders have failed to appreciate the quality and service standards demanded on the South African market. In Malawi, where smallholders have constantly been responsive to identified market opportunities, the problem in the more recent period has been related to the (dys-)functioning of the rural marketing system. The restriction of Asian traders from rural areas and the inefficiencies of the parastatal system have inhibited growth in smallholder MIC development.

While the above constraints perhaps inhibited wide-spread adoption of MICs in southern Africa over the last century, the few success stories are illustrative that with creativity and persistance, MIC production has considerable potential in the region. Contract farming arrangements; high-value, small volume niche marketing; the use of traditional farming methods and infrastructure for new crop production, and making the most of contacts and all sources of information are all strategies that have enabled a few farmers in the region to profit from MIC production and processing in recent years. The following section will examine the current status of MIC production in the region and speculate on the trends in MIC development and the comparative advantages of several of the southern African countries in this process.

Status and Trends in the Mid-1990s

South Africa: South African agriculture is undergoing a major transition as a result of the combined effects of market deregulation, land redistribution, water shortages for irrigation and rising labour costs. This will undoubtedly impact on commercial farmer production of MICs, probably most severely with crops such as coriander which have been marginally profitable in most years, and possibly on paprika for which yields are irrigation dependent and availability of labour for harvesting shows signs of becoming a problem. These trends suggest that the future of MICs in South Africa lies with agricultural production of higher quality/price products for niche markets and added-value processing of materials from neighbouring countries.

Paprika production is illustrative of the future for MICs in South Africa. Water and labour availability problems have already prompted the major South African exporter to seek contract production in neighbouring countries and to focus domestically on high product quality/value rather than on yields. Paprika remains the giant in South Africa spice production and, uniquely for the region, it has state involvement in the form of estate cultivation and oleoresin manufacture by subsidiaries of the South African Estate Corporation (SAPEKO). In addition to the major private sector buyer (which is also the only exporter of ground paprika), there has also been a move towards contract production to guarantee supplies by the SAPEKO oleoresin factory. Non-contracted paprika growers can make sales to a range of independent exporters. Sales by farmers of the only two other volume spices, coriander and chillies, can be made directly to traders, end-users or through the agricultural commodity exchange.

In the essential oil sector, citrus oil output by large fruit juicing companies remains substantial. However, eucalyptus oil production (see Box 5) has severely contracted since 1992 owing to a prolonged period of low international prices and a growth in demand for the timber on the domestic market. A revival of eucalyptus oil output to its former level in the Transvaal is questionable - even with improved market prices - in view of the profit expectations of producers. Minor-scale production of a range of other oils is made by some half a dozen farmer-distillers around the country; exports in significant quantities are restricted to the specialities, buchu and tagete with direct sales to overseas dealers. Added-value processing of citrus and medicinal eucalyptus oils to the ready-to-use form for the domestic market is undertaken by one company. Facilities exist within the private sector for added-value processing of other MICs, eg. guar, castor and natural colourants, but supply of the raw materials is presently poor both within South Africa and from its neighbours.

Production of pine gum naval stores, including added-value derivative manufacture, commenced in Natal in 1990 by Pinechem, a private company which has close links to the producer of 'sulphate naval stores' (by products of paper pulping). By 1995, production of gum rosin had almost reached full import substitution levels. Installed processing capacity is greatly underutilized owing to restrictions placed on tapping by the major pine tree source owner, the national Forestry Department.

Swaziland: A modest production of citrus oils continues as by-products of the estate run fruit industry. However, the eucalyptus oil industry has contracted with the closure of the Commonwealth Development Corporation (CDC) operation. Unlike neighbouring Transvaal, this decision was taken not because of world market prices but since the plantations and factory were very old and it was cheaper to relocate production for its targeted share of the market to another CDC forestry operation in Tanzania.

Box 5: The Large and the Small Approach to Essential Oil Production

The eucalyptus oil industry in South Africa and Swaziland developed from recognition of an opportunity to generate additional revenue by distillation of 'waste' leaf on plantations established for timber. Most distillers soon decided that oil production was more remunerative than timber and changed plantation management to an annual coppicing regime in order to produce bushes and to maximise leaf yields. Also, blocks were harvested in rotation to permit continuous operation of the distilleries through the year and individual producer outputs ranged from 20-80 tonnes of oil annually.

By contrast, a group of tobacco farmers in Zimbabwe who entered into essential oil production around 1980 have taken the approach of small volume production of high unit-value oils. Initial crop trials showed that volume market herbaceous oils, such as lemongrass and geranium, demanded three to four annual harvests to provide an economic return and, also, a substantial investment would be necessary in equipment, labour and management to produce the minimum volumes necessary for sale to mainstream market buyers. Production of tagete (marigold) oil proved more suitable for their situation in which tobacco was seen as the core business. The plant grew as a weed on their farms and supplementary raw material could be readily purchased from neighbours. Moreover, harvesting and distillation fell in the slack period of the tobacco year and investment in equipment could be lowered by 50 per cent by employing existing infrastructure; specifically, the tobacco barn's steam boiler. By forging links with committed overseas buyers, paying attention to product quality control and avoidance of oversupply, this group and two other tagete oil producers have been highly successful and while exports average only 5 tonnes annually Zimbabwe now holds a major share of the world market, largely at the expense of South African producers.

Attempts have been made in South Africa to draw on the resources of small-scale farmers for essential oil production (from tagete and some other indigenous weeds). One initiative involved use of a self-contained, transportable distillation unit which was moved from one location to another where farmers sold small quantities of the wild-harvested or informally cultivated plants. This venture has ceased owing to problems in generating a continuous supply of raw materials.

Several other opportunities exist in Swaziland. For example, suitable pine plantations exist in CDC's Swazi plantation to support a naval stores factory but a thorough feasibility study has not yet been undertaken. A part of the wattle bark production, destined for the South African tanning industry, arises

from smallholders. A recent feasibility study advised against establishing a wattle extraction factory and to focus on improved crop management.

Zimbabwe: As in South Africa, MIC production arises almost exclusively from commercial farming and forestry operations and the volume product is also paprika. However, the climate is superior for MIC production and labour is more competitively priced. Attitudes to diversification by Zimbabwe's commercial farmers, virtually all of whom are tobacco growers, remain divided but the majority now are more receptive to new ideas. Various factors are of importance in decisions on crop diversification. The first is the impact on the core business of tobacco production: will the crop integrate well, like paprika and chillies or demand radical changes in farm management systems? Secondly, high investment costs are a disincentive in view of prevailing interest rates. Another, and new consideration for many farmers with irrigation facilities is the return per unit of water; this is becoming as significant as the traditional tobacco return benchmark. Perennial crops are gaining interest, especially well-known ones - such as citrus - while those subject to erratic price fluctuations are regarded negatively from a community which has been used to many years of officially announced prices (for most major crops other than tobacco).

Paprika continues to dominate MIC production. While the stimulus to develop paprika initially came from South African buyers, the industry has largely developed independently. There are two major domestic buyers, of which one produces the oleoresin, and both offer contracts to farmers. Independent growers can sell to a range of other domestic buyers and agents of South African and Spanish firms. The smaller but very successful Birdseye chillie production is run by a farmers' cooperative whose marketing arm has close links with a major South African paprika and chillie exporter. Spices are now quoted on the Zimbabwe Agricultural Commodity Exchange (Zimace), which was established in response to the deregulation of agricultural markets.

No new essential oil producers entered the market between 1990 and 1995. The current actors in the market have refined their strategies through a slow process of trial and error and diversified production. The only change in recent years by the non-citrus oil producers has been refocussing on the most remunerative oils; two are supplying the niche 'organic/aromatherapy' market in Europe, which purchases very small quantities (less than 2 kg. for most orders by individual buyers) but at premium prices (See Box 6). All sales are made direct between distillers and overseas essential oil dealers.

Processing of gum naval stores by Zimbabwe Phosphates Ltd in Harare is declining due to reduced supplies of crude gum from the private forestry company, Border Timbers Ltd, which is focussing more on timber production for the domestic market. There are no alternative, suitable pine plantations in Zimbabwe and the processing operation has a finite lifetime if it remains reliant on domestic gum as feedstock. Processing capacity exists in Zimbabwe for guar, castor and pyrethrum but this is presently underutilized through shortage of feedstock.

Box 6: Finding the Right Product for the Right Market

Through attending an organic products trade fair in Germany, the Zimbabwean Essen Oils Co. became interested in the oil of a previously unexploited **indigenous Lippia species**. The company, who had been experiencing a decline in returns from its medicinal eucalyptus oil production, commenced commercial (organic) production of the new species in 1993 and the current annual oil output is 200kg. from 10 ha. Aromatherapists in Germany purchase quantities of a few kg. or less at a time and are presently prepared to pay around US$ 200/kg. Production provides good returns through the combination of the high price and the crop's low maintenance needs, drought resistance and capability of being harvested mechanically. On the basis of this experience, the success of similar tea -tree and tagete oil operations, and the high management and labour demands on an already highly diversified farm, Essen Oils has decided to avoid bulk volume oils in future and to focus on niche market, high value oils.

No significant R & D has been undertaken by government departments on MICs and funding constraints appears to preclude any future initiatives. All recent commercial successes have been based

on individual farmers or enterprises solving problems with their own resources. Some funding has been received by the University from several donors for work on smallholder production of essential oils.

Zambia's reawakening of interest in MICs has been both more limited and recent than that of Zimbabwe. While Zambia's endowment of natural resources is to its advantage, the capacity of Zambian commercial farmers and smallholders in adopting novel crops of high quality has not been tested. The high cost of transport is another inhibiting factor.

As in Zimbabwe and South Africa, attention in Zambia has focussed on paprika but its development has been chequered since its introduction around 1990. The stimulus came from South African buyers and commercial farmers commenced production devoid of knowledge of technical requirements or of the market. Over-optimistic expectations on crop yields and problems in dealings with some South African buyers dampened the initial enthusiasm. These problems were further compounded in 1994 by the collapse of a new domestic buyer, established by expatriates. This occurred just as a privately owned company (with a background in the cut rose industry) had embarked on the construction of the largest paprika oleoresin factory in the region. Promotion of the crop was renewed in 1995 by a newly formed, expatriate owned exporter company, Cheetah Zambia Ltd, whose activities include trial production with smallholders in the northern region.

The only other significant MIC development during the early 1990s was the initiation of production of marigold meal in the Zambesi Valley by a company called Mastock. As a possible option to export of the meal, trials of extract production began in 1995 at the underutilized paprika oleoresin factory. The Tobacco Association of Zambia is seeking to identify diversification crops and is promoting castor amongst smallholders and small commercial farmers in its current programme. Installation of a castor oil mill was undertaken in 1996.

There is no current initiatives on naval stores development with the large pine tree resource in the Copperbelt. Previous explorations by the Forestry Corporation in the 1980s faltered on the withdrawal of interest by a Portuguese company on which technology acquisition was dependent. Some other initiatives, not yet resulting in a commitment to production, are in hand with individual commercial farmers, including some with essential oils. These are based more on the desire to produce high-unit value export products than on a sound understanding of market opportunities and constraints.

Broadly, attitudes to crop diversification in the commercial farming sector in Zambia are more conservative than in Zimbabwe. Foreign corporations considering purchase of government estates - offered for sale under the privatization programme - are focussing on traditional estate crops. Independent commercial farmers are particularly wary of new crops for which markets are poorly understood and there is no existing marketing mechanism. The indebtedness incurred by many commercial farmers through a radical hike in bank interest rates in 1993, has inhibited new investment. Unless new crops can be developed using own financial resources, most commercial farmers are inclined to avoid risk-taking.

It is possible that a change in attitudes may occur if there continues to be an influx of South African capital and agro-processing enterprises in the coming years. Zambia holds an attraction for South African investment through the availability of inexpensive land and the high rainfall in the northern region. The incomers will bring new ideas and, importantly, links with the large South African market.

Malawi's position in the mid-1990s remained that of a tremendous proven but under-exploited potential in the smallholder sector. Traditional smallholder MIC production, save for Birdseye chillies, had fallen further as a result of ADMARC's crop pricing, the long-standing ban of Asian trading in rural areas, lack of access to affordable capital by interested indigenous traders, and the financial attractiveness of tobacco production. Attempts to promote various crops - by issue of free seed and the offer of attractive prices - have been made by Asian traders and the Unilever factory, which has a policy of sourcing raw materials locally when possible.

Set against this, there has been a growth in small commercial farms which are eager to produce cash crops but are devoid of knowledge of market opportunities. There has been a growth of Birdseye chillie production by such enterprises in non-traditional growing areas on the basis of unfounded optimism and no contact with the traders in Blantyre who are fearful of increasing market competition from neighbouring countries.

Within the large commercial estate sector, attitudes to crop diversification and MICs range from the ultra-conservative to openness to ideas and innovation. Perennial crops are of interest to tea and other estates and as a means of border definition to deter potential encroachment from surrounding communities. Those interested in diversification are presently also inclined towards better known crops. However there is an evident degree of interest by some in 'exotics', including essential oils. The Lonrho estate briefly produced citronella oil for Unilever's soap factory in the early 1990s but this has ceased owing to a problem which is not unique to citronella; the taxation structure allows imports via Zimbabwe of various products at a price below that which gives an attractive margin for domestic production.

The MIC crop most likely to take off in the immediate future is paprika. This was introduced to Malawi in 1994 by the same company which was operating in Zambia. Yields on estates proved promising and significantly, tenant tobacco farmers adapted well to the crop. On the collapse of the Zambian company, growers were left with no obvious market outlet until the later entry of Zimbabwean and Spanish buyers. However, this initial problem did not undermine interest in the crop. Several estates undertook a major expansion and a new company, Cheetah Malawi Ltd (the sister to Cheetah Zambia), vigorously promoted the crop among smallholders and small commercial farms. Government support services for agricultural diversification are limited and the onus now falls largely on ARET (the Agricultural Research and Extension Trust) which is a private body, funded through a cess deducted at the tobacco auctions.

Current constraints on development across the region: Resource endowment and comparative advantages for MIC production differ widely across the region. South Africa has by far the best management experience and infrastructure for agribusiness but this is heavily offset by a climate unsuitable for many MICs, land and water availability constraints and the rising costs of labour. Zimbabwe occupies the middle ground with respect to climate, management capability and infrastructure but land and water are not abundant and the cost and availability of labour is an increasingly important consideration. Malawi and Zambia have the best climatic conditions (particularly in their northern regions), land availability is not a major constraint (in Zambia), and both land and labour resources are underutilized. However, these two countries have the weakest infrastructure and are the most distant from the major markets. Overall, South Africa is the most disadvantaged for MIC production and, amongst the northern countries, Malawi and Zambia hold the greatest potential for the future, especially with crops requiring good rainfall and which are suitable for smallholder production.

Some particular problems for the individual northern countries have been mentioned earlier. The major and common constraints relate to:

(1) limited market awareness and access to market and technical information, with a lack of an institutionalized R&D capability on MICs, a general lack of MIC knowledge among official extension staff, and very limited knowledge and data on MICs among trade and investment promotion agencies. A regional rather than national approach to market and technical knowledge generation and disemmination might be most appropriate.

(2) limited awareness and two-way information flows about the opportunities for collaboration with South Africa, whether in the form of joint investments, raw material supply arrangements, or collaborative exporting operations.

