



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

ISNAR

Research Report

NUMBER

10

**Research Options for High-Value
Agricultural Exports in
South Pacific Island Nations**

Euan M. Fleming

The mandate of the International Service for National Agricultural Research (ISNAR) is to assist developing countries in bringing about lasting improvements in the performance of their national agricultural research systems and organizations. It does this by promoting appropriate agricultural research policies, sustainable research institutions, and improved research management. ISNAR's services to national research are ultimately intended to benefit producers and consumers in developing countries and to safeguard the national environment for future generations.

ISNAR offers developing countries three types of service, supported by research and training:

- For a limited number of countries, ISNAR establishes long-term, comprehensive partnerships to support the development of sustainable national agricultural research systems and institutions.
- For a wider range of countries, ISNAR gives support for strengthening specific policy and management components within the research system or constituent entities.
- For all developing countries, as well as the international development community and other interested parties, ISNAR disseminates knowledge and information about national agricultural research.

ISNAR was established in 1979 by the Consultative Group on International Agricultural Research (CGIAR), on the basis of recommendations from an international task force. It began operating at its headquarters in The Hague, the Netherlands, on September 1, 1980.

ISNAR is a nonprofit autonomous institute, international in character, and apolitical in its management, staffing, and operations. It is financially supported by a number of the members of the CGIAR, an informal group of donors that includes countries, development banks, international organizations, and foundations. Of the 16 centers in the CGIAR system of international centers, ISNAR is the only one that focuses specifically on institutional development with national agricultural research systems.

ISNAR's Research Report series presents the findings of research conducted by the institute and its partners in the area of agricultural research policy, organization, and management.

isnar

Research Report

NUMBER

10

**Research Options for High-Value
Agricultural Exports in
South Pacific Island Nations**

Euan M. Fleming

December 1996

Copyright © 1996 by the International Service for National Agricultural Research.
All rights reserved.
ISNAR encourages the fair use of this material. Proper citation is requested.

About the Author

*Egan M. Fleming, Department of Agricultural & Resource Economics, University of
New England, Armidale, Australia.*

Citation

Fleming, E.M. 1996. Research Options for High-Value Agricultural Exports in South Pacific Island Nations. ISNAR Research Report No. 10. The Hague: International Service for National Agricultural Research.

AGROVOC Descriptors

Export policies; agriculture; research; crops; commodity markets; developing countries.

CABI Descriptors

Exports; agricultural products; agricultural research; crops; commodity markets; developing countries.

ISSN 1021-4429
ISBN 92-9118-030-0

CONTENTS

FOREWORD	vii
ABSTRACT	viii
ACRONYMS	x
EXECUTIVE SUMMARY	xi
1. Introduction	1
The Imperative to Diversify into High-Value Exports in Small Developing Nations: Need for Improved Agricultural Research	1
Performance of High-Value Exports in South Pacific Island Nations	1
Outline of Study	3
Overview of High-Value Exports in SPINs	4
2. A History of the Performance of High-Value Agricultural Export Industries in Selected South Pacific Island Nations	9
Cook Islands	9
Overview	9
Traditional Exports	12
Minor Food Crops	14
HVNT Exports	14
Fiji	17
Overview	17
Traditional Exports	24
Minor Food Crops	30
HVNT Exports	30
Kiribati	35
Overview	35
Traditional Export Crops	38
Niue	39
Overview	39
Traditional Export Crops	40
Minor Food Crops	41
HVNT Exports	42
Papua New Guinea	43
Overview	43
Traditional Export Crops	48
HVNT Export Crops	54
Solomon Islands	59
Overview	59
Traditional Export Crops	62
Global Staples	66
HVNT Export Crops	67

Tonga	69
Overview	69
Traditional Export Crops	72
Minor Food Crops	75
HVNT Export Crops	76
Tuvalu	83
Overview	83
Traditional Export Crops	84
Minor Food Crops	84
Vanuatu	84
Overview	84
Traditional Export Crops	86
HVNT Exports	89
Livestock	93
Western Samoa	94
Overview	94
Traditional Export Crops	98
Minor Food Crops	102
HVNT Exports	104
3. Factors Influencing High-Value Agricultural Export Performance	109
Setting the Investment Climate	109
Government Commitment to a Competitive Export Marketing Strategy	111
Production Factors Influencing Export Success	114
Marketing Factors Influencing Export Success	118
4. Setting Agricultural Research Priorities for High-Value Agricultural Exporting	129
Implications of Findings	129
Research Priorities and Adoption of a Research Portfolio Approach	135
Special Functions of Concern in a Research Portfolio Approach for High-Value Agricultural Exports	141
Catering for Diverse Research Capabilities among SPINs	147
5. Conclusion	149
Summary	149
An Illustrative Case Study	149
Research Approach	150
6. References	151

FIGURES

Figure 2.1 Agricultural research numbers and expenditure in Cook Islands: five-year averages, 1961 to 1985	10
Figure 2.2 Agricultural exports from Cook Islands, 1960 to 1991	13
Figure 2.3 Value of chili exports from Cook Islands, 1983 to 1991	16

Figure 2.4	Composition of fruit and vegetable exports from Cook Islands, 1979 and 1991	17
Figure 2.5	Agricultural research numbers in Fiji: 1960 to 1990	21
Figure 2.6	Sugar exports from Fiji, 1961 to 1994	25
Figure 2.7	Cocoa exports from Fiji, 1971 to 1994	28
Figure 2.8	Value of exports of bananas, dalo, and passion fruit from Fiji, 1960 to 1994	29
Figure 2.9	Ginger exports from Fiji, 1970 to 1994	32
Figure 2.10	Major agricultural exports from Niue, 1960 to 1993	41
Figure 2.11	Agricultural research numbers and expenditure in Papua New Guinea: five-year averages, 1961 to 1985	46
Figure 2.12	Values of coffee, cocoa, and palm oil exports from Papua New Guinea, 1960 to 1994	49
Figure 2.13	Values of tea and rubber exports from Papua New Guinea, 1960 to 1994	53
Figure 2.14	Volumes and values of exports of chilies from Papua New Guinea, 1971 to 1993	55
Figure 2.15	Volumes and values of exports of cardamom from Papua New Guinea, 1973 to 1993	56
Figure 2.16	Value and volume of exports of pyrethrum crude extract from Papua New Guinea, 1965 to 1993	58
Figure 2.17	Values of exports of passion-fruit juice and groundnuts from Papua New Guinea, 1960 to 1977	59
Figure 2.18	Agricultural research numbers and expenditure in Solomon Islands: five-year averages, 1961 to 1985	61
Figure 2.19	Value and volume of exports of palm oil products from Solomon Islands, 1975 to 1992	64
Figure 2.20	Values and volumes of exports of cocoa from Solomon Islands, 1960 to 1992	65
Figure 2.21	Exports of rice from Solomon Islands, 1970 to 1987	67
Figure 2.22	Agricultural research numbers and expenditure in Tonga: five-year averages, 1961 to 1985	71
Figure 2.23	Exports of processed coconut products from Tonga, 1960 to 1994	73
Figure 2.24	Exports of bananas and root crops from Tonga, 1960 to 1994	74
Figure 2.25	Decomposition of root-crop exports from Tonga, 1980 to 1992	76
Figure 2.26	Exports of squash and vanilla from Tonga, 1970 to 1994	77
Figure 2.27	Exports of melons and kava from Tonga, 1960 to 1994	80
Figure 2.28	Exports of fruits, vegetables and nuts from Tonga, 1960 to 1993	82

Figure 2.29	Exports of coffee and kava from Vanuatu, 1960 to 1994.	87
Figure 2.30	Exports of cocoa and beef from Vanuatu, 1960 to 1994	88
Figure 2.31	Agricultural research numbers and expenditure in Western Samoa: five-year averages, 1961 to 1985	96
Figure 2.32	Values of exports of major processed coconut products from Western Samoa: 1970 to 1994	98
Figure 2.33	Value of cocoa and banana exports from Western Samoa: 1960 to 1994	101
Figure 2.34	Value of taro exports from Western Samoa: 1960 to 1994	103
Figure 2.35	Value of exports of passion-fruit products from Western Samoa: 1980 to 1993	104
Figure 4.1	Setting the scope in a research portfolio.	137
Figure 4.2	Factors in determining the comparative advantage of institutions.	138

TABLES

Table 1.1	High-Value Exports from Selected SPINs	7
Table 2.1	Nontraditional Crop Exports with High-Value Potential in Fiji, 1986	18
Table 2.2	Fiji: Research Components and Research Scope, 1990	23

FOREWORD

In 1989, ISNAR began a global study on agricultural research in small, low-income developing countries with populations of fewer than five million people. Because of resource limitations and the inherent constraint of size that restrict the scale of the research effort in these countries, their national agricultural research systems (NARS) are small—often under 50 researchers. The major goals of that study were to identify the strategic role of NARS in small developing countries and to determine how essential tasks can be carried out in small research systems. The project culminated in 1996 in a book by Dr. Pablo Eyzaguirre titled *Agricultural and Environmental Research in Small Countries: Innovative Approaches to Strategic Planning*.

In the present Research Report, which elaborates and tests some of the propositions coming out of the ISNAR book, Dr. Egan Fleming focuses on a particularly interesting set of small countries: the small-island nations of the South Pacific. The report documents the problems these nations have experienced, on the one hand, in introducing, maintaining, and trading in high-value agricultural exports and, on the other, in carrying out agricultural research on those crops.

A product of ISNAR's cooperation with the University of New England (Armidale, Australia), the Report illustrates the value of collaboration in bringing the knowledge of the university's Department of Agricultural & Resource Economics Dr. Fleming to a global audience through ISNAR. ISNAR is fortunate to have been able to tap into his expertise in the area. The Report is one of the few studies that assembles and analyzes empirical data to show that analysis of marketing systems and opportunities should be brought to bear on agricultural research policy and organization. In view of the demonstrated importance that agricultural export diversification and nontraditional high-value exports are given in development policies of many small countries, this Report helps policymakers and research leaders in the South Pacific region make more realistic and knowledge-supported decisions.

ISNAR's interest in small countries does not end with this valuable Report. The Technical Advisory Committee of the Consultative Group on International Agricultural Research (CGIAR), which comprises 16 international agricultural research centers, approved a CGIAR-wide initiative to further strengthen agricultural research in small developing countries. As a result, ISNAR and CTA organized a workshop in January 1996 that brought together a number of small Caribbean countries. The workshop laid the foundation for a focal point for strengthening the partnership between the CGIAR and the NARS and regional organizations in small Caribbean countries. In addition, the author of the present study represented ISNAR at a technical consultation on sustainable development in South-Pacific small-island nations, organized by the Food and Agriculture Organization of the United Nations (FAO) in May 1996. The consultation recommended, inter alia, strengthening existing networks and initiatives in the South Pacific region. ISNAR strongly supports initiatives and approaches of this kind and is highly interested in helping to develop them in its work to strengthen agricultural research as a major input in agricultural development.

Christian Bonte-Friedheim
Director General
ISNAR
December 1996
The Hague

ABSTRACT

This study focuses on the determinants of high-value agricultural export performance in 10 South Pacific island nations and research options for the future improvement of this performance. These nations are representative of many small developing nations that suffer special problems in carrying out agricultural research, notably diseconomies of institutional development, small production bases and markets, fragile and/or restricted agricultural resource bases, and vulnerability of institutions. In the first stage of the study, the histories of all significant high-value agricultural export industries are charted, identifying determinants of their emergence and market defense and, in the case of those no longer in existence, factors contributing to their demise. In the second stage of the study, findings are then compared with criteria for successful agricultural research in small developing nations. Key research functions and institutional responsibilities in research are identified to improve a small nation's ability to create, penetrate, and defend high-value agricultural export markets.

ABREGE

Cette étude porte sur les facteurs qui déterminent les performances de l'exportation de produits agricoles à haute valeur ajoutée, dans dix états insulaires du Pacifique Sud, et sur les solutions offertes par la recherche visant l'amélioration des résultats futurs.

Ces états présentent les problèmes spécifiques auxquels sont confrontés de nombreux petits pays en développement en matière de recherche agricole, notamment les déséconomies d'échelle liées au développement institutionnel, la faiblesse des productions, l'étroitesse des marchés, les ressources agricoles fragiles et/ou restreintes, et la vulnérabilité des institutions.

La première partie de l'étude retrace le parcours de toutes les industries importantes exportatrices des produits agricoles à haute valeur ajoutée, en identifiant les facteurs qui ont joué un rôle déterminant dans la création et la protection de leur marché, voire, pour celles qui ont aujourd'hui disparu, les facteurs qui ont contribué à leur échec. Les résultats sont ensuite comparés aux critères d'une recherche agricole réussie dans les petits pays en développement, dans la deuxième partie de l'étude. Les fonctions clés de la recherche et les responsabilités institutionnelles sont identifiées, afin de rendre les petits pays plus à même de créer, de pénétrer et de protéger des marchés exportateurs de produits agricoles à haute valeur ajoutée.

RESUMEN

Este estudio se enfoca en los factores que determinan el desempeño de exportaciones agrícolas de alto valor en diez naciones isleñas del Pacífico Sur y opciones de investigación para su mejoramiento en el futuro. Estas naciones representan las múltiples pequeñas naciones en desarrollo que sufren de problemas especiales en lo que se refiere a su investigación agrícola, particularmente de diseconomías de desarrollo institucional, limitados mercados y base de producción, bases de recursos agrícolas frágiles y la vulnerabilidad de las institucio-

nes. En la primera etapa del estudio, se reseñan las historias de todas las industrias importantes de exportaciones agrícolas de alto valor, identificando los factores que determinan su surgimiento y su defensa en el mercado y, en el caso de aquellas industrias que no existen más, los factores que contribuyeron a su desaparición. En la segunda etapa del estudio, se comparó los hallazgos con los criterios de éxito usados para evaluar la investigación agrícola en pequeñas naciones en desarrollo. Se identificó funciones claves de investigación y responsabilidades institucionales para mejorar la habilidad de una pequeña nación para crear, penetrar y defender sus mercados de exportaciones agrícolas de alto valor.

ACRONYMS

ADB	Asian Development Bank
CDC	Commonwealth Development Corporation
CEMA	Commodities Export Marketing Authority
DAL	Department of Agriculture and Livestock
EU	European Union
FSC	Fiji Sugar Corporation
FSR	farming systems research
FTIB	Fiji Trade and Investment Board
GDP	gross domestic product
HTFA	high-temperature forced air
HVNT	high-value nontraditional
IRETA	Institute for Research, Extension, and Training in Agriculture (Western Samoa)
ISNAR	International Service for National Agricultural Research
MAF	Ministry of Agriculture and Forests (Tonga)
MAFF	Ministry of Agriculture, Forestry and Fisheries (Fiji)
MAFF	Ministry of Agriculture, Fisheries and Forests (Tonga)
MIRAB	migration, aid, remittance, and bureaucracy
MPI	Ministry of Primary Industries (Fiji)
MSR	marketing systems research
NARS	national agricultural research system(s)
NMA	National Marketing Authority (Fiji)
SPC	South Pacific Commission
SPIN	South Pacific island nation
UN	United Nations
VCMR	Vanuatu Commodities Marketing Board

EXECUTIVE SUMMARY

This study focuses on the determinants of performance of high-value agricultural exporting in 10 South Pacific island nations (SPINs) and research options for its future improvement. Governments of SPINs have long put a priority on export expansion, with modest but growing hopes pinned on the development of new high-value agricultural exports. However, diversification into these exports has met with limited success, either through new agricultural export industries or new value-adding activities to new and traditional industries, despite the commercialization of a large number of products.

SPINs are representative of many small developing nations that suffer special problems in carrying out research for high-value agricultural export industries, notably diseconomies of institutional development, small production bases and markets, fragile and/or restricted agricultural resource bases, and vulnerability of institutions. Four particularly difficult aspects of the environment are that (a) the agricultural sector is by and large a “research orphan,” (b) it is difficult to maintain long-term research to develop new technologies on a national basis, (c) a low success rate in commercialization of research outputs has forced experimentation with numerous possible activities to achieve the few commercial successes, and (d) research systems are vulnerable to technical and financial biases introduced by external agencies. National agricultural research systems appear to have fragmented while struggling to support all research priorities and have largely lost coherence.

A “boom-bust” syndrome has featured prominently in high-value agricultural exporting, manifested by concurrent symptoms associated with the demise of an agricultural export following its seeming healthy early growth. Evidence suggests that its causes are complex and reflect failings in both production and marketing management, compounded by deficiencies in economic policy making and agricultural research. Partly as a consequence of the boom-bust syndrome, the progressive strengthening of the product base and an underlying upward trend in the value of these exports have not materialized. Export values have tended to fall back after successes have been achieved as industries fail and are not replaced by new exports coming through the research and development process. Nevertheless, there have been sufficient success stories in most SPINs to persevere with high-value exporting.

The study entailed an analysis of the determinants of performance of high-value agricultural exports introduced in the selected SPINs over the past four decades, and preparation of a research framework and processes to help improve performance of high-value agricultural exports in small developing nations in general. In the first stage of the study, the histories of all significant high-value agricultural export industries were charted, identifying factors influencing their emergence and market defense and, in the case of those no longer in existence, contributing to their demise. Over 30 industries were included, covering a wide range of exports belonging to different product types: global staples, traditional export crops, minor food crops, high-value non-traditional (HVNT) exports, and livestock. Findings were then compared with criteria for successful agricultural research in small developing nations in the second stage of the study. Key research functions and institutional responsibilities in research were identified to improve a small nation’s ability to create, penetrate, and defend high-value agricultural export markets.

Numerous factors are shown to influence high-value agricultural-export performance in SPINs. This variety springs from the diverse and largely unrelated export industries that have come into being. Factors influencing export success were categorized according to their source:

- *the investment climate and economic background for high-value agricultural exports*—public provision of trade support services, foreign investment incentives and rules, macroeconomic settings, intersectoral strategies, and reconciling export orientation with concern for food security;
- *commitment to a competitive export marketing strategy*—product differentiation, market focus, and identifying and reinforcing comparative advantage;
- *production factors*—endemic and exogenous technical and physical factors, quality control, production characteristics, costs of production, mode of production, land tenure and related social factors; and
- *marketing factors*—infrastructure and transfer, channel relations, market access and quarantine regulations, choice of domestic marketing organization, export market knowledge, market width and depth, product attributes, product-cycle management, product range and new product development, economics of processing, technological advances in agricultural processing, product quality, marketing margins, export pricing strategy, pricing for quality premiums, price instability, forecasting future price levels, and promotion.

Implications of findings were explored for establishing research priorities, covering strategic decisions about horizontal versus vertical diversification; mix of traditional crop, minor food crop, and HVNT exports; priorities accorded to general versus specific factors influencing export performance; how best to deal with multiple symptoms of export failure; market penetration versus market defense research; production versus marketing research; and how best to integrate the production and marketing of high-value exports.

Improving public support to high-value export industries was identified as an urgent government responsibility. An innovative approach to providing an essential plank of this support is a research portfolio approach that recognizes the difficult environment in which research is undertaken. Such an approach should sharpen priorities and research investment decisions to overcome the disintegration of agricultural research systems struggling in vain to support all research priorities. Decisions following this approach are largely determined by the comparative advantages of public and private sectors in conducting research into agricultural export production, processing, and marketing.

Eight key areas of institutional responsibility for research functions were identified to improve high-value agricultural exporting from SPINs, consistent with a research portfolio approach:

- improved policy advice, especially by upgrading economic research
- extending a research portfolio approach to the regional level
- making more effective use of aid funds for agricultural research activity and nongovernment research resources to exploit diversity
- processing research information from foreign sources
- experimentation that entails a research role for foreign agribusiness investors

- experimentation that combines farming systems research with marketing systems research
- judiciously choosing between applied research, adaptive research, and testing
- improving quarantine and satisfying phytosanitary requirements.

Vastly different capabilities exist between national agricultural research systems in the South Pacific region to undertake research of benefit to high-value agricultural export industries. Research ambitions in smaller SPINs would need to be trimmed according to their more restricted circumstances and lesser needs. Size influences the balance between diversity and specialization in high-value research and export activity. While it may be desirable to have diverse research portfolios and export bases, limitations imposed by very small size may well mean a high degree of specialization is inevitable.

1. Introduction

The Imperative to Diversify into High-Value Exports in Small Developing Nations: Need for Improved Agricultural Research

Government policymakers in small developing nations are under pressure to boost earnings of foreign exchange to finance economic development initiatives. These nations usually have open economies, relying on the development of export industries. Yet, because of their small size, they find it difficult to establish internationally competitive manufacturing and service industries. Consequently, they rely heavily on primary industries to spearhead export development. Traditionally, in the post World-War-II era these have been cash-crop export industries, producing mainly undifferentiated commodities. Increasing competition on international markets for these commodities (which favor large, low-cost producing nations) means that small developing nations cannot rely on these industries to the same extent as in the past. In addition, since future prospects for these industries are unlikely to improve and will probably get dimmer, there is a need to develop new, primary-sector export industries. These will have to focus on high-value, largely nontraditional, primary products without the vulnerability now afflicting traditional primary export products.

Success stories in the export of high-value, nontraditional primary products (see, for example, with Gordon 1994) have created high expectations among governments of these new industries. However, few such export ventures have emerged from the private sector or, where they were private initiatives or government-sponsored schemes, either failed to reach the commercialization stage or collapsed after a period of initial prosperity.

An important implication of this situation is the need for better knowledge of factors influencing the emergence and sustained success of high-value nontraditional export industries. It points up the potential gains from research in overcoming past failures and disappointments. Research should help to

- increase the chances of commercialization of a succession of high-value export industries, expanding the export base and replacing any industries in decline;
- enable a better understanding by policymakers of factors determining the success or failure of these industries;
- discern the best opportunities to add value to domestic economic activity through these industries.

Performance of High-Value Exports in South Pacific Island Nations

This study focuses on the performance of high-value agricultural exports and their contributions to agricultural development in South Pacific island nations (SPINs). Findings reached in the study can be relevant to other small developing nations that share some of the difficulties experienced by SPINs in maintaining high-value agricultural export volumes and receipts in recent years.

All qualify as small nations on the basis of both their populations, being less than 5 million (Eyzaguirre 1996, p. 1), and their economic size (gross domestic product (GDP) less than US \$5 billion). All have agricultural sectors that are economically important and have less than 100 agricultural researchers.

The special problems of smallness in carrying out agricultural research in these nations, as in other small developing nations, are diseconomies of institutional development, small production bases and markets, fragile and/or restricted agricultural resource bases, and vulnerability of institutions (Eyzaguirre 1996, pp. 2-6).

Mixed success in export diversification

Governments of have long put a priority on export expansion as a centerpiece of their development plans, with modest but growing hopes pinned on diversification into new high-value agricultural exports (McGregor 1990, p. 1; Forum Secretariat 1995b, p. 11). Whether it has been through the addition of new agricultural export industries (horizontal diversification) or new value-adding activities in traditional industries (vertical diversification), diversification into these exports has met with limited and mixed success.

Even with the occasional successes, diversification has not contributed to GDP and foreign exchange earnings as strongly as planners had hoped. Despite the commercialization of a large number of products in these industries, have so far made little impression in diversifying their export base (Fleming and Hardaker 1992). It is difficult to quantify exactly the contribution of nontraditional high-value exports to agricultural export earnings, because many small high-value exports are not recorded separately in official publications. Yet, it is clear that traditional crops still provide the bulk. Also, the threat of failure hangs heavily for those high-value agricultural export industries that have been successful to date. Most are susceptible to the convergence of a number of adverse events and must be considered as having an endangered status.

“Boom-bust” syndrome

A “boom-bust” syndrome has featured prominently in high-value agricultural exporting in SPINs. The syndrome refers to the manifestation of a number of concurrent symptoms associated with the decline or demise of an agricultural export product, following its seemingly healthy initial growth. Many nations have experienced a history of initial success in exporting high-value agricultural products, followed by failure and the virtual disappearance of the export industry. The boom-bust syndrome is often attributed to the naiveté and “hot and cold” attitudes of producers, yet the evidence does not support this explanation. A corollary to this view is the implication that producers have paid too little attention to the marketing side of exporting. Such a view is challenged in this study.

The traditional view of the boom-bust syndrome is especially damaging when held by development bureaucrats in government and international aid agencies. It reflects their implicit assumption that entering into new agricultural export markets is fairly straightforward, as evidenced by a lack of assessment of the success of diversification campaigns. In reality, breaking into new niche export markets and establishing downstream

value-adding processes for existing export industries, as well as sustaining a profitable market share, are difficult and risky ventures.

A failure to build on experiences

The observer of the performance of high-value agricultural exports in SPINs cannot help but be struck that SPINs generally fail to achieve a progressive strengthening of the product base and bring about an upward trend in the value of such exports. Progress has been erratic, and any momentum gained has not been maintained. Export values have tended to fall back after initial export successes, as failing industries are not replaced by new exports generated through the research and development process. In other words, short-lived export industries would not be such a problem if they were progressively replaced by more such industries over time.

More detailed inquiry into why high-value export ventures fail, often in a boom-bust fashion, would be invaluable in demonstrating to governments how they can best support exporters and thereby improve the performance of agricultural exports.

Outline of Study

The study is based on the performance of high-value agricultural exports in 10 small South Pacific nations: Cook Islands, Fiji, Kiribati, Niue, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, and Western Samoa. All nations can be reasonably described as small developing nations, although size varies enormously. Populations range from a mere 2,330 in Niue to almost 4 million in Papua New Guinea.

The study covers a period beginning in the 1960s, when most SPINs gained their political independence and their governments began to implement formal development planning processes. To provide some background to efforts to diversify agricultural exports, the study also summarizes the historical context of endeavors to develop high-value agricultural exports. This includes brief descriptions of experiences since the mid-19th century in the development of traditional export crop industries.

Since the 1960s, agriculture has been expected to play a key role in achieving overall economic development. Diversification into high-value agricultural exports has been a cornerstone of most agricultural planning processes in SPINs. With a couple of exceptions, nations have not suffered from a lack of attempts to establish new agricultural export industries—high-value exports in particular. Only two of the 10 nations under study (Kiribati and Tuvalu) have experienced negligible high-value export development, for reasons discussed below. Where attempts have been made in other SPINs, producers have responded to incentives to produce exports in the expected manner. Fleming's (1988) review of price responsiveness of export crop producers shows consistently positive price elasticities of supply.

The material in this study comprises analyses at two stages:

1. Analysis of determinants of the performance in the selected SPINs of high-value agricultural exports introduced over the past four decades.

2. Preparation of a research framework and processes to help improve agricultural export performance in nations such as those included in this study.

The plan of the study first charts the history of all significant high-value agricultural export industries, identifying factors influencing their emergence and market defense and, if they no longer exist, factors contributing to their demise (chapter 2). Industries to be studied cover the following commodities or commodity groups: bananas, chilies, cocoa, coconut products other than copra, coffee, fruit, fruit juice, ginger, kava (yaqona), lime products, melons, nuts, palm oil, papaya, passion-fruit products, pyrethrum, rice, rubber, spices, squash, sugar, sweet potato, tea, taro, vanilla, and vegetables.

Chapter 3 provides a summary of factors found to be important in influencing high-value agricultural export performance. These factors are studied with a view to suggesting appropriate research and development work for nontraditional high-value agricultural exports in small developing nations.

The second stage entails two phases. The first establishes an analytical framework for setting research priorities to improve high-value agricultural export performance. This framework is modelled on a research portfolio approach (Eyzaguirre 1996, Ch. 3) to suit agricultural export marketing, and it is linked to farming-systems-research (FSR) approaches in agricultural production and marketing-systems-research (MSR) approaches in marketing research. The second phase identifies key research processes that can improve the management of the factors identified in the first stage, which facilitate the penetration and defense of high-value export markets and thereby have the greatest influence on export performance.

Overview of High-Value Exports in SPINs

The high-value agricultural exports of interest cover five sets of activities:

1. Most new production activities in farming systems have been introduced through horizontal diversification to complement the limited number of traditional exports (mainly copra).
2. Some activities that were part of the traditional farming systems (and that provided food for domestic consumption) have developed a new status as exports.
3. A few value-adding activities have developed through vertical diversification, resulting in particular in partly processed coconut products and palm oil.
4. Some traditional industries such as cocoa and coffee have developed high-value segments based on superior quality.
5. A small number of traditional export industries enjoy a high-value status, thanks to particular institutional arrangements and trade policies, which enable them to obtain export prices above world levels (e.g., rice, rubber, and sugar).

In the case of horizontal diversification, it is not clear what should be regarded as a high-value agricultural export. The following classification is therefore necessarily arbitrary. Using Porter's (1980) classification of competitive strategies, high-value exports are distinguished according to the competitive export strategy that best fits their form of market penetration. These strategies are the following:

- cost minimization;
- product differentiation;
- market focus.

Cost-minimization strategies can be usefully subdivided into four categories:

- *cost leadership*;
- *close follower*;
- *distant follower*;
- *selective follower*.

The first strategy, cost leadership, is not found in SPINs. The other three are “market-follower” hybrid strategies, which are based on a combination of Porter’s three strategies (Fleming 1992a, p. 86):

- *Close-follower strategy*. Close followers are export industries competing on cost and following the international cost leader closely, but making minor strategic adjustments by product differentiation or market focus.
- *Distant-follower strategy*. A distant-follower industry follows the international cost leader but makes major strategic adjustments by product differentiation or market focus.
- *Selective-follower strategy*. Selective followers follow an independent set of marketing strategies but with selective imitation of marketing strategies of world market leaders.

These market-follower strategies are identified mainly with the traditional agricultural export commodities. Sugar, copra, coconut oil, coffee, and cocoa exporters of standard-quality commodities use this strategy. SPINs account for very small shares of the world trade in these commodities, which means they are essentially price-takers in the world market. Since copra, coconut oil, sugar,¹ and palm oil are largely undifferentiated products, little opportunity exists for product differentiation on the basis of quality or market focus. Export firms therefore compete on world markets predominantly on cost, which forces them to follow a cost-minimization strategy.

Marketing of cocoa and coffee provides greater scope for export firms to deploy distant-follower or selective-follower strategies. By differentiating their product on quality or market focus grounds, they can achieve premiums.

High-value exports, then, are taken clearly to include exports based on product-differentiation and market-focus strategies, not on cost-leadership or close-follower strategies. Selective-follower strategies are also clearly associated with high-value exports. Distant-follower strategies are more problematic to classify. For the purposes of this study, they are treated as suited to high-value exports, because significant emphasis is placed on adding value.

¹ Some countries, however, produce special sugars as a means of product differentiation to earn a premium over world price.

Exports based solely on product differentiation or market focus are termed niche exports. Those with a component of cost minimization or market-following, including processed products of traditional export crops, are regarded as mainstream high-value exports.

This study distinguishes four types of high-value exports that range across the export categories specified by Eyzaguirre (1991) as global staples, nontraditional export crops, traditional export crops, minor food crops, and livestock. These exports include the following:

- following Eyzaguirre (1991), exports designated as high-value nontraditional (HVNT) export crops;
- to account for vertical diversification, other agricultural exports that have a high value-added component through in-country processing;
- exports earning significant premiums over world prices through product differentiation;
- products that are marketed in specific export market segments.

To-be-analyzed exports that have achieved some degree of market penetration are presented in table 1.1. They cover almost all high-value agricultural exports that have been introduced over the past three decades. The study also discusses other activities considered by researchers in various nations to have export prospects, and it assesses their potential for export.

Table 1.1 High-Value Exports from Selected SPINs

Nation	Commodity	Maximum annual export value 1960-94 (US \$mn, 1987 values)
Cook Islands Population 20,000 Land area 240 km ² GDP per head 1993 US \$3904	Bananas	2.35 [1970]
	Chilies	0.025 [1988]
	Coconut products	3.50 [1965]
	Fresh and canned fruit	12.81 [1970]
	Taro	0.189 [1982]
	Vegetables	0.490 [1983]
Fiji Population 783,000 Land area 18,376 km ² GNP per head 1992 US \$2070	Bananas	3.22 [1960]
	Beverages	0.715 [1980]
	Coconut products	39.95 [1960]
	<i>Dalo (taro)</i>	2.52 [1994]
	Fruit, nuts and vegetables	1.23 [1986]
	Ginger	4.11 [1982]
	Sugar	319.10 [1980]
<i>Yaqona</i>	0.910 [1994]	
Niue Population 2300 Land area 255 km ² GDP per head 1991 US \$2881	Coconut cream	0.404 [1983]
	Limes	0.025 [1984]
	Papaya	0.046 [1980]
	Passion fruit	0.336 [1975]
	Sweet potato	0.155 [1965]
	Taro	0.179 [1993]
Papua New Guinea Population 4.2 mn Land area 462,000 km ² GNP per head 1992 US \$950	Cocoa	100.23 [1980]
	Coffee	255.64 [1980]
	Groundnuts	3.14 [1963]
	Passion fruit products	1.07 [1964]
	Palm oil	93.75 [1984]
	Pyrethrum	27.10 [1968]
	Rubber	16.18 [1960]
	Spices	2.64 [1985]
	Tea	21.18 [1984]
Solomon Islands Population 396,000 Land area 28,370 km ² GNP per head 1992 US \$710	Chilies	..
	Cocoa	4.59 [1987]
	<i>Ngali</i> nuts	(est.) 0.030 [1992]
	Palm oil and palm kernel oil	23.00 [1980]
	Rice	4.92 [1980]

Table 1.1 High-Value Exports from Selected SPINs (continued)

Nation	Commodity	Maximum annual export value 1960-94 (US \$mn, 1987 values)
Tonga	Bananas	6.59 [1965]
Population 105,000	Coconut oil	5.14 [1985]
Land area 697 km ²	Coconuts (whole)	0.160 [1981]
GNP per head 1992 US \$1350	Desiccated coconut	3.43 [1970]
	Kava	0.655 [1975]
	Melons	0.884 [1983]
	Passion fruit products	0.042 [1989]
	Root crops	1.23 [1990]
	Squash	6.31 [1992]
	Vanilla	1.87 [1991]
Tuvalu	Sweet potato	..
Population 20,000		
Land area 26 km ²		
GDP per head 1990 US \$6330		
Vanuatu	Beef	2.75 [1994]
Population 170,000	Cocoa	2.29 [1983]
Land area 11,880 km ²	Coffee	0.260 [1960]
GNP per head 1992 US \$1210	Fruit and nuts	..
	Kava	0.347 [1994]
	Pepper	..
	Squash	..
	Vanilla	..
Western Samoa	Bananas	14.93 [1960]
Population 165,000	Cocoa	16.33 [1960]
Land area 2934 km ²	Coconut cream	1.95 [1989]
GDP per head 1992 US \$940	Coconut oil	13.39 [1984]
	Fruit and vegetables (other)	..
	Ginger	..
	Kava	(est.) 0.200 [1988]
	Koko Samoa	(est.) 0.700 [1989]
	Passion fruit	0.496 [1985]
	Taro	5.24 [1989]

Note: Estimates of population, land area, and GDP or GNP per head are derived from NCDS (1995).
.. negligible or not recorded individually as an export.

2. History of the Performance of High-Value Agricultural Export Industries in Selected South Pacific Island Nations

COOK ISLANDS

Overview

The small population of Cook Islands, now less than 20,000, has been declining over the past few decades with emigration to New Zealand (with which it is economically and politically integrated). Emigrants are mainly members of the economically active population. Their migration has been felt most keenly in the outer islands where there is most potential for agricultural development.

The nation comprises two main island groups covering a vast marine area. The southern group consists of high islands, has most agricultural potential, and accommodates most of the population. The northern group is mainly made up of atolls, has a more tropical climate, and is sparsely populated. The extremely fragmented and dispersed nature of the nation has made internal transport very difficult and costly. Even those outer islands in the southern group, which lie closer to the main island of Rarotonga than the northern group, suffer from expensive interisland transport because of their scattered nature and low population.

High-value export performance

Cook Islands has followed a fairly narrow path in agricultural exporting in terms of both range of product group and market destination, determined in large part by its small economic size and close economic ties to New Zealand. Yet, although originally based on copra and bananas, the agricultural export system diversified successfully into niche marketing of a variety of exotic fruits and vegetables marketed in the New Zealand market. It has also exported small quantities of taro and chilies to the same market.

The nation has been experiencing a seminal decline in the value of its agricultural exports over the past two decades. This trend can be attributed to the fading performance of traditional export products, which has not been sufficiently countered by the emergence of non-traditional exports.

Macroeconomic background

According to the World Bank (1993a, p. 48), part of the early success in exporting fresh produce can be attributed to the maintenance of competitive facilities to assist private-sector development, especially in the development of infrastructure. Agriculture has nevertheless had to contend with the effects of the rapid growth of tourism and off-shore financial services as well as the impact of close economic relations with New Zealand. The economy exhibits very strong "MIRAB" characteristics: a pervasive influence on domestic economic activity of migration, remittances, aid, and bureaucracy (Bertram and Watters 1985). These characteristics tend to stifle the emergence of competitive export industries.

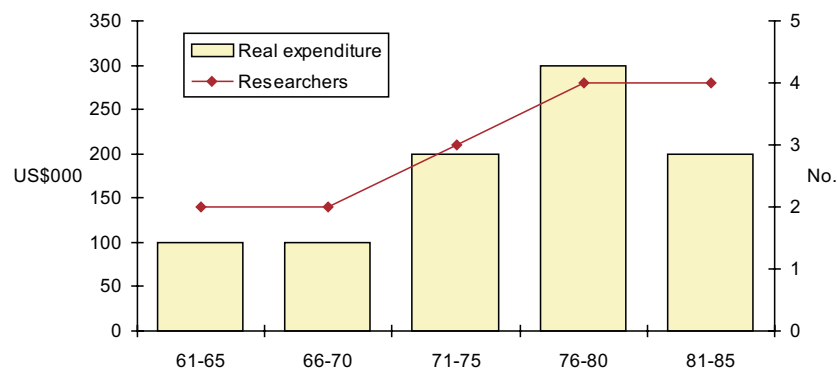
The macroeconomic climate is currently very bleak. The government of the main aid donor—New Zealand—has expressed considerable disquiet about mismanagement of public finances in recent years.

Foreign investment regime

Foreign investment in Cook Islands has been traditionally dominated by New Zealand interests, reflecting the close economic ties with that nation. Fairbairn (1985, pp. 407-9) provided some details on the extent of subsidization of agricultural production. These subsidies encouraged some foreign investment from New Zealand in agricultural processing facilities in the 1960s and 1970s.

Agricultural research

Trends in real expenditure in agricultural research and number of researchers in Cook Islands are summarized for the period 1961-85 in figure 2.1.² The scope for establishing domestic agricultural research capacity in Cook Islands is extremely limited, as can be expected for such a small nation. Total agricultural research expenditure peaked at just over US \$450,000 in 1980, declining to US \$177,000 by 1986. The number of researchers averaged four between 1980 and 1986 (Pardey and Roseboom 1989, p. 138). Three of the four researchers in 1980 were expatriate. Two were still expatriate and two local by 1986; one of the local researchers had an MSc and the other a BSc. Real expenditure per researcher dropped from over US \$100,000 in 1980 to US \$45,000 in 1986 (Pardey and Roseboom 1989, p. 138).



Source: Pardey, Roseboom, and Anderson (1991, p. 416)

Note: Expenditures are expressed in 1980 US dollars using a purchasing power parity index.

Figure 2.1 Agricultural research numbers and expenditure in Cook Islands: five-year averages, 1961 to 1985

² A lack of recent published data on numbers of research personnel and research expenditure has meant that data to the mid-1980s only has had to be used in this study for most SPINs.

Early agricultural research was largely directed towards establishing niche markets in New Zealand for fresh and canned produce and juice. The focus was on horticultural products that could be easily grown on various islands but which were not easily grown in New Zealand. This was because of either the tropical nature of the product or the existence in New Zealand of low production seasons, especially in the winter months, that could be exploited by Cook Islands growers. Some research is now also undertaken into the production of staple root crops of taro and cassava, which were largely neglected in the past (Gamble, Bourke, and Brookson 1981, p. 146).

Research is based at the Totokoitu Research Station on the main island of Rarotonga, with little research presence on other islands. A heavy reliance has historically been placed on assistance from New Zealand through the assignment of personnel, the application of technologies and guidance given by the staff of the New Zealand Department of Scientific and Industrial Research (DSIR) (Pardey and Roseboom 1989, p. 139), to good effect (Gamble, Bourke, and Brookson 1981, p. 147). This has been especially evident in satisfying phytosanitary requirements in the key New Zealand market. For example, as Sevele (1980, p. 6) noted many years ago:

Largely as a result of the efforts of the New Zealand research station (DSIR) there, Cook Islands bananas have been fetching better prices on the New Zealand market than bananas from Tonga and Western Samoa. ... the improvement in the Cooks would not have been possible without the resources, technology and expert advice put in by the DSIR.

A good deal of research has gone into finding more acceptable methods than fumigation for treating fresh produce prior to shipment to New Zealand. A high-temperature forced-air (HTFA) treatment for some types of fruit was developed and is being used for papaya exports (Fleming and Hardaker 1995).

Apart from work on postharvest quality issues, research is undertaken primarily on production matters. A review of crop research in the early 1980s by Gamble, Bourke, and Brookson (1981, pp. 149-51) revealed that work was being undertaken on the following:

- rootstock, spacing, fertilizer, and pest and disease control in citrus;
- pest and disease control, solar drying techniques, fertilizer response, and breeding in bananas;
- various pest and disease control methods in pineapple, vegetables, papaya, pandanus, and taro;
- varietal evaluation in vegetables;
- breeding program in passion fruit;
- variety collection and evaluation in taro and cassava;
- variety trial in soyabean;
- fertilizer trial in coconuts.

In addition, a number of other crops were being considered, many of which had high-value nontraditional export potential.

The substantial reliance on donor support for agricultural research was evident in particular in 1980, when little more than 20 percent of the research budget was met from the national

contribution (Gamble, Bourke, and Brookson 1981). Little has changed over the past 15 years to alter this.

Traditional Exports

Copra

Copra was historically the only traditional export from Cook Islands and dominated export earnings until the early 1960s, when the export of fruit juice began. By 1970, copra had been reduced to a minor export crop (see figure 2.2), accounting for less than 20 percent of agricultural exports. Copra exports ceased in 1987 when utilization of nuts switched to coconut cream processing and the manufacture of cosmetics.

Other coconut products

A coconut-cream processing firm that was originally based in Niue shifted its operations to Cook Islands in 1987. The introduction of coconut-cream processing substituted for the decline in processing of other horticultural products (see below) (Mataio 1991, p. 51).

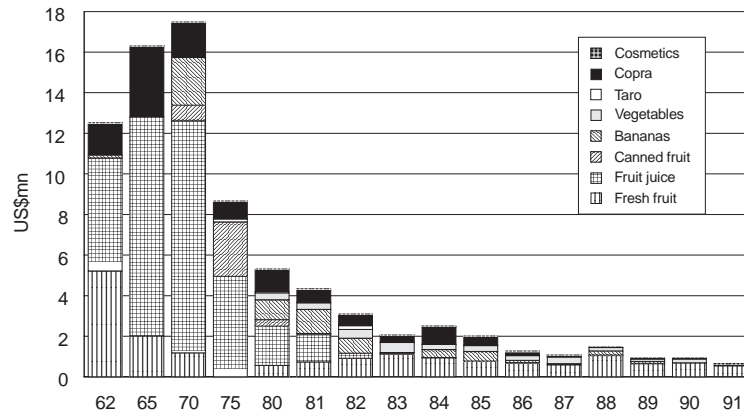
A factory producing cosmetics based on coconut was established in 1983. It helped substitute for declining horticultural exports (Mataio 1991, p. 53). By 1991, exports had grown to US \$121,000,³ but the industry remained a minor one.

Bananas

The banana export industry in Cook Islands and other SPINs, notably Fiji, Tonga, and Western Samoa, provides a graphic illustration of certain types of difficulties faced when defending export market niches. For about four decades South Pacific bananas had a strong niche market in New Zealand, helped by secure access, good growing conditions, adequate international transport connections, with regular and reliable shipping services, and a product whose taste and texture were appreciated by consumers. The industry was ideal in the sense that growers had a long history in banana production, and there was a substantial domestic market as well as an export market.

Boiled, baked, or uncooked bananas have long been a staple food in the South Pacific region. Apart from varieties introduced with the arrival of Melanesian and Polynesian people, a large number of varieties have been introduced into the region in recent times (Daniells 1995). The traditional importance of Cook Islands bananas as an export to the New Zealand market is evident in figure 2.2. In 1970, exports were valued at US \$2.35 million in 1987 prices, the second most valuable export behind fruit juice. Although performance until the mid-1980s was uneven, the industry nevertheless performed better in the 1970s and early 1980s than those in other SPINs largely because of the more thorough approach that was adopted to control export quality. This was a result of the assistance given by New Zealand researchers in disease control, as noted above. Its impressive performance was not to last,

³ All data on export values reported here and below are expressed in real 1987 US dollars, calculated by deflating nominal export values in domestic currencies (1987=100) and then converting to US dollars using the average annual exchange rate.



Sources: 1960-65: Carter (1981); 1970: UN (1972), Carter (1981), and SPC (1989); 1975-82: Fairbairn (1985, p. 400); 1983-91: NCDS (1995)

Figure 2.2 Agricultural exports from Cook Islands, 1960 to 1991

however. The industry entered a period of decline in the second half of the 1980s, and no bananas have been exported since 1990.

Today, the export sector of the industry lies in ruin in all SPINs. What went wrong? The kernel of the problem has been the immense challenge of producing

... fruit with sufficient hardiness and green-life to allow processing and packaging in the Pacific Islands, cold storage during sea transport, uniform ripening and distribution of blemish-free fruit to consumer outlets in New Zealand. To achieve this requires inputs of fertilizers, chemicals, packaging equipment and materials which are usually high cost factors.

(Walker 1976, p. 6)

The favorable nature of the New Zealand market and availability of foreign technical assistance meant this inherent problem was largely suppressed during early postwar decades. However, Sevele (1980) identified three changes that were occurring 15 years ago, leading to the decline in banana exports:

- increased competition from Ecuadorian bananas, which, although of less desired taste and texture, were superior to South Pacific bananas in terms of presentation and other quality dimensions, and more competitive on price;
- a decline in packaging standards for export;
- greater incidence of pests and diseases in production (black leaf, bunchy top, scab moth, banana weevil borer, and nematodes), which drastically reduced yields and affected the quality of bananas to the final consumer.

Recent institutional changes in the main market of New Zealand that led to its liberalization have added to the difficulties faced by SPIN producers in exporting bananas to that nation. South Pacific growers are no longer granted preferential access to a part of the market.

Difficulties in the export marketing of bananas have become especially acute for smallholders (Walker 1976). From the standpoint of smallholders, the effect has been that the domestic market has proved a more secure and remunerative destination for bananas than the export market.

Minor Food Crops

Taro

Compared with other SPINs, Cook Islands did not appear to have an early advantage in the export of taro. Ward and Proctor (1980, pp. 373-4) observed that the local market was undersupplied in the 1970s and that local prices were higher than in many other SPINs. Exports began in 1978, mainly to the Cook Islands expatriate population in New Zealand (Statistics Office 1980, p. 7), and peaked at US \$189,000 in 1982 (figure 2.2). They then fell back to small amounts until 1993, when the failure of the taro export industry in Western Samoa encouraged a resurgence in exports.

HVNT Exports

Fruits and vegetables

The intensity of production of a variety of fruits and vegetables (with high returns to the limited land resource) and a suitable export market in New Zealand enabled Cook Islands to develop a strong horticultural export industry by South Pacific standards. The types of exotic fruits and vegetables exported include a number of citrus fruits, pineapples, papaya, avocados, tomatoes, beans, capsicums, eggplant, and zucchini. The export of these products is based on a (mainly seasonal) niche market in New Zealand, to which virtually all produce has been marketed (Fairbairn 1985, p. 401). Produce has been exported in both processed (juice and canned) and fresh form.

An overview of the developments in fruit exports is presented in figure 2.2, which shows clearly the rise and fall of fruit juice and canned fruit exports, as well as the persistence of fresh fruit exports, except for a period in the 1970s, when processed fruit dominated. Development of the fruit industry in the 1960s owes much to ease of access to the New Zealand market and the availability of adequate quarantine, transport, communications, and other export marketing infrastructure for efficient transfer of fresh and processed produce. But progress has been somewhat rocky. Fresh citrus, tomato, and pineapple exports dominated early. Export of these products was already well established by 1960, but received a boost in the early 1960s following the erection of a processing plant in 1961 by Islands Foods Ltd, a subsidiary of a New Zealand firm, W. Gregg and Co (Tudor 1968, p. 144). They remained the dominant exports throughout the 1960s and, by 1965-70, accounted for around 40 percent of total exports (Anon. 1973). Tomato exports were very important in the early 1960s, averaging almost 100 tons between 1963 and 1965. Their decline after 1965 was quite rapid,

falling from 102 tons in 1965 to zero by 1970. Only very small quantities were exported thereafter until the 1980s (UN 1972).

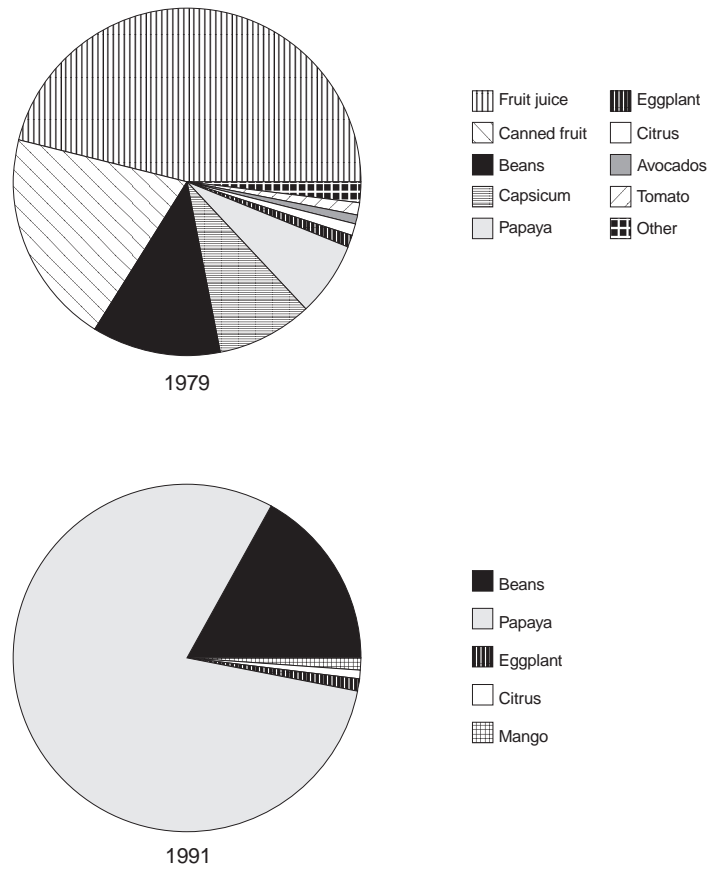
The export of canned fruit began in 1966 following the opening of canning facilities in the Islands Foods factory (Tudor 1968, p. 144). The value of exports of canned fruit had reached US \$764,000 by 1970 (figure 2.2), and peaked in 1975 at US \$2.7 million. It declined sharply after 1979 to zero by 1982. The demise of canned-fruit exports can be largely attributed to the high costs of canning fruit in small quantities in a nation with a relatively high wage structure compared with competing developing nations in Asia (Mataio 1991, p. 51).

Both the citrus and pineapple industries were in trouble by 1982 as exports plummeted to below US \$300,000, around one-eighth their combined export value two years before. This decline was caused primarily by processing problems and reequipment of the factory (Fairbairn 1985, p. 401). Citrus and pineapple production were never to recover and their exports had fallen below US \$20,000 by 1987 (NCDS 1995). These processing problems were largely of an operational nature and not subject to resolution through research work.

Production difficulties were already encountered during the 1970s, especially in citrus production on Rarotonga, which was uneconomic. Exports of citrus were maintained during this period by the subsidization of production (Ward and Proctor 1980). Production of pineapples on the island of Mangaia for canning on Rarotonga and direct export of fresh produce had begun to expand in the 1970s but again was helped by input subsidies. Fairbairn (1985, p. 422) recorded annual input and output subsidies to citrus, banana, and pineapple producers averaging NZ \$365,000, more than one-third of the total value of their exports over the period 1973-76. By the turn of the decade, Ward and Proctor (1980, p. 375) were warning of the imminent danger of soil degradation. Supply inadequacies were a major factor bringing about the downfall of fruit juice exports (Sevele 1980, p. 7).

Fresh fruit remain the only major agricultural export. While exports of a number of fresh fruits and vegetables (avocados, beans, capsicums, zucchini, eggplants, and mangoes, to name a few) expanded and declined over the second half of the 1970s and the 1980s, the most notable feature was the emergence of papaya as the major export product. From negligible export volumes prior to 1976, the papaya export industry steadily rose over the next 12 years. Export values peaked in 1988 at a little over US \$1 million, largely as a consequence of increased tourism "that created a backloading capacity into the Auckland market" (McGregor 1990, p. 6). By 1991, exports had almost halved to US \$521,000. No alternatives emerged to offset this decline, and papaya remains the major fruit export.

Figure 2.3 gives some idea of the variety of fruits and vegetables exported in 1979 and in 1991. The horizontal and vertical diversity of exports in the 1970s and 1980s, reflected by the 1979 export composition, is quite striking for such a small nation. It demonstrates the valuable complementary research and development work done before this period across a number of different commodities. It also shows the erratic composition of fruit and vegetable exports that were brought about by domestic and external factors. These factors were enumerated by Fairbairn (1985, p. 403) and Mataio (1991, pp. 44-5). Yet even by the end of the 1970s the distribution of export revenue among this quite wide range of exports tends to be highly skewed, reflecting limited agricultural land (Ward 1983, pp. 5-6) and the need to concentrate on high-value exports to make best use of that land. A majority of export value in the 1970s came from citrus and pineapple. This concentration became much more pro-



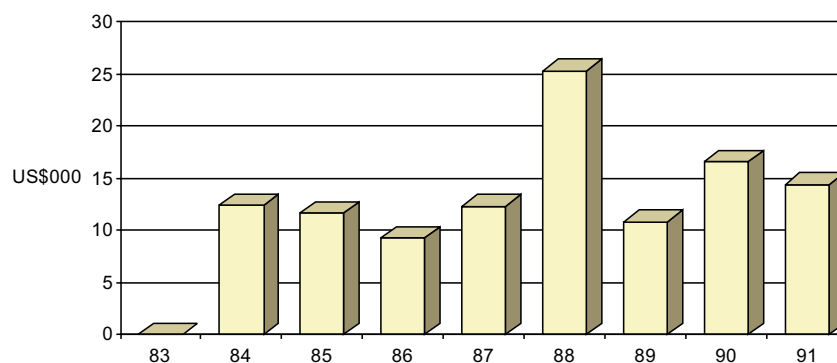
Sources: 1979: Cook Islands Quarterly Statistical Bulletin, June 1980; 1991: NCDS (1995)

Figure 2.3 Composition of fruit and vegetable exports from Cook Islands, 1979 and 1991

nounced by 1991, as figure 2.3 attests, with papaya exports predominant despite the decline in their export value from 1988, reported above.

Chilies

Chili exports since 1983 are presented in figure 2.4. They developed modestly during the 1980s, reaching their highest value at just over US \$25,000 in 1988. Since that year, the real value of exports has declined. Limited marketing opportunities and labor-shortages for a labor-intensive activity with relatively low returns to labor are the main factors explaining this decline.



Source: Cook Islands Quarterly Statistical Bulletin

Figure 2.4 Value of chili exports from Cook Islands, 1983 to 1991

FIJI

Overview

High-value export performance

Fiji has more scope for high-value agricultural exports than virtually any other SPIN, but its record to date has not been as impressive as might be expected. This is partly because of the still considerable reliance on the traditional sugar and coconut industries. Some progress has been made in developing exports of traditional beverages but little success has been achieved in the high-value segments of these industries. Another traditional export, bananas, has declined in importance and has a dismal future. Of the HVNT exports, the ginger, *yaqona*, and root crop industries have succeeded in establishing niche export markets, but their futures are also, to varying degrees, uncertain. Many types of exotic fruits and vegetables offer potential for export, but their penetration of export markets has been limited to date.

As an indication of the potential for high-value exports, Fiji currently exports high-value products to 16 nations (MAFF 1996, p. 15). But this potential is not new, as demonstrated by the list of crop exports with high-value potential a decade ago, presented in table 3.1. The scope for developing many of these exports was curtailed over the past decade by failure to meet quarantine regulations in key export markets (e.g., MAFF 1996, pp. 45-50).

Macroeconomic background

A strong competitive advantage in export industries materialized after the two coups in 1987, which led to a 30-percent devaluation of the currency in that year. Six elements were

identified in 1989 to strengthen export production: deregulation of the economy; restraint in growth of public expenditure; tax reform to improve incentives to the private sector; a wages policy that favored private enterprise; community mobilization to support economic activities; and reorientation of sector policies to support the above five measures (Treadgold 1992, p. 31). In recent years, agricultural export industries have suffered from the erosion of the advantage created by these measures. This has worsened the damage done to private investment in agriculture by the political instability created by the coups.

Sizable increases in general wage levels were led by wage growth in the public sector in an effort to attract employees following the adverse publicity brought about by the coups. They especially hobbled efforts to expand into new agricultural exports. According to the World Bank (1993b, p. 15), a “high public sector wage bill has tended to crowd out capital spending as well as much needed operational expenditures.”

Table 2.1 Nontraditional Crop Exports with High-Value Potential in Fiji, 1986

Exported product	Volume (tons)	Value (F \$000)
Green ginger	2896	3001
Cocoa beans	242	536
Taro	587	460
Yaqona	80	438
Other fresh fruit	199	406
Other ginger	..	400
Mangoes and avocados	172	332
Other vegetables	211	307
Coffee beans	64	187
Other roots and tubers	220	115
Soyabean oil	..	108
Eggplants	141	93
Desiccated coconut	86	93
Tea	21	75
Okra	61	70
Curry powder	24	67
Turmeric	59	58
Dried chilies	16	42
Passion fruit juice	..	37
Passion fruit pulp	24	29
Yams	37	27
Fresh coconuts	62	23
Fresh pineapples	31	18
Bananas	4	3

Source: Bureau of Statistics (1986)

Much-needed trade liberalization in 1987 assisted the development of agricultural exports by reducing protection of certain domestic industries. There is still scope for further liberalization as tariffs on some products are still high (World Bank 1993b, p. 23). Liberalization and/or commercialization of public enterprises were instigated in 1993 but nothing substantial has thus far been achieved (World Bank 1995, p. 105). The Research Division within the Ministry of Agriculture, Forestry and Fisheries (MAFF) (1996, pp. 10-11) reports continuing efforts in this direction, with implications for the agricultural sector, especially in the export of traditional bulk commodities.

Although Fiji is well situated for transport infrastructure by the standards of other SPINs, lack of maintenance has led to reduced quality of facilities (World Bank 1993b, p. 29). Air freight possibilities for fresh produce exports are greater in Fiji than in other SPINs because international air links are better, but capacity bottlenecks are still a constraint (World Bank 1993b, p. 30). Maritime transport is good by South Pacific standards with three major ports, 60 interisland shipping origins, adequate port and vessel capacity, but relatively high port operating costs (World Bank 1993b, p. 30).

Foreign investment regime

The essence of the foreign investment regime in the agricultural sector in Fiji is as follows (World Bank 1995, pp. 26-7):

- a one-stop shop has been established for approval of proposals by prospective foreign investors, located in the Fiji Trade and Investment Board (FTIB);
- a limited amount of freehold land is available for foreign investment; otherwise land must be leased from the Native Land Trust Board;
- employment of expatriates is not expected where adequate local manpower is available;
- the tax-free zone/factory scheme provides for a 13-year holiday from corporate tax and import and excise duty exemptions for capital and raw material imports as well as loss carry-forward allowances for tax purposes, for firms exporting more than 95 percent of their output.

This regime was put in place in the late 1980s and, according to Elek (1992, p. 24), it elicited a strong response from foreign investors. Net direct foreign investment rose from around US \$30 million for most of the 1980s to US \$100 million in 1990 (Cole 1992, p. 12). The FTIB provides a means of giving financial incentives to the agribusiness community in Fiji, encouraging foreign investment in horticultural exports processing of agricultural products and facilitating negotiations on freight rates (MAFF 1996, p. 31). To date, according to MAFF (1996, p. 42), few agribusiness firms appear to be aware of, and have sought, FTIB incentives. This is partly due to a continuing multiagency process of investment approval, despite the one-stop shop supposedly established.

Land-tenure issues remain pivotal to the development of high-value agricultural exports. The World Bank (1995, p. 105) reported that the issues of property rights and tenancy are pressing, especially with many leases coming up for renewal. The private investment necessary for high-value export industries is being discouraged in the current climate of uncertainty.

The latest review of the agricultural sector offers hope for an investment climate suitable to high-value export industries. This review provides a thorough and logical coverage of high-value export opportunities, requirements that need to be fulfilled, and a strategy for expanding high-value export. The 12-point strategy covers the following:

1. *Enhanced quality and consistency of supply ...*
2. *Safeguarding and commercially exploiting Fiji's favourable quarantine status ...*
3. *Ensuring and commercially capitalising on environmental sustainability ...*
4. *Improving export market access ...*
5. *Encouraging the continued transformation of subsistence to commercial farming ...*
6. *Revitalisation of agricultural research and access to technology ...*
7. *Rationalising and focusing extension efforts ...*
8. *Improving supply and effectiveness of credit ...*
9. *Public investment in critical infrastructure ...*
10. *Support for industry organisations ...*
11. *Attracting investment to agriculture ...*
12. *Promoting farming as a business...*

(MAFF 1996, pp. 30-1).

Agricultural research

Agricultural research in Fiji is primarily carried out at present by MAFF, the Research Section in the Animal Health and Production Division of MAFF, and the Sugar Cane Research Centre operated by the Fiji Sugar Corporation (FSC) (formerly owned by the Colonial Sugar Refining Company and partly funded by cane growers). There are also researchers based in Fiji but employed by regional organizations. They include educationalists in the University of the South Pacific and agricultural scientists in the Agriculture Programme of the South Pacific Commission. Fiji is one of the few SPINs having a research system capable of carrying out applied research and maintaining a research staff of at least 50 (Eyzaguirre 1996, p. 71).

Attention is paid to the varied edaphic conditions throughout Fiji when drawing up crop research programs. Historically, this has resulted in the development of a number of research centers throughout the nation. In addition to research by the Sugar Cane Research Centre in cane-growing areas, there are research centers in the following areas (Gamble, Bourke, and Brookson 1981, p. 187):

- Koronivia (wet zone, covering rice, root crops and vegetables);
- Sigatoka (intermediate zone, covering vegetables, fruits and rice);
- Legalega (dry zone, covering pulses, peanuts and other dry zone crops);
- Seaqaqa (dry zone, covering citrus and other dry zone crops);
- Wainigata (wet zone, covering cocoa and coconuts);
- Dobilevu (intermediate zone, covering cocoa, root crops and rice);
- Naduruloulou (wet zone, covering cocoa and various tree crops).

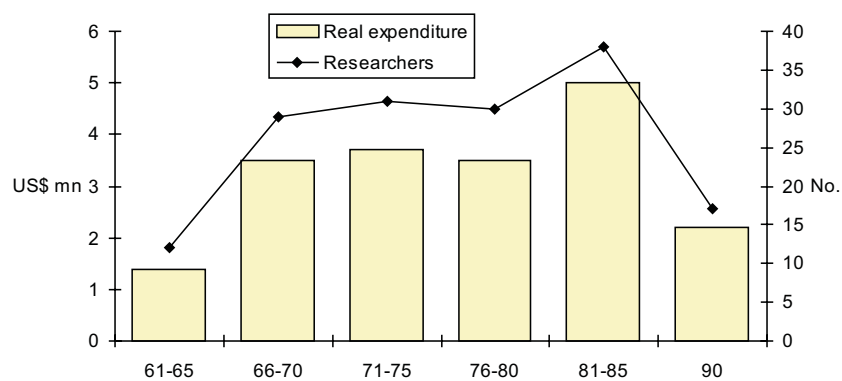
The massive extent to which research was historically concentrated on technical aspects of production is clear from the summary of the crop research program for 1981 provided by Gamble, Bourke, and Brookson (1981, pp. 195-212). Out of almost 150 research projects

reported here, only three could be said to have any relevance to postharvest activity for export: quality evaluation of a number of crops, some either exported or with export potential (p.213); investigation of the active ingredients of kava (p.214); and diagnostic services and quarantine (p.221).

Agricultural research numbers for the period 1961-90 are presented in figure 2.5. The numbers cover research by MAFF (previously the Ministry of Primary Industries [MPI]), and so include forestry and fishery researchers, but exclude numbers of researchers in the Sugar Cane Research Institute. A steady increase in the total number of researchers took place from the mid-1960s to the mid-1980s, spread across all categories of academic qualification. A significant decline in the number of expatriate researchers was achieved between 1982 and 1985 following an increase in the number of qualified local personnel, but the number increased again in 1986. Most local researchers were Fiji Indians.

By 1990, the effects of the coups in 1987 were showing in the number of researchers in the research division of MPI. Eyzaguirre (1996, p. 65) reported a dramatic drop from 27 researchers in 1987 to 17 in 1990 (see figure 2.5), at least partly in response to pressure put on government organizations to give native Fijians preference in employment and promotion. The fall in numbers over this period was made worse by the loss in experience and knowledge of people who departed. Only nine remaining staff in 1990 had qualifications of PhD or MSc (Eyzaguirre 1996, p. 65).

The increases in research numbers from the late 1970s to 1986 were closely tracked by increases in real research expenditure (again, excluding that by the Sugar Cane Research Centre) (see figure 2.5). The doubling of total research expenditure during this period allowed real expenditure per researcher to increase from around US \$100,000 to almost US \$150,000. Then, as with numbers, real expenditure declined, falling to around US \$2.2 million in 1990 for crop and livestock research (figure 2.5). In 1990, expenditure per researcher



Sources: 1961-65 to 1981-85: Pardey, Roseboom, and Anderson (1991, p. 416); 1990: Eyzaguirre (1996, p. 65)

Note: Expenditures are expressed in constant 1980 US dollars using a purchasing power parity index.

Figure 2.5 Agricultural research numbers in Fiji: 1960 to 1990

in crop and livestock research in MPI was approximately US \$130,000 in 1990 dollars which, in real terms, was below the level prevailing in the early 1980s.

Agricultural research is largely financed out of government revenue, which has given research managers a stable basis on which to plan research activities (Eyzaguirre 1996, p. 67). In 1981, the national contribution was almost 95 percent of the research budget. The only area relying substantially on outside funding is in maintaining external research linkages for information and technology (Eyzaguirre 1996, p. 69).

Expenditure by the Sugar Cane Research Centre was around F \$1 million (US \$1.4 million in PPP terms) from the early 1980s to 1987 (Pardey and Roseboom 1989, p. 172, Eyzaguirre 1996, p. 65). This was equivalent to approximately 40 percent of the total research expenditure by MPI.

Eyzaguirre (1996, p. 67) outlined the research components and research scope in Fiji in 1990, providing a picture that reasonably represents the current situation. His outline is reproduced here in table 2.2. Two matters are striking about this table. First, for a small agricultural economy by international standards, agricultural researchers in Fiji try to cover a wide range of activities. While Eyzaguirre (1996, p. 66) reported on some economies of scope through researchers working across a number of commodities, there is little evidence that this has resulted in profitable new high-value export opportunities. Eyzaguirre (1996, pp. 65) appealed for better research coordination, organizational change to facilitate staff mobility and knowledge across research components, upgrading of human resources, improved linkages with users of technologies and improved linkages with external institutions as ways of improving research performance. Although many of the latter were lost with the departure of experienced staff from 1987 onwards, Fiji still has “a cadre of competent scientists,” according to MAFF (1996, p. 23).

Second, there are no socioeconomic and natural resource management research components in agriculture. This appears to be a major deficiency given the importance attached by MAFF (1994) to the impending problems of natural resource management, and the need to sharpen research focus on those high-value exports that offer most remuneration in the future.

Table 2.2 does not reflect the extent to which research still focuses largely on traditional export industries. Little headway has been made so far in reorienting research activities (and marketing infrastructure) away from sugar and coconuts—and certain import-substitution industries, especially rice—towards newer high-value exports (World Bank 1993b, p. 31).

Finally, Eyzaguirre (1996, p. 68) commented on the large number of nonresearch functions undertaken by researchers in Fiji. Some of these functions, he noted, bore little relation to agriculture. Given the difficulty of establishing separate organizations to undertake these activities, he concluded that research institutions will likely need to continue to accommodate them within their work plans in the future. One recent positive trend has been greater encouragement to scientists to work closely with the private sector (MAFF 1996, p. 23).

Table 2.2 Fiji: Research Components and Research Scope, 1990

National Research Portfolio						
NARS Institutions	Global staples	Traditional export crops	Minor food crops	High-input nontrad. export crops	Livestock	NRM
Research Division, Dept of Agriculture	Beans	Bananas	Cabbage	Cardamom	Goats/	
	Cowpeas	Cocoa	Carrots	Citrus	sheep	
	Groundnuts	Coconuts	Garlic	Ginger	Pasture/	
	Maize		Onions	High-value	fodder	
	Potatoes		Pigeon peas	vegetables	Swine	
	Rice		Taro	Mangoes		
			Tomatoes	Papaya		
		Vegetables	Passionfruit			
			Pineapples			
Research Section, Animal Health & Production Division					Cattle	
					Goats	
					Sheep	
					Swine	
					Pasture/	
					fodder	
Sugar Cane Research Centre		Sugar				
Silviculture Section, Ministry of Forestry						Forestry
						Forest protection
Pine Section, Ministry of Forestry						Forestry
						Agroforestry
						Forest protection
Timber Utilisation Section, Ministry of Forestry						Processing/
						postharvest
						Storage &
						transport
Fisheries Division, Ministry of Primary Industries						Fisheries

Source: Eyzaguirre (1996, p. 67)

Note: Socioeconomics and rural engineering are not included in Fiji's research portfolio.

Traditional Exports

Two traditional export industries—sugar and coconut products—have been a towering influence on the agricultural landscape in Fiji. They continue to dominate export earnings up to the present as diversification has made little impression on the structure of agricultural exports.

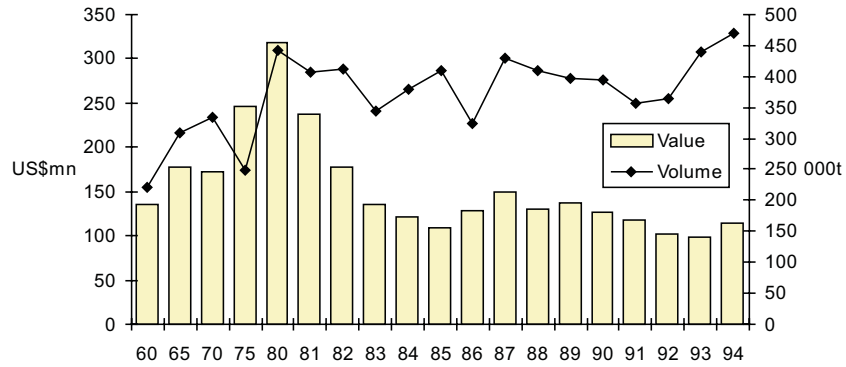
Sugar

Despite its credentials as a traditional export requiring a cost-following export marketing strategy, sugar can be construed as a high-value export based on nontraditional mechanisms for achieving its high value. This is by virtue of institutional arrangements, notably the Sugar Protocol of the Lomé Convention of the European Union (EU), which enable the industry to earn high prices on a substantial portion of its exports. Currently, Fiji is securing prices for its sugar about double the world price because of these favorable trading arrangements.

Sugar, together with its major by-product, molasses, has dominated the agricultural economy of Fiji for more than a century and continues to do so. Its importance has scarcely diminished over the past couple of decades despite the view held by the government in the mid-1980s about the need to diversify in agriculture (Development Plan 8) and the conviction expressed in Development Plan 9 that “[t]he major avenues for diversification and expansion [in agriculture] have already been identified and in some instances implementation has commenced” (Central Planning Office 1985, p. 43). In fact, the share of agricultural exports held by sugar and molasses actually increased from around 85 percent to around 90 percent between 1969 and 1989, and around one-quarter of the economically active population derives income directly from the industry (Singh 1994).

Sugar export volumes and values grew rapidly in the 1960s and 1970s. Then followed a period of stagnation until 1987 and a gradual decline from that year until 1993. Figure 2.6 shows real values of sugar exports falling by more than one-third from US \$150 million in 1987 to US \$99 million in 1993,—despite a recovery in export volumes since 1991—and sugar’s share of total exports fell from 46 percent to 39 percent over the same period (NCDS 1995). However, export values recovered to US \$115 million in 1994. The future of the industry is likely to be one of holding onto current production values and volumes on the most optimistic assumptions. More likely, it will be one of further decline, perhaps precipitously so. Best current estimates are that prices for Fijian sugar will decline over the next six years at around two to three percent per year (Singh 1994, p. 26).

While the continued domination by sugar of agricultural exports can be partly explained by the disappointments of diversification efforts, despite the rosy view of them held a decade ago, the fact is that sugar is so well suited for export production in Fiji. It is well suited in three important ways. First, and most obviously, the growing conditions in certain parts of the nation enable Fiji to maintain a comparative advantage in sugar production and milling.



Sources: 1961-75: IMF (1993); 1980-94: NCDS (1995)

Figure 2.6 Sugar exports from Fiji, 1961 to 1994

Second, the land tenure system has thus far been well adapted to commercial sugar production on small holdings by Fiji Indians who have proved adept and skilled at growing sugar. The decision in 1910 to introduce a system of small sugar farms on long-leased land operated by the formerly indentured Indian labor proved to be an inspired one in an economic sense.

Third, the principal organization supporting the sugar industry, the FSC, is the largest public company in Fiji. Historically, it facilitated export through its functions of milling and marketing of sugar output, as well as through the other facilitatory functions of research, extension, input supply, harvesting schedules, and transport services (Sevele 1980). This enabled scale economies in milling and marketing. Autonomy in the operations of FSC has been a vital ingredient in the success of the sugar industry to date. Sugar marketing is the responsibility of Fiji Sugar Marketing, which is owned by the government.

As indicated above, it is not all “clear sailing” ahead for the sugar industry. Milling capacity and rail transport constraints and a declining cane-to-sugar ratio (Central Planning Office 1985, p. 48) are major concerns, with the current payments system not favoring higher-yielding cane (Singh 1994, p. 27). The World Bank (1995, p. 106) has revised Fiji’s status from a low-cost sugar producer 15 years ago to a medium-cost producer today. The overriding concern, however, is that the comfortable marketing arrangements with the EU should disappear in the future (World Bank 1995, p. 106), although some respite has been gained with the recent agreement for 40,000 tons guaranteed annual export to the EU at a price well above world prices for the next six years (Forum Secretariat 1995b, p. 11).

Pressures to make production and (especially) processing more efficient are acknowledged by industry leaders, and research could have an important role in this respect. Yet, three years after the completion of a Landell Mills industry report, which recommended much-needed reforms that would lower production and milling costs and reward quality, it has not been released to the public, and many recommendations contained in it have not

been implemented (Singh 1994, p. 39). Economic pressures on the industry can be expected to grow with the increasingly competitive nature of the world sugar market as the EU market becomes less secure following the liberalization of world agricultural trade. It remains to be seen, however, whether proposed restructuring will be realized, and, if so, whether it will be sufficient to enable the industry to return to its erstwhile status of a low-cost producer able to compete on world markets at lower prices.

An overriding research issue for the government of Fiji is whether to sustain current levels of research funding in order to make the industry more efficient and therefore better able to compete in an almost certainly more difficult international market. The alternative is to accept decline as inevitable and switch research funds to other potentially more attractive export industries. It is unlikely that research is going to resolve the major problems faced by the sugar industry. The current research structure, however, militates against the flexible use of research resources in response to changed economic circumstances in the industry and the agricultural sector in general.

The land tenure issue has become more contentious with increased ethnic tension over the past decade. According to the World Bank (1995, p. 105), the “combination of changing world prospects for sugar and domestic uncertainties over renewal of land leases creates an explosive mixture.” Concerns are also growing about the possibility of land degradation with more intensive land use.

Coconut products

Only parts of Fiji have been suitable for sugar production; in most of the remaining area, cash crop production has traditionally been based on the coconut products industry. Fiji is one of the few SPINs that has been large enough to persevere with coconut oil milling rather than rely on copra exports. Copra production began in Fiji around the middle of the 19th century, and by 1877 exports had reached 4372 tons (Deo 1991, p. 2). Increased oil milling capacity in the early postwar years gave a considerable boost to coconut oil exports.

Yet the industry is somewhat in the doldrums and has been stagnant for a couple of decades. Even in nominal terms, the value of exports has not increased since 1970, when F \$5.131 million of coconut oil was exported: the value of exports of coconut oil in 1989 was F \$5.559 million (SPC 1989) but only F \$3.667 million by 1993 (NCDS 1995).

The volume of copra production averaged about 27,000 tons in the first half of the 1970s, but output declined during the 1970s and 1980s to such an extent that it had fallen to around 16,000 tons by the second half of the 1980s—a decline of around 40 percent in 15 years. The encouragement of replanting led to some increase in production in the early 1980s, and copra output had recovered to around 25,000 tons in 1985. But thereafter it declined and only 15,193 tons were produced in 1991 (World Bank 1993b, p. 72). The volume of coconut oil exports in 1991 was only around 4000 tons, less than one-third of what it had been a decade earlier, but rose to around 8000 tons in 1992 before falling back to 7000 tons in 1993 (NCDS 1995).