(3) access to and affordability of finance, both for producers and processors as most financial institutions lack awareness and understanding of MICs and their financial viability.

Future Prospects and Strategy for Realizing Potential

The preceding sections of this review have identified a substantial potential for import-substitution and export-oriented production of MICs by the region and, furthermore, that a production capability has been proven already for many of the commodities. This concluding section discusses a strategy for realization of the potential and specific initiatives which would assist.

Development Strategy

MIC development would be best planned as a two stage process:-

- **Phase 1** would involve immediate development of selected commodities for the overseas market (for example, a modest expansion with paprika and new developments - aiming at a 5 to 10 per cent world market share - with annatto and the essential oils of lime, geranium and vetiver), plus immediate development of a wider range of crops for import-substitution on the regional market.

- **Phase 2** would be directed primarily at further development of export-oriented production, perhaps between the years 2000 and 2005. This would include: the northern countries filling a supply gap resulting from any reduced production by South Africa (eg of paprika and eucalyptus oil); and expansion of production of certain commodities developed in phase 1 for import substitution and after this goal has been achieved for export. This step would be dependent upon the absence of major production constraints, the products displaying price and quality competitiveness on the international market and that conditions on this market are favourable for the entrance of new suppliers. (Examples of possible candidates have been listed earlier in Table 3.)

The regional market clearly offers the greater potential by far in the medium-term with regard to volume and value, plus an opportunity of major involvement by smallholders and communal farmers. Therefore, the regional market should be assigned high priority in Phase 1.

For a number of commodities, there are advantages also in passing through an initial phase of production for the regional market prior to venturing on to the international market. These include:

- First, allowing a learning phase for the acquisition of the technology and experience necessary to produce highly price-and quality-competitive materials;

- Second, establishing a volume production base which will create confidence amongst overseas buyers on the ability for continuous supply of products; and

- Third, provision of a 'buffer' or 'safety-net' regional market in which a large product offtake is reasonably assured before confronting the vagaries of world supply and price fluctuations on the international market.

Within this strategy, South Africa is foreseen not only as the major market but also as the location for much of the downstream-processing of commodities, either for resale on the regional market or for overseas export. Economics-of-scale constraints on secondary and tertiary-level processing will apply to the northern countries for at least the medium-term with a number of commodities.

Success will be dependent to a considerable extent on the adoption of the concept of regional collaboration for development at both the national and the private sector levels. An example of the benefits possible from a concerted approach is given with gum naval stores in Box 7. Other commodities have a clear potential for several countries but constraints exist from lack of technical knowledge or germplasm. In these cases, it would be more cost-effective to collaborate on development by networked, mutually supportive R & D and germplasm bulking centres, training facilities and information clearing-houses.

As a historical consequence of the long years of South Africa's isolation, the northern countries still tend to look overseas for acquisition of technology and associated skills. Consequently, the very substantial reservoir of relevant management, marketing and technology skills available in South Africa remain untapped. The inevitable process of direct involvement in the northern countries by South African agribusiness will lead to a transfer of skills, if initially on a modest and compartmentalised basis with individual ventures. However, considerable scope exists for a transfer of skills at an institutional level under collaborative agreements - as has been mooted by the Government of South Africa - and this could involve formal vocational training and R & D in agriculture and agro-industries. A range of candidate institutions exist in South Africa and for the focal commodities the Institute for Tropical and Sub-Tropical Crops in Nelspruit is of direct relevance. (This organisation also could supply germplasm of a range of the focal commodities to the northern countries.) Owing to government funding constraints in the northern countries, their counterpart bodies for this technology transfer probably will need to be private-sector organisations, such as tobacco associations.

Box 7: Gum Naval Stores : A Vision of Cooperative Regional Development

The extant pine tree resource in the region has a theoretical potential to produce some 30,000 tonnes or more of gum rosin annually. However, production of gum rosin in 1995 was restricted to South Africa and Zimbabwe and totalled less than 3,000 tonnes.

The industry in Zimbabwe is now in terminal decline, owing to ageing pine tree stock and a change in tree utilization priorities by the growers. This loss of production on a regional basis will be offset by an expected growth in output by South Africia and, also, new ventures are mooted in Malawi and Zambia. Nevertheless, the scale of the new developments - presently conceived on an independent, national basis - are inadequate for projected regional demand in the year 2000 and the annual requirement for rosin imports from overseas could rise from the current 1,600 tonnes to over 5,000 tonnes (valued at some US$3.6 million).

If future development were planned on a regional basis with the aim of maximising economic benefits, import dependence could transform to the creation of a substantial export trade (tentatively valued at US$20 million annually if Zambia's potential were fully exploited). As a minimalist step, Zambia could aim to produce a surplus for the Zimbabwe market, either shipped after primary processing or in the form of crude gum for use as a feedstock by Zimbabwe's factory. In a fully developed scenario, South Africa's technologically advanced and underutilized industry would absorb all surpluses (crude gum, rosin and turpentine) produced in the region and carry out tertiary processing to derivatives, both to supply the needs of the region and for the overseas market.

Specific Initiatives

Creation of market awareness on MIC opportunities is the priority and pre-requisite for development. This would be greatly assisted by holding seminars within the region. The first seminar should cover the international market but the emphasis should lie with the opportunities offered to the northern countries by South Africa as a market and as a source of investment. It should involve participation of prospective producers, traders and loaning institutions from the northern countries and interested representatives of South African agribusiness. This would provide a valuable and cost-

effective preliminary bridging mechanism to fill the present gaps in awareness, knowledge and direct personal contact. This initial seminar on the South African market could be followed up by: (i) organized familiarization visits by groups of interested producers and traders from the northern countries to interested sectors of South African agribusiness; (ii) a thorough survey of the South African market for some volume products and the identification of existing trade barriers; and (iii) the compilation of a regional trade directory covering the focal commodities.

For the international market, familiarization visits should be organised for prospective producers and traders to key markets. The most cost-effective means would be the participation of delegations in trade conferences which cover the focal commodities. For example, the annual meeting in London of the International General Produce Association (IGPA) is attended by representatives of most of the world's major trading houses. A similar opportunity is presented for those interested in essential oils by the annual seminar of the International Federation of Essential Oils and Aroma Trades (IFEAT). In addition to facilitating direct contact with a wide range of buyers, the formal presentation at these meetings by world authorities furnish an overview of the scale and trends in the international market.

Improvement of MIC data-bases and their accessibility is of importance to all countries in the region. This topic could be usefully addressed in the seminar proposed above. Parallel sessions to the main trade-oriented events could be held by representative of existing national and private sector information resource centres and other technical experts. The present status of market and technical information and of germplasm availability or deficiency should be reviewed, together with discussion of the most effective means of pooling existing data, acquiring and disseminating new information in the future via nominated national clearing houses.

Since publications on market, economic and technical aspects for most of the focal commodities appear irregularly, consideration could be given to commissioning the preparation by international experts of techno-economic profiles on those items offering the greatest potential for the region. Possible funding sources for this proposal and any regional information dissemination network require identification.

The potential for technology transfer and R & D strengthening could be valuably examined in complementary sessions within the first regional market seminar by technical personnel from the public and private sectors. The aim should be to: review the status of current knowledge, human and physical resources for R & D and training on MICs in the region; to identify areas of common interest; and to explore the potential for future regional collaboration. Particular attention should be devoted to the possible contribution from South African institutions.

A follow-up meeting on regional collaboration could be held at which elaborated costed proposals are presented and then refined for submission to prospective funding sources (private sector, government and donors). These proposals should be very specific in relation to prioritization of commodities, targets and time-frames and to identification of the individual institutions best suited to carry out R & D or training. One particularly useful initiative would be the bulking (perhaps after introduction of elite material) of germplasm by one or more regional centres for issue to the commercial sector, which would then undertake the crop trials.

SELECTIVE BIBLIOGRAPHY

American Spice Trade Association. (1995). *Spice Consumption '93. Imports, US Production and Current Trends.* American Spice Trade Association (ASTA), POB 1267, Englewood Cliffs, NJ 07632, USA.

Blignaut, C.S. (1995). *Paper presented at the Farm Management Conference, Bloemfontein, 28 June 1995.*

Coppen, J.J.W. (1995). *Prospects for New Gum Naval Stores Production in Sub-Sahalian Africa. An Assessment of the Pine Resources in Malawi, Zambia, Tanzania and Uganda and their Potential for the Production of Turpentine and Rosin.* Accra, Ghana: FAO Regional Office for Africa (POB 1628, Accra).

Coppen, J.J.W. (1995). *Gums, Resins and Latexes of Plant Origin.* Rome: FAO. (Covers gum arabic, karaya, tragacanth, locust bean; various hard and soft resins; balsams and latexes.)

Coppen, J.J.W. and Hone, G.A. (1995). *Gum Naval Stores: Turpentine and Rosin from Pine Resin.* Rome: FAO; Non-wood Forest Products Series No. 2.

Coppen, J.J.W. and Hone, G.A. (1992). *Eucalyptus Oils: A Review of Production and Markets.* Chatham, UK: Natural Resources Institute Bulletin No. 56.

Green, C.L. (1995). *Natural Colourants and Dyestuffs: A Review of Production, Markets and Developmental Potential.* Rome: Food and Agriculture Organisation (FAO).

ITC. (1992). *Report of the Third Meeting of the International Spice Group, Kingston, Jamaica, Nov. 1991.* Geneva, Switzerland: International Trade Centre.

Truter, K. (1995). *Considerations for a Common Market for South Africa.* Paper presented at Agrecona Outlook Conference, 2 March 1995.

USDA. (1995). *Tropical Products - World Markets and Trade.* Washington D.C., USA: United States Dept of Agriculture, Foreign Agricultural Service Circular Series FTROP 1-95, April 1995.

Wallace, W. (1995). *The South African Market for Spices.* Paper presented at the World Spice Congress held in Cochin, India, February 1995.

PRO-GROWTH REGULATORY REFORMS FOR AGRICULTURAL INPUTS IN MALAWI, ZAMBIA, AND ZIMBABWE

David Gisselquist

Introduction

This paper describes the regulations, recent regulatory reforms, and the trading patterns for agricultural inputs for three Southern African countries — Malawi, Zambia, and Zimbabwe – and recommends additional regulatory reforms. Although the paper deals specifically with these three countries, many of the recent patterns and most of the recommendations are also relevant for other African countries.[1]

The paper argues that regulatory reforms for agricultural inputs can accelerate agricultural growth and help to narrow the technology and yield gaps between large and small farms. Evidence for these impacts is beginning to emerge, though reforms to date have been recent, incomplete, and been paralleled by the occurrence adverse weather and economic conditions.

Getting New Technologies to Farmers

Agricultural inputs markets deliver known and established inputs such as seeds of a popular variety and common fertilizers. However, inputs markets have another role to play in agricultural development: most new agricultural technology is embodied in inputs and disseminated to farmers through markets. For example, new varieties are distributed through seeds. Hence, to accelerate agricultural growth, policies and regulations may be designed not only to foster competitive markets for established inputs but also to reduce barriers to the introduction of new technology through new inputs.

In countries with developed market economies, multiple institutions including private companies, universities, and government research institutes are involved in agricultural research and technology transfer. Technology moves nationally and internationally through many channels, including publications, trade, direct investments, licensing agreements, academic conferences, etc. Coordination comes from competition and communication; there is no master research plan.

In contrast, governments of many developing countries have tried to manage all agricultural research and technology transfer through a few public sector agencies, often with the guidance of research master plans. Efforts to coordinate and control agricultural research and technology transfer have often limited the activities of private companies (eg. seed companies) and autonomous public organizations (eg. universities) and restricted technology flows to farmers.

For many African countries, increasing the flow of new agricultural technology for faster growth may entail moving away from central planning and toward systems with multiple sources and channels for

[1] During preparation of this paper, four consultants contributed supporting studies, as follows: Joseph Rusike provided special assistance on seed trade and regulation for all three countries and on all inputs trade for Zimbabwe. Maxton Grant Tsoka prepared a stand-alone study on "Retail Trade in Agricultural Inputs in Malawi." For Zambia, J S Phiri and G I Akafekwa prepared reports, respectively, on pesticides and livestock pharmaceuticals.

technology and technology transfer, as in developed countries. For the three countries in this study, multiple sources and channels are most evident in Zimbabwe and are increasing in Malawi and Zambia.

Divisible and Scale Neutral Technology

Farmer investments in most inputs such as fertilizers, improved seeds, livestock feed, and pesticides can be arbitrarily small. Even for agricultural machinery, where investments are lumpy, farmers can often work out arrangements to hire services of tractors, threshers, and other machinery according to area or time, so that these inputs too can be equally accessible to small as well as large farmers. Hence, unlike other sectors, where lumpy investments often limit modern technology to larger companies, changing or increasing the level of technology in agriculture does not necessarily favor larger farms.

While poor farmers, with relatively low labor and management costs, may be able and willing to substitute labor for machinery or herbicides, they cannot easily substitute labor for fertilizers, improved seeds, and feed pre-mixes. Hence, much agricultural technology tends to be suitable across farm size classes, as long as access to water, soils, and other aspects of the physical context are comparable. Studies in many countries show that small farmers adopt new technology along with large farmers, even when adoption entails greater investment in new inputs. For example, the smallest farms in Bangladesh (less than one hectare) use more fertilizer per unit area, irrigate a higher percent of planted area, plant a higher percent of cropped area to improved varieties, and harvest higher yields than medium (1-2 hectares) or relatively larger farms (more than two hectares).[2] Furthermore, where inputs are available in the market, access to formal credit has little impact on technology choice for small farmers.

Regulatory Reforms vs Other Reforms

Advocates for a wide range of economic policies use the term "reform" to describe their agendas. This paper focuses on regulatory and other trade liberalizing reforms for agricultural inputs. The basic nature of such reforms is to remove government controls that block people from taking independent initiatives to produce and trade inputs. These reforms are empowering, allowing people to act without first getting some central government official to approve. Hence, these reforms are inherently pro-growth, both in the short term as well as over longer periods.

Similarly, trade liberalizing reforms for agricultural outputs are commonly pro-growth, allowing farmers to sell at higher prices in more competitive markets. With some exceptions, government interventions in output trade have systematically depressed farm prices in African countries.

While trade liberalizing reforms (for inputs and outputs) are empowering and growth-promoting, some other "reforms" have arguably hurt agriculture in the three countries during the 1990s. For example, stabilization programs press for austerity through central government tax increases and other policy measures; austerity slows growth, while central government tax increases disempower the private sector along with local governments. Also, financial reforms can bring high real interest rates and disrupt existing channels for directed credit. Similarly, privatizing input parastatals or cutting subsidies can save

[2]Mahabub Hossain, *Green Revolution in Bangladesh: Impact on Growth and Distribution of Income* (Dhaka: University Press Limited, 1989), pp 74, 77, 79, and 87.

government money, but the impact on input trade and agriculture may be disruptive, at least in the short term. The discussion in this paper focuses on regulatory and other trade liberalizing reforms for inputs. An adequate discussion of other reform agendas is not feasible in this short paper. Depending on what happens with other reforms, however, the pro-growth impact of trade reforms for inputs can be undermined or strengthened.