The troubles of the copra industry are general throughout the South Pacific. Tree productivity is declining due to aging plantations, causing a decline in copra supply, which was exac-

erminated until recently by an extended period of low world prices. Labor shortages are also apparent (MAFF 1996, p. 49). As copra is the chief input in the coconut oil mill industry, that industry shares much of the current difficulties of the copra industry. In addition, however, the milling industry faces growing competitive pressures from foreign millers, especially in Asia, which have much lower unit labor costs.

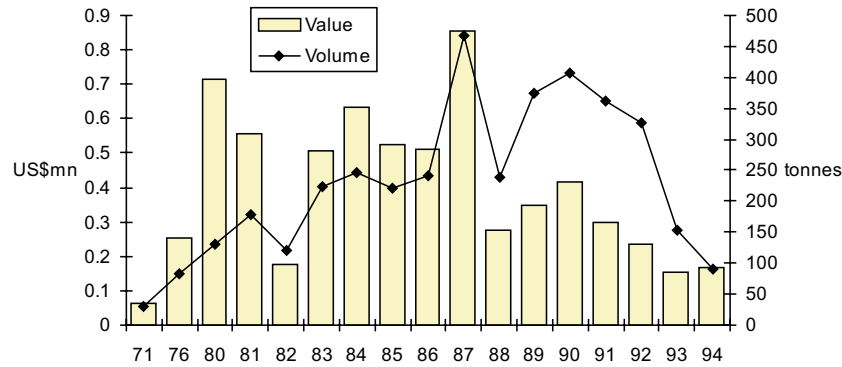
Exports of one coconut by-product—feedstuffs—have been more buoyant with the value of feedstuff exports increasing in nominal terms from F \$407,000 in 1970 to F \$2.591 million by 1989 (but declining somewhat in real terms from US \$2.22 million to US \$1.56 million). Other coconut by-products (fresh coconuts, coconut cream, desiccated coconut, frozen grated coconut, and coir) have been produced over an extended period, but exports have never reached substantial proportions. The most successful year was in 1980, when the value of exports rose above F \$500,000 (SPC 1989), but many ventures have failed (Deo 1991, pp. 42-4). Coconut cream appears to offer the best prospects, with Australia the main market destination, but foreign competition from the Philippines, Thailand, and Western Samoa is the main factor limiting expansion. Export of husked whole nuts to Australia and USA by the National Market Authority (NMA), a parastatal, began in 1985 but failed because of the high costs, irregularity of shipping, and problems in preventing cracking and germination in transit (Deo 1991, p. 56).

Beverages

Three beverage industries concentrate on export in Fiji: cocoa, coffee, and tea. Established in the 1960s, the cocoa industry is the largest and oldest. Cocoa is produced in the wetter parts of the two main islands of Viti Levu and Vanua Levu. Around 2400 farmers currently grow cocoa trees on about 3300 ha (MAFF 1994).

The growing importance of cocoa exports is presented in figure 2.7. Development of the industry in the early 1960s can be attributed to government efforts to establish cocoa as a smallholder crop to be interplanted with coconuts, but it took place slowly. The Colonial Office (1966, p. 35) reported that smallholders were showing little interest in the crop in the mid-1960s, and that “a major effort will be required if cocoa is to be developed beyond its present nonviable initial stages.” Increases in prices and government efforts led to an upswing in the industry in the second half of the 1960s. Output of pods (in dried cocoa bean equivalent) supplied to the Department of Agriculture rose from a paltry 12 tons in 1967 to 63 tons by 1969 (Foreign Commonwealth Office 1970, p. 52).

Cocoa exports remained at negligible levels until the mid-1970s, due largely to problems with seed varieties (Carter 1981, p. 100), then rose substantially to F \$380,000 (US \$720,000) by 1980, with increased world prices and progress made in disease control (figure 2.7). A 30-percent decline in world prices between 1980 and 1982 slightly delayed penetration of the cocoa export market, which became established only in the mid-1980s (figure 2.7). A large increase in plantings in the early 1980s, brought about by development projects and high prices in the late 1970s, meant that the area planted to cocoa almost tripled between 1981 and 1985. As a consequence, the bearing area almost quadrupled over the same period. Yet, with the exception of 1982, export values remained fairly constant in real terms in the first half of the 1980s despite high world prices. Figure 2.7 shows a sharp increase in export volume in 1987 and its subsequent decline in 1988. Production problems caused by black



Sources: 1971: CPO (1975, p. 73); 1976-80: CPO (1980, p. 52); 1981-83: CPO (1985, p. 52); 1984-86: Bureau of Statistics (1986); 1987-92: MPI (MAFF) Annual Reports

Figure 2.7 Cocoa exports from Fiji, 1971 to 1994

pod disease and canker combined with a fall in world prices, marketing problems, smoke contamination, and political instability to bring about this decline. Output picked up from 1989 to 1990, then declined again quite steeply until 1994. Cyclone Kina in 1993 was a major factor causing this decline: it destroyed many trees on the main island of Viti Levu (MAFF 1996, p. 49). Another cause was low producer prices, a combination of a depressed world market, poor quality, low export volumes, and inadequate marketing processes (MAFF 1996, p. 49).

To qualify as a high-value export, cocoa should be able to be sold on the basis of its capacity to command price premiums over the world price. Unfortunately, this has not proved to be the case as the industry has suffered from low-quality output. Locational and trade access advantages in the Australian market (Central Planning Office 1985) offer cocoa producers in Fiji the opportunity to earn above world market prices, but shortcomings in quality of produce to date has proved limiting. Export marketing of cocoa was solely in the hands of NMA until its recent privatization (now known as the National Trading Corporation, or Natco); this contributed to the poor quality and heavy price discounting of Fijian cocoa, according to McGregor (1990). Emphasis is currently being placed on raising productivity and improving quality of cocoa beans exported (MAFF 1994). The most promising avenues appear to be developing an organic cocoa-production system, and rehabilitating the fine or flavor segment of the industry for specialty markets, given that Fiji “has maintained an outstanding collection of Trinitario clones and hybrids” (MAFF 1996, p. 49).

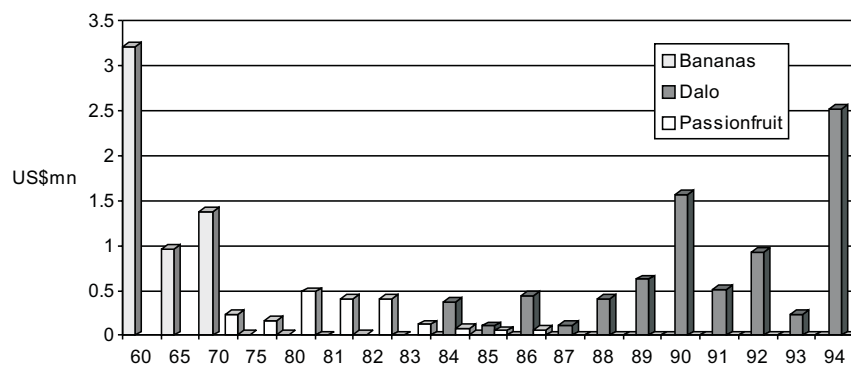
Efforts to develop a coffee industry have not been particularly successful. The industry was initiated with the planting by the Carpenters Group of 200 ha of robusta coffee in 1978, followed by a smallholder planting program commencing in 1979, which resulted in the planting of a further 80 ha (Deo 1991, p. 31). Exports reached 64 tons in 1986, valued at F \$187,000 (Bureau of Statistics 1986).

The subsequent loss of enthusiasm and effort by smallholders stands in contrast to the performance by smallholders in the coffee industry in Papua New Guinea. The most plausible explanation for the contrast is the success achieved in Papua New Guinea in integrating the operations of the smallholder and plantation industries in research and in processing and marketing activities. Prospects for high-value exports of lower-value robusta coffee varieties are extremely dim. Currently, a small amount of high-quality arabica coffee is produced for the tourist market from an estate on Taveuni, but it is not sufficient to meet domestic requirements (MAFF 1996, p. 4).

The tea industry is relatively new, as planting began only in the 1980s and was confined to a small area where growing conditions are favorable. By 1986, exports had reached 21 tons, worth F \$75,000 (Bureau of Statistics 1986). Product attributes are suited to smallholder production in Fiji but the tea produced has exhibited no special features that would enable the product to be differentiated from tea produced in Asia. It appears, therefore, that the industry will at best be small, struggling to survive against larger, more experienced competitors, which have the benefit of lower unit costs in harvesting and processing.

Bananas

In 1970, bananas were the third most valuable agricultural export in Fiji (after sugar and coconut products) at US \$1.2 million (see figure 2.8). By 1975, exports had slumped to negligible levels at which they have remained. The failure of the industry in Fiji bears the same hallmarks as that in Cook Islands and other SPINs: pests and diseases in production and an inability to surmount the considerable difficulties in export marketing.



Sources: 1960-65: Colonial Office (1966); 1970: Tudor (1972); 1975: Inder (1977); MPI Annual Reports; 1990-94: NCDS (1995)

Figure 2.8 Value of exports of bananas, dalo, and passion fruit from Fiji, 1960 to 1994

Minor Food Crops

Taro (Dalo)

Dalo (taro) has long been a minor export to the Fijian expatriate populations in certain Pacific-rim nations, notably New Zealand and Australia. Compared with the taro export industries in other South Pacific nations, though, the contribution made by *dalo* exports to total export earnings was modest and variable until recently. Figure 2.8 shows that the reduced exports of taro from Western Samoa in 1990 due to cyclone damage allowed Fiji an opportunity to increase its exports to over US \$21.5 million in that year. The end of exports from Western Samoa in 1994 again caused major shortages in the New Zealand market and presented Fiji with a more sustained opportunity to expand exports, which was quickly seized. Export volumes soared to their highest level of 3491 tons in that year, already well above the previous highest export volume of 2188 tons in 1990 (NCDS 1995). The industry shares the positive and negative attributes of those competitors (see the description of the industry in Western Samoa), and has so far been restricted in its development by the small number of expatriates relative to those from some other South Pacific nations.

Neglect of *dalo* as an important food crop—let alone as an export crop—was evident in the Ninth Development Plan 1986-1990. In the chapter on primary production sectors, no mention at all was made of this key staple food and minor export crop, while almost two pages were given to rice and one page was devoted to maize (Central Planning Office 1985, pp. 62-4). This neglect has been gradually overcome in the past decade, reflected in the quick response that the industry was able to make to the market opportunity in New Zealand.

HVNT Exports

Yaqona (kava)

Expectations have been growing throughout the South Pacific for the emergence of a major niche export industry for kava, or *yaqona* in Fiji. Such expectations are reflected in a recent headline in *Pacific Islands Monthly*: “Kava—the Next Boom Industry?” (Decloitre 1995). It was observed in this article that a German pharmaceutical company was to buy 100 tons of dried kava from the major South Pacific producing nations of Fiji, Tonga, Vanuatu, and Western Samoa (Decloitre 1995, p. 44). Potential there is, but its realization in terms of substantial export receipts has proved elusive until recently, as attempts to break into the potentially profitable European pharmaceuticals market have yet to yield significant dividends.

The production of *yaqona* as an intercrop with coconut in Fiji has proved successful (Deo 1991), and a small export industry has been built upon the domestic beverage industry, which is the destination of most of the output. The industry is the third largest cash crop in Fiji, valued at between F \$40 million and F \$60 million (MAFF 1996, p. 48). Despite some limited and sporadic exports, aimed mainly at the beverage market for the expatriate Fijian population in Pacific-rim nations, Fiji was a net importer of kava for most of the time until the 1980s, as the industry struggled to keep pace with urban demand (Chandra 1983, p. 117).

Modest exports were achieved during the 1980s, but with increased plantings, volumes have expanded during the 1990s. They increased from around 70 tons in the mid-1980s (Bureau of Statistics 1986) to 160 tons in 1990, and then more than doubled to 340 tons in 1994, valued at around F \$2 million (US \$910,000) (MAFF 1996, p. 48). Increased production has no doubt been spurred by the high returns to labor of between F \$75 and F \$85 per day (MAFF 1996, p. 12). Almost one-half of 1994 exports were in the form of peelings to the German pharmaceutical market (MAFF 1996, p. 48), well above the amount in the purchase order reported by Decloitre. Yet potential is likely to remain limited without a major injection of funds from foreign investors if the pharmaceutical uses of the crop are to be exploited. The beverage market is likely to reach only modest levels of exports.

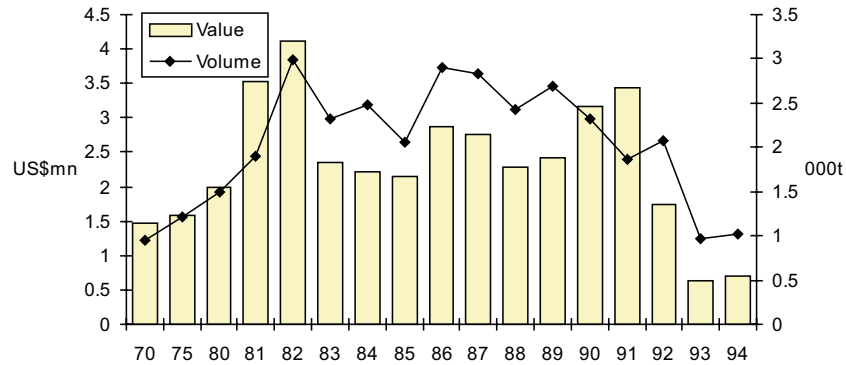
Ginger

The most successful HVNT export to date has been ginger. The history of the ginger export industry in Fiji has been thoroughly described by ACC (1985), McGregor (1988) and Tokalau (1993). It is a niche industry based on a market focus strategy. The principal market is North America during the off-season in Hawaiian ginger production, namely August to November (McGregor 1988). During August, the Fijian ginger exporters had unaccustomed power (for South Pacific exporters) to influence price in the Los Angeles market (McGregor 1990) until recent years, when competition intensified (MAFF 1996, p. 16).

The development of the ginger export industry since 1970 is traced in figure 2.9, but the industry extends back well before the 1970s. Ginger production was begun by immigrants from Asia who brought with them ginger roots for their own consumption. Migrants played a major role in the development of the industry. The pioneers of ginger as an export crop were Chinese and, in terms of output, the industry is still dominated by growers of Chinese origin. Fijians and Indians have taken to the crop and now account for 20 to 30 percent of the total production by volume. Some export took place from the early 1950s, but the opening up of the North American market in the late 1960s was the major catalyst for export development (ACC 1985).

The industry has been developed primarily on the basis of private endeavor, with little useful government assistance. In fact, a review of *Annual Research Reports* published by the Department of Agriculture from 1974 to 1981 shows that ginger did not figure in research work until 1977, when trials were undertaken to study growth patterns for optimal harvesting times and mechanization of ginger production. Later trials covered spacing, planting depth, and fertilizer response, but ginger research appeared to be minor relative to the overall research work covering numerous other minor crops. According to ACC (1985, p. 1), the so-called Fijian ginger cultivar is thought to have had its origins in Queensland, Australia.

Tokalau (1993) reported that early ginger exports by private exporters began to New Zealand in the 1950s and then to the North American market in the early 1960s, with exports to North America aided by Turners and Growers (a New Zealand company) and Pacific Produce Ltd (a Canadian importer/wholesaler) (McGregor 1988, p. 11). The number of growers peaked at 603 in 1983 before falling to 175 in 1988. It has stabilized at around 200 since then (Tokalau 1993).



Sources: 1970-75 volumes: McGregor (1988, p. 8); NCDS (1995)

Figure 2.9 Ginger exports from Fiji, 1970 to 1994

The ginger industry has reached a crucial stage in its development, reflected in the tenor of discussions at a recent forum (Ministry of Primary Industries, Forestry and Cooperatives 1993). Thus far it has successfully established a profitable market niche, but, as figure 2.9 shows, there has been an alarming decline in the value of exports since 1991. Export values were depressed at around US \$700,000 during 1993-94. This was due in part to cyclone Kina in 1993 which destroyed much of the crop and caused seed shortages in 1994. Vinning (1990, p. 34) assessed ginger as having a low ranking on availability of planting material.

More deep-seated trouble is looming in the form of low-cost competitors for the seasonal niche from the People's Republic of China and the more traditional rivals, Brazil and Indonesia. Ginger production is demanding of labor input and commitment (Vinning 1990, p. 32), and competing nations have a relative advantage over Fiji in low-wage labor. One way of meeting this challenge is to differentiate the product through quality improvement. MAFF (1996, p. 16) revealed price differentials of over 100 percent. Yet judging by the literature on the industry (e.g., McGregor 1988, Ministry of Primary Industries, Forestry and Cooperatives 1993, Tokalau 1993, MAFF 1996), the greatest concern in the industry is the lack of quality control, which is causing quality standards to decline. The difficulty here is in the apparent lack of adequate research on quality and grading standards from the buyers' perspectives in North America. This has been quite a long-standing issue and was being highlighted already a decade ago (e.g., Central Planning Office 1985, pp. 55-6) and reflected in growers' views that the current grading system is not functioning well (Tokalau 1993). Although a two-grade system was introduced in 1987 in response to a deterioration in export quality in 1986 (McGregor 1988, p. 23), Fiji continued to lose market share between 1989 and 1991 (Tokalau 1993). One reason that the industry was unsuccessful in improving market share may be that the grading system was ineffective—only one export grade has been sold since 1989 (McGregor 1990, p. 20). Another reason may go beyond purely quality, and another likely cause is the introduction of controlled atmosphere storage in Hawaii.

Formation of the Ginger Council has helped improve control of ginger quality (MAFF 1996, p. 32). Also, a new five-grade system was recently proposed for exports (Ministry of Primary Industries, Forestry and Cooperatives 1993). But, before any large public investment is made in attempts to improve ginger quality, some analysis would be needed on the economics of grading and improving ginger quality to see if this is the best way of defending the market niche.

An alternative industry strategy is diversification, either of markets or ginger products. The latter strategy has been pursued for a number of years through vertical diversification into more processed products, especially crystallized ginger, by Tropical Food Products (a subsidiary of Natco) to Pacific-rim nations such as Australia. The industry met with some initial success (McGregor 1988), but it also faced risks, given the poor record in the South Pacific of primary processing and a well-established competing ginger industry in southeast Queensland in Australia. The industry had to undertake detailed marketing research. Recently, the industry became embroiled with problems of “declining production, falling quality standards and low grower returns” (MAFF 1996, p. 18), and was taken over by Frespac (Fiji) Ltd. A new factory was constructed, based on its own production and contracted smallholders. Quality improved to the extent that the main Australian ginger producer and processor, Buderim Cooperative, is discussing a joint venture proposal (MAFF 1996, p. 18). To date, success in vertical diversification has been limited but potentially rewarding, given that the European market is currently undersupplied in high-quality crystallized ginger (MAFF 1996, p. 46), and the new proposals offer considerable hope for export development if they reach fruition.

Fruits, nuts, and vegetables

The marketing of fresh and processed tropical fruits to Pacific-rim nations remains a small export industry. Because they can supply only small volumes to buyers, these small producers face marketing difficulties in exporting to large Pacific-rim nations (see, for example, MAFF 1996, pp. 16-17). As a result, the chances of success for such industries remain slim, unless they can establish valuable small niches. The main fruits exported in the past, currently exported, or considered to have export potential are passion fruit (*Passiflora edulis f. flavicarpa*), oranges, pineapples, mangoes, papaya and avocado.

Success to date in exporting fruits has been limited to passion-fruit juice and pulp, papaya, mangoes, and pineapple exports. While achieving significant export values early in its history, the passion-fruit industry failed to live up to its potential. In the 1960s and early to mid 1970s, there were over 400 producers and two processing firms operating in the Sigatoka Valley on the main island of Viti Levu. In 1966, exports were valued at US \$600,000 (Tudor 1968). By 1979, the number of growers had slumped to 215 (Carter 1981, p. 100) although juice exports had reached 121 kL (Chandra 1983, p. 111). Although export prospects appeared reasonably bright in the early 1980s, especially for exports to New Zealand (Chandra 1983, p. 111), juice and pulp exports declined markedly, from US \$485,000 in 1980 to only US \$79,000 in 1984 (see figure 2.8).

Some revitalization of the industry was attempted through government efforts, working with the one remaining processing firm in Sigatoka, Tropical Fruit Products Ltd. This firm operated what Central Planning Office (1985, p. 58) described as “a tightly controlled contracted outgrower programme” in which 450 farmers participated in 1984, a doubling of

numbers in five years and a return to approximately the same number of growers as in the early 1970s. The Central Planning Office (1985) optimistically forecast a doubling in export value by the end of the 1980s. In the event, exports continued to decline slowly and the industry failed to rejuvenate. Passion-fruit export was not even mentioned as a potentially valuable high-value export industry by MAFF (1996). Two major constraints facing the industry have been the high labor demands in production and limited export market potential (Chandra 1983, p. 112).

Modest quantities of pineapples were exported during the 1980s. Exports of 37 tons fetched F \$35,000 (US \$61,000) in 1981 (Central Planning Office 1985, p. 59) but declined to US \$17,000 by 1986 (Bureau of Statistics 1986). The industry failed to progress, and, at present, the local market is undersupplied by an estimated 1000 tons (MAFF 1996, p. 45). Total pineapple output declined threefold from 4376 tons in 1989 to 1407 tons in 1993 (MPI 1993). The best prospects for a revitalized pineapple export industry lie with the development of "minimally processed (pouched) pineapple" (MAFF 1996, p. 45), a technology tested in the region by Pacific Products Ltd and the University of the South Pacific, which have applied for an international patent on their pouching process (MAFF 1996, p. 16). Given the small quantities likely to be exported, MAFF suggested targeting a relatively small market such as New Zealand, at least as a bridgehead, before attempting to export to larger Pacific-rim nations.

Small quantities of papaya were air freighted to Australia, New Zealand, and Canada, peaking at US \$347,000 in 1990. But McGregor (1990) reported a number of difficulties experienced in attempts to get a papaya export industry off the ground. They included inadequate and haphazard production and marketing structures and processes, poor fruit quality at export retail level, and inadequate packaging. Cyclone Kina and the loss of fumigation facilities forced the closure of the industry (MAFF 1996, p. 45). A similar experience occurred with mango exports, which peaked at US \$317,000 in 1986. Exports of around 20 tons per annum of improved varieties had been achieved into the Japanese market. Negligible quantities were exported during the 1990s, and export ceased altogether with the loss of fumigation facilities.

Renewed efforts are being made to export papaya and mango, based on a more rigorous regime of nucleus estate production and marketing (MAFF 1996, pp. 17-18). A private company is involved in both ventures. The potential for papaya and mango exports to Japan, New Zealand, and Australian markets is considerable, while Korea and the west coast of the USA also offer potentially rewarding markets for papaya (MAFF 1996, p. 45). From growers' viewpoints, production of the two crops is rewarding, with relatively high returns to labor of around F \$20-25 per day.

The major constraints to expanding fruit exports have been identified as small, scattered, and irregular supplies, which is not surprising given the narrow base and insecurity of the industries. Until recently, these industries were in an early stage of development, but that is not now a valid reason for slow progress. Other difficulties identified for passion-fruit production are also relevant to all products: the dangers of adverse weather conditions, especially cyclones, and relatively unattractive returns to labor compared with other activities. Finally, it is evident that most of the public assistance to these industries has been in production, whereas the biggest imponderables currently lie in export marketing.

All the fruits mentioned in this section are either marketed to the tourist sector in sizable quantities already or have considerable growth potential in that sector. MAFF (1996, p. 18) suggested that the Hawaiian experience in linking floriculture to tourism provides a good example to follow.

Fiji has also been a major producer of groundnuts, squash, potatoes, and vegetables, which are potential HVNT exports. Vegetable exports built up to quite substantial levels from the mid-1980s, especially in 1989 when they were valued at US \$2.56 million. Significant but variable exports between US \$300,000 and US \$800,000 were achieved in the early 1990s before quarantine problems restricted market access in 1993. An example has been the development of eggplant exports to the seasonal niche New-Zealand market and Fijian-expatriate segment of the Canadian market. Eggplant production is ideally suited to the Sigatoka valley (MAFF 1996, p. 49), so production should not be a problem. But exports were interrupted for a period in early 1995 due to the discovery of fruit fly in a shipment to New Zealand (Forum Secretariat 1995a, p. 11). Export can be expected to resume thanks to the introduction of HTFA treatment and quarantine protocols with the governments of importing nations. It is conceivable that the volume of exports to New Zealand and Canada could reach around 300 tons, with possibilities of extending the export market base to Australia and Japan (MAFF 1996, p. 49).

Fiji is following the lead of Cook Islands and establishing an HTFA treatment facility at Nadi airport (MAFF 1996, p. 18). This is expected to renew interest in the export of tropical fruits and other fresh foods to Pacific-rim nations.

KIRIBATI

Overview

High-value export performance

Kiribati is unique among the SPINs included in this study in not being able to develop any high-value exports: its agriculture is dominated by giant swamp-taro and coconut production. Three factors explain this failure. First, agricultural land resources are exceptionally limiting, which, when combined with a high population growth rate, means that it is difficult to supply enough staple foods to satisfy basic food needs. Second, internal and international transport constraints make agricultural exporting an unattractive option. The only agricultural export has been the traditional cash crop of copra. Third, the macroeconomic environment is not conducive to the development of high-value export industries.

Macroeconomic background

Kiribati exhibits strong MIRAB characteristics, with large rents earned from aid, remittances, and licensing of foreign fishing vessels. It has a large public sector, accounting for

around one-quarter of GDP (NCDS 1995), and a weakly developed private sector, with negligible manufacturing.

Economic management in Kiribati in recent times is best described as prudent (World Bank 1993c, p. 107). The growth rate in real GDP in the 1980s was low, averaging just over one percent per annum (NCDS 1995). Negative rates of -3.0 and -4.5 percent were recorded in 1989 and 1990, respectively (World Bank 1993c, p. 3), due to downturns in primary industries. A modest recovery has been made since, but it has been retarded by a slow recovery in production in the commercial fisheries sector.

After some years of significant devaluation of the real effective exchange rate in the early 1980s, Kiribati experienced a slight appreciation from 1988 to 1992 (World Bank 1995, p. 11), in large part a function of its use of the Australian dollar as the domestic currency. Weakening of the Australian dollar in 1992 followed through to a devaluation of the real effective exchange rate in Kiribati in that year (World Bank 1993c, p. 7).

The widely scattered outer islands offer most opportunities for agricultural development. The overriding constraint here, however, is the absence of efficient interisland transport. Among the outer islands, Kiritimati (Christmas Island) alone possesses any potential for high-value exports, with its unique natural environment and superior transport connections.

Foreign investment regime

The World Bank (1995, pp. 26-7) presented the salient features of the foreign investment regime of Kiribati as:

- approval for foreign investment is to be obtained from the Foreign Investment Commission, with proposals in excess of US \$195,000 needing Cabinet approval;
- no land is to be owned by foreigners;
- expatriates are granted work permits only where suitable *I-Kiribati* are unavailable;
- incentives are provided on a case-by-case basis, and include a 10-percent preferential tax rate for five years for “pioneering” firms, accelerated depreciation and three-year loss carry-forward for tax purposes, loan interest deduction, exemption from import duty on initial capital goods, government equity investment or joint-venturing, and specific provision of infrastructure for certain projects.

Especially given its small economy, incentives to foreign corporations to invest in Kiribati are much less attractive than in many other SPINs.

Agricultural research

Kiribati has very limited capacity for agricultural research, but other factors mentioned above mean that limited research capacity is probably not among the major constraints to developing high-value exports. From independence in 1979, Kiribati has funded a good deal of research and extension work out of the national budget. Contributions in the early 1980s were in the order of US \$500,000 (Gamble, Bourke, and Brookson 1981, p. 118). The ability to allocate funds of this order was due to direct budgetary assistance from the UK. Funds from donors were also used for projects that contained some research activity. Examples for

1981 mentioned by Gamble, Bourke, and Brookson (1981, p. 121) included vegetable production and rodent control.

A research has shared in the tight budget constraints in force since the 1980s, which saw government recurrent expenditure fall as a proportion of GDP from 55 percent in 1982 to 43 percent in 1989 (World Bank 1991a, p. 163). As agriculture's share of the recurrent budget has been low, greater emphasis has been placed over time on project aid to fund agricultural research activities. Aid funds have recently been used to develop small livestock multiplication units and to construct research facilities used for coconut research and studying farming systems in general.

Research infrastructure is scarcely adequate, but is at least as good as could reasonably be expected given the size of the agricultural sector. Gamble, Bourke, and Brookson (1981, p. 119) highlighted the difficulty of land shortage and the tenure system, which discourage farmers from providing land for on-farm research. A small extension section operates mainly in the outer islands but lacks the infrastructure and personnel to be effective beyond the main island of South Tarawa.

Agricultural research falls within the mandate of the Ministry of Environment and Natural Resource Development (MENRD), which is also responsible for formulating and implementing externally funded agricultural development projects. Early research priorities prior to independence were on the agronomy of increasing coconut productivity. Coconut production research began in 1963 (Barr 1992) and has been undertaken intermittently ever since. Agricultural research emphasis moved to vegetable research in the 1970s in an attempt to increase the quantity of vegetables in diets (Barr 1992). A return to coconut research occurred in 1984 in response to a perceived need to overcome nutrient deficiencies that were constraining yields of palms planted in the Coconut Replanting Scheme (Trewren 1983). Recently, more emphasis has been placed on farming systems and conservation of atoll agroecosystems.

The main project work currently undertaken, or under consideration, that involves some applied research work is on the development of outer island agriculture; a study of the future of the copra industry; coconut demonstration; small livestock multiplication and development; supply of various tree crop seedlings to outer islands and rehabilitation of tree crops; and farming systems analysis of the introduction of new crops into existing farming systems to develop what Ward (1982) maintained was the most appropriate system for atoll nations such as Kiribati, a tree-crop-based multistorey farming system. A feature of all of these projects is that they lack work on high-value export crops.

Gamble, Bourke, and Brookson (1981, p. 118) pointed to the difficulties created by shortages of trained and experienced personnel at the beginning of the 1980s. Recent observations by Thaman (1992, p. 10) indicate that there is still a lack of "trained local ... agricultural scientists, who can assess new technologies and crops or cultivars before they replace existing, more appropriate, agricultural technologies." Variations in physical and human conditions among atoll agroecosystems makes agricultural research much less effective because of a restricted ability to generalize research results (Liew 1992).

Fleming and Hardaker (1995) reported that an absence of international research and limited national research capacity in the main staple food of Kiribati, the giant swamp taro, recently

prompted some regional research, but so far to little effect. Two attempts to establish a regional breeding program were unsuccessful (Sivan 1992), which does not bode well for future regional research collaboration on this crop. The three main causes of failure were a lack of long-term resource commitment, limited genetic diversity, and a lack of knowledge of the scope for performance gains (Sivan 1992). Sivan (1992) also pointed to more successful regional collaboration in taro production research, but so far it has had little relevance to atoll agriculture. Further adaptive and evaluative research is needed if improved varieties are to be successfully introduced, yet only a small amount of such work has so far been attempted.

ADB (1992, p. 64) felt that insufficient attention has so far been given to evaluating research performance and examining the impact of past research results, especially in ascertaining which food crops are potentially suited to production conditions. The absence of such a review heightens the risk of duplicating past research. Economic and marketing research is negligible.

Traditional Export Crops

Copra

Copra is the sole agricultural export and to date virtually the only commercial agricultural crop in Kiribati. The industry began around 1840 with the export of coconut oil but reverted to copra around 1870, because technical advances in drying copra made it more convenient to handle copra, and oil extraction was done more efficiently in Europe. Following the end of earnings from phosphate in 1979, copra became the major export and in 1980 contributed around 90 percent of total domestic export revenue. Even by 1992, it still accounted for close to 80 percent of domestic earnings, with only the erratic fish exports challenging its supremacy (NCDS 1995).

Despite recent low prices and poor market prospects, which have seen output decline, copra production remains the only commercial agricultural crop, because it alone possesses the attributes suitable to Kiribati's highly constrained agricultural environment. The crop is well adapted to the agroecosystem, it can be easily maintained, and it has simple postharvest methods and flexibility in labor use and output.

Other exports

The economic and physical obstacles to agricultural export development, described above, have virtually ruled out high-value export possibilities in Kiribati. The very limited extent and nature of agricultural research and development activities, and negligible prospects of foreign investment in agriculture, also described above, compound the economic and physical difficulties of attempting to commercialize any high-value crop production.

NIUE

Overview

High-value export performance

For an exceptionally small nation with little capacity for agricultural research, Niue has been remarkably active in exporting high-value agricultural exports. Their values have been on a downward trend since the early 1980s with the recent exception of taro. Evidence of the boom-bust syndrome is clearly visible for a number of commodities.

The boom-bust syndrome in Niue is symptomatic of four constraints faced by a tiny agricultural sector and are likely to become ever more limiting:

- it is becoming much more difficult to satisfy the increasingly exacting conditions demanded by buyers in export markets;
- defense of niche export markets is especially difficult because Niue often has to compete for the same market with other small (but considerably larger) SPINs with similar resource endowments;
- where such a small economy also possesses strong MIRAB characteristics and is closely integrated with a larger economy (in Niue's case: New Zealand), any comparative disadvantage in downstream value-adding activities is further exacerbated by relatively high wage and exchange rates;
- inadequate transport facilities and services place extremely serious drawbacks on agricultural exporters.

These obstacles have often been exacerbated by problems in production caused by climatic abnormalities, failure to meet strict crop maintenance requirements, and the incidence of pests and diseases. But marketing problems have been the overwhelming causes of failure of export ventures.

Severe cyclones have tended to have an inordinate impact on agricultural exports. Extensive damage to crops caused by cyclones in 1959 and 1968 and the second cyclone Ofa in February 1990 largely explains the poor export performance in these years. But the successful expansion of taro exports, beginning in 1992, masks the fact that export performance has shown little sign of recovery after the effects of second cyclone Ofa dissipated.

Macroeconomic background

The economy in Niue is closely tied to that of New Zealand and relies heavily on that nation for aid, trade, and links to the outside world. It is a classic MIRAB economy, with aid accounting for almost two-thirds of GDP in 1990-91 (Statistics Unit 1993, p. 11) and a very large bureaucracy for the population size, although there has recently been some pruning. Unlike other Polynesian nations, remittances do not form a large part of foreign inflows.

Agricultural research

Niue has no staff dedicated to agricultural research but, like Cook Islands, relies heavily on New Zealand aid to undertake some adaptive research, demonstration trials, and seed and livestock distribution on two research farms. Responsibility for research is vested in the plant protection, crops, and research section of the Department of Agriculture, Forestry and Fisheries (DAFF). Vaiea research farm is set up for livestock research, but few research facilities exist at present. Research activities at Vaipapahi research farm are directed towards improving crop productivity. Modest research facilities exist, as can be expected given the extremely small size of the agricultural sector (Fleming and Hardaker 1995), and the nation has done well for agricultural production research in the past given the limitations faced. Research capacity to undertake marketing and economic analyses, however, has been and continues to be especially deficient.

Agriculture is under increasing pressure for research funds and personnel within DAFF from expanding activities in the forestry and fishing sections as well as from outside the Department as the government becomes more concerned with environmental issues. Salaries consume a large share of the research budget.

Traditional Export Crops

Copra

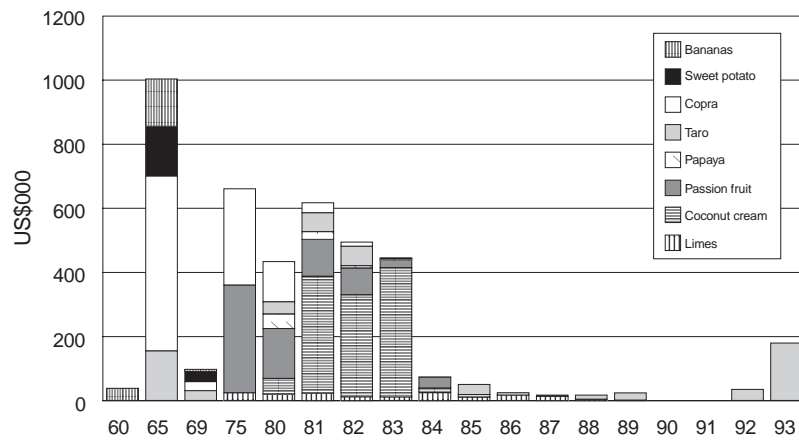
Copra was for long the only traditional export from Niue and, prior to 1970, was the most significant export. Its preeminence is less marked in figure 2.10 than it should be, because the cyclones of 1959 and 1968 had devastating effects on copra exports in 1960 and 1969, respectively. The 1970s witnessed the advent of a number of high-value export industries and copra exports ended in 1982 as producers found a more profitable outlet for their nuts with the rapid emergence of the coconut cream industry. To a much smaller extent, some green nuts were also exported to New Zealand from 1983 onwards (NCDS 1995).

Coconut cream

The largest agricultural export boom in the 1980s was in coconut cream exports, valued at over US \$400,000 at their peak in 1983, eclipsing the copra industry and being the major cause of its demise (see figure 2.10). The coconut cream industry was unique to agricultural exporting in Niue in that it was based on private enterprise, but it was also short-lived. It began with the establishment in 1980 of a privately-owned factory that purchased nuts from smallholders and exported the processed coconut cream primarily to New Zealand. It had collapsed by 1988 with the closure of the plant (Varnakulasingam 1991, p. 27). A shortage of coconuts due to a drought contributed to the collapse, but the main reason was a dispute between growers, who felt they were not being paid enough for their nuts, and the processing firm, which proceeded to move its operations to Cook Islands (S. Talagi, personal communication, 1994).

Bananas

As in Cook Islands, bananas were traditionally a very important export, directed almost exclusively to the New Zealand market. This export industry was at its peak in the prewar period (Tudor 1968) but retained some importance during the 1960s. Figure 2.10 shows that bananas were the third most important export to copra and handicrafts in 1965 when they were valued at almost US \$150,000. As for copra, the effects of cyclones explain the low value of exports in 1960 and 1969. The 1968 cyclone marked the virtual end of the industry, and banana exports had ended to be of value by the early 1970s.



Sources: 1960-69: Tudor (1968); 1970-85 and 1992-93 Hardaker and Fleming (1995); 1986-89: NCDS (1995); 1992-93: Statistics Unit (1993)

Note: Export figures for 1990 and 1991 are unavailable. 1969 is chosen in preference to 1970 because of unavailability of data in the latter year.

Figure 2.10 Major agricultural exports from Niue, 1960 to 1993

Minor Food Crops

Sweet potato

Sweet potato exports to New Zealand were third in importance to copra and handicraft exports in the early part of the study period, vying with bananas for that position. Exports were at their peak during the early 1960s. However, they were irregular during this period with no exports recorded in 1960 but US \$380,000 in the following year (Tudor 1968). Exports ceased in the early 1970s.

Taro

The recent expansion of root crop exports (figure 2.10) occurred primarily in response to shortages of taro in New Zealand, which in turn arose from the cessation of taro exports from Western Samoa as a result of the incidence of taro leaf blight. It also coincided with a one-off increase in the number of farmers in Niue (because of public-service cutbacks) looking for export opportunities.