Box 1: Turkey: Impact of Seed Regulatory Reforms

Turkey's 1963 seed law gives the Ministry of Agriculture authority to control seed production and trade, including registration (approval) of new varieties. With this authority, the Ministry suppressed private seed companies into the 1980s, allowing only a few to produce and trade vegetable seeds for registered varieties. Evidence of failed seed policies included widespread smuggling of vegetable seeds of illegal (unregistered) varieties, low adoption of hybrid maize, and expensive government seed agencies serving no more than about 10 percent of planted area.

In the early 1980s, policy-makers recognized that private seed companies could help Turkey's farmers adopt modern technology. From 1982, government eased regulatory obstacles to the introduction of new varieties and removed seed price controls. These and other reforms brought a rapid increase in the number of private seed companies from about five in 1980 to several dozen in the mid-1980s and an estimated 80 in 1994. During the mid-1980s, most major seed multinationals established a presence in Turkey through a subsidiary, joint venture, or licensing arrangement.

Reforms brought dramatic increases in the numbers of varieties allowed for sale. From 1982 to 1987, the number of registered sunflower varieties increased from three to about 30, and registered soybean varieties increased from two to more than 40. From 1980 to 1993, private companies took over seed markets for hybrid maize and sunflower, with aggregate sales increasing from zero to over 10,000 tons, supplying a third of the maize planted area and most of the sunflower area planted. Other crops for which post-reform private varieties and seed sales have had a major impact include: soybeans and potatoes, for which private companies supplied over 90 percent of commercial seed in 1993; wheat, where private companies have taken about 10 percent of the market; and vegetables, where there have been large increases in variety choice and seed sales. Turkey has also increased seed exports, notably for hybrid maize, hybrid sunflower, and vegetables.

National average maize yields doubled from 1983 to 1986 as farmers with suitable conditions shifted to new private hybrids; the net impact of private maize hybrids on annual farm incomes can be estimated at about $US 100 million. Although sunflower hybrids did not bring large yield increases, new private hybrids have higher oil content and, more importantly, are resistant to the orobanki parasite, which would otherwise have decimated sunflower area and production in the 1980s. Seed trade data also suggest increases in farm incomes and consumer surpluses with vegetables, but these impacts are more difficult to measure.

Pre-Reform Situation in Zimbabwe, Zambia, and Malawi

Line Ministries Control Inputs Trade

When countries follow non-market patterns of economic organization, as did all three countries in this study prior to reforms, line ministries control production and trade in their areas of responsibility, including production and trade through private companies as well as through parastatals and other public agencies.

Controlling Private Trade

Ministries of agriculture controlled private inputs production and trade through multiple mechanisms, including allocation of foreign exchange, licensing, and government intervention in retail trade. In Zimbabwe, for example, government provided an annual foreign exchange budget to the Ministry of Agriculture, which allocated it among trade associations for agricultural machinery, pesticides, and seeds; trade associations in turn distributed foreign exchange to their (public and private) members. Since foreign exchange was limited and undervalued, government allocation gave trade associations oligopoly control over input markets.

To limit price gouging by oligopolies, Zimbabwe imposed price controls on inputs in domestic trade, so that prices did not clear markets. Agricultural machinery dealers report long waiting lists for tractors during the 1980s. Ministers of agriculture in the three countries had legal authority during the 1980s to set prices for agricultural inputs in domestic trade.

In some situations, private companies that dominated import or production of inputs sold them wholesale to parastatals or government-dominated cooperatives for retail sales to farmers. In Malawi, for example, private seed and fertilizer companies at the beginning of the 1990s sold inputs wholesale to a parastatal, Agricultural Development and Marketing Corporation (ADMARC). With such patterns, private companies did not have touch with farmers, so that incentives and competition to meet farmer interests were weak or absent.

Ministers of agriculture in the three countries also registered producers and traders for at least some inputs. In Malawi and Zambia, governments limited registrations for seed dealers so that small farmers had virtually no alternative to parastatal and cooperative outlets. The Government of Zimbabwe protected a private oligopoly in seed production by limiting registrations for producers; on the other hand, the government registered enough dealers to serve small as well as large farms.

State Trade

Governments managed a significant share of inputs production and trade directly through parastatals and government-controlled cooperatives. For example, the Government of Zimbabwe in 1980 bought controlling shares in Sable and Zimphos, companies which produce most of the nitrogen and phosphorus fertilizers used in the country, as well as Zimbabwe Fertilizer Company, which dominates wholesale fertilizer trade. In Zambia, Zamseed handled almost all commercial seed production, import, and domestic trade.

Privatization without Liberalization

The 1988 privatization of National Seed Company of Malawi (NSCM) illustrates the weakness of privatization alone as a policy to ensure farmer access to technology and inputs at competitive prices. In the late 1980s, the Government of Malawi sold a controlling share of NSCM to Cargill. However, the government continued to limit entry of other private companies, protecting NSCM's monopolies in major seed markets (eg, for hybrid maize). The government also continued to limit varieties allowed for sale, so that NSCM did not introduce any new private maize hybrids; Cargill's one private hybrid, CG4141, had been approved for sale in 1986, and others came from public research. Despite privatization, there was no competition (so no chance for government to do away with price controls) and no influx of private technology that would come with a deregulated and competitive seed industry.

Subsidies

Governments of all three countries sometimes subsidized trade in agricultural inputs during the 1980s. Characteristically, governments paid subsidies directly to parastatals, allowing them to sell inputs at prices that did not cover costs. However, some subsidies went to private companies; for example, NSCM sold seeds wholesale to ADMARC at a negotiated price, while ADMARC absorbed losses in retailing seeds to farmers. Insofar as there were so many other government controls on private inputs trade, 1980s subsidies taken alone did not block private entry and competition. Even in the face of unfair competition from parastatals with subsidies, private companies, if allowed, would arguably have been able to enter and compete through new technology (eg. new maize hybrids), except possibly for major fertilizers, for which all sellers offer the same basic product.

Problems with Pre-Reform Inputs Trade

Prior to the 1990s reforms, pervasive government controls limiting entry, competition, and response to market incentives caused market failures in multiple forms, including persistent shortages, monopolies and oligopolies with unnecessary profits, etc (see Table 1).

Limited Technology Transfer

Before reform, officials in ministries of agriculture decided which inputs to trade or to allow, and thereby controlled technology transfer. For example, in all three countries, pre-reform governments used seed regulations and other trade controls to limit private introduction of seeds of varieties that government had not approved.

Similarly, ministries of agriculture in all three countries established national fertilizer recommendations according to crops and enforced those recommendations through controls on parastatal and private fertilizer trade. These national recommendations were often out of line with what soils needed. In Malawi, for example, recent research on five sites in Dedza Hills found that adding modest amounts of boron, zinc, potassium, and sulfur to standard fertilizer recommendations boosts yields 82

percent above yields with standard fertilizer recommendations.[3] In Zimbabwe, the parastatal that dominated fertilizer trade for many years developed and promoted 15 composites for different crops and circumstances based on soil tests. Although good science went into designing these 15 composites, the approach nevertheless leads to inefficient fertilizer use since specific soils and conditions do not always fit average patterns.

Bias toward Large Farms

Regulatory controls on inputs trade disproportionately affected small farms in all three countries, putting them at a disadvantage against large farms. In Malawi, the government encouraged separate input marketing arrangements for estates and small farmers. For fertilizers, estates bought from Optichem, a private company, while government retailed fertilizers with subsidies and credit to small farmers through ADMARC, a parastatal. Despite the evident intent to favor small farmers with subsidies, service was deficient. ADMARC linked distribution so closely with credit that "farmers complain that it is difficult and sometimes impossible to buy fertilizer [for] cash."[4] Also, standard fertilizer packages often did not match soil deficiencies.

Controls on seed trade gave ADMARC a monopoly for seed sales to small farmers, while ADMARC's seed sales were limited to varieties approved by government. In contrast, estates were able to import seeds of any crop and variety on own account for own use. For example, Cargill's CG4141 maize hybrid entered Malawi in the mid-1980s through seed imports by estates, after which popular demand led government to approve ADMARC sales of CG4141 seed to small farmers. Another example is magoye soybean, a self-nodulating variety which could be a cheap source of nitrogen for small farms, but which government of Malawi refused to register, so that small farmers could not buy seeds through ADMARC or any other formal commercial channel.

A 1995 study of retail input trade in Malawi found that:[5] (i) rural farmers have trouble in getting agricultural inputs even from their district headquarters and ADMARC markets. Even if ADMARC stocks some inputs, they are not always what the farmers want, and (ii) the marketing arrangements of many private companies are not favorable for rural farmers because they concentrate their outlets in urban areas. They seem to have no urge to use rural retailers due to the weakness in the policy, legislative and regulatory framework.

In Zambia as in Malawi, large farms were able to import seeds, fertilizers, and pesticides on own account, while small farms were forced to rely on government choice of technology and government-managed distribution (eg, through cooperatives). Also in Zambia, government allows registered

---

[3]Charles J Matawba and John Wendt, "Soil Fertility Management: Present Knowledge and Prospects," in D C Munthali, et al, *Proceedings: Conference on Agricultural Research for Development*, organized by the Soil Pests Project, University of Malawi, and Maize Research Team, Ministry of Agriculture (Lilongwe: Rockefeller Foundation, 1993), p 111.

[4]Ann Conroy, "Inputs Sector: Fertilizer and Seeds," working paper no 6, p 5. This paper contributed to: WB, *Malawi: Agricultural Sector Memorandum: Strategy and Options in the 1990s*, report no 12805-MAI (Washington DC: WB, 1995).

[5]Maxton Grant Tsoka, "Retail Trade in Agricultural Inputs in Malawi," mimeo (Lilongwe: World Bank Field Office, 1995), p 11.

companies with approved investment plans to import agricultural machinery duty free (eg, saving 15 percent duty on tractors in 1995); large farms can qualify for these tax breaks, whereas small farms cannot. These tax breaks have been so important that many machinery dealers bring in most of their equipment as agents for importing farmers rather than on own account.

Table 1: Consequences of Pre-Reform Suppression of Private Inputs Trade

Input	Major Consequences
Agricultural Machinery	MzaZi: shortages MzaZi: limited choice with few low cost makes and models; available machinery favors large farms
Fertilizers	MzaZi: virtually no private dealers for small farms, so that fertilizer not always conveniently available MzaZi: limited choice of nutrients; farmers not able to match nutrients with soil deficiencies Za: parallel markets; smuggling to Zaire and Malawi note: large farms in MZa able to import on own account, giving them favorable access
Seeds	MZaZi: commercial maize seeds available for only a few improved varieties; for other crops, choice is even more limited MZa: virtually no private dealers for small farms, so that seeds not always conveniently available note: large farms in MZa able to import on own account have access to more varieties
Pesticides	MZaZi: controlled access to foreign exchange ensures oligopoly MZi: for proprietary products (covered by patents in major producing countries), registration processes impose costs and delays on introduction of new products MZi: for commodity products (out of patent in major producing countries), prices are higher than necessary as registration processes block competing brands note: large farms in MZa able to import on own account have access to more technology and better prices

Note: Letters indicate countries: M for Malawi; Za for Zambia; and Zi for Zimbabwe.

In Zimbabwe prior to reforms, small farms generally had access to the same choice of inputs as large farms through public and private retail outlets. However, regulations favored large farms in other ways. For example, the government blocked sale of seed of non-hybrid maize varieties from 1980.[6]

[6]Sales of non-hybrid maize seeds fall from 1971 and have been nil from 1980. Although banning non-hybrid varieties appears to be inconsistent with seed regulations (at least through 1993), it was effective. In 1988/89, when one company sold some seed of a popular non-hybrid maize variety, Kalahari Early Pearl, the Ministry of Trade and Industry (rather than the Director of Seeds and Special Services of the Ministry of Agriculture) wrote a letter to the company demanding an end to sales.

Since small farms are more likely to use non-hybrid varieties (yields are lower than for hybrids, particularly under improved management, but seed is cheaper and farmers can save their own), blocking non-hybrid maize varieties hurt small farms more than large farms.[7] Prior to reforms, agricultural machinery markets in Zimbabwe also favored large farms. Companies allocated foreign exchange (ie, members of the Agricultural Dealers and Manufacturers Association) imported high cost and high quality West European and US machinery suitable for wealthy farmers rather than low cost machinery from developing countries suitable for poor farmers willing to spend more time and effort on maintenance.

Deregulating Inputs Trade

During trade liberalizing reforms, governments allow private businesses to trade more classes of goods without special permission. Standard import trade reforms limit the categories of restricted or controlled goods to those that offend religious sensitivities or threaten public health. Reforms strip line ministries of the authority to control private imports by allocating foreign exchange, issuing import permits, etc.

However, regulations limiting trade in agricultural inputs often survive general trade liberalizing reforms. Since some inputs threaten negative externalities,it is not reasonable to do away with all controls on all inputs. For example, governments regulate pesticide trade to limit damage to public health and the environment. However, many governments, including the three in this study, regulate input trade in ways that have nothing to do with externalities. The challenge for deregulating agricultural inputs trade is to remove regulatory controls that have nothing to do with externalities, leaving in place or revising others to focus on and to efficiently limit externalities.

With this approach to regulatory reform, agricultural inputs fall into two general groups:

(a) Inputs without significant externalities, for which a strong argument can be made to simply deregulate import and domestic trade: Agricultural machinery and fertilizers fall into this category. Sub-sections 3.1 and 3.2 discuss regulatory reforms and trade for agricultural machinery and fertilizers; Table 2 gives a brief summary.

(b) Inputs which threaten externalities, for which trade liberalization involves redesigning regulations to focus on externalities: Seeds, pesticides, livestock feeds, and veterinary medicines fall into this category. Sub-sections 3.3 and 3.4 discuss regulatory reforms and trade for seeds and pesticides; Table 2 gives a brief summary.

The 1990s regulatory reforms in the three countries in this study have generally followed several years of discussions among government,industry, and donor experts. Once sufficient agreement has been reached among experts to allow senior officials and politicians to go ahead, the actual nuts and bolts of regulatory reform can often be implemented by ministries of agriculture without parliamentary action. In all three countries, parliamentary acts set the framework for regulations and give ministries authority to set and adjust some regulations without returning to parliament for approval.

[7]See discussion on this point in: Esbern Friis-Hansen, *The Zimbabwe Seed Industry*, mimeo, Agricultural Division, Southern Africa Department (Washington DC: WB, 1991), pp 86-87.

Agricultural Machinery

In all three countries, general trade liberalization effectively freed import and trade in agricultural machinery. Once machinery importers gained market access to foreign exchange (Malawi from 1991, Zambia from about 1993, and Zimbabwe from end-1993) there have been no other important regulatory obstacles to market entry and trade for new equipment or new companies.

In Zimbabwe, new dealers have entered the market with new products, such as Same brand tractors from Italy and 15-28 horsepower tractors from China. Some of these new importers have not joined the industry association, since membership is no longer a condition for access to foreign exchange. In early 1996, an established tractor dealer reported that staff must now actually sell tractors, whereas for 30 years they were able to merely sit in their shop, allocating tractors to farmers on a waiting list. A company offering diesel engines and pumps reported that with no limit on imports it has been able to expand operations, increasing from two to 11 dealerships from 1993 through early 1996. New products have also entered agricultural machinery markets in Zambia and Malawi, but sales have been less bouyant due to general weakness of the economy and of agriculture in particular.