The long-term future for expansion of taro exports to New Zealand is problematic. On the positive side, Niue looks set to emulate the performance of farmers in Western Samoa in developing what was for the Samoans a lucrative agricultural export market until the incidence of leaf blight. Three clouds are on the horizon, though. First, there is strong competition from other SPINs, which will become even stronger if Western Samoa overcomes its disease problems and returns to the New Zealand taro market. Therefore, current high prices might not last. Second, in the long term, increased substitution of domestically produced starchy food products for taro by the next generation of the expatriate Polynesian population in New Zealand would reduce overall demand for taro imports. Third, a lapse in quarantine could see Niue facing the same disease problems in taro as Western Samoa has recently experienced. If these clouds begin to close in, taro could join Niue's list of boom-bust exports and reveal a very dismal future for exports, unless new industries develop.

HVNT Exports

Passion fruit

Passion-fruit exports are summarized in figure 2.10. They started in 1965 and peaked at NZ \$194,000 (nearly US \$400,000) in 1979, when there were 220 listed growers, who had planted about 54 ha (Government of Niue 1979). Three types of product were exported: fresh passion fruit, pulp, and juice, with a good niche market exploited in Japan for fresh fruit.

By 1986 the industry had disappeared, following quite a steep decline in exports after 1979. Its failure was due in part to various production problems: planting materials were poorly selected, pests and diseases became rife, and pollination procedures were not followed satisfactorily (Fleming and Hardaker 1995). Yet the main problems in the final years before it failed can be attributed to management deficiencies in processing and marketing, poor returns to producers (due to the high costs of processing and marketing), and relatively low export prices.

Limes

Like the passion-fruit industry, the lime export industry existed for quite a long period—from 1973 to 1988—and peaked twice: at NZ \$32,000 (US \$65,000) in 1979 and NZ \$34,000 (US \$25,000) in 1984 (figure 2.10). It also occupied a relatively large number of farmers and had a relatively large planted area at its height—225 growers farming 62 ha in 1979 (Government of Niue 1979, p. 39). The lime industry had three important production advantages over passion fruit: no pollination requirements, easier maintenance, and lower labor intensity.

There were, however, two major disadvantages compared with passion fruit. First, growers had to wait longer to get returns from their investment. Second, the lime industry is more susceptible to cyclone damage, as witnessed by the problems precipitated in the industry by the first cyclone Ofa in 1985, when a large number of trees were uprooted. But the overriding cause of industry failure was a lack of economically sustainable export outlets for either limes or lime juice and oil, given transport constraints and dubious economics of processing (GRM International 1994).

Papaya

Papaya puree was exported between 1977 and 1983, reaching its highest annual value of NZ \$23,000 (US \$45,000) in 1980 (figure 2.10). The major reasons for failure of the export industry were, again, processing and marketing limitations. The Government of Niue already foresaw these dangers (1979, p. 40) when the industry was approaching its zenith.

PAPUA NEW GUINEA

Overview

High-value export performance

As the largest nation in the South Pacific region, Papua New Guinea shares with Fiji the greatest potential to develop high-value agricultural export industries. Some have been developed through vertical diversification into processing, product differentiation strategies aiming at the high-quality end of world markets for traditional crop exports, and expansion into niche export industries based on HVNT crops.

Macroeconomic background

While good agricultural land is plentiful by South Pacific standards, the geography of the country combined with lawlessness makes internal transport of agricultural produce difficult and costly. Agricultural marketing infrastructure is poorly developed, except for the traditional export crops, yet even in those crops there is considerable room for improvement. The dispersed nature of commercial agricultural production has limited the capacity to use common infrastructure for export crops. For example, coffee is mainly a highland crop, whereas cocoa is grown mainly in coastal provinces. Scope exists for complementary use of infrastructure by the cocoa, coconut, and palm-oil industries in lowland provinces, since the infrastructure has not been exploited to its full extent.

Another major economic constraint faced by agricultural exporters in the past was the conservative policy of maintaining the domestic currency unit, the Kina, at a high value against the currencies of its trading partners. This was made worse in recent years by the fact that

major export industries have been experiencing depressed world market prices for their products. The government has offset these depressed market effects to a considerable degree by providing output subsidies.

The government traditionally had access to considerable revenue by South Pacific standards and had the benefit of sound, if conservative, monetary management. But a recent financial crisis brought about by fiscal lassitude has thrown economic management into turmoil. It forced the government to embark on a rigorous structural adjustment program under IMF/World Bank scrutiny in 1995 to avoid insolvency. The financial crisis has had adverse effects on staff resources and morale in the public service, including the Department of Agriculture and Livestock (DAL), and forced the government to abandon its “hard Kina” policy by devaluing the currency by 25 percent in 1995.

Foreign investment regime

A Medium Term Industry and Trade Development Action Plan, implemented in 1991, laid the groundwork for public efforts to develop a more suitable investment climate and promote international competitiveness of industries in Papua New Guinea. The Plan unfortunately also contained a strong element of protection, which was slanted more towards import substitution in domestic markets than exports (Fairbairn 1993, p. 19). This has conflicted with other recent measures, such as the removal of minimum wage provisions, which have been directed towards liberalizing economic activity.

Budget reform measures put in place in 1993 gave Papua New Guinea what Fairbairn (1993, p. 17) expected to be “one of the most attractive tax regimes in the region if not in the developing world.” He qualified his enthusiasm for the measures by adding that a favorable tax regime is a necessary but not sufficient condition for encouraging private investment. Other, potentially more discouraging factors facing foreign investors are lack of skilled labor and infrastructural deficiencies. Political and personal insecurity, the latter brought about largely by well-publicized law and order problems (Stein 1991, pp. 56-7, Elek 1992, p. 25), could be added as further major drawbacks to encouraging foreign investment. Also, it remains to be seen how much of any foreign investment encouraged by the tax regime is attracted to agriculture as opposed to other sectors of the economy—mining, in particular.

The government has had in place generous output subsidies to tree-crop industries in recent years. This has been a temporary measure to shore up rural economic activity in the face of recession in world commodity markets for key export industries such as coffee, cocoa, palm oil, and copra.

A factor encouraging foreign investment for export to date in Papua New Guinea has been preferential duty-free access to the Australian and New Zealand markets. As Elek (1992, p. 25) observed, this advantage can be expected to dissipate as trade liberalization proceeds in the Asia-Pacific region.

Agricultural research

Charles (1982, p. 75) reported that agricultural research in Papua New Guinea in the 1950s was principally the responsibility of the Department of Agriculture, Stock and Fisheries

(DASF, now DAL), and was undertaken solely by expatriate researchers. Since that decade, major changes have been induced by alterations in the agricultural sector. In particular, growth in commercial production in which smallholders have played a progressively more prominent role, improved education standards, political independence, and associated localization policies have wrought changes impinging on agricultural research processes.

Charles (1982, pp. 77-80) listed, among other changes, the following:

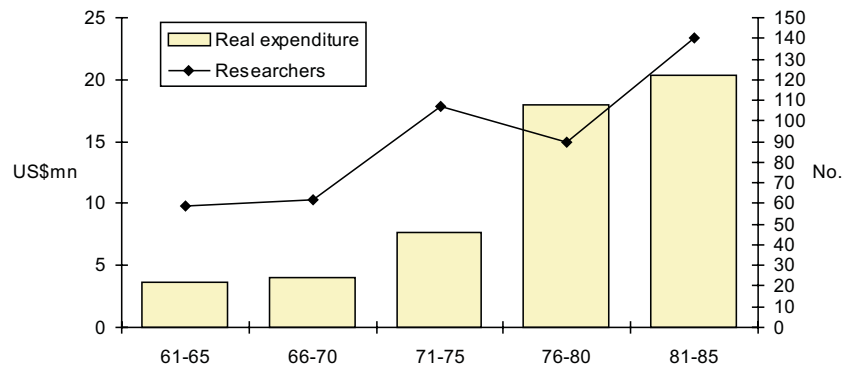
- the localization of research support positions and an increased number of national scientists entering the research service;
- greater involvement by the government in agricultural policy formulation requiring allocation of more time by senior research personnel to administrative policy matters;
- a weakening of the link between researchers in DAL and extension staff who were assigned at the provincial level;
- agriculture ceasing to be the sole responsibility of the then Department of Primary Industry (DPI, now DAL) with the emergence of industry research organizations, and research work undertaken by universities, nongovernmental organizations, and within integrated rural development projects;
- the introduction of limited-period contracts and less remunerative employment conditions for expatriate researchers;
- a weakening of the position of crop researchers in agricultural policy formulation.

One unchanging attribute during this period was the disciplinary research approach through hierarchical control (Charles 1982, p. 80).

Between 1965 and the early 1970s, there was almost a doubling of the numbers of researchers working on crop research in DAL and, before it, DASF to 1975 and DPI following independence. This was prompted in part by the expansion of tree-cash-crop industries and their consequent demand for greater research capacity. The build-up in numbers was spread across all levels of academic qualification (Pardey and Roseboom 1989, p. 350), but this trend was reversed following self-government in 1973 and political independence in 1975. By 1976, the total number of researchers had fallen by almost one-half to a level not greatly above that prevailing in the late 1960s. Departure of a number of expatriate researchers is the main explanation given for this fall (Pardey and Roseboom 1989, p. 351), but the establishment of special tree-crop research institutes also contributed.

The latter years of the 1970s and early 1980s saw a recovery in numbers and by 1980 they were back to the level prevailing a decade earlier in 1971. ISNAR (1982, p. 25) observed, however, that formal qualifications and levels of work experience declined during this period. After independence, progress appears to have been made in building up indigenous research capacity, and even though 60 percent of researchers were still expatriates (Pardey and Roseboom 1989, p. 350), this proportion had fallen to 32 percent by 1987 (Fernando 1987, p. 17). The decline, however, was attributable not so much to a build-up in indigenous research capacity as to a fall in the number of expatriate researchers, due principally to the changed basis for their employment, referred to above. The overall number of researchers in the agricultural research division of DPI (DAL) fell from 69 to 50 between 1980 and 1987. It has remained at around that level over the past decade, with Ghodake and Wayi (1994) reporting 49 researchers in 1993-94.

The real expenditure and total numbers of personnel working in agricultural research for the period 1961-85 are presented in figure 2.11. Real expenditure per researcher fell during the 1960s and until independence, but then increased rapidly in the second half of the 1970s. It declined again in the first half of the 1980s and has continued to decline since. Based on data for 1993-94, presented by Ghodake and Wayi (1994), expenditure per researcher in the research division of DAL in that year was around US \$60,000 in 1980 values, much less than one-half the figure of about US \$143,000 for all agricultural research institutions over the period 1981-85 (see figure 2.11).⁴



Source: Pardey, Roseboom, and Anderson (1991, p. 416)

Note: Financial years to 1976; calendar years thereafter. Expenditures are expressed in constant 1980 US dollars, using a purchasing power parity index.

Figure 2.11 Agricultural research numbers and expenditure in Papua New Guinea: five-year averages, 1961 to 1985

Total research expenditure on crops, livestock, fishery, and forestry stayed around US \$4 million in the 1960s, before increasing rapidly during the 1970s. In 1980, it totaled US \$18 million of which US \$ 8.2 million was on crops (Pardey and Roseboom 1989, pp. 350-2). For crop researchers, this worked out at almost US \$130,000 per researcher. Expenditure on crop research increased in the early 1980s but has since declined. In 1981, expenditure on research accounted for about five percent of the agricultural budget (Gamble, Bourke, and Brookson 1981, p. 269).

Gamble, Bourke, and Brookson (1981, pp. 267-8) reported no formal research policy, limited evaluation of research work, and an absence of research leadership and direction at the beginning of the 1980s. While economic evaluation of projects was common, little economic input was apparent in agricultural research. Gamble, Bourke, and Brookson (1981, p. 268) also reported an impressive amount of publication of research work, notably on field trials, but much work still went unpublished, and there was a long lag between the comple-

⁴ The research division of DPI in the early 1980s accounted for three-quarters of all agricultural researchers in Papua New Guinea (ISNAR 1982, p. 34).

tion of work and its publication. Informal links between research institutions were considered good, but were thought to be weak between research and extension, a problem exacerbated by the devolution of extension to provincial authorities, which has persisted to the present. Research infrastructure was argued to be just adequate.

Papua New Guinea shares with Fiji an array of research centers that cover a wide range of agroecological conditions. The following descriptions of centers operated by DAL at the national level are largely taken from Gamble, Bourke, and Brookson (1981, pp. 275-9) and Ghodake and Wayi (1994). The agricultural research division of DAL has six research programs: (1) Highlands Farming Systems Research Programme, Highlands Agricultural Experiment Station, Aiyura; (2) Lowlands Farming System Research Programme, Bubia Agricultural Research Station, Bubia; (3) Cocoa-Coconut Based Farming Systems Research, Lowlands Agricultural Experiment Station, Keravat; (4) Dry-Lowlands Research Programme, Laloki Agricultural Research Station, Laloki; (5) Livestock Research Programme, Animal Husbandry Research Centre, Labu; and (6) the Land Utilization Section, Konedobu.

The Highlands Agricultural Experiment Station, in the Eastern Highlands, receives around 2200 mm rainfall. It researches food-crop farming systems, cash-crop diversification, agroforestry and the agronomy of sweet potato, corn, fruit, nuts, spices, and coffee. It has also undertaken past research into pastures, groundnuts, and soybeans. Its current status falls well below its past important position due mainly to the emergence of specialized coffee research within the Coffee Industry Corporation on land formerly part of Aiyura station. The research scope of the Lowlands Farming Systems Research Programme at Bubia covers control and management of pests and diseases, integrated pest management, cropping systems, and the agronomy of a variety of root crops and vegetables. Examples of crops researched in recent years include taro, rice, soybeans, mung beans, adzuki beans, sugar cane, maize, groundnuts, sorghum, and spices. Keravat is a Lowlands high-rainfall center researching into cocoa-coconut cropping systems, agroforestry, soil and water management, pest and disease management, and the agronomy of a variety of lowland crops, including cocoa, sweet potato, coconuts, robusta coffee, taro, spices, traditional vegetables, and various spices, fruits, and nuts. The Dry Lowlands Research Programme at Laloki carries out biological and integrated pest management on food crops, vegetables, and fruits, and covers the agronomy of a variety of dry lowland food crops and vegetables. It is also responsible for germplasm maintenance. The major research components of the Livestock Research Programme at Labu are the improvement and adaptation of chicken, sheep, goats, ducks, and guinea pigs, the assessment and improvement of feeds and pastures, and livestock nutrition.

Other research institutes include Bisianamu, on the Sogeri Plateau with 2600 mm rainfall, which researches rubber agronomy. Lejo, a wet Lowlands research station, specializes in cocoa agronomy. Nearby, the entomology of cocoa and oil palm is the concern of Popondetta research station. Omaru, another Lowlands station, researches into hybrid coconut production. Tambul, a Western Highlands station with a rainfall of 2600 mm, now mainly carries out research into potato selection and production, and sheep grazing trials. In the past, research at this station covered the agronomy of pyrethrum, lupins, sweet potatoes, potatoes, and some vegetables. Other national centers specialize in chemistry, plant pathology, entomology, land use, economics and statistics, food processing, and postharvest handling. At the provincial level, soil erosion is the topic of research at the DPI Lowlands

station of Rabaul, and sweet potato is researched at the DPI West Sepik station of Oksapmin. Kuk, a Highlands station with a rainfall of 2600 mm, specialized in FSR, tea agronomy, entomology and the agronomy of a variety of root crops, vegetables, and maize. It is currently not an active research post.

Export tree-crop corporations also have important research functions. The Coffee Industry Corporation works on various aspects of coffee production and marketing, the Cocoa and Coconut Research Institute specializes in cocoa and coconut production research, and the Oil Palm Research Group researches into oil-palm agronomy and breeding. Also, the sole sugar producer, Ramu Sugar Ltd, carries out research into the agronomy of sugar production. Many research studies pertaining to agriculture have been carried out by national and foreign universities and colleges. Finally, research components were included in a number of integrated rural development programs that were undertaken in the 1970s and 1980s at the provincial level.

A perusal of the summary of crop research projects in the early 1980s by Gamble, Bourke, and Brookson (1981, pp. 280-90) reveals an overwhelming bias towards production research and then towards technical research, and a limited amount of socioeconomic research was undertaken. Little research was directed specifically towards the expansion of exports of high-value agricultural products, but indirectly some trials provided the potential to develop such exports.

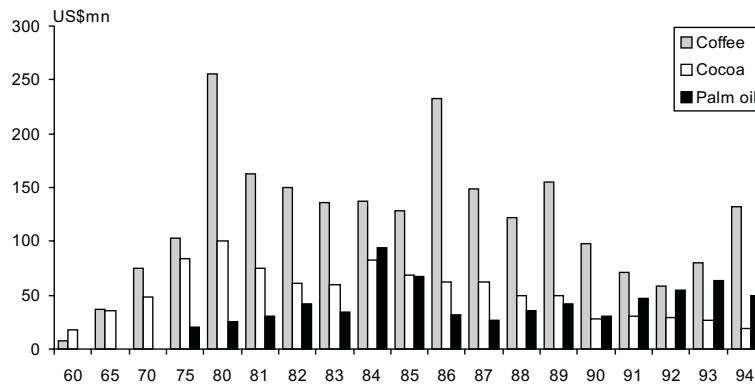
Traditional Export Crops

Copra and coconut oil

The traditional export from Papua New Guinea was coconut products in the forms of copra and coconut oil. Although coconut oil was originally exported, copra soon assumed prime importance because it proved to be a more suitable commodity for the plantation system on which production was based. By the early 1970s, the value of coffee exports had overtaken the combined value of coconut oil and copra exports, as had the value of cocoa exports a few years later (World Bank 1982, p. 68).

Coffee

Of all efforts to raise smallholder incomes in SPINs, those in the coffee industry of Papua New Guinea stand out as a major success story. Following the example set by the plantation coffee industry in the Highlands, smallholders were the driving force behind an increase in coffee export earnings from a mere US \$8 million in 1960 to a peak of US \$232 million during the world coffee boom of 1986 (see figure 2.12). An extended period of low prices from the late 1980s to 1993 badly dented export performance, with revenue falling to a 25-year low of US \$58 million in 1992 before reviving, due to the recent recovery in world prices, to US \$8181 million in 1993 (figure 2.12). Further increases in price sustained the revival in 1994, and exports were valued at US \$133 mn in 33 million in that year (NCDS 1995).



Sources: 1960-65: IMF (1991); 1970-80: World Bank (1982); 1981-94: NCDS (1995).

Note: Financial years to 1974-75; calendar years thereafter.

Figure 2.12 Values of coffee, cocoa, and palm oil exports from Papua New Guinea, 1960 to 1994

The success of the industry in the postwar period has been chronicled by Fleming and Antony (1993), but the industry goes back well before the second world war to the 1890s. Smallholder production began in the 1950s. The industry developed through private marketing regulated lightly by the Coffee Industry Corporation (formerly the Coffee Marketing Board). Papua New Guinea has a strong comparative advantage in coffee production by smallholders, although comparative advantage in estate production depends largely on world prices and the quality of coffee produced (Fleming and Antony 1993).

Success in coffee production is largely attributable to the favorable growing conditions for arabica coffee in the Highlands. Growing conditions also suit the production of a high-quality product, and indeed some Papua New Guinea coffee fetches high prices in the European market, to which most beans are exported. There is thus a window for high-value green bean exports of arabica coffee (the robusta industry is relatively small, producing only around five percent of total exports). With the declining relative importance of the plantation industry, which suffered considerably during the recent world coffee recession, the scope for increasing high-quality exports will rest primarily on the smallholder industry, which has shown it has the potential to produce high-quality green beans for export.

Unfortunately, this potential has not yet been realized. Technical factors in production and processing have so far confined high-quality exports to a small number of producer-exporters of green beans, who comprise a segment of the plantation sector. They sell directly to foreign buyers on consignment and use their good reputations to earn premiums over New York market prices (Fleming and Antony 1993).

Factors reducing overall quality of green bean exports have been summarized by Fleming and Antony (1993) as occurring not only in production, but also in processing and export

marketing management. The proportion of coffee exports designated as top quality has declined slightly since the early 1980s to below 10 percent (Fleming and Antony 1993, p. 55), and PNG coffee has been increasingly discounted against Other Milds coffees in the world market (McConnell, Rambaldi and Fleming 1996). Recent efforts to improve quality and international reputation include the splitting of the basic smallholder coffee exports (“Y grade”) into two categories in order to encourage better smallholder quality by offering a higher price for “Y1” coffee and a lower price for poorer quality “Y2” coffee. Teething problems in the first year of operation of this scheme prevented quality gains; in fact, the overall average price for Y-grade coffee was estimated to be lower than it would have been without the scheme (Kufinale 1994). It remains to be seen whether this measure will have any marked impact on the quality of smallholder exports.

Another quality-related initiative with some potential for success that has not yet been greatly exploited is the production and export of organically grown coffee. Fleming and Antony (1993, pp. 331-2) considered that enthusiasm for such an endeavor needs to be tempered by recognizing that it can be difficult and expensive to meet the criteria set by consuming nations for organically produced exports.

The export marketing strategy adopted by the coffee industry has been described by Fleming and Antony (1993, pp. 198-217) as one of following the market leaders (Colombia and Brazil) “at a distance.” Differentiation of coffee by grades has allowed some discretion among marketers of high-quality coffee in pricing, product management, distribution policies, and promotion. Fleming and Antony considered the domestic marketing sector to be quite competitive.

A small but quite successful roast coffee industry has also existed in Papua New Guinea for a couple of decades, marketing output to both the domestic and export markets. Export volumes grew from 2 tons in 1981-82 to over 8 tons in 1990-91, peaking at over 13 tons in 1988 (Fleming and Antony 1993, p. 51).

Fleming and Antony (1993, pp. 330-1) listed the following four factors that limit its prospects for expansion and, even more constraining, a move even further downstream into the manufacture of soluble coffee (which has been mooted from some quarters):

- concentration of the roasting industry in consuming nations, which makes market penetration difficult;
- difficulties in blending, given the remoteness of Papua New Guinea from other producing and consuming nations;
- difficulties in marketing caused by remoteness from consumers;
- constraints on producing enough good-quality beans to make processing worthwhile.

So far, pressures to manufacture soluble coffee have been resisted by the coffee industry, and rightly so. Fleming and Antony pointed out that the criteria for such manufacturing to succeed are far most stringent than for roast coffee.

Cocoa

Cocoa production in Papua New Guinea dates back to before the second world war. Originally a crop for plantations, cocoa has increasingly become a smallholder crop to the ex-

tent that the proportion of output attributed to smallholders increased from around one-quarter in 1970 to two-thirds by 1986 (NCDS 1995). The technical efficiency of smallholder production is quite high (Gimbol, Battese, and Fleming 1995).

The trend in the value of exports since 1960 can be seen in figure 2.12. In the 1960s cocoa was a more valuable export industry than coffee, and export revenue briefly eclipsed that of coffee again in the mid-1970s. Since then, cocoa exports have lagged well behind those of coffee despite peaking at US \$125 million in 1978. They suffered a decline in value from 1978 to 1983, when exports were valued at US \$59 million, then recovered to US \$83 million in 1984 before declining again to only US \$28.5 million by 1990. The steepest decline took place from 1987, caused by the impact on the industry of the Bougainville secession problems. After a brief recovery to US \$30.5 million in 1991, export values have since fallen back and were a mere US \$1919 million in 1994.

The scope for achieving high-value cocoa exports from Papua New Guinea rests on the ability of exporters to differentiate their cocoa beans from beans from competing nations through superior quality, thereby earning a premium. Cocoa exporting has been undertaken by private processing and marketing firms that have been prudently facilitated and regulated by the Coffee Board based in Rabaul (although the base was recently shifted temporarily to Madang in the aftermath of volcanic eruptions which largely destroyed the city in 1994). Fleming (1992) described the export marketing strategy adopted by the cocoa industry as one of following at a distance, allowing private exporters some discretion to make their own marketing decisions.

The capacity of producers in Papua New Guinea to earn premiums in the world cocoa market has been achieved to a limited extent, mainly due to the favorable physical conditions for growing cocoa. Ivarami and Coulter (1992, pp. 108-9) compared returns to producers in Papua New Guinea with those from other major cocoa-producing nations, including the oft-acknowledged market leader, Ghana, and found them to be higher. They attributed much of the success to the regulatory role played by the Cocoa Board in maintaining export quality standards since the early 1970s. Nevertheless, acknowledgment of the scope and need for quality improvement (Ivarami and Yarbrow 1992, pp. 172-3) indicates all has not been well with quality standards of cocoa in Papua New Guinea.

Postharvest activities, in particular, have left a good deal to be desired. Two factors led to concern about deteriorating quality: poor postharvest methods used on farms and lack of appropriate grading standards. As a consequence of the latter, a major cocoa quality control and assurance project began in the late 1980s in an attempt to raise the quality of exports, and a cocoa quality management system was introduced in 1988 with the primary aim of increasing self-regulation among participants in the industry (Ivarami and Yarbrow 1992, p. 172).

A related major project, the Cocoa Quality Improvement Project, commenced in 1991. This project helped identify causes of poor quality arising from growers' harvesting and postharvesting practices and techniques. One shortcoming of the project has been the limited economic analysis of the relations between quality and price premiums. In particular, concern has been expressed about the willingness of producers to adopt the improved practices and techniques identified in the project (QDPI 1993). Political instability in a major co-

coa-producing province—North Solomons—has limited the beneficial impact of the project, as well as reduced cocoa output, in recent years.

Palm oil

The oil-palm industry in Papua New Guinea competes basically on price in world markets. But the industry can be claimed as a high-value export industry on the basis of the development of its value-adding processing activities, which accompanied the build-up of production capacity through settlement schemes in the late 1960s and early 1970s. Although there is evidence that oil palm had been grown on an experimental basis since the 1920s, it was not until the mid-1960s that the industry became a commercial proposition following a favorable World Bank report in 1964 (Christensen and Densley 1978). Development proceeded on a nucleus estate basis:

The nucleus estate, owned 50% by the Government and 50% by an experienced plantation company, was to supply 50% of the crop and provide full processing, marketing, management and technical services for the estate and associated smallholders. The smallholder scheme was to be developed by the Government and to supply fruit to a mill operated by the nucleus estate.

(Christensen and Densley 1978, p. 2)

Production of palm oil is well suited to certain parts of Papua New Guinea, which have a strong comparative advantage in its export (World Bank 1992).

Export values of palm oil expanded rapidly following the inception of the industry, and peaked at US \$94 million during the commodity boom of the mid-1980s. Barring the years of 1984–85, it can be seen from figure 2.12 that export revenues have shown a steady increase in real terms, surpassing US \$60 million in 1993, even though palm oil prices declined over the last six years of the study period (NCDS 1995). It has proved a successful industry for adding value to raw agricultural output.

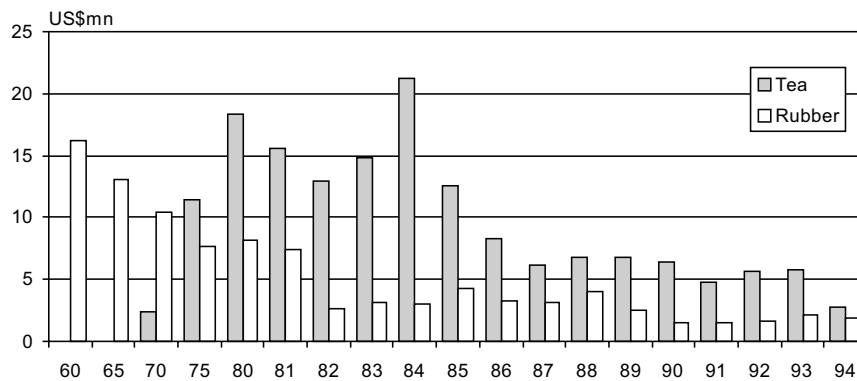
Tea

As with coffee and cocoa, the potential for high-value tea exports from Papua New Guinea depends on the ability of tea exporters to earn premiums in world markets through product differentiation based on quality. According to the World Bank (1982), early experiments in tea production and processing, based on a small factory built in the Highlands in 1962, led to the successful export of tea in 1964, which earned “a price toward the top of its grade” (Arthur 1978, p. 2).

The tea industry was developed as an alternative cash crop to coffee for smallholders in the Highlands, but has remained mainly a plantation crop, because smallholders did not take to tea production as they did to coffee production. Attempts to establish an outgrower system, whereby smallholders could take their green leaf to factories on nearby plantations, failed. One plausible reason for this failure was that tea production and postharvest activities suit smallholders’ resources and circumstances less well than alternative crops such as coffee (Munnall 1973). Other plausible reasons were that high skill requirements were not easily satisfied (Arthur 1978, p. 2), and that there was a “need for continuous work to maintain a good plucking table” (World Bank 1982, p. 236).

The predominant position of the plantation sector meant that the marketing of tea in the early decades of development of the industry was in the hands of the main foreign-owned factory-estates in Western Highlands province. These factory-estates grew most of the green leaf and manufactured virtually all of it (Arthur 1978, p. 3).

Figure 2.13 shows that the value of tea exports has been on a downward path since 1984, when it reached its highest point at US \$21 million. By 1993, exports were valued at just under US \$6 million before falling precipitously to less than US \$3 million in 1994.



Sources: 1960-70: Statistics Section (1973); 1975-80: World Bank (1982); 1981-94: NCDS (1995)

Note: Financial years to 1974-75; calendar years thereafter.

Figure 2.13 Values of tea and rubber exports from Papua New Guinea, 1960 to 1994

Despite its potential, tea has never really been exported at a quality higher than what Arthur (1978, p. 2) had described early in the industry's existence as "acceptable by world standards." Arthur (1978, p. 7) reported that by 1977 most plantations were opting for "a medium rather than coarse plucking policy while smallholders were obliged to pluck fine." The average price for Papua New Guinea tea in London auction in 1976 was around six percent lower than the average for all teas, but this camouflaged the fact that some tea was being sold for a premium, while discounted tea from one plantation had a large downward effect on average price (Arthur 1978, p. 11).

Rubber

The rubber industry is a traditional export industry that began in the plantation sector in Papua New Guinea before the second world war. The industry became significant by the 1960s, but, although the volume of exports expanded to 6500 tons by 1971-72 (Densley, Rady and Arnold 1978, p. 2), their real value declined continuously from 1960 until the early 1980s (see figure 2.13). The industry has since stagnated, and, between 1982 and

1994, export values fluctuated between US \$4.27 million in 1985 and US \$1.54 million in 1991 (see figure 2.13).

The area under rubber in the plantation sector was virtually halved between the late 1960s and mid-1970s (Densley et al. 1978, p. 5), largely as a result of the uncertainty that plantation producers felt about their future in the industry in the aftermath of political independence. Smallholder area was about 4100 ha in mid-1977 (Densley et al. 1978, p. 7) but contributed only around 5 percent of output as most of the trees had been planted in the previous decade and were not yet in tapping (Densley et al. 1978, p. 8). By 1986, smallholder output had grown to 1556 tons (about one-quarter of total output) (NCDS 1995), but this was hardly sufficient to offset the decline in largeholder output resulting from a decrease in area planted from 33,958 ha in 1970 to 10,591 ha in 1986 (NCDS 1995).

Rubber was developed as a cash crop during the early postwar decades on the basis of its export to the Australian market, into which it could be imported duty-free under a preferential tariff system. DASF (1984, p. 89) recorded that low quality was not a major factor influencing price in these circumstances. Other advantages that enabled early development of rubber as an export crop for smallholders included the absence of significant pests and diseases, simple production technology with little need for cash inputs, the option of tapping irregularly without harming trees, the provision of a regular source of cash income, and relatively high returns to labor (DASF 1984). Disadvantages facing the smallholder sector towards the close of the 1970s included low productivity, inadequate marketing services and extension advice (especially for more remote smallholders), and likely increased incidence of diseconomies of small scale in smallholder production. This last problem was expected to become more acute with the prerequisite for concentrated areas of production with relatively large outputs to take advantage of new technically specified rubber (TSR) processing. This form of processing offered improvements in labor productivity and enhanced ability to meet the requirements of Australian buyers (Densley et al. 1978). These shortcomings have not dissipated with time, and DAL (1992, p. 28) reported continued low productivity and dubious commercial viability.

Marketing of rubber was historically unregulated by the government. Plantation output was sold by the estates through forwarding agents, while smallholder rubber was bought by DPI field staff (Densley et al. 1978, p. 13). More regulation of export marketing was introduced in 1977, when a Rubber Industry Advisory Committee was established with the chief aim of ensuring that rubber quality would be acceptable to Australian buyers in the future, especially given the imperative of switching to TSR-processed exports (Densley et al. 1978, p. 13).

HVNT Export Crops

Spices

Spices have been at the forefront of plans to diversify agricultural exports into high-value products for quite some time, but they have achieved variable success. Efforts to pursue spice exports continue despite this mixed record. They were given a boost recently with the establishment in 1991 of a Spices Industry Board, but institutional development of the Board has been slow (DAL 1994, p. 35).

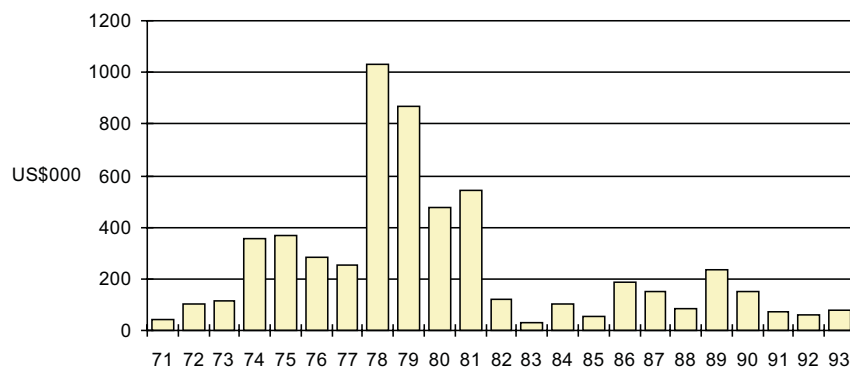
Three spices of note have been grown for export in Papua New Guinea: cardamom (*Elletaria cardamomum* Met.), “birds-eye” chilies (*Capsicum frutescens*), and pepper. A good description of the early development of these spice industries was provided by Wyatt (1978). Other spices that have been subject to investigation about their production potential include nutmeg, vanilla, ginger, cinnamon, anatto, cloves, aniseed, peppermint, turmeric, and all-spice (Wyatt 1978).

Spice exports never reached the levels of major exports, but cardamom and chilies both had periods when values exceeded US \$1 million. Export values peaked in periods of high world prices and in their immediate aftermath, during which export supply was stimulated by the earlier high prices. This occurred in the late 1970s to early 1980s for chilies and the mid-1980s for cardamom.

Smallholder chili production grew quite rapidly in the early 1970s (see figure 2.14) in response to the opening up of export marketing possibilities through the buying operations at extension centers by DPI field staff and because the crop possessed some favorable characteristics as a source of cash.

High prices in the late 1970s instigated increased exports, which peaked at 258 tons in 1981 (DASF 1984). Exports collapsed in the early 1980s, and consequently the spice export values fell drastically, from US \$542,000 in 1981 to only US \$121,000 in 1982. The decline in export volumes lagged prices by around two years.

The chili export industry failed to expand despite some favorable attributes. The crop requires little maintenance, major pests and diseases are absent, and it is well adapted to grow-



Sources: Year ending June 1971-76: Densley (1978); 1977-84: DPI (1986); 1985-93: Rural Statistics Division (1996)

Note: Financial years to 1974-75; calendar years thereafter.

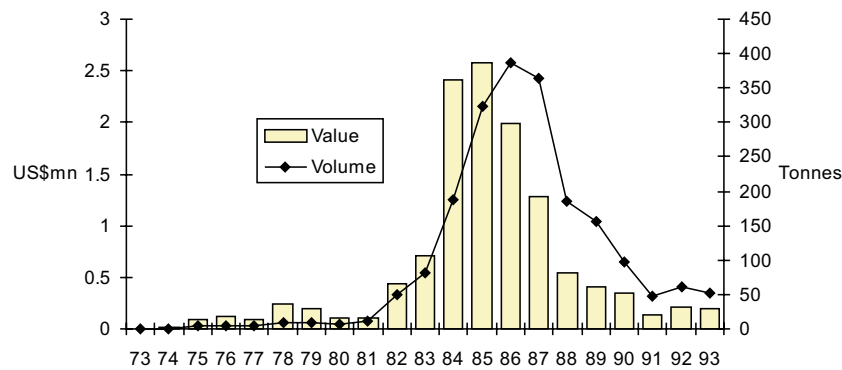
Figure 2.14 Volumes and values of exports of chilies from Papua New Guinea, 1971 to 1993

ing conditions (Wyatt 1978). It also has a high value-weight ratio. Its descent to a minor export since the early 1980s was largely attributable to the collapse of the DPI buying activities with the abolition of the marketing section within the Department, but other factors also contributed:

- the volatile and astringent nature of the crop, which makes it unattractive to pickers and difficult to handle and store;
- fluctuating returns to growers;
- relatively low returns to labor (World Bank 1988, Annex 3, p. 53).

Cardamom exports initially appeared to be very promising, with the crop possessing the same sorts of favorable attributes as chilies without the volatile and astringent nature of the latter. Yet the industry proved unable to weather the collapse of world cardamom prices in the 1980s. Some years earlier, a number of developing nations had identified cardamom as a good prospect for a niche export crop and entered production (Eyzaguirre 1996, p. 113).

Following its introduction in 1964 (Fintrac 1986), the cardamom industry experienced a modest beginning. The value of exports rose slowly from US \$9000 in 1974 to US \$44,000 by 1982, but the industry expanded rapidly in response to the world price boom in the early 1980s (figure 2.15). Export prices rose from an average f.o.b. price of K4.633/kg (US \$8.91/kg in real terms) in 1982 to K10.406/kg (US \$12.89/kg) in 1984, before subsiding just as quickly to K4.638/kg (US \$5.16/kg) in 1986. As for chilies, export volumes lagged behind price changes by about two years.



Sources: Year ending June 1971-76: Densley (1978); 1977-93: Rural Statistics Bulletins

Note: Financial years to 1974-75; calendar years thereafter.

Figure 2.15 Volumes and values of exports of cardamom from Papua New Guinea, 1973 to 1993

The price decline made production unprofitable and contributed largely to industry failure, although there were other factors, cited by DASF (1984, pp. 92-3) and Fintrac (1986, pp. 4.60, 4.67), that exacerbated the price impact:

- inadequate procedures—especially quality control—in harvesting, curing, drying, and grading, which are essential to obtain high prices;
- competition from coffee production, especially subsequent to the dramatic rise in world coffee prices in the mid-1980s;
- inefficient public marketing, which might have been avoided with greater private-sector involvement.