Table 2: Agricultural Inputs Trade: Regulatory Barriers and Reforms

nput	Major obstacles before 1990	Situation in early 1996
All inputs	MZaZi: no market access to foreign exchange	Removed
Fertilizers	MZaZi: import permits required	MZa: removed Zi: no change
	Zi: government must approve fertilizer compositions	No change
	MZaZi: prices controlled	Removed
	MZaZi: parastatals offer subsidized fertilizers	MZi: removed Za: continues intermittently
	M: retail trade not allowed without license	Removed
Seeds	MZaZi: commercial environment difficult for foreign companies	Removed
	MZaZi: prices controlled	Removed
	MZa: new varieties not allowed without variety registration, which was difficult	MZa: registration easier but still required for 2-5 crops Zi: from 1993 registration required for 11 crops, but the situation is ambiguous
	MZa: seed certification required for 5 crops in Zambia and all crops in Malawi	M: certification required for 2 crops only Za: no change Zi: from 1993 certification required for 11 crops, but the situation is ambiguous
	MZaZi: registration for seed companies not	M: removed ZaZi: no change

	freely granted MZaZi: registration required for retail seed sales	 M: removed ZaZi: no change
Pesticides	MZi: for new formulations, long registration process delays entry Zi: for competing brands of approved formulations, long registration process blocks or delays entry	no change no change

Note: Letters indicate countries: M for Malawi; Za for Zambia; and Zi for Zimbabwe.

Fertilizer

In all three countries, Acts that set the framework for fertilizer regulation are several decades old, though for many years they were not much used since limited access to foreign exchange along with other import and trade controls blocked private fertilizer trade. General trade liberalization in the early 1990s favored emergence of private fertilizer trade. This has stimulated review of existing fertilizer regulations, leading to controversy and conflicting initiatives in all three countries.

Regulating Fertilizer Composition

Governments of Malawi and Zambia follow a truth-in-labelling strategy to regulate fertilizer trade, allowing traders to decide what to sell but setting rules for labelling and acceptable variation around stated content for each nutrient. With a truth-in-labelling strategy, governments may ask that traders register each different mix of nutrients, but registrars have no authority to deny registration. A truth-in-labelling approach allows governments to regulate quality at the retail level without obstructing private competition through introduction of new technology (eg, new composites or micronutrients).

The alternative to a truth-in-labelling approach is for governments to control mixes of nutrients allowed for trade, so that registration of new compositions is not automatic but rather depends on decisions of official experts or committees. During 1995-96, for example, officials in Zimbabwe enforced a minimum sulfur content, demanding that Omnia, a new entrant from South Africa, add sulfur to some of their fertilizers. Compared to Zimbabwe Fertilizer Company, the dominant parastatal, Omnia's production processes deliver high analysis fertilizers with low sulfur content; forcing Omnia to add sulfur raises their costs and weakens their competitive challenge.

Enforcing a minimum sulfur content forces farmers to buy sulfur they may not want or need. Advocates for minimum sulfur content and similar rules about fertilizer composition argue that restricting choice of fertilizer products saves farmers from making bad decisions. Such arguments discount the ability of farmers to choose effective fertilizers. Also, regulating fertilizers allowed for trade has little to do with externalities, since losses from a bad decision (low yields and waste of money on nutrients that are not needed) are absorbed by farmers who make those decisions. Hence, controlling introduction of new fertilizers is inconsistent with market principles.

In the early 1990s, some people in Malawi and Zambia argued that the existing truth-in-labelling approach was not adequate, that with private trade growing more important, government should control

composition of fertilizers allowed for trade. In 1992, government of Malawi issued an order (*Gazette Supplement*, 20 March 1992, nos 32, 33) that Bureau of Standards must approve the composition of a fertilizer product before it could be imported or traded. This order was outside the framework of the *Fertilizer, Farm Feeds and Remedies Act*, which provides for regulation through the Ministry of Agriculture. However, in December 1995, government of Malawi reversed itself, moving decisively to de-control composition of fertilizers allowed for import and sale. In Zambia, Bureau of Standards circulated a list of recommended fertilizers in early 1995 to Fertilizer Importers and Manufacturers Association (which has about five members), proposing that the Bureau maintain a list of allowed fertilizers; the proposal met opposition and was not implemented.

Import Permits and Trade Licenses

In 1995, the Government of Malawi stopped requiring fertilizer importers to obtain import permits from Ministry of Agriculture stating volume of allowed fertilizer. The Ministry of Lands and Agriculture in Zimbabwe continues to manage fertilizer imports through permits, although obtaining such permits has generally been non-problematic. Those favoring import permits argue that permits provide information about fertilizer supply; however, such information is already available from customs records. Zambia no longer requires fertilizer import permits.

Price Controls, Subsidies, and Import Duties

In 1993, the Government of Zimbabwe lifted price controls for all but two fertilizers, ammonium nitrate and compound D (recommended for maize), which are important for communal farmers; all price controls ended from mid-1995. Malawi ended subsidies through ADMARC in mid-1995, which created for the first time in many years a unified and competitive fertilizer market serving both estates and small farmers. In Zambia, price controls and subsidies officially ended in the early 1990s, though government continued to upset markets with occasional fertilizer sales below import parity price levels.

Zimbabwe is the only one of the three countries for which domestic fertilizer production provides a significant proportion (over half) of consumption. Not surprisingly, Zimbabwe is also the only one that taxes fertilizer imports, with rates ranging from 5 percent duty and no surcharge on urea to 10 percent duty and 10 percent surcharge for ammonium nitrate (which competes directly with domestic production). Although these rates are low, they come on top of high transport costs for imports. Duties protect government-owned Sable (which produces ammonium nitrate) and Zimphos (which produces single and triple super phosphate), since downstream companies and users would gain from improved access to competing international sources of nitrogen and phosphate fertilizers.

Fertilizer Trade after Reforms

In all three countries, reforms establishing market access to foreign exchange were not sufficient by themselves to allow market entry and emergence of competitive fertilizer trade. In Zimbabwe, reforms began to have an impact on fertilizer markets from 1995, when government ended price controls on common maize fertilizers. Omnia, a South African company, entered the market in 1995, taking about 2 percent of aggregate fertilizer sales in that year. Another nine small companies have entered during the 1990s, often focusing on specialty products such as liquid fertilizers for use with pressure irrigation systems.

From 1991, Malawi allowed Norsk Hydro to sell imported fertilizers directly to small farmers (later through Farmwise, a local distributor), changing ADMARC's monopoly in that market to a managed duopoly; government continued to control fertilizer imports through permits and foreign exchange allocations. From 1995, a competitive market began to emerge when government allowed fertilizer imports without special permission; about the same time, government stopped subsidizing ADMARC sales to small farms, creating a unified fertilizer market. Reforms allowed Optichem, a private company already present in the country but oriented toward estates, to sell also to small farms. One new company, Interfert (associated with Press Agriculture), entered Malawi's fertilizer market in 1995 as an importer. Other companies have established retail networks serving small farmers.

Box 2: Malawi Fertilizers: Subsidies, Reforms, and Prices

Until the mid-1990s, debate about fertilizer policies in Malawi focused on subsidies through Agricultural Development and Marketing Corporation (ADMARC). Donors funded ADMARC to buy fertilizers (through Small Farm Fertilizer Revolving Fund of Malawi), accepted regulations giving ADMARC a monopoly on import and distribution to small farms, and debated level of subsidies (often accepting ADMARC distribution of subsidized and even free fertilizers).

In fiscal years 1993 and 1994, ADMARC retailed urea fertilizer at US$ 280 and 290 per ton, respectively, when the international price was US$ 140 and 110 only. In those years, Ministry of Agriculture calculated ADMARC's rate of subsidy on urea fertilizer as 15.5 and 10.7 percent, respectively. Despite these formal subsidies, urea prices to small farmers were two or more times world prices. Norsk Hydro, the one private company that government allowed to import fertilizers for small farmers in those years, successfully competed with ADMARC by importing from low cost sources, shopping for low transport costs, and offering good service.

In the early 1990s, ADMARC could have eliminated formal subidies with modest increases in its retail prices. Can one then conclude that the fertilizer trade reforms hurt farmers, and that damage can be measured by the subsidies that were cut? No, since other factors are involved. With full liberalization, private importers save by shopping for cheaper imports. Transport costs fall when government dismantles transport controls. On the other hand, devaluation boosts domestic prices for imported fertilizers.

What actually happened to fertilizer prices? In 1996, immediately after regulatory reforms, Malawi's farmers paid about US$ 400 for urea against an international FOB price of US$ 210 (for 1995). For urea, the 1996 ratio of domestic to international prices was greater than in 1993 but less than in 1994. As more companies entered, fertilizer mark-ups subsequently fell. If other regional countries follow Malawi's example to deregulate trade, larger multi-country markets may develop, bringing larger bulk orders, more competition, and lower prices to farmers.

In addition, deregulation allows farmers to better match nutrients with deficiencies, which can raise (even double or more) returns to fertilizers for some plots and regions. In short, deregulation has impacts far beyond small changes in formal ADMARC subsidies.

In Zimbabwe, reforms and consequent market entry have had a big impact on technology transfer. Omnia has introduced relatively high analysis composites; Zimbabwe's former duopoly – Zimbabwe Fertilizer Company and Windmill – have responded with their own new composites. Overall more than 260 new fertilizer products have been registered during 1991-96 compared with only 18 available in 1990. In

addition, four privately-owned laboratories offer soil tests in competition with the government. In coming years, Omnia expects to offer large customers made-to-order bulk blends based on soil tests.

In Malawi, Norsk-Hydro has prepared and distributed high-quality color sheets showing maize leaves and cobs with different nutrient deficiencies to empower farmers to decide what fertilizers to buy. Also in Malawi, Interfert has introduced facilities to bulk mix small amounts of composites for specific soil conditions.

For fertilizers, prices can be a problem. All three countries are land-locked and face high transport costs to import fertilizer. In Malawi import parity prices for fertilizers can be as much as US$ 100 above FOB prices in major world markets. Transport costs are somewhat lower for Zambia or Zimbabwe, at least in part because of better rail connections to ports. Competition among fertilizer importers and traders is still weak in all three countries.

Seeds

Zimbabwe's basic seed act passed in 1965 and Zambia's in 1968. Both are relatively enlightened documents that are favorable for private seed trade. However, ministries of agriculture have at times used authority given to them under these acts to interfere with development of competitive private seed industries. Malawi's basic seed act, passed in 1988 and amended in 1996, gives Malawi along with Zimbabwe the most progressive seed laws in the region.

Variety Registration and Seed Certification

Governments generally follow one of three strategies with respect to variety[8] registration:

(a) *Variety registration optional*: Governments of many countries, such as the US and India, allow companies to sell seed of new varieties without having to register those varieties with a government office. (This also allows commercial sale of seeds of land races which have too much genetic variation to be registered as varieties.)

(b) *Multi-country list of allowed varieties*: Seed regulations in the European Union (EU) illustrate multi-country lists. For many crops, EU governments do not allow seed sale unless a variety is registered based on performance tests (vcu tests of value in cultivation and use) and tests to establish that seeds represent a new variety (dus tests of distinctness, uniformity, and stability across generations). In any EU country, tests and registration take two years; however, varieties registered in any one EU country go into an EU *Common Catalogue*, so that seeds can be sold throughout the EU without further testing.

(c) *Single-country list of allowed varieties*: In many other countries, governments maintain single-country lists of allowed (registered) varieties. These may be limited to one or

[8]Generally, each crop is a separate species, within which there may be wide genetic variation. A variety of a crop is a particular population with limited genetic variation. Commercial seed is usually sold according to varieties. In traditional agriculture, farmers plant land races that have wider genetic variation than most varieties in commercial seed trade.

more major crops, but in some countries lists of allowed varieties are extended to cover essentially all commercial planting material, including minor crops, vegetables, and cuttings.

Compulsory variety registration based on performance tests can be a serious obstacle to the introduction of new varieties, particularly for small countries, non-hybrids, and minor crops. When expected sales are small, private companies are not interested to go through the effort and expense to register a new variety. For example, the gross value of annual wheat seed sales in Zambia (population 10 million) may be estimated at US$ 250,000, so that expected annual gross revenues from a new variety anticipated to take 5 percent of the market would be only US$ 12,500, much of which would go for seed production. The cost of official tests and registration (on top of a company's own tests) can make it financially unattractive for a company to introduce a new wheat variety.

Seed certification is an assertion by some organization (usually a government agency) that seeds are of the variety stated on the label. For seeds to be certified, the variety must first be registered. Certification entails the cost of multiple trips by official experts to inspect fields of seed crops to ensure that plants are healthy, homogeneous, and of the stated variety. Hence, certified seed is more expensive than uncertified seed. Many countries (eg, the US and India) allow seeds of any crop to be sold as uncertified seed, though certification is available as a option. Others, such as the EU, require certification for some crops, such as major field crops, but not for others.

Aside from certification, some governments set other minimum quality standards, such as germination and purity (minimal percentages of other seeds or inert matter) or demand that seeds be tested in government laboratories. Many other countries (eg, US and India) take a truth-in-labelling approach to seed quality, mandating that companies put information about germination and purity on seed labels and allowing companies to do their own testing. Where certification and official quality tests are voluntary, farmers may buy more expensive certified and tested seed if they think there is an important difference in quality. Often there is no difference, since companies trying to maintain confidence in brand names set their own high standards. Also, farmers may not always care that much about some aspects of seed quality if there is little impact on expected yield.

In all three countries, seed acts seem designed for voluntary variety registration and seed certification. However, in each country this basic design has been modified by regulations that impose compulsory variety registration and seed certification for two or more major crops.

Zimbabwe's *Seeds Regulations, 1971* (see especially Section 6) establish multiple classes of commercial seed for all relevant crops, including: "standard seed" that "conforms to the minimum percentages of purity and germination"; "substandard seed" that does not conform to minimum standards, but for which labels must state germination and purity; and certified seed. In the 1980s, Pannar from South Africa, working through Savanna Seeds in Zimbabwe, introduced PAN473, a drought resistant maize hybrid, through sale of standard seed, as allowed under Zimbabwe's *Seeds Regulations* at the time. The option to sell uncertified seed of an unregistered variety allowed Pannar to enter the market; the government of Zimbabwe may have been unwilling to register a variety for a company competing with Seed Coop.

However, from 1993, Zimbabwe's Ministry of Agriculture amended regulations (*Seed [Amendment] Regulations, 1993 [No 13]*), deleting seed standards for 11 crops, (barley, cotton, groundnut, maize, millet, oats, sorghum, soyabean, sunflower, tobacco, and wheat). Most of the seed industry interprets this to mean that Zimbabwe requires certified seed and registered varieties for these

crops. As of 1996, variety registration is a *pro forma* exercise in which the seed company fills out a form describing the variety. However, according to a strict interpretation of seed regulations, companies are still allowed to sell sub-standard seed. In the mid-1990s, one new company, Farmers Coop, began to sell uncertified seed for soybeans and other field crops.