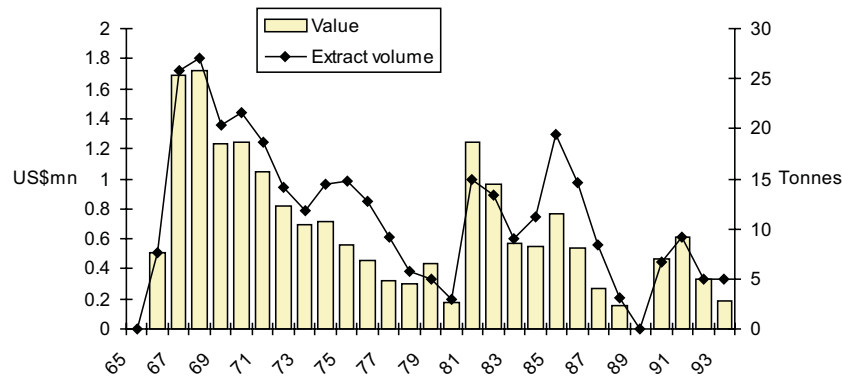
The establishment of the Spices Industry Board was meant to help overcome the heavy discounting on world markets of spices from Papua New Guinea caused by lack of adequate grading processes through the introduction of a uniform grading system, registration of exporters, and the provision of market information (DAL 1994). The Board was also directed to raise factor productivity by using public funds for specific spice research work (through contracts it was to make with research organizations), and by improving extension services to spice growers. However, there must be considerable doubt about the efficacy of this assistance given the weak performance of the Board to date.

Pyrethrum

Pyrethrum was an early HVNT crop for smallholders, developed in the early 1960s in Highlands areas considered too high for coffee (Anderson 1978). Export of crude pyrethrum extract was given its impetus by the erection of a factory by Busch Boake Allen Ltd in 1964, which could process 800 tons of dried flowers (Anderson 1978). When Busch Boake Allen planned to close the factory in 1973, it was purchased by the government of Papua New Guinea and has continued to operate under local government ownership in Mount Hagen (Kagamuga Natural Products), although much of the output comes from Enga Province.

The history of the industry as an early attempt to capture high values from exports is portrayed in figure 2.16, in which three (successively smaller) cycles of rise and fall can be detected. The industry peaked early in its life, in the late 1960s. It then entered a period of gradual decline until another brief recovery in the early 1980s, when an increase in world prices in the late 1970s temporarily lifted export values, with price effects supported with a lag by increased volumes of extract exported. An attempt to develop a group production scheme in Enga province in 1975, using mechanized “broad-acre” methods, failed to make any impression in reversing the decline in output, which had been established in 1969. Production nevertheless has persisted in Enga province, which accounts for most of current output in part because of the lack of alternative cash cropping opportunities (Fintrac 1986). Decline again set in during the second half of the 1980s, before a third short-lived revival took place in the early 1990s.

Reasons for industry failure are many. Chief among them have been inefficient and irregular roadside buying services provided by DPI (Fintrac 1986), exacerbated by security problems in Enga in particular, low returns to labor relative to newer alternative cash-earning activities, insufficient rewards passed onto women and children who did the bulk of the work, poor growing conditions in some areas where pyrethrum was initially grown (Ander-



Source: 1965-76: Anderson (1978); 1977-93: Rural Statistical Bulletins

Note: Financial years to 1974-75, calendar years thereafter.

Figure 2.16 Value and volume of exports of pyrethrum crude extract from Papua New Guinea, 1965 to 1993

son 1978, p. 3, World Bank 1982, p. 238), and chronic financial difficulties experienced by the sole processing plant.

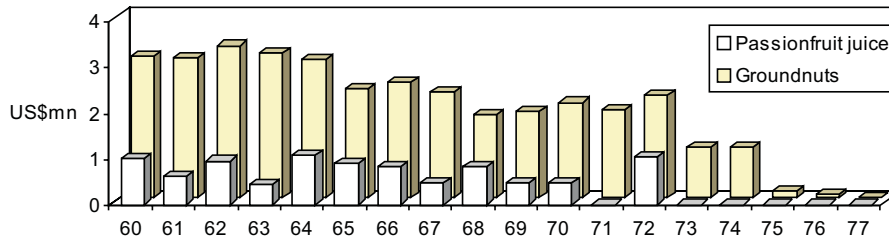
The industry has suffered from low farm-gate prices received relative to those of major East African competitors (Anderson 1978, p. 12), a factor not helped by high overhead costs in processing caused by the failure to increase factory throughput to the levels that were initially expected. Dried flower output of little more than 100 tons by the second part of the 1970s meant very low and uneconomic utilization rates for a factory with a production capacity of 800 tons per year. Throughput averaged around 350 tons in the early 1980s but declined after 1985, reaching less than one-third that volume by 1993.

Passion-fruit products

Exports of passion-fruit juice and pulp began in the mid-1950s and ceased in the mid-1970s (see figure 2.17). Despite initial promise, the real value of exports in the 1960s and 1970s never rose above that prevailing at the beginning of the 1960s until the final year of export (1972), except for a short-lived surge in export volume in 1964. The main reason for failure was lack of commercial viability in processing for export.

Groundnuts

Groundnut exports contributed quite substantially to total agricultural export values in the 1960s (see figure 2.17). Export values began to decline in real terms towards the end of that decade, picked up again in the early 1980s, then fell off sharply with the advent of independence, and ceased in 1977. The fortunes of the industry rested heavily on the success—or lack of it—of four processing factories. Lack of financial viability and inadequate processing facilities (Fintrac 1986) were major causes of the demise of the export industry.



Sources: 1960-71: Statistics Section (1973, p. 57); 1972-77: Rural Statistics Bulletins

Figure 2.17 Values of exports of passion-fruit juice and groundnuts from Papua New Guinea, 1960 to 1977

SOLOMON ISLANDS

Overview

High-value export performance

Ventures into high-value export crops by agricultural producers in Solomon Islands have so far been largely confined to value-adding processing associated with the introduction of two enclave industries (rice and oil palm) and a coconut oil milling industry. Little progress has been made in breaking into the high-value end of the market for the other major export industry (cocoa) or in developing HVNT niche markets for spices and the indigenous ngali nut.

Transport deficiencies remain a major impediment to export development (Wright, Marzin, and Crucefix 1991), despite major infrastructural works in rural areas over the past decade. Some of these works have been criticized, especially—given the importance of infrastructure to internal marketing of high-value export crops—the buying points set up in rural areas to facilitate the transfer of agricultural produce. Agrisystems (1992, p. 115) described their construction as fatally flawed. In their evaluation of the project of which construction of these facilities was part, ADB (1992, p. 4) concluded that the marketing infrastructure associated with the buying points was of little use. ADB felt that the centers that served as buying points should have been better linked to existing marketing infrastructure, and that “it is doubtful that the markets can operate on a sustainable basis without a highly subsidized marketing service” (ADB 1992, p. 6).

Macroeconomic background

Solomon Islands experienced moderate economic growth during the 1980s, punctuated in 1986 by problems caused by cyclone Namu. From 1990, however, the growth rate in GDP dropped to a low level (at which it remained in 1991), then experienced a sharp jump to 10 percent in 1993, before falling back to a low level in 1993 (NCDS 1995). Timber exports played the major role in the high growth rate in 1993 (World Bank 1993d).

The economy has suffered in recent years from fiscal imbalances, which have been financed by domestic borrowing. Double-digit inflation has been averaged over the past five years. Current account deficits, which were quite large at the beginning of the 1990s, have been brought into check in the past couple of years.

The real effective exchange rate has been allowed to depreciate markedly over the past decade, making the export sector among the most competitive in the South Pacific region. The World Bank (1995, p. 11) reported a fall of close to 40 percent between 1985 and 1992.

Foreign investment regime

The foreign investment regime in Solomon Islands has the following attributes (World Bank 1995, pp. 26-7):

- approval of foreign investment proposals is provided by the Foreign Investment Board on advice of the Foreign Investment Division of the Ministry of Commerce and Primary Industries;
- registered land available for leasing by foreign investors is restricted to 12 percent of land area;
- land disputes may arise;
- expatriate employment is only possible when trained nationals are not available;

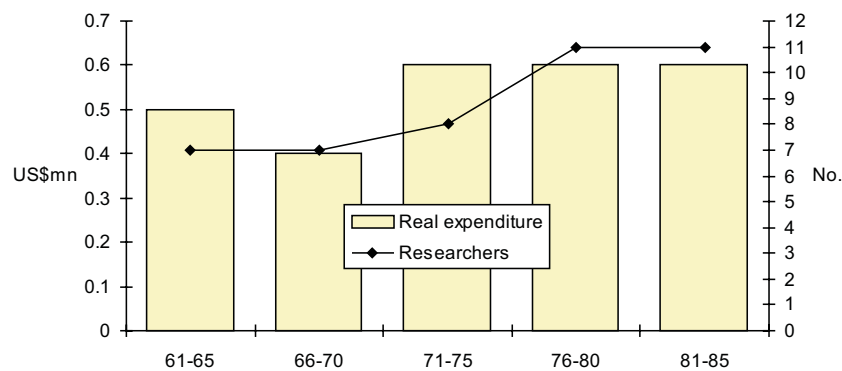
tailored incentives packages for foreign investors may include up to 10 years' tax holiday and 15 years for withholding tax, loss carry-forward, double tax deduction for training expenditures, and 150 percent tax deductions on interprovincial raw material transport and export promotion costs.

A period of negligible net direct foreign investment throughout the first half of the 1980s culminated in a net disinvestment of US \$1 million in 1986. A more favorable investment climate was put in place in the second half of that decade, and net direct foreign investment rose to US \$19 million by 1991 (Cole 1992, p. 12).

Agricultural research

Details of numbers of agricultural researchers and agricultural research expenditure for the period 1961 to 1985 are given in figure 2.18. Formal public agricultural research commenced in Solomon Islands in the 1950s (Wright, Marzin, and Crucefix 1991, Annex 2, p. 16). Numbers of researchers fluctuated between 7 and 11 during the 1970s, finishing the decade at higher levels than in the second half of the 1960s and first part of the 1980s. An impending decline in numbers after 1982 was arrested by the implementation of a major

agricultural development project, the Rural Services Project, which began in 1984 and funded some research positions in the latter half of the 1980s (ADB 1992). This project restored research expenditure per researcher during its implementation (1984 to 1991) following a marked decline during the late 1970s and early 1980s. Expenditure had dropped from around US \$62,000 per researcher during 1965-69 to below US \$25,000 in 1982. By 1986, it had recovered to over US \$100,000. Most of the increase was due to capital expenditures associated with the Rural Services Project of US \$1.071 million and recurrent expenditure of US \$1.181 million (ADB 1992, p. 30). Over 70 percent of the total research budget in 1986 was allocated to capital investment (Fernando 1987, p. 15). Almost 60 percent of research was funded through aid agencies in 1981 (Gamble, Bourke, and Brookson 1981, p. 61), and a large share of funds is still derived in this way.



Source: Pardey, Roseboom, and Anderson (1991, p. 417)

Note: Expenditures are expressed in constant 1980 US dollars using a purchasing power parity index.

Figure 2.18 Agricultural research numbers and expenditure in Solomon Islands: five-year averages, 1961 to 1985

In 1986, 70 percent of research positions were filled by expatriates (Pardey and Roseboom 1989, p. 388), a situation that still largely persists today. With continuing heavy reliance on external funding of agricultural research activity, the direction of research has to a large extent been dictated by the nature of this funding. Of the four local researchers in 1986, one had a MSc and three had BSc qualifications (Pardey and Roseboom 1989, p. 388). Little has changed the observation that Gamble, Bourke, and Brookson (1981, pp. 58-9) made a long time ago about the lack of indigenous researchers and trained support staff.

The goals of agricultural research in Solomon Islands were historically directed towards coconut production, with the operation of a joint Coconut Research Scheme between the Solomon Islands government and Lever Pacific Ltd (Gamble, Bourke, and Brookson 1981, p. 53). Other research priorities in the early years of independence (from 1979) mentioned by Gamble, Bourke, and Brookson (1981, p. 53) were in pasture improvement, cocoa variety, fertilizer response and disease control, oil palm fertilizer response, food crop screening and

disease control, rice disease control, and the introduction of minor cash crops. The introduction of minor cash crops was germane to plans to develop high-value export crops, but Gamble, Bourke, and Brookson (1981, p. 53) reported little success with these crops—ginger, chilies, and other spices—which were introduced “because of local resistance and lack of markets.” Of the 26 research projects in progress over the period 1980-85, as described by Gamble, Bourke, and Brookson (1981, pp. 66-7), all were production-oriented and only one—the introduction and evaluation of new cash crops—was likely to contribute directly to the development of high-value cash-crop exports. The emphasis in this project was on soil analysis, pathology, and entomology.

Until the latter part of the 1980s, all public agricultural research was conducted at the Dodo Creek Research Station, situated around 20 km to the east of the capital, Honiara, on the island of Guadalcanal. Gamble, Bourke, and Brookson (1981, p. 60) described research infrastructure at the station as inadequate for efficient research work, certainly inferior at that time for oil palm research by Solomon Islands Plantations Ltd (SIPL) and rice research by Brewers Solomon Associates Ltd (a US firm growing rice). Poor transport services, funding shortages, and problems in getting land access restricted the amount of on-farm research severely. Other shortcomings mentioned by Gamble, Bourke, and Brookson (1981, pp. 60-1) included a lack of research planning and evaluation, insufficient attention to the circumstances and research needs of small farmers, poor research information flow, and inadequate linkages between researchers and farmers. To this list can be added negligible capacity for economic and marketing research, which has persisted to the present. Wright, Marzin, and Crucefix (1991, Annex 2, p. 16) concluded that few research findings have yet been translated into improved agricultural practices.

Several research substations were created in the late 1980s as part of the Rural Services Project, but, since completion of this project, the number in operation has dropped. Attempts to introduce some FSR work within this project that could prevail in the postproject environment failed for the same sorts of reasons that had prevented much on-farm research work in the past. The ADB (1992, p. 8) observed that results of research programs under the project were disappointing, and many initiatives undertaken by expatriate researchers employed for part of its duration were soon abandoned.

Traditional Export Crops

Copra

The overwhelming importance of the traditional export of copra persisted until 1970, when the value of copra exports still accounted for one-half of the total value of exports from Solomon Islands (NCDS 1995), although well down on its relative contribution a decade earlier. The development of palm oil and cocoa in the agricultural sector and fish and timber exports during the 1970s saw copra’s share of agricultural and total exports quickly diluted. In the early 1980s, copra contributed less than 20 percent of total exports, and, by the late 1980s, this percentage had dropped below 10 percent. In 1992, the combined values of copra and coconut-oil exports were around eight percent of the value of total exports and one-third of the value of agricultural exports.

Coconut oil

A coconut-oil mill was constructed in the late 1980s. The product of a joint venture company formed in 1979 (Lever Solomons Ltd (LSL), which is owned by Lever Pacific Ltd and Land-Purchases Coops), the mill is managed by the Land Use Division within MAL. Its construction was funded by the Commodities Export Marketing Authority (CEMA) (Ilala 1989). While primarily established to mill copra from LSL plantations, it also mills up to 4000 tons of smallholder copra (Ilala 1989, p. 26). The economic success of this venture remains to be seen, given the unfavorable experiences elsewhere in small SPINs and gloomy long-term price forecasts for coconut oil, but the mill must be considered of doubtful viability.

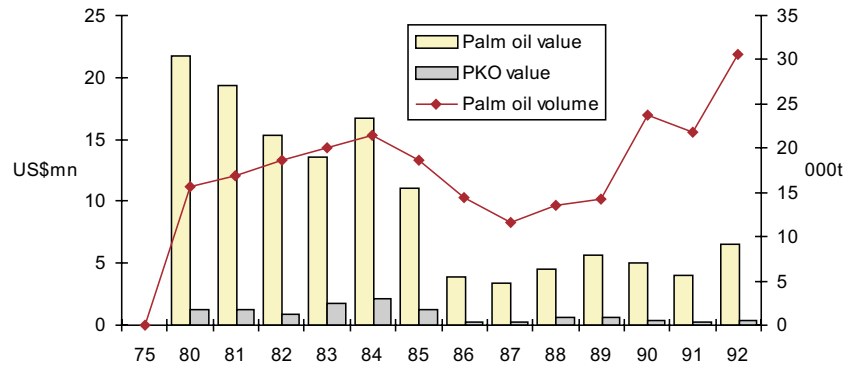
Exports of coconut oil began in 1990 at US \$700,000 in real terms. They had increased modestly to US \$800,000 by 1992.

Palm oil

The export strategy for palm oil in Solomon Island most closely resembles that of a close follower. The high-value component comes not from the nature of the product but from the value-adding processes carried out in-country prior to export. While palm oil is classified as a traditional export crop, it has not been a traditional export in Solomon Islands; planting began in 1971 following trial plantings between 1965 and 1970 (World Bank 1980, p. 23). First exports were achieved in 1976. The industry arose out of a joint venture between the Solomon Islands government (26 percent of shares) and the Commonwealth Development Corporation (CDC) (70 percent) which formed SIPL in 1971. The remaining four percent of shares went to the landholders (Ernst and Young 1990, p. 18). Original plans called for development of the industry along nucleus estate lines, as in Papua New Guinea, but this never eventuated, and it has remained an enclave export industry. The main reason given for the failure to develop a nucleus estate component was lack of smallholder interest in either growing oil palm or participating in a nucleus estate (World Bank 1980, p. 24).

As can be seen from figure 2.19, oil palms have established very well in Solomon Islands, and industry performance has been impressive. The industry rapidly assumed a position of importance as an earner of foreign exchange—and as a contributor to value added in the domestic economy—through palm oil and palm-kernel oil (PKO) exports. These exports had reached a combined value of almost US \$23 million by 1980, just four years after they began. Their value then declined slowly until 1983 in the face of lower world palm-oil prices, despite an upward trend in export volumes, which continued until 1984. High prices lifted export value in the latter year.

The year 1986 saw devastating effects on export volumes and values caused by cyclone Namu. The impact of the cyclone was to be felt for some years thereafter. Despite this setback, however, export volume quickly recovered and by 1990 had surpassed the previous highest level (in 1985). Despite falling real world prices beyond 1985, export volume increased from 11,562 tons to 30,540 tons, enabling values to increase gradually between 1987 and 1992, even though by 1991 revenue was only one-quarter that achieved seven years earlier in 1984. The value of palm oil exports recovered in 1992, almost doubling the 1991 figure, thanks largely to further increases in export volume as well as a 40-percent recovery in export unit value (NCDS 1995).



Source: NCDS (1995)

Figure 2.19 Value and volume of exports of palm oil products from Solomon Islands, 1975 to 1992

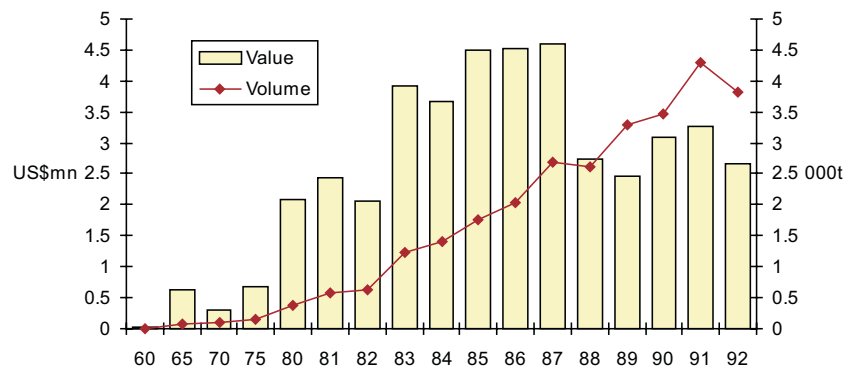
The major threats to the industry are climate and limited world market prospects for palm oil. The resilience of oil palms to cyclones and floods was severely tested by cyclone Namu in 1986, which badly affected some parts of the oil-palm plantation (see above). Export revenues declined after 1989 because of low world prices for palm oil, with unit export values falling from US \$561/ton in 1989 to US \$299/ton in 1990 (World Bank 1993d, p. 51), then to around US \$200/ton in 1991-92. Although published export figures are not yet available beyond 1992, increases in palm-oil prices can be expected to have raised export values in recent years.

Cocoa

Cocoa has been grown in Solomon Islands for many decades, with limited areas planted prior to the second world war (Chase 1986, p. 1). By the 1960s, the industry was dying, beset by problems largely arising from shortcomings in the Cocoa Scheme implemented in the late 1950s and early 1960s. Inappropriate research had led to the planting of unsuitable varieties of Trinitario cocoa, which were causing problems in fermentation, were very susceptible to pests and diseases, and were badly planted and planted in the wrong places (Chase 1986). These problems were exacerbated by dispersed plantings that made collection and marketing difficult and costly and also by poor quality output of beans, caused primarily by the unfamiliarity of smallholders with proper fermentation and drying processes (World Bank 1980, p. 23, Chase 1986). Renewed efforts to develop the industry in the 1970s were made not by MAL but by private entrepreneurs developing road-buying and processing facilities, especially in North-West Malaita. Field officers in MAL supported this development through measures aimed at increasing the area under cocoa through the provision of seedlings, raising tree productivity, and improving processing methods. This renewed interest in cocoa production was shared by both smallholder and plantation sectors, and both now contribute substantially to cocoa exports. By the early 1990s, smallholders and planta-

tions supplied about equal shares of total cocoa exports, after plantations had contributed significantly more exports during most of the 1980s (NCDS 1995).

An increase in the export of cocoa beans from the mid-1970s can be seen in figure 2.20. Export values increased ahead of export volumes until 1987, with the impacts on values of the commodity boom of the early- to mid-1980s clearly seen. A depressed world cocoa market in the late 1980s and early 1990s had a dramatic effect on export values even though volumes continued to rise sharply until 1991. In general, cocoa is an export crop in which Solomon Islands has a comparative advantage (Wright, Marzin, and Crucefix 1991).



Sources: 1960-75: Statistics Office (1979, p. 33); 1980-92: NCDS (1995)

Figure 2.20 Values and volumes of exports of cocoa from Solomon Islands, 1960 to 1992

The industry has been less successful in raising the quality of exported beans to earn premiums. It has been a hard enough struggle for the industry simply trying to achieve average export quality. According to Ivarami and Coulter (1992, pp. 165-6), estimates of f.o.b. prices of cocoa in Solomon Islands compare unfavorably with those for Papua New Guinea. Linton (1986) observed that a negligible amount of work had been done on aspects of cocoa quality by the mid-1980s. Only in the plantation sector has it proved possible consistently to earn some quality premiums. Recent developments in the industry have been based on the planting of Amelonado varieties. As in other cocoa-producing SPINs, the move away from the higher-value Trinitario varieties that originally formed the basis of the industries has helped raise yields and robustness, but it has made it more difficult to earn premiums on exports and hence develop a high-value industry segment.

The major challenge facing the industry, given a soft world market, is to maintain profitability in production, processing, and marketing through a combination of (a) improved marketing infrastructure, which improves market access by smallholders, encourages more active private buying and reduces transport costs, (b) productivity gains, and (c) quality improvements. Private local dealers, processors, and exporters will need to bear much of the burden in raising quality, although the assistance provided by CEMA is also critical. CEMA li-

censes exporters, has undertaken grading since 1986, and also inspects export cocoa (Pelomo 1992), but the effectiveness of its operations has not been great (West 1992). Provincial governments are responsible for licensing intermediate buyers and processors (Pelomo 1992), to even less effect.

Productivity gains will depend largely on how well participants in the industry overcome the problems of a lack of commitment to plantation maintenance, shortage of external inputs, especially fertilizer, and yield losses caused by an unwillingness to thin coconut stands used as shade (Chase 1986). Until recently, support services provided to smallholders have been found wanting (West 1992) and have done little to help participants overcome low productivity.

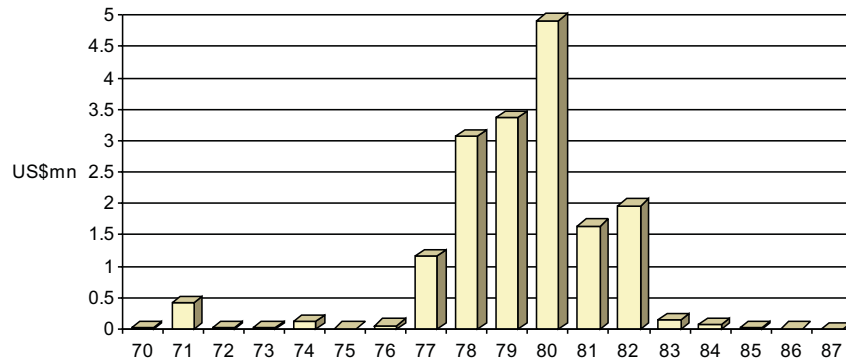
Global Staples

Rice

Rice in Solomon Islands arguably qualifies as a high-value export crop on the grounds that the industry introduced substantial nontraditional value-adding activities. In one of the most unlikely and miscalculated agricultural export ventures experienced in the South Pacific, Solomon Islands became an exporter of rice in the 1970s and early 1980s. The rice industry was the manifestation of an abiding concern by policymakers in SPINs about the amount of food imported, especially rice, when they reasoned it should be possible to grow enough food domestically to satisfy staple food needs. The folly of this concern, when put into practice by subsidizing the production of grains such as rice, is clearly shown by Gibson (1995) in respect of rice production as a import-substitution industry in Papua New Guinea. Gibson clearly shows that SPINs are at a massive comparative disadvantage in rice production.

In the case of Solomon Islands, irrigated rice was grown on the Guadalcanal Plains in a highly intensive fashion using mechanized techniques. The industry eventually failed when pest problems, made worse by difficulties in maintaining machinery in good working order (Abeyinghe 1981), exacerbated the economic plight already confronting the industry. Cyclone Namu in 1986 finally brought rice production and export to an end (World Bank 1993d, p. 61).

The industry was established originally as a food import-substitution industry. However, a production capacity beyond the domestic rice needs of Solomon Islands, coupled with observations that nearby SPINs also imported rice (hence the opportunity to follow a market-focus strategy), led to the sale of surplus rice in the export market. Rice was originally produced in the 1970s by Guadalcanal Plains Ltd, but financial difficulties led to a joint venture being set up between Brewers Solomon Associates Ltd and the Solomon Islands government in 1974. The quadrupling of the harvested area from 599 ha in 1975 to 2512 ha in 1978 (World Bank 1980, p. 23) led to a rapid increase in rice output that was surplus to domestic needs and hence to a rise in exports, as seen in figure 2.21. When exports peaked at almost US \$5 million in 1980, rice had bizarrely become the fifth most valuable export in the country and the third most valuable agricultural export after copra and palm oil. This high level of export was not to last, and the export industry disappeared as fast as it grew.



Sources: 1970-78: Statistics Office (1978); 1979-87: NCDS (1995)

Figure 2.21 Exports of rice from Solomon Islands, 1970 to 1987

HVNT Export Crops

Ngali nuts

Ngali nuts, which are the produce of *Canarium indicum*, have been one of the more innovative ways of creating a niche export market based on a well-established traditional food crop. The edible kernel of a tree, ngali nuts are significant in traditional society in Solomon Islands (Pelomo et al. 1996). They have some positive attributes for a niche export crop, but they also have some less attractive ones.

A small amount of vacuum-packed roasted kernels are sold locally, but throughput constraints have limited sales to the domestic market. Kernels have been the main export. Oil is also extracted from the nuts for perfume and body lotion, and CEMA contracted to export tanning lotion to Body Shop International in 1993 (Pelomo et al. 1996, p. 77).

Purchases of nuts began in 1989, and 205 tons were purchased in 1992 (Pelomo et al. 1996, p. 77). Exports developed in 1991. Thus far, exports of only SI \$184,000 (about US \$37,000 in 1987 values) have been earned (Pelomo et al. 1996, p. 77). Two corporations have entered into commercial production: a parastatal initiative (involving the Dodo Creek Research Station, which carries out the processing, and CEMA, which is responsible for marketing) and a private village enterprise, which is part of a community-development project on the island of Makira (IRETA 1996).

Positive attributes include ease of harvesting from the numerous mature trees in forests and villages, intimate familiarity of smallholders with production and consumption patterns, unique taste, and the existence of small but remunerative niche export markets for the nuts in Australia and Asia.

The major disadvantage at present is a lack of knowledge for commercialization: technical knowledge, market information, and knowledge of how to exploit the export market potential (Pelomo et al. 1996, p. 78). Some international research assistance has been given in overcoming this hurdle, but the product is still in the early stages of market development and marketers are still learning about how to identify the most profitable product lines. A second difficulty being experienced is in establishing quality control for both kernel and oil exports (Pelomo et al. 1996, p. 78). Third, IRETA (1996, p. 5) alluded to the reluctance of village producers to supply nuts because of their cultural value. Fourth, numerous other nuts, such as macadamia, pistachios, and almonds, grown in nearby nations on a larger scale and with greater quality control, provide stiff competition in export markets. Other constraints are high transport costs and scale diseconomies encountered in marketing small volumes (Pelomo et al. 1996, p. 78).

Spices

The potential for spice exports from Solomon Islands was recognized in the early 1960s (Gollifer 1972). Fieldwork on the suitability of production of a number of spices has now been undertaken over a long period, showing that many can be grown successfully in the physical conditions prevailing in Solomon Islands. Some farmers showed early interest in growing spices, such as chilies, turmeric, ginger, cardamom, cloves, vanilla, and nutmeg, but earned relatively low returns to labor (World Bank 1980, p. 24), which retarded the growth of any substantive smallholder spice export industry.

Four types of chilies were introduced in the 1960s and irregularly exported from the late 1960s (Abeysinghe 1981, pp. 46-8). Turmeric was tested first at Dala Research Station in 1972, and exports ranging in value between SI \$1000 and SI \$3000 were recorded for the period 1972-80 (Abeysinghe 1981, p. 50). Two varieties of ginger have been grown in Solomon Islands since 1973, and, although modest production levels of around 3 to 4 tons were achieved during the 1970s (Abeysinghe 1981, p. 52), no export industry was established. Vinning (1990, p. 32) reported returns to labor in chili production that were less than one-third those to coconut production. Vanilla (1958-59), cardamom (1972), cloves, and nutmeg (1974) were all successfully introduced into Solomon Islands (Abeysinghe 1981, pp. 53-8). Despite some experimentation, however, none progressed to export crop status.

A spices project was established in the 1980s to explore the prospects for new spice industries and improve performance in the small existing industries of chilies, turmeric, and ginger. The project ensued from a thorough survey by AACM (1983) of the export prospects for nontraditional crops in Solomon Islands.

Marketing constraints provided the major limitations to expanded export production of all spices mentioned above, especially lack of adequate marketing infrastructure (Green 1985, Pelomo 1991). High labor requirements and commitment (Vinning 1990, pp. 28, 33; Wright, Marzin, and Crucefix 1991, Annex 4, p. 2) and a lack of specialized extension services until recently (Pelomo 1991) have also been contributing factors.

TONGA

Overview

Tonga has a cooler climate than most other SPINs, enabling the production of temperate crops, especially during the winter months and on the more southerly main island of Tongatapu. Cyclones occur but tend to be infrequent, as do short-term droughts. The agricultural resource base is robust and soils are good by the standards of most SPINs.

The population of Tonga is around 100,000 people, spread over three main island groups—Tongatapu and 'Eua, Ha'apai, and Vava'u—with a few other small inhabited islands.

High-value export performance

For such a small nation, Tonga has provided some rich material on the development of high-value export industries in terms of both successes and failures. Greatest success has been achieved in the niche export industries of squash, vanilla, and root crops. Less successful attempts have been made to export processed coconut and fruit products, other fresh produce, and bananas.

Macroeconomic background

The Tongan government recently reiterated its commitment to an export-led growth strategy with a strong emphasis on high-value agriculture. As part of this strategy, according to an attachment to a memorandum from the Minister of Finance dated 18 February 1994, it plans to “accelerate private sector development and rationalize the size of the civil service ... restructure the Ministries/Departments to support expansion of the private sector ... and ... streamline administrative procedures and rationalize exemptions if any, to the private sector.”

The balance of payments is maintained largely by aid and remittances, which have kept the domestic currency (the Pa'anga) relatively strong. Between 1987 and 1993, the real effective exchange rate actually appreciated quite substantially (World Bank 1995, p. 11). Macroeconomic strategy depends to a considerable degree on the sustainability of remittance and aid flows. Some remittances are really payments for agricultural goods exported from Tonga to expatriates (World Bank 1991b), a form of trade that is likely to continue and become more commercial. Whether the flow of genuine remittances will continue at its current rate is difficult to tell. Some decline can be expected as the flow of new emigrants declines and relations between emigrants and their families in Tonga become more attenuated, but it will also depend on economic conditions for emigrants in the overseas nations (Fleming and Hardaker 1995). Some decline in aid flows can be expected as Tongan incomes improve. To the extent that aid and remittance flows decline over time, some devaluation of the Pa'anga can be expected, making high-value agricultural exports more competitive.

Foreign investment regime

The World Bank (1995, p. 11) reported that the foreign direct investment regime in place in Tonga has the following distinctive features:

- investment proposals are reviewed by the Standing Advisory Committee on Industrial Licensing in the Ministry of Labour, Commerce and Industries;
- land may only be leased by foreigners—although in practice there is an active rental market for agricultural land (Fleming and Hardaker 1995);
- the government puts no formal restrictions on the employment of expatriates but expresses a preference for hiring nationals;

incentive packages are tailored for foreign investors and may include income tax holidays for five years with a possible five-year extension, additional tax holidays for expansion activities, tax depreciation of assets after the tax holiday, duty-free capital goods imports for two years, custom-duty exemption for raw materials used in export industries, 50-percent concessional rate provided on port and service tax, time-bound protection from competition, provision of industrial site space, and priority access to telephone and water connections.

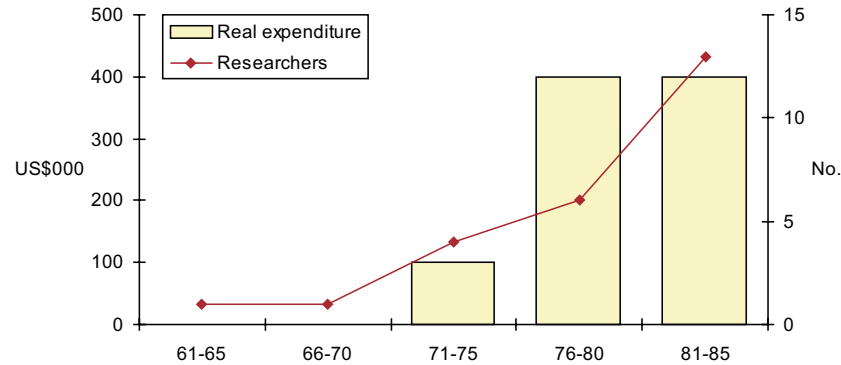
Despite these inducements, net direct foreign investment has remained at low levels (Cole 1992, p. 12).

Agricultural research

Figure 2.22 contains information on trends in research personnel numbers and expenditure for the period 1961-1985. The substantial increase in research activity from a negligible base in the 1960s and 1970s is manifest. As in other SPINs of comparable size, the Tongan research budget—and to some extent the direction of research activity—is largely dictated by foreign assistance. Research was historically funded out of aid funds, which were the source of over 60 percent of the 1980-81 research budget (Gamble, Bourke, and Brookson 1981, p. 15). The apparent leveling off in research expenditure during the 1980s, despite numbers more than doubling by 1986, can be partly explained by the exclusion of expatriate salaries from the figures presented in figure 2.22 (although external funding of research infrastructure costs is included). The number of expatriate researchers tripled from four in 1981 to 12 in 1986 when they represented more than one-half the total research staff (Pardey and Roseboom 1989, p. 443). Of the nine local researchers in 1986, three possessed MSc degrees and six had BSc degrees.

Agricultural research is undertaken by the government in Tonga and is based primarily at the only research station, the Government Experimental Farm, at Vaini on the main island of Tongatapu. Very limited research work is also undertaken on three research farms on nearby 'Eua and in the other two main island groups, Vava'u and Ha'apai. Historically inadequate, research infrastructure at the main research station was greatly improved during the 1980s, following the construction of new laboratory facilities and purchase of new equipment using German and New Zealand aid funds.

A review of the research program for the Research Division of the Ministry of Agriculture, Fisheries and Forests (MAFF), now the Ministry of Agriculture and Forests (MAF), reflects



Source: Pardey, Roseboom, and Anderson (1991, p. 417)

Note: Expenditures are expressed in constant 1980 US dollars using a purchasing power parity index. Expenditure figures exclude salaries paid to expatriate researchers.

Figure 2.22 Agricultural research numbers and expenditure in Tonga: five-year averages, 1961 to 1985

a greater commitment to the development of high-value traditional exports than in most other SPINs. Nevertheless, the majority of projects still emphasize research into the production of local and introduced food crops, traditional export crops and livestock (MAFF 1981, pp. 23-9).

The current mission statement of MAF implies a strong emphasis on technological progress—implying a strong research role—and an involvement in both production and marketing:

To provide adequate, appropriate, timely and high quality technologies, services, facilities and market access to the farming communities including agri-business clients to increase their productivity and income.

Fleming and Hardaker (1995) discerned no clear agricultural research strategy in MAF, concluding that research work is largely driven by the inquiries made to the personnel in the research division and the decisions made by individual researchers. Cash crop research is concerned chiefly with short-term problem solving. This approach has led recently to a preoccupation with what could be regarded as nonresearch functions. An example is the multiplication of taro planting material, following complaints that lack of such material led to the recent relative failure of Tongan exporters to fill the gap in the New Zealand market for *Colocasia* taro, following the cessation of exports from Western Samoa. This has two possibly damaging consequences: diversion of valuable resources from more important research work and the crowding out of private enterprise from key areas of export market development.

Fleming and Hardaker (1995) reported that the development of alternative high-value export crops be given high priority within the Research Division of MAF. They cast doubt, however, on whether such efforts would be any better directed than they had been in the past, when successes were few.

Some useful farming systems research work began in the late 1980s (Gyles and Petelo 1988; Gyles et al. 1989b), but has fallen away in recent years despite a commitment in principle. The Economics and Planning Section in MAF has also done some useful economic analyses of production of crops and livestock, although its contributions have fluctuated according to the vagaries of staffing.

Gamble, Bourke, and Brookson (1981, pp. 97-98) identified a number of shortcomings in the research system. Information flow was considered inadequate, and planning was severely restricted by shortages of experienced, qualified personnel and funds. There was also a shortage of funds for recurrent inputs and travel, which persisted through the 1980s and somewhat negated the beneficial impact of the improved research infrastructure.

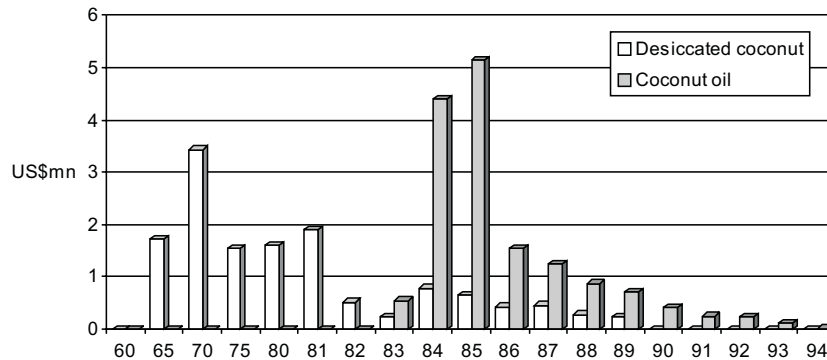
Traditional Export Crops

Copra

Copra exports have followed the same path as in many SPINs, being the predominant export and source of rural cash income along with bananas, until the emergence of nontraditional exports. During the 1970s, when the banana industry was in the doldrums, copra was supplying between one-half and three-quarters of the total value of exports (NCDS 1995). Its "fall from grace" in Tonga was instigated in the late 1970s and early 1980s by the rise to prominence of desiccated coconut exports and the introduction of coconut-oil milling. Exports should have ceased not long after oil milling started, but they lingered at low levels through the 1980s and into the early 1990s (World Bank 1993e, p. 49).

Coconut oil

The construction of an oil mill in 1982 promised to provide a major value-adding industry in Tonga, improving returns from the coconut export industry dominated at that stage by traditional copra exports. Within a decade, the mill had failed to fulfill expectations after good early performance. The tale of the rise and fall of coconut oil exports is told in figure 2.23. Beginning in 1983, exports had climbed above US \$5 million by 1985, spurred by high world prices, but had fallen to only US \$13,500 by 1994. There are four chief reasons for the decline of the industry. First, the world market conditions for coconut oil in recent years have been depressed, with a declining margin between copra and coconut oil (World Bank 1990, p. 14) (although this has since altered with a resurgence of the world coconut oil market in 1994). Second, poor mill management has resulted in low productivity. Third, there are inherent problems in operating a mill with such small throughput in a profitable manner (World Bank 1990, p. 14). Finally, competition for agricultural labor has intensified as a result of the rapidly expanding squash export industry since 1990.



Sources: 1960-65: Kingdom of Tonga (1970); 1970: Minister of Agriculture (1970); 1975: CPD (1976, pp. 25-6); 1980-85: Statistics Department (1987, pp. 117-8); 1986-93: NCDS (1995)

Figure 2.23 Exports of processed coconut products from Tonga, 1960 to 1993

Desiccated coconut

Going back to the early 1960s, the production of desiccated coconut has a longer history than that of coconut oil. As with coconut oil, desiccated coconut production was seen as a way of adding value in the coconut products industry. Processing was undertaken by a subsidiary of the Tonga Commodities Board ('Akolo 1992, p. 203).

The halcyon days of the industry were in the 1970s and early 1980s (see figure 2.23). The value of exports peaked in 1970 at just over US \$3 million. The industry set into decline from the mid-1980s, and was virtually extinct before the turn of the decade. Reasons for its failure were similar to those described above for coconut oil, but labor, quality, and technical problems in factory processing were especially damaging ('Akolo 1992, p. 205).

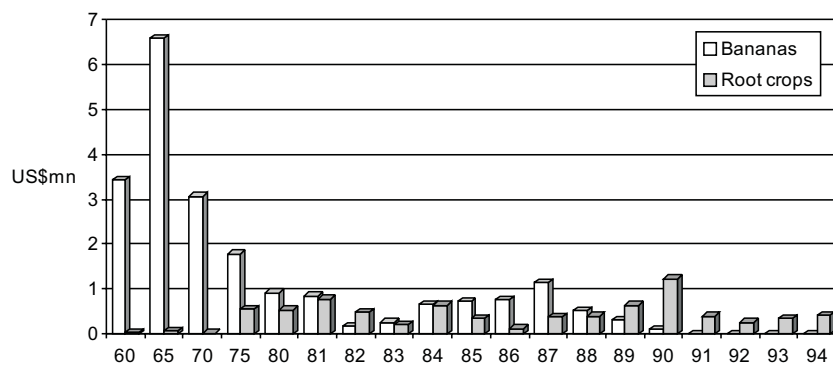
Bananas

The history of the banana industry in Tonga is not much different from other SPINs that have exported bananas to the New Zealand market. Export of almost 3000 tons of Cavendish bananas to the secure New Zealand market began in 1953. Export earnings reached their highest level in 1967 when over 20,000 tons were exported. After a decade and a half of successful trade, changed production and marketing circumstances from 1968 really sealed the fate of the industry, particularly when it was devastated by black leaf disease. Despite two short-lived attempts to revive it—the first in the 1970s and the second in the early to mid-1980s (Felemi 1991), using New Zealand aid—the industry is once again in a dying state.

The first attempt to revive the industry, which took place between 1971 and 1977, centered on disease control and fertilizer usage by growers (Felemi 1991). The second attempt, entitled the Renewed Banana Revitalization Scheme, was effected under the responsibility of

the extension personnel and concentrated on registered growers. It was originally planned for 1981, following the establishment of the Banana Working Committee, which produced a report on the state of the industry in 1979 (Banana Working Committee 1979) and aid negotiations with the New Zealand government in 1980, but delays forced it to be rescheduled to 1982 (MAFF 1981, p. 17). It too fell by the wayside after some initial success.

The bumpy ride experienced by this export industry is shown in figure 2.24 as the decline in exports during the 1970s was scarcely arrested by the first attempt to rehabilitate the industry. The second attempt at revival led to some initial success with the value of exports reaching more than US \$1 million in 1987. Even though these initial results were promising, Felemi's (1991) economic analysis shows that the revitalization effort was probably doomed from the start, maintained only by large project subsidies. The onset of production and marketing management problems towards the end of the 1980s, abetted by market liberalization and discovery of fruit fly in a consignment of plantain in New Zealand (World Bank 1990, p. 15), merely hastened the decline of the industry.



Sources: 1960-65: Kingdom of Tonga (1970); 1970: Minister of Agriculture (1970); 1975: CPD (1976, pp. 25-6); 1980-85: Statistics Department (1987, pp. 117-8); 1986-934: NCDS (1995)

Figure 2.24 Exports of bananas and root crops from Tonga, 1960 to 1994

The World Bank (1990, p. 15) reported on the imminent liberalization of the New Zealand banana market in 1990. This more than anything else dampened prospects for a revival in banana exports as Tonga now finds it particularly difficult to compete on cost with bananas from Ecuador and the Philippines. There is nevertheless a possible window of opportunity for a niche market in New Zealand if disease and quality control are effective and efficient, and in particular if minimizing shelf-life variability is possible (World Bank 1990, p. 15), something that has so far proved difficult to achieve.

In a similar vein, SPC (1996, p. 1) discussed the prospects for niche exports of bananas, and identified five possible options:

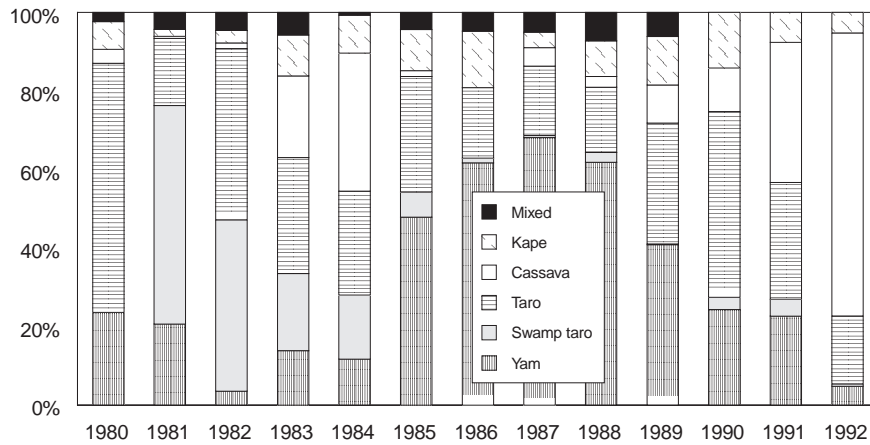
- a market focus strategy for existing export varieties directed at the Polynesian ethnic community in Pacific-rim nations, presumably following a strategy similar to that employed for taro;
- a product differentiation strategy focused on specialty dessert varieties;
- a market-focus/product-differentiation strategy based on organically grown bananas, in which the bananas would be differentiated by their organic production, and sales focused on the market segment favorably disposed to organically grown food;
- a product-differentiation strategy, which entails marketing Cavendish bananas as “Island bananas,” focusing on the sweetness of taste and texture of South Pacific bananas relative to those from competing nations, because anecdotal evidence suggests that many consumers prefer these;
- market-focus/product-differentiation based on the sale of cooking-banana varieties, again presumably with a Polynesian ethnic focus.

Minor Food Crops

Root crops

Tonga exports a variety of root crops predominantly to its expatriate populations in New Zealand, Australia, and the USA using a market-focus strategy. Details of the values of root-crop exports over the period 1960 to 1993, presented in figure 2.24, show that they have remained at modest levels since the mid-1970s and were at low levels until the latter part of the 1980s. The main impetus to increase exports came in 1989 and was the outcome of a growing expatriate population in New Zealand and more attractive returns to production for export. Shortfalls in taro exports by Western Samoa led to significant increases in Tongan exports to New Zealand in 1989-90 and since 1993, although, as reported above, shortages of planting material retarded response to this opportunity in the latter period. Higher values of Tongan root-crop exports can be expected in the future so long as taro leaf blight enforces Western Samoa's absence from the market.

Exporters have managed to achieve a greater variety of exports than those from other SPINs. Figure 2.25 gives the decomposition of root crop exports from 1980 to 1992. It shows the relative importance of yam and taro (*Taro tarua*) exports, which have proven to be very profitable for private firms recently, especially to New Zealand. The composition tends to change from year to year according to seasonal conditions and export market opportunities. The relative importance of taro exports declined during the late 1980s in favor of yam exports, only to recover again by 1989. Their importance has continued into the 1990s, although they have generally been much less prominent than in other SPINs. This has been due chiefly to their less preferred variety and inferior marketing methods in penetrating the New Zealand market (Fleming and Hardaker 1995). Swamp-taro exports were prominent in the early 1980s, but were negligible in the latter part of the decade as yam and taro exports regained the popularity they had achieved by 1980. Cassava exports have gained prominence in recent years, largely at the expense of yam exports.



Sources: 1980-84: Statistics Department (1987, pp. 117-8); 1985-89: Central Planning Department (1991, p. 122); 1990-92: Statistics Department (1993)

Figure 2.25 Decomposition of root-crop exports from Tonga, 1980 to 1992

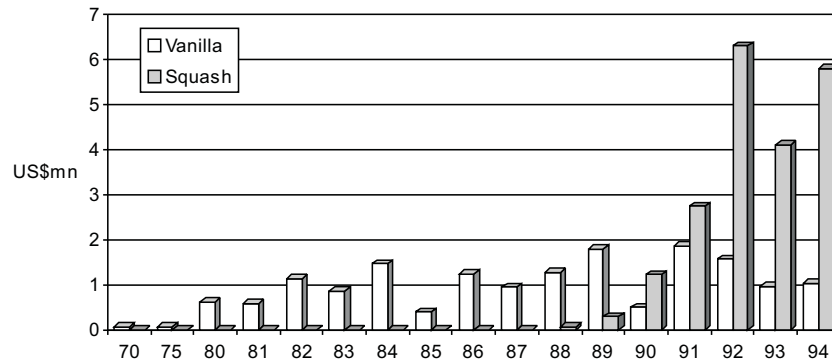
HVNT Export Crops

Squash

The export of pumpkin squash from Tonga to the high-priced Japanese niche market in the months of November and December has undoubtedly been one of the post-war success stories in agricultural exporting from SPINs. This success is all the more impressive, because it entailed penetration of one of the most difficult agricultural markets possible in terms of quality standards. It demonstrates how quickly and energetically smallholders will respond to economic incentives when production and marketing circumstances are favorable.

The industry was established by the activities of a private firm from New Zealand, whose activities were critical to early market penetration (World Bank 1990, p. 15). This firm was excluded from export activities by the government in the following year, and control over exporting activities then passed to the Tonga Growers Association in 1989, which distributed licences mainly to politically well-connected exporters (Fleming and Hardaker 1992). Assistance was provided by MAF, Tonga Development Bank (TDB), and other government agencies in the areas of credit provision, production and market research support, negotiation of forward contracts, quality control, assisting with packing and shipping, setting and distributing quotas to limit exports, and the execution of what was in effect a program for guaranteeing grower price (Fleming and Hardaker 1995).

As can be seen in figure 2.26, exports grew from nothing to almost US \$10 million in the space of four years. In the early stages of development, when the Growers Association took over organization of the industry, problems of poor quality—not just of the product itself



Sources: 1970: Minister of Agriculture (1970); 1975: CPD (1976, pp. 25-6); 1980-85: Statistics Department (1987, pp. 117-8); 1986-934: NCDS (1995)

Figure 2.26 Exports of squash and vanilla from Tonga, 1970 to 1994

but also other elements such as packaging and timeliness in supply—threatened to destroy the niche (Fleming and Hardaker 1992). The World Bank (1990, p. 15) reported that a government subsidy of T \$500,000 in 1989 was crucial to survival of the industry, despite a good growing season, because quality problems had deflated average prices received by growers to the point where production became unprofitable.

Can the industry last, or is it just another example of the boom-bust syndrome? Conditions are certainly favorable for defending the niche, but great dangers lie in wait that could see export revenues quickly evaporate. These dangers reflect quite accurately the major problems of success faced by most niche export industries in SPINs. Chief among them are the following:

- foreign competition from other SPINs and larger nations in the Pacific rim—notably, New Zealand, Vanuatu, New Caledonia, Australia, and Mexico—some of which are attempting to overcome the technical constraints to producing squash for the Japanese market in the November-December period;
- conflict with the traditional farming system and production risks of greater incidence of pests, diseases, and soil degradation that accompany intensification of production and monoculture (World Bank 1990, p. 15, Fleming and Hardaker 1992), especially on Tongatapu, where a high proportion of the cultivated land is now in squash production (Fleming and Hardaker 1995);
- politicization and bureaucratization of the industry, where politicians and government officials seek to become more involved in decision making (these risks have been ever-present in the squash industry in Tonga, and a preferable route would have been to leave such a risky market in the hands of the private sector);
- maintenance of quality control, given the exacting quality assurances demanded by Japanese importers.

The issue of land degradation due to intensive squash production has been exercising the minds of the Research Division of MAF. The use of mechanized land preparation methods is common, and evidence suggests that this has increased the loss of organic matter and damaged soil structure. Fleming and Hardaker (1995) reported that farmers once grew squash as a monoculture but quickly came up against falling yields. Most switched to a rotation involving root crops and a grass fallow, but they have not benefited as much from this as they might because of burning off and a lack of use of legumes for nitrogen fixation.

A further concern is that the squash industry has been built on increasing farm debt to the TDB. Fleming and Hardaker (1995) highlighted the degree of risk exposure by pointing out that the Tonga Development Bank had approved loans to a total of T \$7.7 million to squash producers by September 1994, with more costs still to be met, against annual exports grossing T \$12.89 million in 1993/4 (NCDS 1995). They observed that the loans were mostly unsecured except that receipts from squash sales are meant to be assigned to TDB.

Vanilla

Less dramatic but equally as effective as the squash industry, vanilla (*Vanilla fragrens*) has been one of the most enduring success stories in the export of HVNT crops in the South Pacific, and attempts have been made in other nations in the region (see Niue and Vanuatu) to emulate the performance of Tongan vanilla exporters. To date over 2000 farmers have participated in vanilla production, especially in Vava'u.

Exports grew slowly in the early 1970s. They began at the initiative of a handful of private individuals, one of whom was an official in MAFF as well as a grower, assisted by an operative working for a nongovernment organization, who helped establish contact with foreign buyers (J. Launder, personal communication, 1995). In its initial phase, the industry was not helped by the operations of the Tonga Commodities Board which was paying producers much less than could be obtained through direct dealings with private buyers.

Modest progress was made in vanilla exporting until world prices more than doubled from US \$62/kg to US \$132/kg (New York spot) between 1979 and 1980 (World Bank 1990, Annex 2, p. 19). This price rise was primarily due to reduced exports from the traditionally dominant world producer, Madagascar, in the late 1970s. The area and supply response to price by Tongan producers was marked (Fleming 1988). Even though prices fell back to around US \$70/kg, increased plantings and production took place in the early 1980s. This increased production activity was facilitated by an Asian Development Bank-funded Vanilla Development Project (Fleming and Hardaker 1992). It culminated in a leap in export values from under US \$0.5 million in 1983 to US \$1.78 million six years later in 1989 (figure 2.26). Since then, the industry has undergone a period of consolidation although output has stagnated at around US \$1 million in the past couple of years. Fleming and Hardaker (1995) attributed this partly to the fact that many growers shifted to squash production, yet also noted that vanilla production has been expanding on Tongatapu, where most squash production has been taking place. Another explanation they gave was that marketing difficulties on Vava'u, the center of vanilla production, were created by ill-managed vanilla buying by the former parastatal, the Tonga Commodities Board.

Menz and Fleming (1989, pp. 7-9) listed a number of favorable attributes of vanilla as an export crop for South Pacific nations:

- adaptability;
- ease of production;
- absence of major pests and diseases;
- value-adding processing activities requiring relatively small amounts of capital and simple techniques;
- storability of the processed product;
- a high weight-value ratio;
- sound prospects for profitable production.

The industry is also favored by its affinity with traditional agriculture (Vinning 1990, p. 33) and the fact that it has fitted well into the existing farming system. The World Bank (1990, p. v) reported that it was possible to `vanilla to the farming system while still maintaining productivity in other, main subsistence food activities.

There are four dangers that the industry could, or does, face. First, the major constraint is the high labor commitment in production and curing (Vinning 1990, p. 32). In particular, there is a need to pollinate during the flowering season, a laborious task requiring some care and dexterity. Farm households appear to have overcome this constraint satisfactorily in Tonga. Women have proved themselves to be competent and reliable in performing pollination (and other tasks, including postharvest activities), so the industry has been helpful in providing many women with a valuable source of cash income (World Bank 1990, p. 15).

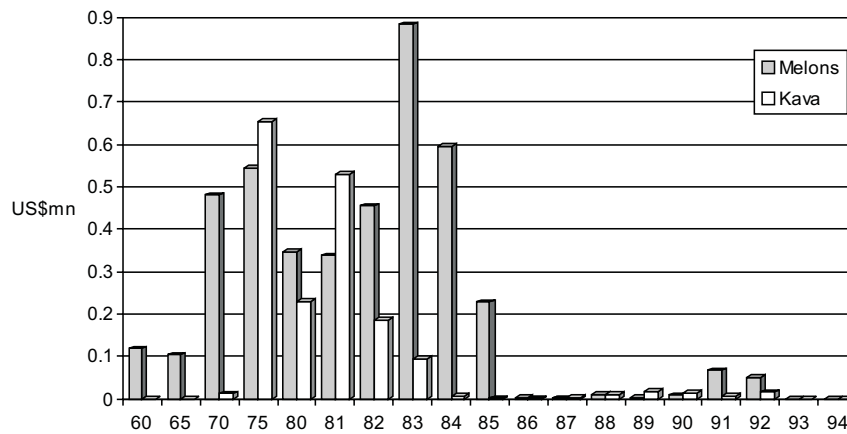
Second, Tongan vanilla is inherently a high-quality crop, but the maintenance of quality control is still essential to achieve high prices. Neither growers nor marketers have had a spotless record in quality control, and extension efforts need to be maintained because of the external costs that a small number of delinquent producers could impose on the whole industry—for example, selling immature beans (Menz and Fleming 1989, p. 9).

A third, related danger is that the incidence of disease is an ever-present threat to the industry. Small outbreaks of virus disease have occurred, but it has been possible to control them and disease is not currently thought to be a serious problem. As mentioned above, the extension service plays an important role in disease control by encouraging farmers to carry out proper maintenance and plant hygiene (World Bank 1990, p. 15), but the research role is also important, especially in the production of disease-free planting material.

Finally, the attractiveness of vanilla as an export crop is evident to many governments throughout the developing world, including other SPINs. A substantial increase in world supply, particularly if coupled with slowly-growing demand (which largely depends on trends in competition between artificial and natural vanilla) (Menz and Fleming 1989), could lead to plummeting profits for vanilla producers in Tonga in the future given the delicate nature of the world market. The world's leading producer of vanilla—Madagascar—sold off part of its stockpile in 1993 (MAFF 1996, p. 15). As a result, f.o.b. unit values of vanilla exports in Tonga fell from an annual average of 83.9 pa'anga/kg in 1992 to a first-quarter average of 67.7 pa'anga/kg in 1996—a decline of close to 20 percent (NCDS 1995).

Melons

The production of watermelons and rockmelons for export to the New Zealand market is potentially a highly profitable activity for farmers in Tonga (Gyles et al. 1989a), but this potential has so far only been partially realized. The key to success is ready accessibility to Pacific-rim markets, which, in the case of the key market of New Zealand, has been intermittent. A mini boom in watermelon exports to New Zealand occurred in the early 1980s (see figure 2.27), led primarily by private exporters (Rathey 1984, p. 157). Sustaining this early success proved elusive, however, thwarted by the presence of fruit fly in Tonga. Fruit-fly larvae were discovered in a shipment of watermelons to New Zealand in 1985, resulting in an embargo on the import of watermelons and all other fruits from Tonga.



Sources: 1960-65: Kingdom of Tonga (1970); 1970: Minister of Agriculture (1970); 1975: CPD (1976, pp. 25-6); 1980-85: Statistics Department (1987, pp. 117-8); 1986-92: Statistics Department (1993); 1993-94: NCDS (1995)

Figure 2.27 Exports of melons and kava from Tonga, 1960 to 1994

Figure 2.27 shows the dramatic decline in melon exports from that year. The embargo was lifted in 1989, and a start was made to export melons again through registered growers, subject to regular inspections by MAF and monitoring by New Zealand quarantine officials (Fleming and Hardaker 1995). But exports have nowhere near recovered their levels achieved in 1982-83, remaining at negligible levels (figure 2.27). As the World Bank (1990, p. 16) observed, production and marketing management are the keys to recovering the market: production potential and profitability are not at issue.

The export trade in melons has largely been in private hands. The key contribution from the Tongan government in the future is undoubtedly in trying to eradicate fruit fly or at least upgrading quarantine services to ensure no future infestation of fruit exports. In this respect, collaboration with the New Zealand quarantine service to meet quarantine protocols and phytosanitary requirements in New Zealand is crucial. Apart from New Zealand, some

small markets for melons have been found in American Samoa, Hawaii, and the west coast of mainland USA.

Passion-fruit products

While passion fruit has been grown in Tonga for quite some time, export of passion-fruit products only commenced following the establishment of a passion-fruit project in 1982, which led to the construction of a processing factory. The industry suffered an early setback when MAF encouraged farmers to grow passion fruit two years before the factory was ready to process the fruit, leading to a degree of grower disillusionment (World Bank 1990, p. 16). Nevertheless, a profitable domestic market softened the impact of this setback, and a modest export industry was eventually established.

Problems nevertheless abounded. The processing capacity was 800 tons per annum, yet throughput in the 1980s was well below this level at around 60-120 tons. Initial yield estimates were too optimistic, returns to growers were not particularly attractive, factory design deficiencies were experienced, and difficulties in establishing appropriate pollination practices proved greater than anticipated (Fleming and Hardaker 1992). This prompted an investigation into the prospects of processing other fruit, such as tomato, pineapple, and papaya (World Bank 1990, p. 16).

By the late 1980s, some exports were being achieved. Fresh fruit, juice, and puree were valued at US \$42,000 (World Bank 1990, p. 59). Currently, the export market remains small, and potential appears limited.

Kava

Kava showed early promise of developing into a valuable export crop in Tonga. A traditional component of farming systems, kava production for export was based on the Fijian market. Sole exporting powers were vested in the Tonga Commodities Board (Rathsmann 1981, p. 56).

The values of kava exports between 1970 and 1994 are shown in figure 2.27, which reveals two distinct phases. The first is one of growth to the early 1980s, when agricultural planners were optimistic that kava would become a valuable niche export on account of its profitability to growers, multiple market outlets, and characteristics such as a high value-weight ratio. Rathsmann (1981), for example, devoted a good deal of space to kava in his evaluation of crops with export potential in Tonga. Exports were US \$655,000 in 1975 (figure 2.27), when 77 tons were exported, and peaked at US \$870,000 in the following year. They were still quite substantial in the early 1980s but fell away dramatically during the second phase as disease problems in production caused wilt. Despite considerable effort to establish the complex causes of disease over the past decade, success in overcoming it has been limited (World Bank 1990, Annex 2, p. 38). The immediate prospects for the resumption of a significant export industry look bleak.

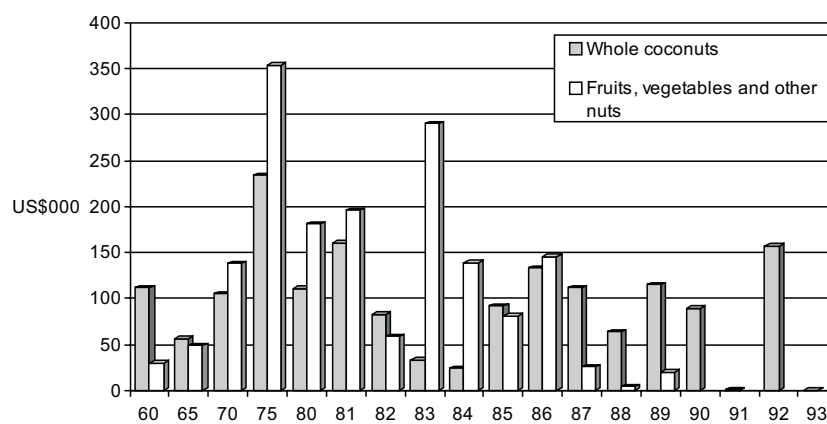
Whole coconuts

Dry and green coconuts have been exported to Australia and New Zealand throughout the study period, albeit in small quantities. In real terms, exports were most valuable in the mid-1970s in the midst of the commodity boom that occurred then, but figure 2.28 shows that the value of exports also rose quite sharply in the second half of the 1980s, after declining to trivial volumes in the early 1980s. Values reached US \$133,000 in 1986. Over 500 tons, or half the market, were supplied to Australia in 1986-87 (World Bank 1990, Annex 3, p. 13). Despite the recent development of this export crop—being the preferred option of the World Bank (1990, p. 14) to copra and coconut oil in the long run—export values have been volatile. It is considered to have little scope for expansion, limited by the small size of the export market and competition from other SPINs.

Other fruits, vegetables and nuts

Tongan producers have proved themselves capable of growing a wide variety of fruits, vegetables, and nuts that have export potential, either through shipments overseas or sale to tourists. Examples mentioned by the World Bank (1990, pp. 16, 59, Annex 8, p. 4) are groundnuts, onions, tomatoes, pineapples, local vegetables and nuts, papaya, capsicum, exotic vegetables (such as carrots), ginger, mangoes, and limes.

Only relatively small volumes of some of these products have so far been exported, chiefly to New Zealand, although their value topped US \$350,000 in 1975 and almost reached US \$300,000 in 1983 (figure 2.28). By 1988, however, the value of exports had plunged to US \$4000 in the face of competition from the squash, passion-fruit, and root-crop industries and as indirect victims of fruit-fly problems in other fruit exports. Export volumes have since remained at very modest levels.



Sources: 1960-65: Kingdom of Tonga (1970); 1970: Minister of Agriculture (1970); 1975: CPD (1976, pp. 25-6); 1980-85: Statistics Department (1987, pp. 117-8); 1986-89: MAFF (1991); 1990-92: Statistics Department (1993); 1993: NCDS (1995)

Figure 2.28 Exports of fruits, vegetables and nuts from Tonga, 1960 to 1993

Export market potential is limited (World Bank 1990, p. 16), and potential is probably greater—and difficulties in storage, transport and handling less—in providing supplies to the local tourist industry. Here, the potential depends on growth in the currently small number of tourists visiting Tonga.

Groundnuts have been mooted as a good export prospect in the past (e.g., Rathsmann 1981), although their returns to labor in production relative to other potential niche exports are fairly low (Gyles et al. 1989a). Modest quantities were exported in the late 1970s, reaching a maximum of 9.4 tons in 1979 (worth US \$3000) but then almost halving to 5.2 tons in 1980 following the incidence of rust (Rathsmann 1981, p. 18). The domestic market has remained the most important destination; Rathey (1984, p. 163) reported that only two to three percent of the crop was reaching the export market.

TUVALU

Overview

Despite prudent economic management by the government of Tuvalu (World Bank 1995, p. 39), the economic environment for conducting high-value agricultural export industries is difficult. Consequently, very few attempts have been made to develop such exports. Small size, MIRAB characteristics, little agricultural land, a lack of incentives to foreign corporations to invest, and severe restrictions on transport are the major reasons for this gloomy outlook. As in Kiribati, the greatest potential for diversification into high-value crops lies in the widely scattered outer islands; yet it is these islands that suffer most from transport difficulties.

Agricultural research capacity is obviously extremely limited, even more so than described above for Kiribati. Pardey and Roseboom (1989, pp. 455-6) reported one part-time expatriate researcher in 1986, commanding US \$42,000 (in 1980 values) in research expenditure. This researcher was working mainly on root crop and vegetable production. Economic and market research is virtually nonexistent as is concern for developing high-value export crops.

Research work in cropping and livestock is based at the research station on the outer island of Vaitupu. Infrastructure is modest but not out of keeping with the limited agricultural potential. Research activity depends heavily on aid funds, which have recently been used for small livestock multiplication, coconut- and root-crop-production research, and for researching the potential for farming systems based on agroforestry suitable to atoll conditions. There are currently three agricultural programs covering crop production, livestock production, and agricultural support services. Crop-production projects are focused on coconut improvement, horticultural promotion, sweet potato production, bee-keeping, and the introduction of new species and varieties of fruit and nut trees. Pig, poultry, and egg projects are aimed at improving breeds and encouraging commercial production, use of local feed

ingredients and better husbandry techniques. Agricultural support is not only concerned particularly with improving extension performance, but also in improving information flow to increase feedback from farmers and ensure better research decision making.

Traditional Export Crops

Copra

Copra has been the only traditional export in Tuvalu, and really the only export of any type. As in Kiribati, it has a long history of production for export, beginning in the then Gilbert and Ellice Islands (now Kiribati and Tuvalu, respectively) in the 1840s with the production of coconut oil and switching to copra export around 1870 (Edwards and Trewren 1992). The value of copra exports declined disastrously in the 1980s, and the industry was moribund by the end of the decade. No copra has been exported in the 1990s, despite the fact that copra production as an export activity possesses the same favorable traits in Tuvalu as described above for Kiribati.

Minor Food Crops

Sweet potato

A brief foray was made into the export marketing of sweet potato (*Ipomea batatas*) in the mid-1980s, encouraged by the government and generated partly by the possibility of commercial sale domestically and to neighboring Pacific island nations with deficiencies in the production of staple root crops. It became an important food crop on some islands (Hawkes 1992, p. 272), and small quantities were exported from 1989. Its commercial expansion foundered because of internal shipment and other marketing difficulties, such as product deterioration (Talake 1992). Exports proved particularly difficult to sustain because of these factors plus the additional costs and difficulties of international shipment.

VANUATU

Overview

Vanuatu comprises an archipelago that is home to a population estimated at 160,000 in 1993 (NCDS 1995). By South Pacific standards, this population is fairly evenly distributed across island groups. The capital, Port Vila, is on the most populous island of Efate, which has about 30,000 people (NCDS 1995). The other most populous islands are Santo (26,000), Tafea (22,000) and Malakula (19,000). Average population density is quite low, at 11.7 people per square kilometer in 1989 (NCDS 1995). Political independence was obtained in 1980; prior to that time Vanuatu was a condominium ruled by France and United Kingdom.

High-value export performance

The long history of plantation agriculture in Vanuatu has meant that traditional export crops and livestock have maintained supremacy in the agricultural export sector. This is not to downplay the number of nontraditional crops that have been the subject of experimentation; but, to date, they have made little impression on the hold that traditional products have in the sector. Food imports are relatively high.

Macroeconomic background

The main features of the macroeconomy that are relevant to agricultural export industries are a quite-well developed private sector, reasonable but patchy financial and political stability, recent trade and tax reforms that have improved the competitiveness of businesses, quite a large public sector that is prominent in the formal sector but of limited competence (especially in terms of services provided to rural areas), and a lack of skilled indigenous human resources (World Bank 1993f). Economic growth was moderate during the 1980s and to 1991, but fell away in 1992 and 1993 (World Bank 1993f, 1995). It has the potential to improve over the next decade. The real effective exchange rate has probably been kept too high in recent years, damaging export opportunities. It fell substantially between 1985 and 1987 but has since remained fairly constant (World Bank 1995, p. 11).

Like other Melanesian nations but unlike Polynesian nations, Vanuatu has not been able to rely on migration as a safety valve for its high rate of population growth, nor as a source of remittances to boost foreign-exchange earnings. It has nevertheless been the recipient of large aid flows, according to the World Bank (1993f, p. iii) among the most generous in the developing world, and foreign inflows earned from its off-shore financial center operations and tourism.

Foreign investment regime

The World Bank (1995, p. 26) described the foreign direct investment regime thus:

- Ministry of Finance approval is required for new foreign investors;
- land leases are available up to 75 years, with government assistance available for negotiations and a requirement that undeveloped land is improved within five years;
- land disputes are common;
- expatriate work permits are granted only if there are no qualified *ni-Vanuatu*;
- investment incentives exist, determined on a case-by-case basis, and advantages can be gained from Vanuatu's tax haven status.

Agricultural research

Indigenous research capacity in Vanuatu has historically been limited, but expatriate staff supported by aid funds have maintained an active research program over a long period at Tagabe Experiment Station, in the Department of Agriculture and Horticulture (DAH) (known as the Department of Agriculture, Livestock and Horticulture (DALH) prior to 1993). Research work was undertaken by "several professional staff" concentrating on vegetables, cocoa, and pasture production in the 1970s and early 1980s (Gamble, Bourke, and

Brookson 1981, p. 331) and working on production and quarantine matters relating to a number of high-value cash crops since, such as kava, pepper, and vanilla. Weightman (1989) also mentioned various production research projects involving potentially useful local and introduced crops. Beyond publicly-funded agricultural research, Vanuatu has also experienced its share of experimentation by private firms interested in establishing cash crop industries. A number of initiatives were mentioned by Weightman (1989), who also recounted how early European planters undertook a lot of experimental work.

Strong research capability has existed for a long period within the *Institut de Recherches pour les Huiles et les Oléagineux* (IRHO) to serve the interests of copra producers, primarily those in the plantation sector. According to Pardey and Roseboom (1989, p. 473), 12 expatriate researchers were employed in this institute in 1985 compared with three during the 1970s.

Vanuatu faces some major shortcomings in developing research into high-value exports, including an inability to make best use of resources and practices that already exist in the agricultural sector. This reflects in part a failure to develop in-house economic and marketing research capacity that could be crucial to one line of research that is mentioned by Weightman (1989, p. 223): exploiting the potential for supplying existing produce to the tourist industry. Weightman also implied that more could be done to research into the complementarities in cash crop production, and to coordinate interindustry activities involving production, processing, and marketing. He mentioned, for example, that the Department of Industry had become involved in establishing a groundnut industry in 1984 without adequately considering production issues (Weightman 1988, p. 225). But the biggest obstacle remains the heavy reliance on external support to continue a reasonable level of agricultural research activity.

Traditional Export Crops

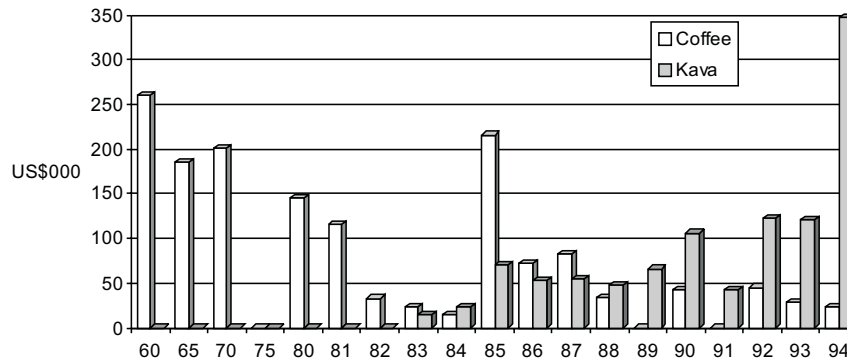
There have been five traditional export crops of note in Vanuatu: one global staple (maize) and four traditional export crops (cocoa, coffee, copra, and cotton).

Cotton and maize

Two traditional export commodities—cotton and maize—have long ceased to figure in export activity. Cotton was introduced in the 1860s and initially played a subsidiary role to maize as a plantation crop. Production experienced a revival from 1910, reaching a planted area of 2015 ha by 1921-22, but exports had ceased by 1938 (Weightman 1989, pp. 166-70). Maize production commenced in the mid-19th century and reached 1200 tons by 1902 but then was progressively abandoned for cotton, especially after 1916 (Weightman 1989, p. 172). Despite favorable growing conditions in certain areas of the country, producers of both crops failed to find profitable export markets that were durable.

Coffee

Coffee and cocoa have had long and chequered histories, yet remain export crops of some significance today. Coffee production began, like maize and cotton, in the mid-19th century on plantations operated by European settlers, and over 2000 ha were planted to *arabica* cof-



Sources: 1960-65: Anglo-French Condominium (1964,1968); 1970: Tudor (1972); 1975: Inder (1977); 1980-934: Economics Section (1992) and NCDS (1995)

Figure 2.29 Exports of coffee and kava from Vanuatu, 1960 to 1994

fee by the turn of the century. Yields declined dramatically after 1909, however, when a fungal disease, *Hemilia vastatrix*, wreaked havoc (Weightman 1989, p. 185). More resilient robusta varieties had begun to be planted from 1915, and, by the 1930s, coffee production and export once again had found favor (Weightman 1989, p. 187). The industry struggled along from the 1940s to the 1970s, by which time most plantings had become senescent or senile, and most plantations had fallen into a state of disrepair. Beef production had now become a more attractive option for both plantations and smallholders. The annual value of exports declined steeply from 1960 until the early 1980s (see figure 2.29); even at the height of the world coffee boom in the mid to late 1970s, exports only averaged around 15 million vatu (US \$300,000) (SPC 1989).