In Zimbabwe as well as in other countries, compulsory seed certification for low value non-hybrid seeds such as millet, sorghum, soybean, and groundnut, boosts seed costs and discourages companies from dealing with such seeds. Many of these crops are important for small farmers, who are left with their own seed or seed from neighbors, often of unimproved varieties. Without commercial seed, introduction of new varieties (even varieties from public international or national research) can be difficult. Also, compulsory seed certification can make it hard for small local seed companies to enter the market-- certification staff are often stationed in major cities, ask for transport assistance to visit fields, etc.

In Zambia, the *Agriculture (Seeds) Act* and *Agriculture (Seeds) (General) Regulations* allow companies to sell prescribed seed (that meets government standards of germination and purity) or certified seeds for all crops. However, Zambia's *Agriculture Seeds Regulations, 1988*, Second Schedule, lists five crops (maize, sorghum, wheat, soyabean, and sunflower) for which seed certification and hence variety registration is required. Government bases registration decisions on official performance trials, charging companies as much as US$ 5,000 to test a new maize hybrid. Aside from steep testing fees, getting a new variety into Zambia has by the mid-1990s become easier than for many other regional countries. After one year of tests, government may allow limited commercial release; after two years of tests registration is possible.

Malawi's *Act* defines certified and prescribed (meeting prescribed standards) seed. As in Zambia and Zimbabwe, regulations require seed certification for selected crops. However, Malawi's list of crops for compulsory seed certification is limited to hybrid maize and tobacco only (vs five crops in Zambia and 11 in Zimbabwe, and in both countries covering non-hybrid as well as hybrid maize). Companies are able to introduce new varieties into Malawi for all other crops (including non-hybrid maize) without having to register them.

Malawi and Zambia require government or government-approved laboratories to test all commercial seed for germination and purity. Malawi's *Act* allows the Minister of Agriculture to license laboratories to test seeds. In Zimbabwe, the situation is ambiguous. Most of Zimbabwe's seed industry operates with the assumption that all seed must be tested in a government-approved laboratory, either in Seed Services (which is part of the Department of Research and Special Services in the Ministry of Agriculture) or in Seed Company (successor organization to Seed Coop), the largest private company. However, recent sales of truthfully labeled seed that has not been certified or tested in a government-approved laboratory appear to be consistent with Zimbabwe's seed regulations.

Phytosanitary and Other Export and Import Controls

Virtually all governments, including those in this study, have phytosanitary regulations in place to address the danger that imported seeds could introduce exotic pests or diseases which could persist and spread, inflicting negative externalities far beyond the fields of those who buy and plant imported seed.

For seed exports, governments of exporting countries commonly leave importing governments to decide what phytosanitary tests and standards to apply. All three countries are members of the

International Seed Testing Association (ISTA) and have at least one ISTA-licensed laboratory; ISTA's Orange International Certificates (OICs), which show that seeds have passed stringent laboratory tests, are available if an importer asks. At times in the 1980s and 1990s, Ministry of Agriculture in Zimbabwe has required OICs for all seed exports; this unusual step boosts export costs.

In addition to phytosanitary controls, many governments impose systems of import permits designed more or less transparently to protect domestic seed industries. Zambia, a high cost seed producer, and Zimbabwe, a low cost producer, use import permits to protect domestic seed producers. On the other hand, Malawi's *Plant Protection Act*, which authorizes Ministry of Agriculture to issue seed import permits, limits their use to address phytosanitary concerns.

Less commonly, governments establish systems of seed export permits to protect farmers against the (supposed) risk that companies might export too much; all of the countries in this study control seed exports. In 1995, Zimbabwe's Ministry of Agriculture used export permits to slow private seed exports following reports that one seed company had collaborated in a scheme to export grain maize falsely labeled as seed.

Plant Breeder's Rights (PBR)

As members of the World Trade Organization, all three countries are committed to establish legal procedures for registering PBRs by 2005. Zimbabwe already has a PBR law. In Zambia and Malawi, drafts laws are in various states of preparation.

Even without PBR laws, seed companies are able to extract profits from hybrids by maintaining physical or legal control of parent lines. In developing countries, even when PBR laws are in place, companies generally want to maintain physical control of parent lines. During the 1990s, Zambia has asked companies to deposit samples of parent lines as part of the variety registration process required for five crops including maize; this was a factor in Pioneer's decision to pull out of Zambia in 1993.[9] On the other hand, Malawi and Zimbabwe allow companies to register and introduce new hybrids without submitting samples of parent lines to any government agency.

Even without PBR laws, research organizations in the region have sold varieties and genetic material to seed-producing organizations. For example, the government of Zimbabwe has for many years maintained a contract to deliver lines to Seed Coop at no cost, with Seed Coop agreeing to some actions in the public interest (eg, to maintain reserve stocks of seeds). The Government of Zambia has similar arrangements with Zamseed which extend through 2004. These sweetheart deals not only deny other private companies access to lines from public research, but also limit farmer access to results from public research to whatever the monopolist decides to pass on at whatever price the market will bear (unless government interferes in price decisions).

[9]Joseph Rusike, *An Institutional Analysis of the Maize Seed Industry in Southern Africa*, PhD dissertation, Department of Agricultural Economics (East Lansing: Michigan State University, 1995), p 133.

Registration of Seed Wholesalers and Retailers

Malawi's 1988 *Seed Act* required seed wholesalers and retailers to register with the Ministry of Agriculture. A 1996 amendment waived this requirement, so that businesses registered with the Ministry of Commerce and Industries under the Business Licensing Act are able to trade in seed among other commodities.

In Zambia and Zimbabwe, seed regulations require all seed wholesalers and retailers to register with ministries of agriculture. In Zambia in 1995, the fee for a retail license was roughly US$ 6 per year, while a wholesale license cost US$ 25 per year. These costs are significant, as is the nuisance to arrange for payment and registration, particularly from remote rural areas. As of 1995, private seed trade was poorly established in Zambia, with few stores selling seeds outside of the largest towns. In Zimbabwe, more than 500 seed retailers registered in 1980, but only 89 in 1994; presumably many seed retailers ignored the requirement to register.

Price Controls and Import Duties

Zimbabwe removed seed price controls in 1991/92. Malawi and Zambia also removed price controls during the early 1990s. Although governments continue to influence seed prices in the region, markets dominate price formation. Duties on seed imports in the three countries generally range from 0-30 percent. As obstacles to seed imports, duties have been a minor irritant compared to variety lists and import permits.

Seed Trade after Reforms

Entering the 1990s, commercial seed trade for maize and other major crops in each of the three countries was virtually monopolized by a parastatal (Zambia) or a private company (Malawi and Zimbabwe). In some cases (eg, cotton in Zimbabwe and Malawi) parastatals or private companies that processed the crop controlled seed trade as well. Many of these monopoly patterns have changed.

In Zimbabwe, Pannar from South Africa entered in the 1980s but did not get more than 1-2 percent market share until the 1990s. Pioneer began research in the 1980s but sold its first hybrid maize seed in 1992. Cargill entered in 1988 through purchase of Ciba-Geigy varieties. Although Seed Company retained an estimated 75 percent of the hybrid maize seed market as of 1998, research programs in competing companies could lead to major shifts in market shares over the next five years. Competing companies produce and sell seeds for crops other than maize, including sunflower, sorghum, millet, vegetables, etc.

Lever Brothers entered Malawi in 1991, breaking NSCM's (Cargill's) monopoly on hybrid maize and also importing and introducing several sunflower hybrids from South Africa. The impact of liberalization on seed technology in Malawi took a quantum leap in 1995, as government approved eight new maize hybrids and also imported and distributed seed of new non-hybrid maize varieties from public and private companies in three neighboring countries. During the same year, government and NGOs introduced seed of new varieties for other crops as well, often through seed purchase from companies in neighboring countries. As of 1998, NSCM retains 90 percent of the market for hybrid maize, with Pannar as its main competitor. Hybrids from Pioneer, Seed Company, and Zamseed are moving through Malawi's three-year trial-and-registration process for hybrid maize.

Four foreign companies, Pannar and Carnia from South Africa and Pioneer and Cargill from the US, entered Zambia's hybrid maize market in the early 1990s (as already noted, Pioneer withdrew in 1993). During 1994, with Zamseed having financial and marketing problems due to late payments from parastatals taking its seed, competing companies reportedly gained 30-40 percent of the market for hybrid maize seed. However, as of 1998, Zamseed has regained 90 percent of the hybrid maize market, while Pannar is its main competitor. Only Zamseed offers seeds for a wide range of field crops. Other players include Africare, an NGO, which distributes sunflower seeds for a variety (Record) from Tanzania.

The impact of competition on plant genetics has been greatest in Zimbabwe. At the end of the 1980s, farmers had access to about a dozen maize hybrids from Seed Coop. By 1997, farmers had access to almost 30 hybrids from four companies (see Table 3). Responding to competition, Seed Company initiated a breeding program that has developed some of the best new maize hybrids. During the 1990s, private companies have introduced varieties for other crops as well, including varieties from own breeding as well as public varieties from International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Maize and Wheat Improvement Center (CIMMYT), and other sources.

In the region, most if not all private breeding has been located in Zimbabwe and South Africa, though some of this research is intended to develop varieties for markets extending throughout much of sub-Saharan Africa. Cargill, for example, crosses material in Zimbabwe then sends lines for testing to Cargill companies in Malawi, Zambia, Uganda, Tanzania, and South Africa and to a partner company in Ethiopia. Similarly, public research programs have regional impact and design. For example, Cargill sells maize hybrids in Zambia that come from public research in Malawi; ICRISAT and CIMMYT have regional breeding programs for groundnuts, open-pollinated maize, and other crops; and Swedish International Development Agency supports millet and sorghum breeding in Zambia, from which lines are distributed to other countries.

Farmers in all three countries continue to pay relatively low prices for seeds. Despite limited competition, seed companies which have entered intend to increase market share, which tends to hold down prices. Over time, prices for maize and other hybrids may rise somewhat as companies deliver better hybrids from private research. At the same time, the threat of oligopoly pricing can be expected to recede with entry of new seed companies and significant declines in market shares for the largest two or three companies in each country-crop market.

Pesticides

In all three countries, pesticides have been regulated for several decades under acts dealing with poisons (in Zambia) and farm remedies (in Malawi and Zimbabwe). Zambia's *Environmental Protection and Pollution Control Act No 12, 1990*, adjusts the legal basis for pesticide regulation, and new regulations have been issued, *Pesticides and Toxic Substances Regulation No 20, 1994*. Malawi has drafted new pesticide legislation. Laws in all three countries provide an adequate framework for regulations to protect public health and the environment.

Pesticide Registration

Most governments, including the three in this study, maintain lists of registered (allowed) pesticide products, defined by formulation (chemical composition) and brand name. The purpose of

pesticide registration is to prevent environmental and public health externalities from use of dangerous products. However, risks are not all on one side; difficult registration procedures can limit competition for old and established chemicals and can block technology transfer for newer and safer products.

The Government of Zimbabwe demands three years of local efficacy tests to register a new product (new brand) for an old formulation, even though other brands of the same formulation have been sold in Zimbabwe for decades. These tests seemingly have no purpose except to protect companies with old registrations. Malawi and Zambia register new brands of established formulations with only laboratory tests to ensure that formulations are accurate.

Table 3: Zimbabwe: Hybrid Maize Releases, 1990-97

ear of Release#	Variety@	Mean Yield in Trials	Yield Relative to R201*
1990	PAN6481 SC601	8.08 7.32	1.15 1.04
1991			
1992	PAN6581 PHB3442	7.23 7.26	1.03 1.03
1993	CG4539 CG5424 PAN6480 PHB3412 PHB3435 SC501	6.93 7.82 7.25 8.14 6.10 7.74	0.98 1.11 1.03 1.15 0.86 1.10
1994	PHB3253 SC701	7.51 7.36	1.06 1.04
1995	PAN6363 SC401	6.93 6.84	0.98 0.97
1996	PHB3033 PHB3043 SC509 SC623 SC707	8.22 7.74 8.15 9.61 7.72	1.17 1.10 1.15 1.36 1.09
1997	CG5121	6.89	0.98

Release is a company decision to sell seeds of the cultivar.
@ PHB is Pioneer; CG is Cargill; SC is Seed Coop; PAN is Pannar.
* R201 is a popular public cultivar, released by Rhodesia in 1971.
Source: Yield data come from maize variety trials conducted by the Crop Breeding Institute, Ministry of Agriculture, on 12 experiment station sites throughout Zimbabwe from 1984-97.

Procedures for registering new formulations (ie, new pesticide technology) in all three countries ask for data on toxicity (which companies can submit from tests done for other countries) as well as

efficacy. Malawi and Zimbabwe require efficacy tests within the country (though exceptions are possible), while Zambia allows registration without local efficacy tests.

Difficult registration procedures (eg, requiring multi-year local efficacy tests) can delay or obstruct introduction of new technology. In countries with relatively small markets, registration costs can easily nullify expected profits for new low-risk biopesticides (eg, viruses or bacteria that infect pests, pheromones that disrupt mating). Since many low-risk pesticides target specific pests, they have smaller markets than conventional synthetic chemical poisons. Hence, registration procedures that treat all products equally (regardless of risk) actually favor more dangerous conventional pesticides.

None of the three countries has adjusted registration procedures to favor introduction of biopesticides and other low-risk products. Procedures for registering all kinds of new pesticides are relatively easier in Zambia than in the other two countries, which may be good for technology transfer but also bad for public health and the environment when new high risk products are seeking entry.

Regulations on Trade and Use

All three countries require registration for pesticide wholesalers and retailers and regulate pesticide handling, labelling, and use. Similarly, all three set maximum limits for pesticide residues in food products. However, testing of food products for the domestic market has been rare to non-existent.

Pesticide Trade after Reforms

In Zimbabwe, government along with the Agricultural Chemicals Industry Association controlled pesticide imports for many years through allocation of foreign exchange to and through the Association to its member companies. With the demise of foreign exchange controls from 1993, Zimbabwe's pesticides market has become more competitive for commodity products (old, off-patent active ingredients and formulations) for which more than one company has a registered product (brand); prices for roughly a third of major pesticides increased no more than 5 percent or even fell from 1993 to February 1995 despite greater than 20 percent devaluation over the period.[10] However, product registration has blocked entry for new companies; only one new company was able to register and trade one new brand of one commodity product through early 1996.

Through the mid-1990s, farmers in Zambia and Malawi have been importing unregistered products on own account, which seriously undermines the effectiveness of pesticide regulations to protect public health and the environment. Zambia's Environmental Protection Agency has asked customs officials to block farmer imports of unregistered pesticides; Malawi has also taken steps to stop farmer imports of pesticides. As these two countries tighten controls on pesticide imports according to lists of registered products, the potential will grow for a small group of companies to control pesticide markets, as happens in Zimbabwe.

[10]Commercial Farmers Union, "Survey of Current Input Costs and Recent Input Cost Increases," (Harare: Commercial Farmers Union, Harare, 1995).

Growth, Dualism, and Recommendations

Impact on Agricultural Growth

Regulatory reforms is that ease entry barriers for companies and technologies are empowering reforms, giving producers, traders, and farmers authority to make their own decisions about inputs and technology without prior approval from government officials. These empowering reforms can be expected to have an immediate and persistent impact in favor of faster change and therefore growth.