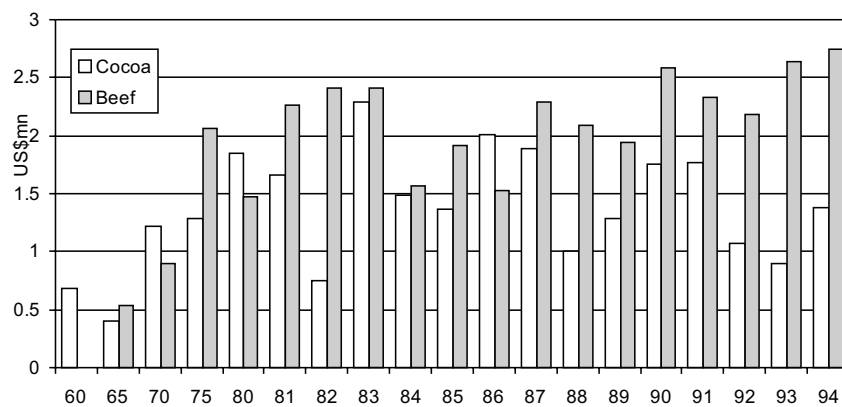
The early 1980s saw an attempt to revive the industry with the creation of the Tanna Coffee Development Company (TCDC) on the island of Tanna. Exports reached 84 tons in 1985, valued at US \$198,000, but had fallen again to very small amounts by the early 1990s. Weightman (1989, p. 193) observed that recent exports have in part been aimed at tourists through the use of attractive packaging, but variable quality has detracted from the potential to tap this market. Scope nevertheless exists for a high-value niche if difficulties in maintaining consistently high quality can be overcome. The establishment in 1991 of roasting facilities on Tanna by TCDC, in order to market a high-value coffee, was assisted by the Tourism Council of the South Pacific (Economics Section 1992, p. 18). It boosted sales in 1992 after low world prices had led to disappointing exports in 1991, but further slight declines were experienced in the final two years of the study period (figure 2.29).

Cocoa

Cocoa production was boosted following the incidence of *Hemilia vastatrix* in coffee in the second decade of the 19th century. The area planted to local hybrids of Criollos and Forastero plants reached more than 2700 ha, with exports over 1000 tons in 1921, peaking at

2672 tons in 1925 (Statistics Office/DALH 1991, p. 8). Yet, by 1952, the planted area had declined to around 2000 ha as a result of low prices, competition from copra, and labor shortages (Weightman 1989, p. 203). Cocoa exports have revived somewhat in recent times and have assumed greater importance than those of coffee in recent decades. Figure 2.30 shows a substantial increase in the value of exports between 1960 and 1980. Smallholders have become the dominant producers: by 1983, the smallholder area was 2077 ha compared with 2383 ha for plantations. A high proportion of cocoa trees in the plantation sector were already old in that year, with only around 20 percent less than 30 years of age (NPSO 1983). Between 1977 and 1988, smallholder output ranged between 70 and 82 percent of total output. The proportion declined from 81 percent in 1988 to 66 percent in 1991, as plantation output climbed from 144 tons to 749 tons (Economics Section 1992, p. 16) as a result of increased output from estates that are a joint venture between the government and CDC (Statistics Office/DALH 1991, p. 8). The value of exports almost halved between 1991 and 1993, in large part a response to depressed world market conditions and climatic factors, but also because the joint venture with CDC experienced financial difficulty. Values recovered somewhat in 1994.

Stubbornly persistent problems remain in developing cocoa into a high-value export industry because, as with coffee, the industry suffers from low-quality produce and competition from the beef industry. According to Weightman (1989, p. 213), exports to the London market were being discounted between around 30 to 40 percent during the 1980s. This is despite the fact that historically, Vanuatu has been able to command a premium for its cocoa (Economics Section 1990, p. 12). Such poor quality performance does not augur well for establishing a high-value industry—or even a significant high-value segment within the industry—despite the long history of cocoa production and physical conditions that offer potential for high-quality output. Quality problems are partly inherent in the small bean size associated with the original choice of planting material (Economics Section 1992, p. 15), which leads to discounting, but factors associated with production and processing also contribute to low unit export values relative to world prices.



Sources: 1960-65: Anglo-French Condominium (1964,1968); 1970: Tudor (1972); 1975: Inder (1977); 1980-93: NCDS (1995)

Figure 2.30 Exports of cocoa and beef from Vanuatu, 1960 to 1994

Fowler (1985) suggested that the main explanators of poor quality are irregular harvesting (which results in cocoa pods that are overripe and diseased), inadequate fermentation, the problem of growers using a variety of different fermentation methods, and inadequate drying. Some plantation exporters selling on consignment have been successful in earning premiums from a differentiated product. However, with the declining influence of the plantation sector, only a reversal in current quality performance by smallholders and processors would enable the emergence of a significant high-value segment of the industry.

Attempts have been made in the past decade to improve quality. They include legislation to require a license to trade in beans produced by others, the establishment of inspection and grading requirements, and the granting of monopoly export powers to the Vanuatu Commodities Marketing Board (VCMB) in 1984 (Wyrley-Birch 1986). These regulations and efforts have not been particularly successful to date. This is partly because, as Wyrley-Birch (1986) observed, regulations and facilities will not by themselves lift quality standards; practice and commitment to quality by producers, processors and marketers also need to be improved. In respect of small bean size, DAH is exploring the introduction of cocoa hybrids with larger bean size (Economics Section 1992, p. 15). Grade 1 cocoa did increase in proportion, from less than 20 percent to almost 40 percent, from 1986 to 1989, but then declined just as quickly back to 20 percent in 1990 and 1991 (Economics Section 1992, p. 15).

Coconut products

Copra has long been the mainstay of the export sector, although, as in other SPINs, it has been suffering from depressed world-market conditions in recent times. Even so, it has retained its preeminence as an agricultural export, contributing around one-third of total domestic exports and about one-half of agricultural exports in the early 1990s. In 1992, the value of copra exports alone was around 60 percent higher than the combined value of other agricultural exports (NCDS 1995).

Some attempts were made to diversify the coconut industry away from copra production in the early post-war period with the construction of two small factories for coir and desiccated coconut and for soap production, but neither venture succeeded (Weightman 1989, pp. 137-8). The high costs of processing relative to those in competing nations ensured no profitable export industries could be based on these coconut by-products.

HVNT Exports

Only limited success has thus far been attained in developing HVNT exports in Vanuatu. Even by the early 1990s, they, together with coffee, were accounting for only one percent of total agricultural exports (NCDS 1995). Yet, policymakers still hold out hope for significant progress.

Vanuatu currently produces, or has significant potential to produce, four HVNT exports: kava, squash, vanilla, and pepper. In addition, there are numerous fruits with some export potential that can be included as HVNT crops. Weightman (1989, pp. 216-52) gave a comprehensive account of the history of these commodities, and he and Hassall and Associates (1983) reported on their export potential.

Kava

Kava is the most established of the HVNT crops produced in Vanuatu, distinguished by its long-standing cultural importance and diversity in use. It is a beverage of considerable importance in the domestic market as well in the export market. There is also an export market in the pharmaceutical industry of possibly great potential, although to date exports to this industry have only been of relatively small value. Weightman (1989, p. 240) reported on recent tests in Europe to identify and isolate its potentially valuable properties, which had already been recognized in traditional medicine in Vanuatu.

The initial impetus to kava exports came from a shortage of kava (*yaqona*) in Fiji in 1970, but price instability was a major discouraging factor (Weightman 1989, p. 240). The next main event, a handmaiden to kava export, was the revival in domestic consumption of kava from the mid-1970s. This largely private development pointed up the advantage for exporting of experiences in initially developing a domestic market. Exports began following a survey of nontraditional export crops by Hassall and Associates (1983), which suggested there was potential for export to both the European pharmaceutical market and the beverage market, especially in Fiji. Kava was successfully exported to France on a trial basis in October 1983 (Weightman 1989, p. 242). Total exports in that year were minimal, but the success of the trial led to further European orders, and the volume of exports rose to 4 tons in the following year and 14 tons in 1985 (NPSO 1992, p. 78). The value of kava exports reached its highest level at US \$123,000 in 1992, declined slightly in 1993, then almost tripled to a new maximum of almost US \$350,000 in 1994 (figure 2.29).

Pakoa (1996) provides an account of the development of the export market for kava, and highlights some of the production conditions and product attributes that make kava a potentially major export success story. Key among the production conditions are the simple and well-understood production methods, with relative freedom from disease (Weightman 1989, p. 243), suitability to smallholder production, a wealth of planting material, good returns from production (Pakoa 1996), and its complementarity to other activities in the farming system. Its favorable product attributes include multiple uses, storability, and relative ease of transport.

The main marketing danger to the development of the export industry at present is the potentially inappropriate and/or inadequate involvement of the government in marketing. So far the government has had a relatively minor role (by South Pacific standards) in the development of the export market and has provided little assistance (Pakoa 1996). Its major presence has been in the pharmaceuticals segment where exports have been erratic in recent years, witnessed by the sudden decline in export volume and value in 1991 (NPSO 1992, p. 78). There is a risk that the government might see a need for more direct participation and heavy regulation of the industry rather than light regulation and facilitation. Currently, VCMB markets very little of the total kava produced for sale. Over one-half is sold by growers directly to dealers from Port Vila and Luganville, and a further one-third is sold to other dealers operating in the islands Statistics Office/DAH 1993, p. 11).

Other dangers include export price instability, the prospect of growing competition from other Pacific island producers, and uncertainty about the potential in the pharmaceutical market, prompting fears that the fresh kava market might easily become flooded, with consequent catastrophic falls in the profitability of production. The latter concern dramatizes

the lack of market information currently available in either the domestic or export market, and it reflects a lack of facilitatory measures by the government to help the industry build upon its encouraging development to date. There are also heightened risks of pest and disease incidence (which is currently low), reduced varietal diversity and soil degradation in production that might ensue were large areas of smallholdings to be continuously devoted to its production.

Another factor influencing kava exports is the profitability of supply to the domestic market relative to the export market. The size of the domestic market is around 100 million vatu (Decloitre 1995, p. 44), at present dwarfing the export market, which is around 20 million vatu.

Squash

Squash exports from Vanuatu are quite a recent occurrence and are the outcome of decisions made in Tonga about quotas for squash exports from that nation. Dissatisfaction by one prominent and successful Tongan exporter with regulations on squash exports to the Japanese market led to a decision to begin squash production in Vanuatu. By producing and exporting squash from Vanuatu to Japan, the firm could circumvent restrictions imposed by the government in Tonga. Production conditions were considered favorable and transport services have proved to be at least as satisfactory as those in Tonga. At present, the industry is struggling to overcome some agronomic difficulties despite the apparently favorable growing conditions. Water shortages during the growing season have made irrigation desirable, but the high overhead costs of irrigation make production less attractive to the smallholders, at whom the industry was initially directed.

As mentioned in the description of the Tongan squash industry, inadequate quality control, risks of pests and diseases from large, unrotated plantings, and foreign competition for a narrow niche market are the major dangers facing the development of squash exports. As in Tonga, the way in which the government decides to help this fledgling export industry is also likely to be a key factor: resort to a heavily interventionist role would probably hamper efforts to penetrate this narrow export niche.

Vanilla

Production of vanilla was undertaken as long ago as the 1870s, although little remained by the 1930s according to Weightman (1989, p. 250). Weightman (1989, p. 251) reported renewed interest in cultivation in the 1950s, but a cyclone in 1959 destroyed available planting material. Little headway has since been made despite a degree of official interest in developing a vanilla export industry. NPSO (1992, p. 79) reported a mere two ha planted to vanilla.

Official interest has no doubt been stimulated by the success of a smallholder-based export industry in Tonga. While production prospects appear sound and pest and disease problems are not especially serious, Weightman (1989, p. 245) considered the labor intensity of vanilla production as a factor potentially constraining the development of exports. Relative to the situation in other vanilla-producing nations such as Tonga, Vanuatu is less suited to such a labor-intensive industry, and doubts remain over the ability of smallholders to undertake

the necessary pollination during the flowering season. Yet much the same reservation was expressed in Tonga in the past; perhaps concentration on women producers might yield satisfactory results. The recent market downturn does not augur well, especially for a very small industry trying to establish a base. According to MAFF (1996, p. 47), a minimum export volume of around three tons is needed to attract the interest of foreign buyers to establish a viable vanilla export industry.

In other respects, prospects for a successful vanilla export industry in Vanuatu appear not much different from those for the Tongan industry. The key issue is the trend in world prices, which means careful attention needs to be given to likely future changes in world demand and supply conditions. As mentioned above in discussions of high-value crops in other nations such as Tonga, Vanuatu is not alone in eyeing the vanilla industry as potentially remunerative for smallholder production.

Pepper

Although he alluded to the possibility that some pepper (*Piper nigrum*) might have been grown in the late 19th century, Weightman (1989, p. 245) mentioned 1960 as the first time in the modern era when trials of pepper production were undertaken in Vanuatu. Despite further trial plantings in 1972, little progress was made until the 1980s, when seven varieties were tested (Weightman 1989, p. 247). Production prospects should be favorable given the promising returns estimated by Hassall and Associates (1983). In addition, the product attributes for a smallholder industry afflicted by the problems of remoteness of producers from markets are admirable, the crop is suitable to existing farming systems, and growing conditions are favorable. Yet, trial results in the 1980s were well below expectations. Weightman (1989, p. 248) reported that early projections “greatly underrated the demands and complexities involved in launching an entirely new crop in the smallholder sector.” As in the production of vanilla, the relatively high labor intensity of pepper harvesting and post-harvest activities militates against smallholder production. NPSO (1992, p. 79) also referred to difficulties in establishing an adequate market.

Another danger that pepper production shares with vanilla production is the uncertainty of the trend in world prices. Again, the ability to forecast prices well into the future is highly desirable, at least in terms of trying to discern major changes in world demand and supply conditions, as many governments see pepper as a desirable HVNT export.

According to NPSO (1992, p. 79), more than 500 smallholders have planted pepper vines. To date, the total planted area is only around 20 ha.

Fruits and nuts

A number of indigenous and introduced fruits and nuts grow successfully in Vanuatu and offer potential for export. Weightman (1989, pp. 216-25) described growing conditions for the following: orange, mandarin, lemon, grapefruit, pomelo, lime, papaya, pineapple, strawberry, passion fruit, custard apple, guava, mango, cashew nut, groundnut, and macadamia nut. Other fruit introduced with varying degrees of success he listed as cape gooseberry, peach, tree tomato, Surinam cherry, star apple, soursop, carambola, bullock’s heart, Chinese

guava, tamarind, mangosteen, litchi, rambutan, grape, pomegranate, fig, longan, granadilla, jackfruit, mulberry, and Panama cherry (Weightman 1989, pp. 220, 223).

It is obvious from the above list that there is no shortage of fruits and nuts that can be successfully grown in Vanuatu. On the surface, it appears that those responsible in government for encouraging new commercial crops are faced with an embarrassment of activities to support, rather than a lack of alternatives. Indeed, many crops have become successfully traded in the domestic market. Yet the record in developing commercial industries for export and tourism based on these products is far from impressive. While pests and diseases cause some production problems in these crop industries, marketing problems are overwhelmingly the most prevalent and difficult obstacles to overcome.

It appears that the crucial bottleneck is the link between production (which in itself is not an obstacle as these crops will grow under the right conditions that exist in certain parts of Vanuatu) and marketing. Getting enough growers to supply regular quantities of consistently high-quality produce for export has proved difficult. Hence, exploiting the potential for exporting these products is a serious challenge even ignoring the difficulties in finding and tapping into attractive export marketing opportunities. Other obstacles include setting up profitable processing activities and overcoming the difficulties inherent in exporting fresh produce in respect of quarantine and phytosanitary requirements and maintaining freshness to the point of retail sale.

Of two ways forward in developing export industries for any of these crops—export to foreign markets or export through sales to tourists—the latter recommends itself as the less daunting alternative. Efforts to increase the value-added component in the tourist industry have been weak to date, and massive leakages to food imports persist. If producers and marketers of fresh and partially processed fruits and nuts are unable to compete with imports in their own country, they stand negligible chance of competing in foreign Pacific-rim markets that are the natural targets for any efforts at food export development.

Livestock

Beef

Beef exports in Vanuatu are unique in the South Pacific, in that no other nation has managed to make a success of livestock exports. The beef export industry initially succeeded in establishing an export niche to French territories, exploiting the strong links that existed prior to independence. The case for including beef as a high-value exports rests on an ability to tap into the high-quality end of the market, and some success has been achieved here. Most low-grade beef exports now go from Luganville to Japan for processing, while high-grade primal cuts of chilled beef are exported from Port Vila, principally to New Caledonia (Economics Section 1990, pp. 8-9, World Bank 1993f, p. 15).

Cattle were introduced to Vanuatu at around the same time as plantations were beginning to develop in the latter part of the 19th century. Weightman (1989, p. 264) reported that French planters and companies were slowly extending the size of their herds of cattle in line with the expanded areas of coconut plantations at the turn of the century. The industry was oriented solely towards satisfying domestic demand until exports began in 1958 (Weightman

1989, p. 278). For the next two decades, cattle numbers expanded rapidly from 33,129 in 1961 to 98,430 in 1983 (Weightman 1989, p. 273). Numbers increased in similar magnitudes in the plantation and smallholder sectors (35,382 and 29,919, respectively), but the increase was most dramatic in the smallholder sector, which began the 1960s with only around 2000 head. Until the 1970s, little official encouragement had been given to smallholder production, although smallholders had long been familiar with beef cattle production (McKillop n.d., p. 4).

The possibilities of exports to nearby Pacific nations began to be explored in the early 1960s (Anglo-French Condominium 1964), and exports were soon realized. The value of beef exports rose quickly from a little more than US \$500,000 in 1965 to over US \$2 million by 1970 (see figure 2.30). Exports have been maintained on average at about US \$2 million since, with the highest value of US \$2.75 million achieved in 1994 (figure 2.30).

Beef production takes place mainly on the islands of Efate and Santo. Production on Efate is predominantly by estates and is of higher quality than that produced by smallholders who predominate on Santo and elsewhere. Hence, product quality variations follow the dualistic production and export structure mentioned above. The World Bank (1993b, p. 10) listed a number of constraints currently facing the industry: export taxes, lack of buyer competition on Santo, deficiencies in interisland shipping, the threat of unsustainability of veterinary services (which could damage health inspection procedures and grade certification in the future), and export market concentration on Japan. The last-mentioned constraint is of special concern for any attempts to expand high-grade exports.

WESTERN SAMOA

Overview

Western Samoa is a fairly compact SPIN, comprising two main islands that are close to each other, and hence does not share the difficulty of inadequate and costly interisland transport common to most other SPINs. Its population is around 165,000 and population density is about 60 persons per square kilometer. Around 20 percent of the population is urban (NCDS 1995).

High-value export performance

There has been a long-standing avowed intention by the government of Western Samoa to diversify the agricultural production and export base. For example, agricultural development goals a decade ago were to “strengthen and broaden the national export base ... [and] exploit new opportunities for agricultural processing” (Department of Economic Development 1984, p. 49). Yet, the agricultural export sector today has little to show for decades of effort, and even traditional export crops have shrunk.

Macroeconomic background

Unraveling the reasons for retreat from agricultural export markets is not easy, because there have been many factors at work. But chief among them must be the unfavorable macroeconomic environment in which export industries have operated. In particular, the real effective exchange rate is high when measured against the dismal performance of the traded goods sector over the past decade. It declined by only around 10 percent between 1987 and 1992 (World Bank 1995, p. 11).

Macroeconomic performance over the past five years has bordered on disastrous, prompted to a significant extent by the effects of two highly destructive cyclones: Ofa in February 1990 and Val in December 1991. The average real growth rate in GDP over this period was negative and prospects remain subdued (World Bank 1995, p. 126). Annual inflation rate has increased recently as shortages in the economy have emerged, government expenditures as a proportion of GDP reached a historic high at 91 percent in 1993, and external debt as a percentage of GDP rose to an unacceptably high level of 118 percent in 1993, compared with 66 percent in 1989 (World Bank 1995, p. 126).

Foreign investment regime

The following description of the foreign investment rules and incentives are summarized from the World Bank (1995, pp. 26-7):

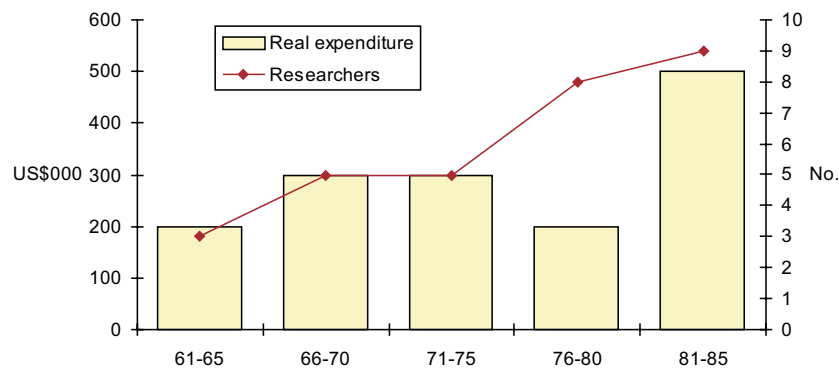
- foreign investment proposals need approval from the Department of Economic Development;
- land is available for leasing;
- expatriate permits are reviewed every six months, and are given only where local people with appropriate skills are not available;
- the Enterprise Incentives and Export Promotion Act 1990 governs the incentive structure for foreign investors. Incentives include tax and dividend tax holidays up to five years, import duty exemption for five years on capital goods, extendible to ten years, eligibility for a ten-year tax holiday, customs duty relief and a subsequent tax rate of 25 percent on corporate income, export finance facility and free zone site space.

Agricultural research

Few details are available on agricultural research numbers and expenditure prior to 1980, because responsibility for agricultural research rested with the Regional College of Tropical Agriculture until 1977, when the College became the campus for the School of Agriculture of the University of the South Pacific (Gamble, Bourke, and Brookson 1981, p. 158). The Department of Agriculture and Forests (DAF) assumed research responsibilities from that year. Little research work was carried out prior to 1975 (ISNAR 1983, p. 210).

Regional research in agricultural production in the South Pacific over the past 15 years has been undertaken mainly by the Institute for Research, Extension and Training in Agriculture (IRETA)⁵, which is based in Western Samoa. In the absence of much international research, IRETA has taken a leading role in researching taro production, and some successful breeding programs have been completed. Sivan (1992) made the comment that these breeding programs were not relevant to all forms of South Pacific agriculture, but they have been relevant to taro production in Western Samoa. The incidence of taro leaf blight in Western Samoa in 1993 has combined with staff shortages to hamper current taro breeding research (Umar and Yapa 1996, p. 2).

Figure 2.31 shows the trend in real expenditure on agricultural research at the national level for five-year averages between 1961 and 1986. Three distinct periods are evident. In the first period, research effort was intensified under colonial influence during the 1960s and early 1970s.



Source: Pardey, Roseboom, and Anderson (1991, p. 417)

Note: Expenditures are expressed in constant 1980 US dollars using a purchasing power parity index.

Figure 2.31 Agricultural research numbers and expenditure in Western Samoa: five-year averages, 1961 to 1985

This initial period was followed by a second period of decline in real expenditure in the late 1970s. In 1980, DAF had eight researchers and a research budget of US \$232,000, an expenditure per person of less than US \$30,000. Over 80 percent of this budget was externally funded (Gamble, Bourke, and Brookson 1981, p. 15). The nature of this external funding largely dictated the research portfolio: German funds financed and provided researchers for a Samoan-German Plant Protection Project, the People’s Republic of China did the same for

5 IRETA is part of the University of the South Pacific, based at Alafua Campus in Western Samoa. Its mission is “to contribute to sustainable growth and development of the South Pacific countries by appropriately responding to their expressed needs for research, training, information, education and extension programs, and consultancies in the broad fields of agriculture and rural development. In respect of research work, its mandate is to “implement a relevant applied research program in agriculture and rural development that is responsive to expressed national and regional needs” (Umar and Yapa 1996, p. 1).

a vegetable project, Australia funded a cocoa rehabilitation project, and there was also a UNDP/FAO-funded hybrid coconut project (Gamble, Bourke, and Brookson 1981, pp. 158-9). From the early 1980s, research was mainly based on the main island of Upolu, at the newly-developed Nu'u Crop Development Station, with crop development centers at Togitogiga and Nafanua. USP continued to carry out mainly production-based technical research at Alafua although, with the exception of research into small livestock production, experimental work was limited as staff mainly performed teaching duties. Crop field work largely disappeared by 1980 but was to be revived with the establishment of the externally funded IRETA in that year.

In the third period, the decline in real expenditure was arrested in the 1980s as a result of an influx of aid for agricultural research. Although a regional institution, IRETA has had a significant impact on the amount of agricultural research work conducted in Western Samoa over the past decade. Yet researchers in DAF failed to take full advantage of the facilities available at Alafua (ISNAR 1983, p. 26). Some valuable research work was undertaken on taro by IRETA and in the UNDP/FAO regional program on root crops, in particular, during the 1980s, correcting previous and continuing neglect by DAF (ISNAR 1983, p. 101). This work was complemented by FAO/SPC plant protection research, especially in breeding for resistance to taro leaf blight caused by *Phytophthora colocasiae* (ISNAR 1983, p. 31). Yet all this work could not prepare the industry for the destruction caused in late 1993, when leaf blight decimated the crop, and no effective disease control measures could be instituted nor resistant varieties quickly introduced.

By 1986, research expenditure had risen to US \$811,000 at US \$81,000 per researcher, boosted largely by aid projects (and probably by the use of an artificially high purchasing power parity index which had been calculated on the basis of economic circumstances prevailing in 1980). One-half of the researchers were expatriates in that year, while of the five local researchers, two had MScs and three had BScs. There were still 10 research officers in position in 1994, but another seven positions were vacant. Of the 10 people in position, none was expatriate. One had a PhD, one a MSc, and there were seven with BScs (Research Division 1995).

The implementation of a number of projects, such as the cocoa rehabilitation project in 1979, and establishment of a research program by IRETA in the early 1980s led to a broadening of the research mandate. This enabled ISNAR (1983) to report that there was a considerable amount of research in progress relative to the needs of the agricultural sector. The research portfolio was still uneven, though, and many potential high-value export crops remained under-researched (ADB 1985, pp. 64-5).

Scrutiny of the research portfolio in 1981 in both DAF and USP reveals an overwhelming bias towards production research. Research activity in DAF concentrated on the main commodities of coconut, cocoa, and bananas, prompting ISNAR (1983, p. 102) to comment that "the possibilities of exporting high value fruit crops need to be explored," while greater experimentation in introduced crops is evident among the USP research work. Some work of relevance to high-value exports was undertaken by DAF researchers in the 1980s, such as trials in taro storage and fruit fly control.

Perhaps because of the reliance on research undertaken as part of externally funded projects, the constraints on research within DAF identified by Gamble, Bourke, and Brookson (1981,

pp. 162-3) and ISNAR (1983) have persisted and, if anything, intensified. Coordination between research and extension has been weak, the flow of information about research results to farmers inadequate, and economic and market analytical capacity haphazard. Research planning has also been weak, reflecting an inability to build up local research manpower and leadership.

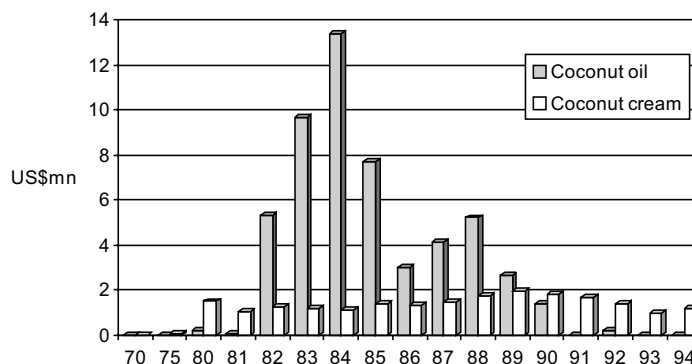
Traditional Export Crops

Coconut products

Copra exports dominated the foreign sector in Western Samoa following the introduction by the German colonizers in the 1870s of easy methods of drying copra for export to substitute for the more labor-intensive and expensive oil processing methods that had prevailed until then (Ilala 1989, p. 3). They continued to account for over one-half of export revenue until 1980 and contributed 60 percent in 1975 (NCDS 1995).

Coconut-oil milling was introduced as an important value-adding industry in 1980 and reached full operating capacity by 1983. It was meant to replace the export of copra, and, indeed, this appeared to have been achieved by 1984, when no copra was exported (see figure 2.32). But troubles with the coconut-oil mill meant that copra continued to be exported in small but significant quantities between 1985 and 1990 (NCDS 1995). The cyclones of the early 1990s put an end to both copra and coconut-oil exports. , although increases in coconut-oil prices between 1993 and 1995 enabled some coconut oil to be exported again from early 1995 (NCDS 1995), through a private company leasing existing milling facilities.

During the 1980s, coconut cream gradually overhauled copra, and then coconut oil, and the use of coconuts for export has now largely been taken up by the coconut-cream industry. Figure 2.32 charts the rise in importance of coconut-cream exports since 1975, following first exports in 1973 (ISNAR 1983, p. 68). Three private processing firms have been respon-



Sources: 1975-81: ISNAR (1983, p. 68); 1982-91: World Bank (1991a, p. 350; 1993, p. 57); 1992-4: NCDS (1995)

Figure 2.32 Values of exports of major processed coconut products from Western Samoa: 1970 to 1994

sible for the impressive progress made by this industry despite having to export into a very competitive world market. Western Samoan processors have attempted to exploit two ways of distinguishing their product from more price-competitive Asian producers. First, they particularly targeted Pacific-island populations in the New Zealand and Australian markets. Second, attempts have been made to gain a quality advantage by introducing labeling laws in the Asian and Pacific region that indicate clearly to consumers the lower water content in Western Samoan coconut cream.

By 1990, exports had almost reached 1576 tons, valued at almost US \$2 million, and contributed 27 percent of merchandise exports (World Bank 1993g, pp. 10, 57). When cyclones Ofa and Val damaged coconut production in the early 1990s, some nuts had to be imported to maintain output of coconut cream (World Bank 1993g, p. 7).

Cocoa and koko Samoa

Two joint export products can be identified in the cocoa industry in Western Samoa, each with a different target export market and following separate marketing strategies. The industry is a traditional one, dating back to 1883 (World Bank 1991b), although the export of koko Samoa is a more recent phenomenon coinciding with the emigration of Western Samoans to Pacific-rim nations.

The marketing functions in the traditional cocoa industry were performed by a few private exporters under license to DAF until 1972, when monopoly export powers were assumed by the Cocoa Board (Toelupe and Coulter 1992, p. 219). The industry was again privatized in 1990, which, given the parlous state of the industry, proved unfortunate timing (Toelupe and Coulter 1992, pp. 219-20).

Traditional cocoa exports qualified as high-value on the grounds of a substantial premium that was consistently achieved in world markets. The Trinitario cocoa that used to dominate exports achieved its high quality from superior trees and most suitable growing conditions, making it eligible for sale in the "fine or flavor" high-quality segment of the world cocoa market. Yet ISNAR (1983, p. 97) reported that Western Samoan cocoa beans were being sold at an appreciable discount to Ghana by 1982-83, and Toelupe and Coulter (1992) reported further deterioration in quality since then. Numerous factors contributed to this decline (Toelupe and Coulter 1992, p. 224), but two factors were prominent in leading to the erosion of price premiums in recent decades. First, poor marketing management led to a deterioration in the preparation of cocoa for export, especially in fermentation, drying and storage. This is evidenced by ADB's (1985, p. 170) account of the buying policy of the Cocoa Board which

. . . does not differentiate among different grades of beans and accepts delivery provided beans are dry. The standards of fermentation are not high, particularly for village supplies. . . . There is much that can be done [by the Board] to improve processing and grading. A constraint has been that there is an insufficient premium to be earned to justify the additional efforts required to produce quality cocoa.

Second, increased plantings of lower-value Amelonado cocoa varieties as part of cocoa rehabilitation programs led to a reduced proportion of cocoa capable of being sold into the high-value "fine or flavor" segment. Where high-quality Trinitario cocoa was produced

from Western Samoan plantations in a depressed world cocoa market in the late 1980s and early 1990s, substantial premiums on world prices could still be earned (Toelupe and Coulter 1992, p. 228), implying that the impact of depressed market conditions were felt most keenly in bulk cocoa trade.

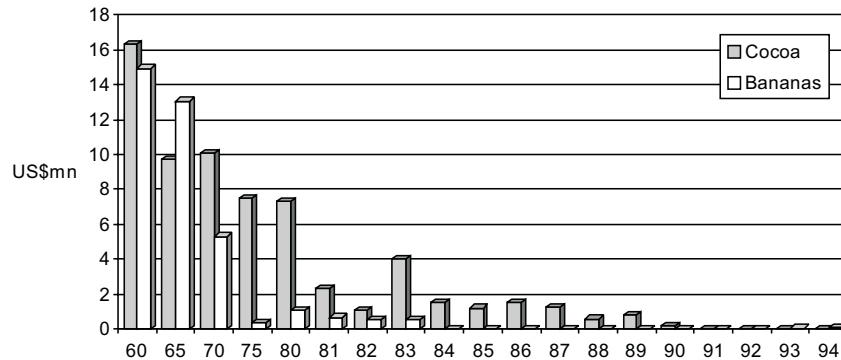
Cocoa export values are presented in figure 2.33. Along with bananas, cocoa rivaled copra in relative importance as an earner of export revenue in the early 1960s. A declining trend to 1972 was reversed by increases in world cocoa prices, which rose more than seven-fold from US \$0.24/lb in New York and London in 1971 to US \$1.72/lb in 1977 (IMF 1993), and export earnings peaked again in the late 1970s. Decline set in during the early 1980s as prices fell back, and falling yields, which had been evident since the early 1960s (ISNAR 1983, p. 59), began to take their toll despite the major rehabilitation work implemented around this time. Some recovery was initiated in 1983 when the volume of cocoa-bean exports almost tripled and the unit value of exports almost doubled (NCDS 1995). This rapid increase in export value was short-lived as volumes declined in 1984 more precipitously than they had risen (NCDS 1995). The effects of cyclones Ofa and Val compounded the negative impact of an extended period of low world prices and virtually destroyed the industry from 1990 to the present.

Although seldom recognized in official statistics, koko Samoa exports are quite significant: they were estimated by the World Bank (1991b) at around WS \$1.5 million (US \$700,000 million) in 1989, not much below the export figure for cocoa in that year. The main market is domestic, valued at WS \$6.8 million (US \$3 million) in the same year. More intimate knowledge of the quality demands in production and product attributes desired by consumers makes this product a more dependable niche export market than cocoa. But market scope is limited and depends on the availability of Trinitario cocoa beans and the demand by expatriate Samoans in Pacific-rim nations.

Bananas

The banana export industry in Western Samoa is strictly a traditional one as exports began in 1929 and peaked as early as 1957 (Tudor 1963, p. 88). It is included here because of its market focus and some nontraditional elements in modern attempts to revive it, which provide useful lessons for high-value exporting in general.

The industry bears the hallmarks and experiences of the banana industries described above for Fiji and Tonga. A niche export industry based on one specific market (New Zealand), it was developed ostensibly under the control of a parastatal, the Banana Board within DAF, but the managerial functions of this organization were not performed well (World Bank 1991b). The industry accounted for one-third of all exports at its peak in 1958 (ISNAR 1983, p. 99) and was profitable until the mid-1960s, at which time the real value of exports exceeded US \$12 million. It suffered badly from the onset of both production problems (especially disease and cyclones) and marketing problems from that time, as is evident in figure 2.33. Real export value fell to US \$1.7 million in 1966. An attempt to revive the industry in the late 1960s saw output climb to US \$6 million in 1969, only to fall again to US \$335,000 by 1975.



Sources: 1960-75: Economic Development Department (1980, p. 109); 1980-83: ADB (1985, p. 252); 1984-934: NCDS (1995)

Figure 2.33 Value of cocoa and banana exports from Western Samoa: 1960 to 1994

Further attempts to revive the industry have subsequently failed and the future for banana exports looks bleak. This is despite recent increases in output, following the incidence of taro leaf blight, destined mainly for the domestic market with only US \$52,000 exports in 1994. One such attempt in the late 1970s is especially noteworthy because it followed a path recommended by Sevele (1980), who, as reported above, had clearly identified some of the major factors that were damaging the industry in SPINs. Sevele (1980, p. 6) had suggested the establishment of “large holdings within banana export zones . . . Wherever possible, Governments should establish model plantations.”

The government of Western Samoa established the Tanumalala plantation, operated under the aid-funded Tanumalala Plantation Project, which began export operations in 1980 (Fairbairn 1985, p. 315). Sevele commented specifically on the improved quality of Western Samoan banana exports achieved through large plantations in the late 1970s, including that owned by the government, and exports temporarily increased from WS \$62,000 (about US \$220,000 in real terms) in 1977 to WS \$651,000 (US \$845,000) in 1982 (SPC 1989). By 1983, the government venture had failed and its plantation for all purposes abandoned, with national banana exports falling again to negligible levels by 1984, although the Tanumalala Plantation Project was not officially terminated until 1987 (Department of Economic Development 1987, p. 3). In its agricultural sector study, ADB (1985, p. 59) pronounced bananas as an export industry for development to be “highly questionable as it does not appear to be as attractive a commercial proposition as alternative crops.” Once again, the banana export industry faded into oblivion. Another attempt was made in the late 1980s to rehabilitate the industry based on a small number of producers, and exports of over WS \$400,000 were still forecast for each year from 1988 to 1990 (Department of Economic Development 1987, p. 69). This attempt also failed for the same reasons that were apparent in the late 1960s, and caused hardly any change in the value of exports (see figure 2.33).

The attempt by the government to revive the industry in the late 1970s and early 1980s is noteworthy, because a different strategy was adopted, albeit one that also proved to be uncompetitive. This strategy accorded more with the plantation-style banana export industries in Central and South America, with intensive and modern production, harvesting, and transport methods used. Clearly, it was an approach aimed at overcoming what Leung Wai (quoted by Sevele 1980) had observed in Western Samoa as smallholders' incapacity to handle advanced technology for export bananas compared with those methods needed for bananas produced for sale in the domestic market. Yet this strategy failed to lead to the production of bananas that could compete on either cost or quality in the New Zealand market with those bananas from competing nations such as Ecuador and the Philippines. At least smallholders continue to supply the domestic market in a profitable manner.

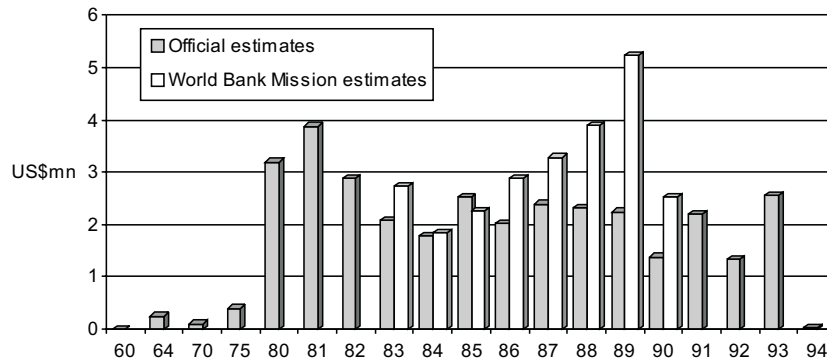
Minor Food Crops

Taro

Until 1993, the taro export industry in Western Samoa could be held up as one that had succeeded admirably without government assistance and in the face of immense difficulties in that taro is a perishable product with a low value-weight ratio. It was based, as in other SPINs, on a market-focus strategy directed towards an identifiable market segment in specific Pacific-rim markets: those with large expatriate Polynesian populations.