One possible approach to measure impact of regulatory reforms to compare growth of aggregate agricultural production before and after reforms. However, this approach does not work well, since many other factors affect agricultural growth. For example, during the early 1990s, the three countries in this study adopted other pro-growth reforms (such as liberalizing foreign and domestic agricultural trade) as well as growth-dampening policies (disruptive macroeconomic and financial market reforms). Serious droughts in 1994 and 1995 also disturbed agricultural production trends. Hence, changes in aggregate agricultural growth rates cannot be convincingly attributed to input reforms.

Table 4: **Agricultural Production Index** (1989-91 = 100)

ountry	1990	1991	1992	1993	1994	1995	1996	1997
Malawi	97	107	87	113	92	109	116	109
Zambia	93	98	81	118	96	89	104	93
Zimbabwe	100	100	74	96	101	82	112	114

Source: FAO

Another approach to identify impact of reforms on growth is to follow the train of causation from regulatory reforms through changes in volume of specific inputs trade (eg, maize seed) to impact on agricultural production for selected products (eg, maize). This method allows one to measure partial impacts of reforms on one or more specific outputs. As of 1998, it is possible to see impact on technology introduction for many inputs, however the impact on quantity traded is harder to see insofar as quantities are so heavily affected by other factors, such as weather, macroeconomic conditions, and programs to distribute free seed and fertilizer. And opportunities to trace the impact of new inputs on selected agricultural outputs are even more limited.

Despite the sometimes slow and unsteady progress toward open markets, new companies and new technology have entered machinery, seed, and fertilizer markets in all three countries. The following paragraphs discuss impact of new post-reform technology and inputs on Zimbabwe's tractor fleet, maize production, and horticultural exports.

In Zimbabwe, reforms have had a clear impact on tractor sales, with average annual imports increasing from less than 1,300 during 1988-94 to over 3,000 during 1994-96. During 1987-89,

Zimbabwe had a total of 20,400 tractors, only 3 percent more than in 1977-79.[11] Average annual imports of 1,300 were probably below the replacement rate (the average tractor would have to run 16 years). Aggregate tractor imports of 9,200 during 1994-96, the first three years after market liberalization, are equivalent to 45 percent of total tractors in Zimbabwe at the end of the 1980s. Assuming that half of these 9,200 new tractors replace older ones going out of service, farmers would have over 20 percent more tractors in 1996 due to reforms. Within a few years, large increases in tractors could be expected to have some measurable impacts on agricultural production, eg, earlier maize planting, more land brought under cultivation by communal farmers with low-cost or used tractors.

For maize in Zimbabwe, as estimate of the yield impact of reform can be developed from information on: (a) share of area planted to new (post-reform) hybrids; and (b) average yield of new vs old hybrids in multi-year field trials. This approach circumvents problems with year-to-year fluctuations in rainfall and inexact production estimates, which could overwhelm even very large yield changes with new technology. Farmers in 1996 planted 52 percent of maize area to post-1996 hybrids, for which the weighted average yield is 5.6 percent above weighted average yields for the pre-1990 hybrids planted in 1996. Assuming that in the absence of reform, all of the area would have been planted to the same pre-1990, post-1990 hybrids are responsible for an almost 3 percent increase in maize yield and production by 1996. This figure can be compared to annual increases in yield potential due to breeding of roughly 2/3rds percent in developed countries and over 1 percent in other developing countries with active private breeding. While several private companies have been breeding in Zimbabwe for almost a decade, competition in the hybrid maize market was minimal until 1995, and some excellent material has not yet reached the market.

Also for Zimbabwe, seed reforms allowing an increase in vegetable seed imports from 1994 have supported improvements in vegetable production. Data are not available to show impact on quantity and value for domestic vegetable supply. However, value of produce exports more than doubled from $ 5.2 million in FY($ to $ 12.1 million in FY96 (annual average growth of 52 percent, compared to an annual average of 30 percent over the previous five years).

Expected Impacts on Planted Area, Fertilizer Use, and Yields

While reform impacts to date on quantity of inputs traded and on production are for the most part relatively small and difficult to measure, some international comparisons suggest that large impacts can be expected over the next 5-10 years through increases in cropped area, fertilizer use, and yields. In Bangladesh, for example, comparable reforms had a large impact on mechanized irrigation and tillage (see Box 3).

[11]World Resources Institute, UNEP, and UNDP, *World Resources 1992-93* (New York: Oxford University Press, 1992).

Table 5: Impact of Regulatory Reforms on Inputs Trade

Input	Major Impacts
Agricult-ural Machinery	Regulatory situation: reforms have been effective since importers gained market access to foreign exchange: 1991 in Malawi; about 1993 in Zambia; and end-1993 in Zimbabwe Structure of input industry: formerly private or public/private oligopolies; with reform, some new entrants (particularly in Zimbabwe) and some privatization (eg, African Farming Equipment Ltd [AFE] in Zambia) Technology transfer: impact evident in Zimbabwe, with entry of low cost tractors and other equipment from, eg, China (from 1994) and Italy; also, large Zimbabwe farmers report major shift to improved imported planters Price: competition and new low cost makes and models lead to lower prices in Zimbabwe Quantity: significant impact in Zimbabwe (eg, average annual 1994-96 tractor imports over 3,000 vs less than 1,300 in the previous six years); impact restrained in Zambia and Malawi by austerity and drought
Ferti-Lizers	Regulatory situation: reforms complete in Malawi from 1995; the situation is workable in Zambia from early 1990s and Zimbabwe from 1995 Structure of input industry: formerly protected public monopolies or public/private duopolies; with reform, there have been new importing companies in Malawi (eg, Norsk Hydro), Zimbabwe(eg,Omnia), and also several new private companies in Zambia Technology transfer: evident in Malawi and Zimbabwe, with new companies offering soil tests, made-to-order compound fertilizers, higher analysis fertilizers, etc Price: fertilizer mark-ups still much higher than necessary in Malawi and Zambia. most major price changes linked to exchange rate changes. Quantity: recent fluctuations in fertilizer use in all three countries have been dominated by austerity, drought, and free fertilizer programs; reduced use of fertilizer for maize in Malawi and Zambia.

Table 5 (cont'd): Impact of Regulatory Reforms on Inputs Trade

Input	Major Impacts
Seeds	Regulatory situation: reforms incomplete but workable in Zambia from early 1990s; reforms complete in Malawi from early 1996; in Zimbabwe, imposition of compulsory certification for 11 crops from 1993 and erratic government policies (eg, intervention in seed exports) disturbs a basically sound legal framework Structure of input industry: before reform, private monopoly/oligopoly in Malawi and Zimbabwe and public monopoly in Zambia; with reform, 1-3 new regional or international companies enter each country through end-1995; for hybrid maize, market shares for dominant firms fall from about 99 percent in 1990 to about 75-90 percent through 1998 Technology transfer: private companies introduce new cultivars for hybrid maize, sunflower, and other crops; seed sales in all countries show shift to new maize hybrids; from 1995, seed imports into Malawi introduce new cultivars for multiple crops, including soybeans and non-hybrid maize; regional private breeding programs (in Zimbabwe) increase from three companies (Seed Coop, Cargill, and Pioneer) to four (with Pannar) Price: no major impact Quantity: no significant change; recent fluctuations in seed sales in all three countries have been dominated by austerity, drought, and free seed programs
Pesticides	Regulatory situation: situation improved in all countries with market access to foreign exchange, but company and product approvals still difficult in Malawi and Zimbabwe Structure of input industry: before reform, (mostly) private oligopolies; one new company enters in Zimbabwe; little change in other countries Technology transfer: new technology allowed in Zambia through new product registrations and farmer imports (without registration); new technology still slow to enter in Zimbabwe Price: increase in competition brings reduction in real prices for some products in Zimbabwe Quantity: some increase

Box 3: Bangladesh: Reforms Bring Rapid Growth in Minor Irrigation and Machine Tillage

During the early and mid-1980s, the Ministry of Agriculture in Bangladesh maintained lists of "standardized" (tested and approved) models of diesel engines for irrigation and of power tillers. Models not on the list could not be imported for agriculture. Trade liberalization for agricultural machinery occured in 1988-89 when Ministry of Agriculture did away with lists of standardized engines and power tillers, allowing import of any and all models. This allowed farmers (with dealers) to work out which models suited their needs.

Prior to trade reforms, the Bangladesh Agricultural Development Corporation, a parastatal, imported most of the diesel engines that went to agriculture, selling them to farmers with subsidies and credit (which was often not repaid).

Given the chance to choose models, farmers (with traders) selected less costly equipment from China. Private imports of diesel engines soared, and minor irrigation expanded at record rates. From 1988 (the last year before reforms) to 1996, the number of small powered pumps lifting ground or surface water for irrigation (roughly 90 percent powered by diesel engines, 10 percent by electricity) increased by 390,000 or by 170 percent, delivering new irrigation to roughly 14 percent of gross cropped area. Markets also moved towards smaller equipment, from 8-12 horsepower engines and 100 mm diameter pumps to 4-8 horsepower engines and 75-100 mm pumps. Parastatal sales continued for several more years, but by end-1991 private traders clearly dominated the market; farmers felt no loss when the government stopped support for parastatal engine imports.

For power tillers, the 1988 list of standardized models included only one low cost model from China (CIF import price about $ 1,000), one from South Korea (CIF about $1,700), and more than 10 others from high cost sources (CIF well over $ 2,000). Dealers bringing in the two low cost models dominated trade but took advantage of market controls to retail power tillers at well over $ 2,000. With reforms ending standardization, multiple additional models from China with CIF near $ 1,000 entered the market, and competition soon cut the retail price to about $ 1,300.

Before reforms, power tillers were so rare that one normally did not see any during a multi-day tour of rural areas. In 1996, power tillers prepare an estimated 40-50 percent of all land for cultivation (based on interviews with farmers during several weeks of rural tours) and are widely used for transport.

In both Zambia and Zimbabwe farmers currently plant only a small share of arable land. In Zambia, land is essentially free to small farmers, who can expand planted area with permission of local chiefs; even so, the average small farmer plants less than two hectares. Similarly in Zimbabwe, the average small farmer owns 18 hectares but plants less than 2.5 hectares (out of an estimated 3-5 hectares of arable land). During early 1996, several farmers in communal and resettlement areas in high potential regions of Zimbabwe (over 750 mms average annual rainfall) reported annual land rents of only US $ 6 per hectare against gross yield value of US $ 240 per hectare; low rent suggests that land is not the major limiting factor for small farm production, although the potential productivity of some smallholder areas, especially in Zimbabwe, is comparatively low. These statistics suggest that early 1990s reforms improving availability of low cost tractors and other farm equipment will allow large increases in small farm cropped area in Zambia and Zimbabwe.

Average annual fertilizer (nutrients) use in Malawi and Zambia (11 kgs per hectare in 1977-79, rising to 17-21 kgs per hectare in 1987-89) has been near continental averages for Africa. In Zimbabwe, average fertilizer use has leveled off around 60 kgs per hectare (and about half that level for small farms); although much of Zimbabwe is dry, roughly 80 percent of cropped land is in high potential areas (natural regions I and II, with average annual rainfall exceeding 750 mms). In contrast, 1987-89 fertilizer use in India, Iran, Jordan, Lebanon, Pakistan, and Turkey ranged from 62 to 85 kgs per hectare, while average use exceeded 200 kgs per hectare in China and Europe. Although rainfall is a limiting factor in the three countries, rates of fertilizer use can be expected to increase with better matching of nutrients to soil deficiencies, lower transport costs with tractorization, and competition cutting prices and improving delivery to the farm level. Also, fertilizer use can be expected to expand with cropped area (from mechanization).

In all three countries, yields for most crops are far below potentials with current world technology. Even for maize, yields at 0.9-1.3 tons per hectare are far below yields in other countries with somewhat comparable conditions (see Table 6). Multiple reasons for these low yields include late or poor cultivation, low and inappropriate fertilizer use, low and declining soil fertility and relatively low yield potential of available varieties. With reforms, input companies, dealers, and farmers can address these short-comings.

Impact on Dualism

Recent reforms liberalizing input (and output) markets in the three countries allow input companies to build wholesale-retail networks to serve small farmers and also to introduce technologies suited to small farms (eg, low cost tractors). As markets develop, small farmers in the three countries can be expected to adopt more advanced technology and to close the long-standing technology and productivity gap between small and large farms.

The argument that input reforms will undermine dualism conflicts with some conventional wisdom. For example, *Zimbabwe's Agriculture Policy and Strategy*, prepared in 1995, states:[12]

> On balance, large-scale farmers are benefiting more from ESAP [Economic Structural Adjustment Programme] than smallholders. Large-scale farmers, situated on the best agricultural land, having better access to finance and markets, and backed by a well organized advisory service are able to seize marketing opportunities both locally and internationally. These major benefits of ESAP have eluded the remotely located, poor smallholders, worsening the position of this group of farmers.

The argument that small farmers are at a disadvantage when markets are allowed to operate has stimulated and supported years of special institutions and regulations for input and credit distribution to small farms. As already described, special arrangements for small farmers have limited their choice of technology and provided poor and unreliable service, putting them at a competitive disadvantage compared to large farms. Prior to recent reforms, governments in the region also disadvantaged small farmers through output market controls.

[12]MOA, *Zimbabwe's Agricultural Policy and Strategy*, (Harare: MOA, 1995), pp 6-7.

Table 6: International Comparisons: Farm Size, Fertilizer Use, Varieties, and Yields

Input	Malawi	Zambia	Zimbabwe	Others
Average Planted Area for Small Farms	0.5 ha	Less than 2 ha	about 2.5 ha	
Average Fertilizer (nutrients) Use for All Farms	21 kgs/ha	17 kgs/ha	56 kgs/ha (for small farms, about half this amount)	India: 62 kgs/ha Iran: 72 kgs/ha Pakistan: 85 kgs/ha Syria: 46 kgs/ha Turkey: 62 kgs/ha
Use of Improved Var's (percent of planted area for all farms)	maize: 26 sorghum: 6	Maize: 70 Sorg'm: 25	Maize: 100 g'nuts: 3 soyb'n: 51 sorg'm: 30 sunfl'r: 14	Maize: SubSaAfrica: 43 LDCs: 58 Dev'd: 100 E Eur and FSU: 100
Average Maize Yields for All Farms (t/ha)	0.9	1.3	1.2	LDCs: 2.5 dev'd countries: 6.9 E Eur and FSU: 3.5 India: 1.5 Iran: 4.0 Pakistan: 1.4 Syria: 3.3 Thailand: 2.6 Turkey: 4.1

Source: Farm size: figure for Malawi from WB, *Malawi: Agricultural Sector Memorandum: Strategy Options in the 1990s*, report no 12805-MAI (Washington DC, 1995), vol 2, p 13; figure for Zambia derived by adding average cropped area for various crops from Central Statistical Office, *Agricultural and Pastoral Production (Non-Commercial Sector), 1982-83 to 1984-85* (Lusaka: CSO, 1989), various pages; Zimbabwe figure from Ministry of Agriculture, *Zimbabwe's Agricultural Policy and Strategy*, final draft (Harare: MOA, 1995), p 207.

Fertilizer use: data for 1987-89 from World Resources Institute, UNEP, and UNDP, *World Resources 1992-93* (New York: Oxford University Press, 1992), pp 274-5.

Varieties and yields: regional data for sub-Saharan Africa from Derek Byerlee and Paul Heisey, "Past and Potential Impacts of Maize Research in Sub-Saharan Africa: A Critical Assessment," draft, p 47, forthcoming in *Food Policy*; other maize varieties for 1992 and yields for 1990-92 from CIMMYT, *1993/94 World Maize Facts and Trends*; sorghum data show area planted to varieties based on ICRISAT germplasm, and data are for 1995 from ICRISAT; information on other varieties for Zimbabwe from *Zimbabwe's Agricultural Policy and Strategy*.

Through the mid-1990s, input use and yields per hectare are generally much higher for large than small farms in Malawi, Zambia, and Zimbabwe. These differences are inconsistent with observations elsewhere in the world, where input use and yields on small farms generally equal and sometimes exceed those on large farms. Some of the yield advantage for large farms can be explained by better land and irrigation, particularly in Zimbabwe. However, this reason does not work in Zambia, where there is less pressure on land and water.

Despite lower yields, there is evidence from each of these countries that small farms are as or more efficient than large farms for major food and cash crops, according to domestic resource cost

calculations.[13] Large farms face high risks from theft and mismanagement, risks that can be minimized by increasing inputs and yields on a limited area that is easier to supervise.

With recent reforms in tobacco marketing arrangements allowing small farmers to grow and market burley tobacco, small farmers in Malawi are demonstrating their ability to compete with estates. In Zambia and Zimbabwe, land is available to many if not most small farmers to expand cropped area; with better access to inputs (including suitable tractors), small farmers can be expected to increase cropped area and to bid labor away from large farms. Over time, large farmers may feel a squeeze between rising labor costs and falling market prices, reflecting the fact that small farmers are more efficient in Malawi, Zambia, and Zimbabwe, as in many other countries around the world.

Dualism in Inputs Trade

Prior to regulatory reforms, private input trade in Zimbabwe and to a lesser extent in Malawi and Zambia was dominated by oligopolies, some of which had been in place for many years. With partial reforms, multinational seed companies entered each of the three countries. However, for seed industries in Zambia and Zimbabwe and for pesticides trade in Zimbabwe, ministries of agriculture continue to block entry by smaller local companies.

In Zimbabwe, for example, ENDA, a local NGO, coordinates small farmers to produce sorghum seeds, but neither ENDA nor farmers are allowed to package and sell the seeds since government has not registered them as seed companies. Instead, seed goes to a Seed Company facility for processing and packaging, after which it is exported. If the government of Zimbabwe would allow registration of small local seed companies, NGOs, farmers, and small businesses could package and sell seed locally, establish brand names, and eventually expand to serve larger markets. Similarly, registration of pesticides in Zimbabwe has blocked company entry into pesticides trade; over more than a decade to early 1996, only one new black-owned company has been able to register and bring to market just one new brand of a commodity (off-patent) product.

Recommendations for Further Regulatory Reform

Regionalization is a natural by-product of regulatory reform. When governments reduce barriers to company and product entry, input companies adjust sales strategies to serve cross-border markets. Regionalization favors technology transfer, particularly for seeds and pesticides, where costs for product development can be significant. When these costs can be spread over a larger regional market, companies are able to introduce more new technology. Also, farmers may gain as more regional competition brings lower prices and better service. *To increase private technology transfer and competition in inputs markets, promote regionalization of inputs trade.*

Although regulations are not generally an issue for agricultural machinery, taxes and duties create some problems. In Zambia and Zimbabwe, governments allow farmers to buy tractors without paying duties and sales taxes, but arrangements either favor large farmers (as in Zambia) or require onerous paperwork and other arrangements (as in Zimbabwe). Also, with countries introducing VAT taxes, total taxes and duties on imported agricultural machinery may increase, with no change in farm prices (since agricultural products are free from VAT). Aside from duties and taxes on agricultural machinery,

[13] See, for example "Malawi: Agricultural Comparative Advantage" by John Keyser (1997).

relatively high taxes on diesel fuel are serious obstacles to wider adoption of agricultural mechanization in all three countries. *Therefore, there is a need to simplify procedures for small farmers to realize tax and duty exemptions on agricultural machinery, and restrain or reduce diesel fuel taxes.*

Among the three countries in this study, Zimbabwe is the only one that requires import permits for fertilizer, protects domestic producers (parastatals) with import duties, and insists on more than *pro forma* registration for new fertilizer compositions. Zimbabwe's excessive fertilizer regulations discourage competition and also interfere with company and farmer efforts to find the best and cheapest fertilizers to repair soil nutrient deficiencies. Other countries in the region and in Africa can be encouraged to pattern fertilizer regulations after Malawi and Zambia, which allow unrestricted imports and follow a truth-in-labelling strategy for regulating fertilizer quality. *It is recommended that the governments of the three countries do away with import permits for fertilizers, remove tariff protection for domestic fertilizer producers, and do away with registration of compositions or make it a pro forma exercise.*

The three countries in this study retain compulsory variety registration and seed certification for 2-11 crops. As already discussed, these regulations restrict technology transfer and discourage companies from producing non-hybrid seeds (for which prices are limited by competition with farmer-retained seed). Market entry continues to be a problem for new seed companies. At the retail level, registration requirements inhibit development of efficient seed marketing arrangements through existing small stores in rural areas. *It is recommended that the focal countries make variety registration and seed certification voluntary, allowing companies to sell quality-declared (own-tested) standard seed; register new seed companies on demand; do away with registration requirements for seed retailers; and reduce unreasonable phytosanitary and other barriers to regional seed trade.*

Registering agencies can ease entry for new low risk products by waiving or reducing efficacy tests, accepting efficacy data from other countries, or allowing provisional registration without efficacy tests. These adjustments can be focused on low risk products to encourage companies and farmers to shift attention away from high risk products. *To facilitate introduction of biointensive IPM, it is recommended that government's reduce registration requirements for low risk products. To discourage older and more dangerous formulations that are out of patent in major producing countries, expedite registration for competing brands (to squeeze company profits) and tax according to public health and environmental risk (to give farmers better signals about total social and private costs involved). To move towards regional harmonization, reduce time and cost to register products that are already registered in specified other countries.*

Conclusion: Going for Growth

Throughout the developing world, growth in agricultural production depends on technical change. Research that produces new technology useful for any given country takes place not only in that country but in many other countries around the world, and an increasing share of agricultural research takes place in private companies. When input companies are allowed to operate, companies take results from public and private domestic and foreign research, package them into new inputs (seeds of new varieties, fertilizer compounds, pesticides, etc), and compete with other companies to deliver productive new technologies to farmers. Large and small farmers with improved access to inputs, including inputs embodying new technology, are able to boost yields and incomes. In this way, regulatory reforms are pro-growth both immediately and over the longer term.

Government regulation of inputs markets can allow or block private technology transfer in agriculture. In the three countries in this study, governments in the 1990s have liberalized trade and eased regulatory controls for agricultural inputs, allowing more private companies and more private technology transfer. Despite significant changes for some inputs and countries, regulatory reforms remain incomplete.

Through 1996, the pro-growth impact of regulatory reforms in Malawi, Zambia, and Zimbabwe were largely masked by bad weather and disruptive macroeconomic and financial developments. Nevertheless, promising pro-growth impacts are already evident in horticultural production, tractor sales, pesticide prices, maize research, and other aspects of inputs trade and agricultural production in the three countries.

Bibliography

Byerlee, Derek, and Paul Heisey, "Past and Potential Impacts of Maize Research in Sub-Saharan Africa: A Critical Assessment," draft, forthcoming in *Food Policy*.

Central Statistical Office, Zambia, *Agricultural and Pastoral Production (Non-Commercial Sector), 1982-83 to 1984-85* (Lusaka: CSO, 1989).

CIMMYT, *1993/94 World Maize Facts and Trends*.

Commercial Farmers Union, "Survey of Current Input Costs and Recent Input Cost Increases," (Harare: CFU, Harare, 1995).

Conroy, Ann, "Inputs Sector: Fertilizer and Seeds," working paper no 6; this paper was prepared for: World Bank, *Malawi: Agricultural Sector Memorandum: Strategy and Options in the 1990s*, report no 12805-MAI (Washington DC: WB, 1995).

Food and Agricultural Orgsanization, *AGROSTAT* database.

Friis-Hansen, Esbern, *The Zimbabwe Seed Industry*, mimeo, Agricultural Division, Southern Africa Department (Washington DC: WB, 1991).

Keyser, John, Malawi: Agricultural Comparative Advantage. Mimeo. East and Southern Africa Agricultural Operations. World Bank. 1997.

Mahabub Hossain, *Green Revolution in Bangladesh: Impact on Growth and Distribution of Income* (Dhaka: University Press Limited, 1989).

Matawba, Charles J, and John Wendt, "Soil Fertility Management: Present Knowledge and Prospects," in D C Munthali, et al, *Proceedings: Conference on Agricultural Research for Development*, organized by the Soil Pests Project, University of Malawi, and Maize Research Team, Ministry of Agriculture (Lilongwe: Rockefeller Foundation, 1993).

Ministry of Agriculture, Zimbabwe, *Zimbabwe's Agricultural Policy and Strategy*, final draft (Harare: MOA, 1995).

Rusike, Joseph, *An Institutional Analysis of the Maize Seed Industry in Southern Africa*, PhD dissertation, Department of Agricultural Economics (East Lansing: Michigan State University, 1995).

Tsoka, Maxton Grant, "Retail Trade in Agricultural Inputs in Malawi," mimeo (Lilongwe: World Bank Field Office, 1995).

World Bank, *Malawi: Agricultural Sector Memorandum: Strategy Options in the 1990s*, report no 12805-MAI (Washington DC, 1995).

World Resources Institute, UNEP, and UNDP, *World Resources 1992-93* (New York: Oxford University Press, 1992).

Distributors of World Bank Publications

Prices and credit terms vary from country to country. Consult your local distributor before placing an order.

ARGENTINA
Oficina del Libro Internacional
Av. Cordoba 1877
1120 Buenos Aires
Tel: (54 1) 815-8354
Fax: (54 1) 815-8156
E-mail: olilibro@satlink.com

AUSTRALIA, FIJI, PAPUA NEW GUINEA, SOLOMON ISLANDS, VANUATU, AND SAMOA
D.A. Information Services
648 Whitehorse Road
Mitcham 3132
Victoria
Tel: (61) 3 9210 7777
Fax: (61) 3 9210 7788
E-mail: service@dadirect.com.au

AUSTRIA
Gerold and Co.
Weihburggasse 26
A-1011 Wien
Tel: (43 1) 512-47-31-0
Fax: (43 1) 512-47-31-29

BANGLADESH
Micro Industries Development Assistance Society (MIDAS)
House 5, Road 16
Dhanmondi R/Area
Dhaka 1209
Tel: (880 2) 326427
Fax: (880 2) 811188

BELGIUM
Jean De Lannoy
Av. du Roi 202
1060 Brussels
Tel: (32 2) 538-5169
Fax: (32 2) 538-0841

BRAZIL
Publicacões Tecnicas Internacionais Ltda.
Rua Peixoto Gomide, 209
01409 Sao Paulo, SP.
Tel: (55 11) 259-6644
Fax: (55 11) 258-6990
E-mail: postmaster@pti.uol.br

CANADA
Renouf Publishing Co. Ltd.
5369 Canotek Road
Ottawa, Ontario K1J 9J3
Tel: (613) 745-2665
Fax: (613) 745-7660
E-mail: order .dept@renoufbooks.com

CHINA
China Financial & Economic Publishing House
8, Da Fo Si Dong Jie
Beijing
Tel: (86 10) 6333-8257
Fax: (86 10) 6401-7365

China Book Import Centre
P.O. Box 2825
Beijing

COLOMBIA
Infoenlace Ltda.
Carrera 6 No. 51-21
Apartado Aereo 34270
Santafé de Bogotá, D.C.
Tel: (57 1) 285-2798
Fax: (57 1) 285-2798

COTE D'IVOIRE
Center d'Edition et de Diffusion Africaines (CEDA)
04 B.P. 541
Abidjan 04
Tel: (225) 24 6510;24 6511
Fax: (225) 25 0567

CYPRUS
Center for Applied Research
Cyprus College
6, Diogenes Street, Engomi
P.O. Box 2006
Nicosia
Tel: (357 2) 44-1730
Fax: (357 2) 46-2051

CZECH REPUBLIC
USIS, NIS Prodejna
Havelkova 22
130 00 Prague 3
Tel: (420 2) 2423 1486
Fax: (420 2) 2423 1114

DENMARK
SamfundsLitteratur
Rosenoerns Allé 11
DK-1970 Frederiksberg C
Tel: (45 31) 351942
Fax: (45 31) 357822

ECUADOR
Libri Mundi
Libreria Internacional
P.O. Box 17-01-3029
Juan Leon Mera 851
Quito
Tel: (593 2) 521-606; (593 2) 544-185
Fax: (593 2) 504-209
E-mail: librimu1@librimundi.com.ec

CODEU
Ruiz de Castilla 763, Edif. Expocolor
Primer piso, Of. #2
Quito
Tel/Fax: (593 2) 507-383; 253-091
E-mail: codeu@impsat.net.ec

EGYPT, ARAB REPUBLIC OF
Al Ahram Distribution Agency
Al Galaa Street
Cairo
Tel: (20 2) 578-6083
Fax: (20 2) 578-6833

The Middle East Observer
41, Sherif Street
Cairo
Tel: (20 2) 393-9732
Fax: (20 2) 393-9732

FINLAND
Akateeminen Kirjakauppa
P.O. Box 128
FIN-00101 Helsinki
Tel: (358 0) 121 4418
Fax: (358 0) 121-4435
E-mail: akatilaus@stockmann.fi

FRANCE
World Bank Publications
66, avenue d'Iéna
75116 Paris
Tel: (33 1) 40-69-30-56/57
Fax: (33 1) 40-69-30-68

GERMANY
UNO-Verlag
Poppelsdorfer Allee 55
53115 Bonn
Tel: (49 228) 949020
Fax: (49 228) 217492
E-mail: unoverlag@aol.com

GHANA
Epp Books Services
P.O. Box 44
TUC
Accra

GREECE
Papasotiriou S.A.
35, Stournara Str.
106 82 Athens
Tel: (30 1) 364-1826
Fax: (30 1) 364-8254

HAITI
Culture Diffusion
5, Rue Capois
C.P. 257
Port-au-Prince
Tel: (509) 23 9260
Fax: (509) 23 4858

HONG KONG, CHINA; MACAO
Asia 2000 Ltd.
Sales & Circulation Department
Seabird House, unit 1101-02
22-28 Wyndham Street, Central
Hong Kong
Tel: (852) 2530-1409
Fax: (852) 2526-1107
E-mail: sales@asia2000.com.hk

HUNGARY
Euro Info Service
Margitszgeti Europa Haz
H-1138 Budapest
Tel: (36 1) 350 80 24, 350 80 25
Fax: (36 1) 350 90 32
E-mail: euroinfo@mail.matav.hu

INDIA
Allied Publishers Ltd.
751 Mount Road
Madras - 600 002
Tel: (91 44) 852-3938
Fax: (91 44) 852-0649

INDONESIA
Pt. Indira Limited
Jalan Borobudur 20
P.O. Box 181
Jakarta 10320
Tel: (62 21) 390-4290
Fax: (62 21) 390-4289

IRAN
Ketab Sara Co. Publishers
Khaled Eslamboli Ave., 6th Street
Delafrooz Alley No. 8
P.O. Box 15745-733
Tehran 15117
Tel: (98 21) 8717819; 8716104
Fax: (98 21) 8712479
E-mail: ketab-sara@neda.net.ir

Kowkab Publishers
P.O. Box 19575-511
Tehran
Tel: (98 21) 258-3723
Fax: (98 21) 258-3723

IRELAND
Government Supplies Agency
Oifig an tSoláthair
4-5 Harcourt Road
Dublin 2
Tel: (353 1) 661-3111
Fax: (353 1) 475-2670

ISRAEL
Yozmot Literature Ltd.
P.O. Box 56055
3 Yohanan Hasandlar Street
Tel Aviv 61560
Tel: (972 3) 5285-397
Fax: (972 3) 5285-397

R.O.Y. International
PO Box 13056
Tel Aviv 61130
Tel: (972 3) 5461423
Fax: (972 3) 5461442
E-mail: royil@netvision.net.il

Palestinian Authority/Middle East
Index Information Services
P.O.B. 19502 Jerusalem
Tel: (972 2) 6271219
Fax: (972 2) 6271634

ITALY
Licosa Commissionaria Sansoni SPA
Via Duca Di Calabria, 1/1
Casella Postale 552
50125 Firenze
Tel: (55) 645-415
Fax: (55) 641-257
E-mail: licosa@ftbcc.it

JAMAICA
Ian Randle Publishers Ltd.
206 Old Hope Road, Kingston 6
Tel: 876-927-2085
Fax: 876-977-0243
E-mail: irpl@colis.com

JAPAN
Eastern Book Service
3-13 Hongo 3-chome, Bunkyo-ku
Tokyo 113
Tel: (81 3) 3818-0861
Fax: (81 3) 3818-0864
E-mail: orders@svt-ebs.co.jp

KENYA
Africa Book Service (E.A.) Ltd.
Quaran House, Mfangano Street
P.O. Box 45245
Nairobi
Tel: (254 2) 223 641
Fax: (254 2) 330 272

KOREA, REPUBLIC OF
Daejon Trading Co. Ltd.
P.O. Box 34, Youida, 706 Seoun Bldg
44-6 Youido-Dong, Yeongchengpo-Ku
Seoul
Tel: (82 2) 785-1631/4
Fax: (82 2) 784-0315

LEBANON
Librairie du Liban
P.O. Box 11-9232
Beirut
Tel: (961 9) 217 944
Fax: (961 9) 217 434

MALAYSIA
University of Malaya Cooperative Bookshop, Limited
P.O. Box 1127
Jalan Pantai Baru
59700 Kuala Lumpur
Tel: (60 3) 756-5000
Fax: (60 3) 755-4424
E-mail: umkoop@tm.net.my

MEXICO
INFOTEC
Av. San Fernando No. 37
Col. Toriello Guerra
14050 Mexico, D.F.
Tel: (52 5) 624-2800
Fax: (52 5) 624-2822
E-mail: infotec@rtn.net.mx

Mundi-Prensa Mexico S.A. de C.V.
c/Rio Panuco, 141-Colonia Cuauhtemoc
06500 Mexico, D.F.
Tel: (52 5) 533-5658
Fax: (52 5) 514-6799

NEPAL
Everest Media International Services (P.) Ltd.
GPO Box 5443
Kathmandu
Tel: (977 1) 472 152
Fax: (977 1) 224 431

NETHERLANDS
De Lindeboom/InOr-Publikaties
P.O. Box 202, 7480 AE Haaksbergen
Tel: (31 53) 574-0004
Fax: (31 53) 572-9296
E-mail: lindeboo@worldonline.nl

NEW ZEALAND
EBSCO NZ Ltd.
Private Mail Bag 99914
New Market
Auckland
Tel: (64 9) 524-8119
Fax: (64 9) 524-8067

NIGERIA
University Press Limited
Three Crowns Building Jericho
Private Mail Bag 5095
Ibadan
Tel: (234 22) 41-1356
Fax: (234 22) 41-2056

NORWAY
NIC Info A/S
Book Department, Postboks 6512 Etterstad
N-0606 Oslo
Tel: (47 22) 97-4500
Fax: (47 22) 97-4545

PAKISTAN
Mirza Book Agency
65, Shahrah-e-Quaid-e-Azam
Lahore 54000
Tel: (92 42) 735 3601
Fax: (92 42) 576 3714

Oxford University Press
5 Bangalore Town
Sharae Faisal
PO Box 13033
Karachi-75350
Tel: (92 21) 446307
Fax: (92 21) 4547640
E-mail: ouppak@TheOffice.net

Pak Book Corporation
Aziz Chambers 21, Queen's Road
Lahore
Tel: (92 42) 636 3222; 636 0885
Fax: (92 42) 636 2328
E-mail: pbc@brain.net.pk

PERU
Editorial Desarrollo SA
Apartado 3824, Lima 1
Tel: (51 14) 285380
Fax: (51 14) 286628

PHILIPPINES
International Booksource Center Inc.
1127-A Antipolo St, Barangay, Venezuela
Makati City
Tel: (63 2) 896 6501; 6505; 6507
Fax: (63 2) 896 1741

POLAND
International Publishing Service
Ul. Piekna 31/37
00-677 Warzawa
Tel: (48 2) 628-6089
Fax: (48 2) 621-7255
E-mail: books%ips@ikp.atm.com.pl

PORTUGAL
Livraria Portugal
Apartado 2681, Rua Do Carmo 70-74
1200 Lisbon
Tel: (1) 347-4982
Fax: (1) 347-0264

ROMANIA
Compani De Librarii Bucuresti S.A.
Str. Lipscani no. 26, sector 3
Bucharest
Tel: (40 1) 613 9645
Fax: (40 1) 312 4000

RUSSIAN FEDERATION
Isdatelstvo <Ves Mir>
9a, Kolpachniy Pereulok
Moscow 101831
Tel: (7 095) 917 87 49
Fax: (7 095) 917 92 59

SINGAPORE; TAIWAN, CHINA; MYANMAR; BRUNEI
Ashgate Publishing Asia Pacific Pte. Ltd.
41 Kallang Pudding Road #04-03
Golden Wheel Building
Singapore 349316
Tel: (65) 741-5166
Fax: (65) 742-9356
E-mail: ashgate@asianconnect.com

SLOVENIA
Gospodarski Vestnik Publishing Group
Dunajska cesta 5
1000 Ljubljana
Tel: (386 61) 133 83 47; 132 12 30
Fax: (386 61) 133 80 30
E-mail: repansekj@gvestnik.si

SOUTH AFRICA, BOTSWANA
For single titles:
Oxford University Press Southern Africa
Vasco Boulevard, Goodwood
P.O. Box 12119, N1 City 7463
Cape Town
Tel: (27 21) 595 4400
Fax: (27 21) 595 4430
E-mail: oxford@oup.co.za

For subscription orders:
International Subscription Service
P.O. Box 41095
Craighall
Johannesburg 2024
Tel: (27 11) 880-1448
Fax: (27 11) 880-6248
E-mail: iss@is.co.za

SPAIN
Mundi-Prensa Libros, S.A.
Castello 37
28001 Madrid
Tel: (34 1) 431-3399
Fax: (34 1) 575-3998
E-mail: libreria@mundiprensa.es

Mundi-Prensa Barcelona
Consell de Cent, 391
08009 Barcelona
Tel: (34 3) 488-3492
Fax: (34 3) 487-7659
E-mail: barcelona@mundiprensa.es

SRI LANKA, THE MALDIVES
Lake House Bookshop
100, Sir Chittampalam Gardiner Mawatha
Colombo 2
Tel: (94 1) 32105
Fax: (94 1) 432104
E-mail: LHL@sri.lanka.net

SWEDEN
Wennergren-Williams AB
P.O. Box 1305
S-171 25 Solna
Tel: (46 8) 705-97-50
Fax: (46 8) 27-00-71
E-mail: mail@wwi.se

SWITZERLAND
Librairie Payot Service Institutionnel
Côtes-de-Montbenon 30
1002 Lausanne
Tel: (41 21) 341-3229
Fax: (41 21) 341-3235

ADECO Van Diermen EditionsTechniques
Ch. de Lacuez 41
CH1807 Blonay
Tel: (41 21) 943 2673
Fax: (41 21) 943 3605

THAILAND
Central Books Distribution
306 Silom Road
Bangkok 10500
Tel: (66 2) 235-5400
Fax: (66 2) 237-8321

TRINIDAD & TOBAGO AND THE CARRIBBEAN
Systematics Studies Ltd.
St. Augustine Shopping Center
Eastern Main Road, St. Augustine
Trinidad & Tobago, West Indies
Tel: (868) 645-8466
Fax: (868) 645-8467
E-mail: tobe@trinidad.net

UGANDA
Gustro Ltd.
PO Box 9997, Madhvani Building
Plot 16/4 Jinja Rd.
Kampala
Tel: (256 41) 251 467
Fax: (256 41) 251 468
E-mail: gus@swiftuganda.com

UNITED KINGDOM
Microinfo Ltd.
P.O. Box 3, Alton, Hampshire GU34 2PG
England
Tel: (44 1420) 86848
Fax: (44 1420) 89889
E-mail: wbank@ukminfo.demon.co.uk

The Stationery Office
51 Nine Elms Lane
London SW8 5DR
Tel: (44 171) 873-8400
Fax: (44 171) 873-8242

VENEZUELA
Tecni-Ciencia Libros, S.A.
Centro Cuidad Comercial Tamanco - Nivel C2, Caracas
Tel: (58 2) 959 5547; 5035; 0016
Fax: (58 2) 959 5636

ZAMBIA
University Bookshop, University of Zambia
Great East Road Campus
P.O. Box 32379
Lusaka
Tel: (260 1) 252 576
Fax: (260 1) 253 952

ZIMBABWE
Academic and Baobab Books (Pvt.) Ltd.
4 Conald Road, Graniteside
P.O. Box 567
Harare
Tel: 263 4 755035
Fax: 263 4 781913

RECENT WORLD BANK TECHNICAL PAPERS *(continued)*

No. 382 Barker, Tenenbaum, and Woolf, *Governance and Regulation of Power Pools and System Operators: An International Comparison*

No. 383 Goldman, Ergas, Ralph, and Felker, *Technology Institutions and Policies: Their Role in Developing Technological Capability in Industry*

No. 384 Kojima and Okada, *Catching Up to Leadership: The Role of Technology Support Institutions in Japan's Casting Sector*

No. 385 Rowat, Lubrano, and Porrata, *Competition Policy and MERCOSUR*

No. 386 Dinar and Subramanian, *Water Pricing Experiences: An International Perspective*

No. 387 Oskarsson, Berglund, Seling, Snellman, Stenbäck, and Fritz, *A Planner's Guide for Selecting Clean-Coal Technologies for Power Plants*

No. 388 Sanjayan, Shen, and Jansen, *Experiences with Integrated-Conservation Development Projects in Asia*

No. 389 International Commission on Irrigation and Drainage (ICID), *Planning the Management, Operation, and Maintenance of Irrigation and Drainage Systems: A Guide for the Preparation of Strategies and Manuals*

No. 390 Foster, Lawrence, and Morris, *Groundwater in Urban Development: Assessing Management Needs and Formulating Policy Strategies*

No. 391 Lovei and Weiss, Jr., *Environmental Management and Institutions in OECD Countries" Lessons from Experience*

No. 392 Felker, Chaudhuri, György, and Goldman, *The Pharmaceutical Industry in India and Hungary: Policies, Institutions, and Technological Development*

No. 393 Mohan, ed., *Bibliography of Publications: Africa Region, 1990–97*

No. 394 Hill and Shields, *Incentives for Joint Forest Management in India: Analytical Methods and Case Studies*

No. 395 Saleth and Dinar, *Satisfying Urban Thirst: Water Supply Augmentation and Pricing Policy in Hyderabad City, India*

No. 396 Kikeri, *Privatization and Labor: What Happens to Workers When Governments Divest?*

No. 397 Lovei, *Phasing Out Lead from Gasoline: Worldwide Experience and Policy Implications*

No. 398 Ayres, Anderson, and Hanrahan, *Setting Priorities for Environmental MAnagement: An Application to the Mining Sector in Bolivia*

No. 399 Kerf, Gray, Irwin, Lévesque, Taylor, and Klein, *Concessions for Infrastructure: A Guide to Their Design and Award*

No. 401 Benson and Clay, *The Impact of Drought on Sub-Saharan African Economies: A Preliminary Examination*

No. 402 Dinar, Mendelsohn, Evenson, Parikh, Sanghi, Kumar, McKinsey, and Lonergan, *Measuring the Impact of Climate Change on Indian Agriculture*

No. 403 Welch and Frémond, *The Case-by-Case Approach to Privatization: Techniques and Examples*

No. 404 Stephenson, Donnay, Frolova, Melnick, and Worzala, *Improving Women's Health Services in the Russian Federation: Results of a Pilot Project*

No. 405 Onorato, Fox, and Strongman, *World Bank Group Assistance for Minerals Sector Development and Reform in Member Countries*

No. 406 Milazzo, *Subsidies in World Fisheries: A Reexamination*

No. 407 Wiens and Guadagni, *Designing Rules for Demand-Driven Rural Investment Funds: The Latin American Experience*

No. 408 Donovan and Frank, *Soil Fertility Management in Sub-Saharan Africa*

No. 409 Heggie and Vickers, *Commercial Management and Financing of Roads*

No. 410 Sayeg, *Successful Conversion to Unleaded Gasoline in Thailand*

No. 411 Calvo, *Options for Managing and Financing Rural Transport Infrastructure*

No. 413 Langford, Forster, and Malcolm, *Toward a Financially Sustainable Irrigation System: Lessons from the State of Victoria, Australia, 1984–1994*

No. 414 Salman and Boisson de Chazournes, *International Watercourses: Enhancing Cooperation and Managing Conflict, Proceedings of a World Bank Seminar*

No. 415 Feitelson and Haddad, *Identification of Joint Management Structures for Shared Aquifers: A Cooperative Palestinian-Israeli Effort*

No. 416 Miller and Reidinger, eds., *Comprehensive River Basin Development: The Tennessee Valley Authority*

No. 417 Rutkowski, *Welfare and the Labor Market in Poland: Social Policy during Economic Transition*

No. 418 Okidegbe and Associates, *Agriculture Sector Programs: Sourcebook*

No. 420 Francis and others, *Hard Lessons: Primary Schools, Community, and Social Capital in Nigeria*

No. 425 Mohan, ed., *Bibliography of Publications: Africa Region, 1993–98*

THE WORLD BANK

1818 H Street, N.W.
Washington, D.C. 20433 U.S.A.

Telephone: 202-477-1234

Facsimile: 202-477-6391

Telex: MCI 64145 WORLDBANK
MCI 248423 WORLDBANK

World Wide Web: http://www.worldbank.org/

E-mail: books@worldbank.org

ISBN 0-8213-4422-6