At present, the export industry is struggling to regain its former export status, and until recently there were scarcely adequate supplies of taro to the domestic market despite the fact that it is overwhelmingly the most important staple product. However, it was not the prominent marketing difficulties that were the undoing of the industry. Paradoxically, given the vast experience growers have had in taro production, it was in the production system that the industry failed, although the widespread incidence of taro leaf blight that occurred in 1993 was introduced in a way that was outside the control of the taro producers. Yet perhaps it is not a paradox, because export success had brought with it more intensive taro cultivation with fewer rotations and more monocropping, in contrast to the traditional mixed cropping system and well-developed crop rotations. This more intensive production system made producers more exposed to the damaging effects of pest and disease outbreaks.

The sustained success of the taro export industry over two decades can be charted through the seemingly inexorable rise in export receipts to 1989 (World Bank 1991b, p. 57). From modest beginnings in the 1960s, the value of exports grew to an estimated US \$3.88 million in 1981, and taro became one of the major export industries in Western Samoa. In the early years of export, exports varied considerably from year to year. The earliest estimate found was by Tudor (1968, p. 92), who reported exports of WS \$23 200 (US \$248,000 in real terms) in 1964. It was not considered necessary to single out taro in the official export statistics in the 1960s and early 1970s; export values were grouped under "other." Using World Bank Mission estimates of the value of exports in the second half of the 1980s (to correct for underreporting and undervaluing of exports of taro), it can be seen that taro exports increased massively in value, reaching over US \$5 million in 1989 (figure 2.34). The industry was at its peak when Cyclone Ofa caused devastation to agriculture throughout the country in 1990. The industry nevertheless briefly recovered fully from this setback—official statis-



Sources: 1965: Tudor (1968, p. 92); 1970-81: Department of Statistics (1982); 1982-93: AIDAB (1994, p. 88); 1994: NCDS (1995)

Figure 2.34 Value of taro exports from Western Samoa: 1960 to 1994

tics show the value of exports increased to US \$2.2 million in 1991 (World Bank 1993g, p. 57), similar to export values prior to 1990.

Despite its apparent commercial disadvantages as a crop with a low value-weight ratio and short shelf life, plus price volatility in the main export market of New Zealand (Brown 1995, p. 79), taro in Western Samoa has some positive attributes that contributed to its successful export: its production and product characteristics are intimately understood by smallholders and exporters in Western Samoa and importers in key markets such as New Zealand; other positive attributes include its strong domestic-market base, year-round production, resilience to pests and diseases, low purchased input requirements, low technology requirements at the post-harvest stage, and relatively high returns to labor (World Bank 1991b). Taro leaf blight has badly eroded two of these advantageous attributes, in terms of loss of resilience to pests and diseases, and increased requirements of purchased inputs. In respect of the latter, leaf blight now forces taro producers to become heavy users of plant-protection inputs, forcing the taro industry into the high-input category and putting it at a disadvantage to industries in other SPINs that are free of leaf blight.

Six lessons can be learned from the experiences of the taro industry in Western Samoa over the past two decades:

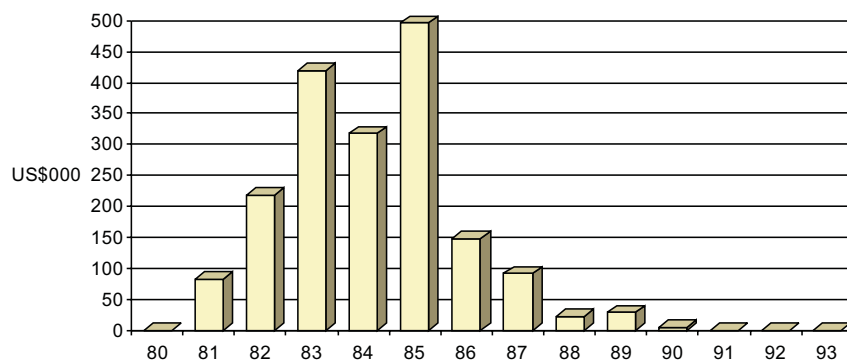
- knowledge of production processes, product attributes, and consumer preferences are critical to achieving export success and can even overcome seemingly insurmountable barriers to export imposed by product perishability and low value-weight ratios;
- the cultural importance of a traditional crop is not necessarily a great barrier to its commercialization for export;
- entrepreneurship can flourish within village-based export production and marketing systems, but the ability to “quarantine” profits may be crucial (in this case presumably a large slice of profits finds its way into bank accounts in the importing nation);

- export marketing efficiency is enhanced by strong private marketing networks, reflecting vertical integration or coordination in marketing channels, notably to Auckland and Wellington in New Zealand (Brown 1995, p. 17);
- intensification of production of traditional crops carries with it increased risk of agroecosystem damage;
- a pest- and disease-free status is an advantage possessed by many SPINs that can be critical to export success and needs to be rigorously protected (see Brown (1995, pp. 22-4) for an outline of phytosanitary and production requirements for root crops in the South Pacific).

HVNT Exports

Passion-fruit juice and pulp

Few export industries better exemplify the boom-bust syndrome than the passion-fruit industry in Western Samoa. A major FAO-funded project, the Food Processing Laboratory (FPL) was established in the mid-1970s with the aim of setting up a fruit-juice processing plant. The FPL plant represented an attempt to secure a fruit export industry as well as a means of processing a variety of foods that could be supplied to the domestic market. The most prominent export industry was to be passion-fruit juice and pulp, export values of which are summarized in figure 2.35. Farmers were first introduced to passion-fruit production in 1977 and 35 tons were produced in 1978 (World Bank 1991b, p. 11). Farmers were strongly encouraged to increase production by agricultural extension officers (Fleming and Hardaker 1992) with incentives of high product prices and subsidized inputs. Their response was dramatic, and, by 1984, the industry had grown rapidly with farm output of passion fruit reaching more than 3000 tons and exports of processed products of 3.3 tons (ADB 1988). Export values peaked in 1985 at almost US \$500,000.



Sources: 1980-81: World Bank (1991a, p. 350); 1982-93: AIDAB (1994, p. 88)

Figure 2.35 Value of exports of passion-fruit products from Western Samoa: 1980 to 1993

Even at its peak the seeds of collapse of the industry had been sown, as crucial processing and marketing issues had been neglected. In the early 1980s, ISNAR (1983, p. 102) was warning that “no research investigations have taken place in Western Samoa on what may happen once the scale of [passion fruit] production is increased,” or if the “large element of government subsidy in the production process” cannot be sustained. The combination of a saturated domestic market, inability to penetrate export markets, restrictive processing capacity, and a fall in world prices (Fleming and Hardaker 1992) led to an equally rapid decline in output, and FPL ceased operations in 1986. By 1987, almost all farmers were discouraged by the evaporation of profits from production and withdrew from the industry. Output sank, and exports contracted to below US \$100,000. Production for export continued at a much reduced level following the collapse of the industry, with a private firm taking over factory operations in 1987 and collecting fruit from a small number of dedicated growers who were reasonably accessible to the factory (World Bank 1991b, p. 11). However, no exports have been recorded since 1990.

Kava

Small amounts of kava were exported during the 1970s and early 1980s, mainly to Fiji. The establishment of a large-scale kava-producing business enterprise in the mid-1980s led to an expansion in exports in the latter half of the 1980s. Exports were valued at 421,000 Tala (almost US \$200,000) in 1988 compared with only 17,000 Tala (US \$8000) in 1987 (Fleming and Hardaker 1992).

The industry continues to provide small amounts of exports, relying heavily on a small number of estates. It shares the same advantages as those mentioned above for Vanuatu. However, cultural demands for domestic use, the much narrower base of commercial growers, and adverse climatic conditions have inhibited substantial export expansion since the initial surge in exports in 1988.

Other processed and fresh fruits and vegetables

ADB (1985) outlined other minor possibilities for agricultural export, chiefly a variety of fruits and vegetables. It reported that the value of these exports at the time was less than WS \$50,000 (US \$20,000). Examples of processed exports included honey, chips, and snacks made from breadfruit, taro, and banana (over WS \$30,000 of these were exported in 1980), canned *palusami*, jam, chilli sauce, coconut syrup, and dried banana and papaya (ADB 1985, p. 254). Prospects for expansion of these exports seemed quite bright then, but they have dimmed in the meantime. The same marketing problems of poor and variable quality and inadequate packaging identified by ADB (1985, p. 65) still bedevil efforts to expand the export of fresh and processed produce. Other problems are in satisfying quarantine requirements in importing nations and establishing regularity in supply (World Bank 1993g, p. 10). As in Cook Islands and Fiji, it is planned to introduce HTFA treatment for exported fruit and vegetables in 1996 in an effort to improve quarantine status in the New Zealand market in particular.

Ginger

The Government of Western Samoa attempted to establish a ginger export industry in 1994 to overcome the rapid fall in smallholder exports created by taro leaf blight in 1993. Some exports were achieved in 1995, but they were disappointing, and growers and the principal exporter who sent consignments to the west coast of USA suffered losses. Reasons for failure were similar to those encountered by various industries where small amounts of a product are sold to export markets without thoroughly studying the market structure and marketing processes. The Ministry of Trade, Commerce and Industry, in collaboration with the Ministry of Agriculture, Forests, Fisheries and Meteorology, decided to call in a consultant from Fiji who was familiar with the history and operations of the ginger industry in that nation and the export markets for ginger products. The findings of the consultancy were presented to a roundtable meeting of Ministry representatives, growers, and exporters in May 1996 (McGregor 1996). They provide an excellent basis for establishing a process for developing a high-value agricultural export industry, if indeed scope exists for one.

McGregor (1996) began with the ginger export market structure and operations, and considered the various marketing strategies that could be followed by a small nation. These strategies were formulated in the light of some important background conditions and events that would influence Western Samoa's export market entry prospects. In respect of conditions in Western Samoa,

- the industry would be a small one by international standards;
- the impact of taro leaf blight left an experienced group of producers and exporters without a major alternative activity to taro export;
- ginger production apparently has a relatively disease-free status;
- agronomic conditions appear favorable to ginger production;
- climatic conditions offer the opportunity to exploit seasonal market niches in that there is potential for a long growing season, given the fairly even distribution of rainfall;
- as a new industry without a history of applying chemical inputs, the ginger industry has the potential to supply organically certifiable exports;
- ginger production is a relatively labor-intensive activity;
- a major farming-systems project recently commenced and could accommodate work on integrating ginger in existing farming systems.

In respect of the export market structure and conditions,

- the ginger industry in Fiji (a major regional competitor) is facing increasingly difficult production obstacles, especially in respect of land degradation and reliance on a high level of agricultural inputs;
- an Australian company has established a joint venture with the Fiji ginger industry in processing preserved ginger products;
- bacterial wilt problems have dramatically reduced Hawaiian exports to mainland USA and shortened the length of season for supplying that market;
- a seasonal niche market on the west coast of USA in the latter part of the year, which was once virtually the preserve of Fiji, is now highly competitive and is supplied by some low-cost exporters;
- the small New Zealand fresh ginger market has grown appreciably in recent years.

These events and situations provide the basis for a strategy to develop a ginger industry in Western Samoa in which the nation has a comparative advantage and producers and exporters have a competitive advantage. This strategy is to be determined initially by examining export marketing constraints and opportunities.

McGregor outlined the main strategic options for the Western Samoan industry. For processed-ginger exports, a number of factors militate against success in exporting dried and preserved ginger. On the other hand, the export of pureed and brine ginger holds out some hope: it entails relatively low-technology processing to a small market.

Fresh ginger exports were considered the most likely to succeed, although McGregor pointed out what would be needed to compete effectively in the limited number of possible markets, and which would be more favorable to a small producer such as Western Samoa. New Zealand offers a good starting point as it is a fairly small but expanding market that would be suited to a small exporter. It could provide a testing ground and bridgehead to larger markets as the ginger export industry develops.

3. Factors Influencing High-Value Agricultural Export Performance

In chapter 2, numerous factors are shown to influence high-value agricultural export performance in SPINs. This variety springs from the diverse and largely unrelated export industries that have come into being over the past few decades, many of which have since perished. The aim in this chapter is to group these factors according to their source. Four source categories are covered:

- the investment climate for high-value agricultural exports;
- the degree of commitment by SPIN governments to a competitive export marketing strategy;
- production factors;
- marketing factors.

Setting the investment climate

Attracting private research and investment in high-value agricultural exporting

Public provision of trade support services. Cole (1992, p. 19) commented that “[t]rade promotion through international missions and fairs is expensive and time consuming.” It is also commonly ineffective, and the export trade support services provided by governments for private exporters of high-value crops in SPINs have been of limited value. They have contributed little in encouraging private investment (and associated skilled management inputs), which has been slow in materializing (McGregor 1990) and overcoming the low absorptive capacity of the private sector in most SPINs (McMaster 1992). Evidence indicates that most successful private export ventures have been achieved with negligible inputs of public planning and support, tempting the inference that high-value agricultural exporting should be left entirely to the private sector. But the evidence reflects more the inadequacies of past and present efforts by governments to provide public support than that their contributions are unnecessary.

The commission of government officials as trade consultants and negotiators on export contracts has likewise been of limited value. The public role is best confined to trade negotiations on market access that can only be determined on a government-to-government basis. Private exporters are best placed (and have the greatest incentive) to negotiate on specific commodity export contracts.

In some areas, as in the provision of public-good services associated with economic infrastructure, there is an obvious case for government involvement in high-value agricultural exporting. Even here, the South Pacific evidence is mixed. Some progress has been made by governments in providing key infrastructure and related services for exporting (transport, handling, storage, and communications). But this progress is seldom enough to enable exporters to cope fully with the natural disadvantages of remoteness and small size of operations and throughput when trying to establish new markets or penetrate existing markets. As a consequence, choice of export market destinations remains restricted for perishable products as well as some nonperishable products.

Prognoses need not be gloomy. As Elek (1992, p. 36) observed, other small island economies have been quite successful in overcoming the disadvantages of remoteness to enable diversification of their export base, principally by developing transport and telecommunications infrastructure. Jaffee with Gordon (1994) explored the factors behind 15 success stories in the production, processing, and marketing of high-value food exports from developing nations in Asia, Latin America, and Asia. While some of the success stories are in large developing nations (e.g., Thailand), others relate to small developing nations that have been able to overcome problems of smallness and remoteness.

Foreign-investment incentives and rules. Limited availability of local research resources and the doubtful wisdom of relying indefinitely on technical assistance through aid suggest that foreign investment offers the best way to ease resource constraints for research and development, especially in agricultural marketing and processing. The climate for foreign investment has not been particularly conducive in SPINs. In fact, it has often led to what Fleming and Hardaker (1995) termed “adverse selection:” discouraging potentially beneficial foreign investors through excessive controls yet allowing in undesirable ones who are prepared to bribe and in other ways obtain a local foothold and who are most unlikely to contribute to the development of high-value agricultural export industries.

Despite the range of official economic incentives provided by governments of all SPINs to foreign investors, outlined in chapter 2, an antiforeign investment sentiment—or at least an ambivalence—pervades many of their bureaucracies. This sentiment makes itself most obstructive where foreign investment rules and incentives are open to interpretation by government officials and allow for capricious changes to be made, which tend to scare off potential investors. The World Bank (1995, p. 24) cited investment approval mechanisms, land access, and rules governing the employment of expatriates as the three biggest obstacles to successful foreign investment in the South Pacific. It also pointed to the need to rationalize fiscal incentives as a key to bringing about more direct foreign investment.

Economic background

Getting macroeconomic settings right. Agricultural exporters in SPINs have been operating in a macroeconomic environment that has been far from helpful. Macroeconomic policies unfavorable to export industries have persisted, a consequence of deep-seated social and political forces at work. The presence of MIRAB characteristics (Bertram and Watters 1985) has created virtual “Dutch disease” effects that militate against export opportunities in all SPINs (Fleming and Hardaker 1994, 1995). This is especially evident in the case of the microeconomies (Cook Islands, Kiribati, Niue, and Tuvalu), where it could prove difficult to take any remedial action. On the other hand, in the next largest group of nations (Solomon Islands, Tonga, Vanuatu, and Western Samoa), there is room for making the macroeconomy more favorable for competitive high-value agricultural and other export industries (World Bank 1995).

In addition to the impediments imposed on agricultural export industries by MIRAB characteristics, government interventions have encouraged widespread rent-seeking in various areas of the economy (Fleming 1995). This has diverted a lot of entrepreneurial resources away from the relatively “hard graft” of agricultural activity to other less taxing and more remunerative (but, in the long run, less productive) means of earning income. Aid has been a culprit in this respect, accounting for between 13 per cent (Fiji) and 122 per cent (Kiribati)

of public revenue in the seven largest SPINs included in this analysis in 1990 (Cole 1992, p. 8).

Intersectoral strategies. The terms of trade facing agricultural producers have trended unfavorably, due not only to the incidence of “Dutch disease” mentioned above, but also to agricultural pricing policies, budgetary allocation effects, poorly developed rural financial markets, and the inefficient operation of agricultural marketing parastatals. These adverse effects have been offset in a sporadic fashion by some subsidization of agricultural inputs and the implementation of agricultural development projects. However, to the extent that the disbursement of subsidies has been inefficiently carried out due to poor management and rent-seeking, their positive impacts on exports have been diluted. Moreover, the provision of subsidies on inputs for a limited period to encourage export market creation and penetration of existing markets is futile if the economic prospects for export are bleak once subsidies cease.

Export orientation versus food self-sufficiency. Public policy statements and actions indicate that strategists in governments of SPINs are confused about the implications of promoting food self-sufficiency through the substitution of food imports while encouraging an outward orientation in agricultural activity. This confusion is perhaps best highlighted by the odd emergence of rice as an export crop in Solomon Islands in the 1970s, but it is not the only example. The government in Papua New Guinea has for years protected its domestic sugar industry despite it being an obviously uneconomic proposition, as the extraordinarily high domestic resource cost ratios estimated by Peter (1993) testify.

Pursuit of a compromise between food self-sufficiency and export orientation is worsened by past failure to provide adequate support for domestic food production in areas where only government can play a role, such as in research, extension, and rural infrastructure. A prosperous and efficient food production system should complement high-value export efforts.

Government commitment to a competitive export marketing strategy

Scope for product differentiation and market focus strategies

Product differentiation. Product differentiation strategies are used by exporters to establish and maintain export market share by differentiating their exports from the commodities of competing export nations. Quality control has been the most common way of trying to do this, enabling the expectations of importers to be met in respect of the uses to which the exported commodity can be put, its attributes in consumption, as well as its dependability and appearance. Product differentiation strategies offer most scope for successful high-value strategies in the mainstream traditional crop exports, particularly in processing. The imperative of providing high-quality exports in these industries is growing as quality consciousness among consumers world-wide feeds back to overseas buyers, who, in turn, become more demanding of exporters. It has been argued (e.g., McGregor 1990) that quality has become a more important factor than price in successful exporting of certain niche products.

Success in establishing product differentiation in export has so far largely eluded SPIN export firms, due especially to the limited progress made in achieving high standards in processing raw materials. Nor have other ways in which exporters can ensure commodity

differentiation, such as the creation of brand image, promotion, and service back-up, featured significantly in strategies so far put in place. Governments in SPINs may therefore have a major role in strengthening quality control to enable exporters to benefit from premiums gained by exporting consistently higher grades.

The evidence to date offers grounds for both optimism and pessimism. There are grounds for pessimism in that governments have so far been of little assistance in improving export quality, despite a number of major projects embodying a good deal of external technical assistance that have been launched with that aim. Disadvantages have surfaced as organizational and skill deficiencies in government agencies, together with limited processing capability, have made consistency in export product quality a difficult goal to achieve. Challenges to the resource and skill base of agricultural sectors in SPINs in the future are formidable.

There is also reason to be optimistic. Smallness in size should be conducive to strong control over production, processing, and marketing processes, and freedom from many pests and diseases is an advantage that can be exploited to secure high prices for exports (Shaw 1982, McGregor 1990). It pays to look at success stories where product differentiation has been effective and quality control has been good as well as remunerative, and to recognize that high quality does not always mean high technology or highly capital-intensive processing. It is often more to do with attention to detail and consistency in quality standards by producers, processors, and marketers, involving timeliness and access to an adequate marketing infrastructure. In other words, simple production and proper post-harvest technology can combine with natural advantages in production and location to yield a high-value export that can be profitably differentiated from its international rivals.

Market focus. Most niche exports from SPINs have been developed through market-focus strategies. Two main types of market-focus strategies have been used. First, specific groups of consumers have been targeted in nearby importing nations, typically Pacific-rim nations. The best example of this type of strategy is the export of root crops by private firms in Western Samoa, Niue, Fiji, and Tonga to Polynesian populations in New Zealand, Australia, and the USA.

Second, opportunities to apply a seasonal or locational market-focus strategy occur where production conditions limit the supplies of a commodity from rival exporting nations in an import market. Being located in the southern hemisphere, SPINs have the potential to supply niche markets in the northern hemisphere during the off-season (McGregor 1990). The ability to follow this strategy in the South Pacific is enhanced by two factors: geographical proximity to a small number of developed nations and climatic conditions favorable to production of most crops for most of the year. The most common use of seasonal/locational strategies by firms in SPINs has been where seasonality in production makes a SPIN the only supplier (or at least one of a very small number of suppliers) of those commodities at a certain time of the year. The supplies of ginger by Fiji to the North American market and squash by Tonga to the Japanese market are examples of this approach.

Another occasional source of market-focus exports is due not so much to the exercise of marketing decisions by exporters but government-to-government negotiations about market access. Certain institutional arrangements on commodity trade agreed between a SPIN government and the government of an importing nation, or group of nations, can allow ex-

porters access to a protected market that enables them to earn prices well above world averages. Examples are the current (but endangered) access to EU markets for sugar exports from Fiji and the former preferential trade agreements for the export of South Pacific bananas to the New Zealand market.

Selection of niche-export marketing strategies based on identified market segments is performed mostly by firms in industries that have recently entered export markets. They are employed by small exporters seeking to find specialized market segments that are unattractive to major exporting nations and large international trading corporations.

Success in SPINs from following this strategy has been spasmodic. Although countless agricultural products have been shown to hold potential for export niches, very few have achieved commercial success. This suggests that the commercialization process is inherently difficult and, where followed, has been defective in practice. It can probably be traced back to the “hit-or-miss” approach adopted by research institutions in testing production possibilities. Almost anything that might grow in the South Pacific has been subject to production research, with little regard to its prospects for commercialization.

Even for those exports that have achieved commercial success, three factors have emerged to complicate market defence. First, foreign competition holds the threat of erosion of the niche or at least of making it less profitable and hence less likely to remain a high-value export market. This is seemingly a universal occurrence (e.g., Durant and Blades 1990). Even though it has not materialized to any degree so far, there is also the threat of greater competition among nations in the region in various niche export markets. Second, few such exports have managed to attain leading export status. Compared with traditional export values, the values of niche exports have by and large remained relatively tiny. Finally, for those high-value exports that enter a protected market courtesy of special institutional arrangements, the risk of institutional change offers grave danger to a profitable and secure export future.

Identifying and reinforcing comparative and competitive advantage in high-value agricultural exporting: the difficulty of trying to “pick winners”

SPIN governments have been quite active in the past in trying to “pick winners” among high-value export-crop industries—whether by export activity or export enterprise—without any rigorous consideration of whether the winners chosen are in industries in which the nation has a comparative advantage for export. Their lack of market information and analytical capability, combined with a dearth of the business acumen needed to pinpoint industries that will succeed in these most demanding of markets, have contributed significantly to the unimpressive records in virtually all nations in the region.

Lack of analytical capacity in economic research has long been a major limitation in all SPINs, even in nations (such as Fiji) that have had well-developed procedures for updating technical and financial information for a variety of agricultural activity budgets. Virtually no in-house work has gone into estimating domestic resource cost ratios or other measures of comparative advantage. Even where outside consultants have attempted this, as in the case of tree-crop industries in Papua New Guinea (e.g., World Bank 1992), shortcomings in procedure, especially in valuing the opportunity cost of the key domestic resources, land and labor, have detracted from the value of this work (Fleming and Antony 1993).

If the decision is made by a government to leave choices about diversification into high-value agricultural exports to the private sector, it cannot fully escape some sort of procedure to pick winners among these industries once a decision is made that it is impossible to support all possible agricultural export ventures. Certain forms of public support in both production and marketing systems can influence the chances of success of such ventures, and the effectiveness of provision of this support depends on how well it is researched. The key is in reducing the possibility of major errors in this procedure, and it is suggested below that a “research-portfolio” approach is the most desirable one to adopt.

In addition, governments need to distinguish between comparative advantage and competitive advantage. As Warr (1994, p. 1) observed, “while competitive advantage may be relevant for the performance of firms, comparative advantage remains as relevant as ever for the performance of the nation.” It is in respect of high-value agricultural exports in which a nation has a comparative advantage that governments should provide public support. Maintaining competitive advantage should be the preoccupation of individual firms involved in high-value agricultural exporting, except where government can assist in a broad sense by the provision of public goods such as education, quarantine, and infrastructure, which partly reinforces that competitive advantage.

Production Factors Influencing Export Success

Endemic technical and physical factors

Production efficiency. Production can be a stumbling block where feasible high-value export industries are simply unprofitable to producers (usually smallholders in the South Pacific), who can only achieve low levels of technical efficiency in production, given their circumstances, knowledge, and skills. The suitability of export crops for smallholder production varies, but it has been shown that some relatively new export crops are very well suited to smallholder producers who can also competently undertake simple post-harvest activities with them. These new export crops include ginger in Fiji (McGregor 1988), *ngali* nuts in Solomon Islands (Pelomo et al. 1996), taro in Western Samoa (Fleming 1988), kava in Vanuatu (Pakoa 1995), and vanilla and squash in Tonga (Menz and Fleming 1989; Fleming and Hardaker 1995).

Production technology has proved a significant impediment to the emergence of high-value exports in few cases. The major area of concern has been in following a product-differentiation strategy in the export of mainstream traditional crops, where quality considerations have demanded close adherence to advanced technologies. Examples are smallholder coffee and cocoa producers in Papua New Guinea and cocoa producers in Solomon Islands, Vanuatu, Fiji and Western Samoa.

The precise technology required to ensure good-quality bananas for export seems to have escaped smallholders in recent times, yet this was not a constraint on exports for two decades in the early post-war period. On the other hand, technology was a factor contributing to the downfall of the banana export industry in Western Samoa in the 1980s. High-input high-output estate banana production, complicated by deficiencies in management, proved very expensive relative to smallholder production. The same fate befell rice production in Solomon Islands. In both cases, it was more a case of an inappropriate intensive technology

choice, given local resource constraints and circumstances, than an inability to master a particular production technology.

The existence or otherwise of size economies in agricultural production has had little discernible impact on production performance in high-value export crop industries.

Exogenous physical factors

Climate. Climatic factors have played a minor, and usually temporary, direct role in influencing high-value export performance. They have had an incidental role in ending a couple of high-value export industries and put others in jeopardy. Cyclones have damaged banana export industries and a cyclone was the “last nail in the coffin” of the limes industry in Niue in 1985. Cyclones combined with low world prices to reduce cocoa exports from Western Samoa to negligible levels in the 1990s. Rice production in Solomon Islands ceased following a cyclone in 1986.

As a counter-factual case study, the oil-palm industry in Solomon Islands was severely affected by Cyclone Namu, but it survived extensive damage to return to above-precyclone output levels within four years. Its economic foundation was considerably stronger than were those of industries that were brought to an abrupt end by climatic events.

Pests and diseases. The most celebrated cases of the impact of disease on export industries in SPINs have been the incidence of coffee leaf rust in Papua New Guinea in 1986 and taro leaf blight in Western Samoa in 1993. In the former case, the outbreak was contained, and no permanent damage was done to coffee exports. In the case of taro, exports have ceased, and shortages in supplies to the domestic market have had a profound impact on the agricultural sector. Given the otherwise almost exemplary record of the taro export industry, it is possible that full recovery of exports could occur with time if leaf blight problems can be overcome through disease control (no effective measure is currently available) or the introduction of blight-resistant varieties.

Pest and disease problems have often been associated with export decline, but the onset of pest and/or disease problems has been a result of the industry decline rather than its cause. Where profitability has declined, the imperative to carry out good maintenance has diminished.

Quality control

Quality control in production has been a persistent problem for many high-value crops for which a product-differentiation marketing strategy has been adopted, especially where advanced technology has been involved, but also where a disciplined approach to crop maintenance has been required. Successful export crops in Tonga, such as squash and vanilla, are examples where significant advances have been made in quality standards but where lapses in quality control in production are a constant threat to the industry. Tongan watermelon exports were effectively stopped for a long period during the 1980s because of one such lapse. With good field management and a little luck, the former two activities will continue to be successful. For others, such as watermelons and bananas, it may already be too late.

Quality in some traditional crop export industries has been maintained by some producers but not others, leading to a bimodal marketing strategy based on quality differences. For example, some estate producers in the coffee industry in Papua New Guinea are able to maintain consistently high quality standards and earn premiums through direct consignments to foreign buyers. Smallholders, on the other hand, have virtually been excluded from the high-value export segment simply by virtue of their production mode, even though a significant amount of their output has the potential to qualify for sale to that sector (Fleming and Antony 1993).

Problems experienced with quality in production, especially by smallholders, can only partly be attributed to production practices. They also occur because personnel in government agencies intervene to influence product quality, yet lack the ability to

- impart knowledge about quality standards to producers;
- make sound economic judgments about the profitability of various measures of quality improvement in production;
- provide appropriate incentives to induce responses from producers that reflect desired quality differentials;
- enforce quality regulations that are put in place as they affect producers.

Even where initiatives have been taken in SPINs through government projects to raise export quality, success has been short-lived. Attempts to maintain consistently high quality are usually unsuccessful, because the procedures put in place on project completion do not overcome previous shortcomings that the projects were meant to fix. It is preferable that governments leave decisions about export quality to the private sector until they can adequately research all aspects of product-quality issues and provide adequate enforcement or inducement mechanisms.

Socioeconomic and institutional factors

Production characteristics. The suitability of a production activity to existing farming systems (and its compatibility with other elements in a system) has proved an important influence on high-value export performance. This is something that has not always been picked up in SPINs, where research work has been based primarily on experiment stations. Witness the successful introduction of high-value exports based on long-standing activities in traditional farming systems with favorable production characteristics (for example, kava is a potentially major export success story in Vanuatu). Important positive attributes of production processes include

- simple and well-understood production methods that are not highly labor-intensive and dependent on high levels of usage of external inputs, nor susceptible to damaging pests and diseases;
- plentiful planting material;
- high gross margins in production;
- complementary relations with other activities in the farming system.

The importance of suitability and compatibility in production processes tends to grow as the activity becomes more successful and its more intensive use places new strains on the farming system. Pest and disease risks become greater—witness the plight of the taro industry in

Western Samoa—and there is emerging evidence that soil degradation problems are heightened (e.g., squash production in Tonga).

Costs of production. High-input production practices in high-value export industries are vulnerable to extended periods of low export prices because of the high farm-gate costs of imported inputs. Industries based on a plantation or cooperative mode of production are especially vulnerable, as shown by the difficulties experienced by plantations and the demise of most group blockholdings in the recent recessions in the world coffee and cocoa markets. Plantation banana production in Western Samoa also suffered from high input costs.

Other high-value export industries have fared less well than might be expected, because they were up against low-cost foreign competitors, particularly in terms of wages (Elek 1992, p. 7). Niue, with its relatively high wage levels even by SPIN standards, has been especially unable to sustain exporter competitiveness in industries such as limes production. This problem is obviously most acute in relatively labor-intensive export production.

A number of high-value exports have proven to be sensitive to production costs. As a case in point, the profitability of ginger exports from Fiji would evaporate with a small increase in costs of production under the trade regime existing in the North American seasonal niche market (Tokalau 1993).

Mode of production. With two possible exceptions, mode of production does not appear to have played a significant role in determining high-value export performance in SPINs. The first exception concerns the resilience of different modes of production to long periods of adverse economic conditions, as indicated above for plantations and cooperative production units in Papua New Guinea. Other factors that make their survival difficult in periods of low world prices are their inflexible production structures and, for some, managerial deficiencies.

Second, and on the other hand, some coffee and cocoa plantations in Papua New Guinea have been successful in applying product differentiation strategies where smallholders have not. The bimodal marketing strategy in existence for most traditional exports with potential to exploit premiums for high quality has been reinforced by a dualistic structure in the production system (Fleming and Hardaker 1994). This dualism has made it very difficult for the usually more prevalent production mode—smallholdings—to penetrate this high-value market segment. But this should not be seen as an inherent defect of smallholders; it springs more from institutional dualism perpetuated by government policies.

Land tenure and related social factors. Many observers have argued that the predominant customary land tenure systems in SPINs is a brake on agricultural growth because they suppress initiatives of village-based export producers (Fleming and Hardaker 1995). Submission to a communitarian code of behavior obliges the desires, aspirations, and actions of individual farm households to be subordinate to the needs of the rural community, typically the village (McMaster 1992). This is felt most keenly in the export of high-value products. Ward (1983, p. 11) notes the following:

The market, as it becomes more developed, whether for fresh food supply or food processing, demands regularity of supply, and adherence [sic] to some set of product specifications. The latter usually require a degree of specialisation and larger scale of production of the particular

line on the part of the grower. Delivery deadlines are inimical to a system of labour mobilisation based on reciprocity in which obligations are incurred, and must be met, outside the agricultural production system. Inevitably, social and market obligations clash—if the social obligations are given precedence the farmer's market arrangements may well collapse . . .

Yet clearly the communal land tenure systems and pervasive community pressures on individual households have not completely suppressed entrepreneurial activity by these households. Some successful high-value export industries—squash and vanilla in Tonga, taro in Western Samoa until leaf blight struck, and kava in Vanuatu—have been village-based, defying the commonly held view that village-based smallholders cannot break out of the constraints imposed by the communities within which they operate.

Marketing Factors Influencing Export Success

Distribution

Logistics: infrastructure and transfer. The difficult physical marketing conditions and diseconomies of small size of export volumes of SPINs (Shaw 1982) count against all forms of agricultural exporting, but underdeveloped distribution channels disadvantage high-value exports to a greater extent than low-value exports. This is because, by their nature, these markets are more complex, and so exporters operating in them require more highly evolved systems to fulfill market conditions than do, say, copra exporters. The cause of many high-value export failures has been the logistical difficulty of transferring products from the farm-gate to the importer. For highly perishable high-value exports, “existing air cargo capacity is insufficient to allow the development of large industries” (McGregor 1990, p. 10). MAFF (1996, p. 19) is almost certainly correct in stating that most high-value export industries in SPINs are unsuitable to more remote islands and other areas with poor access to air and sea ports or centres of tourism.

Channel relations. Channel relations⁶ have varied widely across high-value exports from different SPINs. While one should be circumspect in drawing any generalizations, it appears that the closer these relations between market participants the easier it has been to penetrate and defend export markets. For example, the especially strong channel relations due to clan ties at all marketing stages aid the development of a number of minor food-crop and beverage exports to expatriate populations.

These markets aside, there is a fundamental obstacle to the manipulation of marketing-mix factors by producers and marketers of high-value agricultural exports in the domestic sector of the export-marketing system in any SPIN. It is their lack of control over events further downstream in the marketing channels. They need to be careful about paying too much attention to the dictum, often recited by local politicians and foreign experts, to be responsive to foreign consumers' demands. This is a strange injunction, because it is self-evident in high-value exporting that consumers' wants have to be understood and met. It is needed, though, in considering the issue of channel control in export markets. Government exhortations to growers to meet consumption needs overseas more closely are of little use if, for example, those growers have no control over how the final product is delivered to the foreign

⁶ Channel relations are defined as the relations on matters such as price, conditions of sale, services, and responsibilities developed between people and institutions at different stages in a marketing channel.

consumers. An important aspect of research into high-value agricultural exporting, therefore, is to determine where power lies in retaining and altering product attributes and also how the rewards from doing so are going to be distributed among market participants and producers. For example, intermediaries at a certain stage in the export marketing system of a high-value agricultural product might have the means, but not the financial incentive, to change its attributes, and vice versa for another set of intermediaries.

An important aspect of channel relations for small SPIN producers concerns the guaranteed volume of produce that suppliers sell to foreign buyers. To date, SPINs have often failed to assure minimum and regular supplies. For many high-value export markets, it is probably a waste of time attempting to supply produce, because it is unrealistic to expect to reach minimum supply volumes to satisfy the buyer, especially those from relatively large nations (MAFF 1996, p. 16). In these circumstances, it would be better to follow the advice proffered by MAFF (1996) to begin by supplying buyers from smaller markets, who have lower volume thresholds. These markets can be used to build up volume as a bridge to larger markets in the event that export quantities become sufficiently large.

Another aspect of channel relations that has potentially strong implications for developing market-focus strategies for high-value exports concerns links to conservation-based international corporations. Some such corporations are attempting to exploit growing consumer consciousness in the developed world of the need to promote conservation of natural resources globally. SPINs have an image of unspoiled rural environments, which offers an opportunity for high-value exports of “environmentally friendly” produce to niche markets in developed countries. London (1996), for example, reported on the work being undertaken by Conservation International in four SPINs (Fiji, Papua New Guinea, Solomon Islands, and Vanuatu) with local communities to develop export industries based on natural resources using environmentally sound practices.

Market access and quarantine and phytosanitary requirements. Market access has been conspicuously important for many high-value export industries in SPINs but none more so than those marketing fresh produce to nearby developed nations. This is because of the need to meet increasingly stringent phytosanitary requirements and quarantine protocols, which has often been compromised by inadequate or inappropriate post-harvest technology and methods (McGregor 1990). It has also been important where preferential trade conditions have prevailed or been removed (as in the case of banana exports to New Zealand and, in prospect, Fiji sugar exports to EU nations).

New industries unconstrained by exacting quarantine restrictions imposed by importing nations are among the most appealing for high-value exports. The tendency of some importing nations to change quarantine conditions frequently (and sometimes arbitrarily) makes it risky for potential niche producers and exporters of fresh products. Indeed, the long-term prospects for some fresh produce export markets currently being pursued might not be as good as SPIN governments believe unless a lot of groundwork is done to establish secure quarantine protocols.

Choice of domestic marketing organization. A comparison of the performance of parastatals, private indigenous firms, and foreign companies in SPINs suggests that the performance in high-value export marketing of the last two groups has been much better than that by parastatals (McGregor 1990). The future for private export marketing in a variety of

forms looks by far the more promising, as farmers and private firms tend to operate much more at the “cutting edge” of market development in the early stages of research and development (Eyzaguirre 1996, p. 121). Government agencies in these circumstances would be reduced to regulatory, advisory, and supporting roles, including that of relieving private producers “of some of the high-risk burdens and entry costs that are associated with high-value exports” (Eyzaguirre 1996, p. 120).

Fleming and Hardaker (1995) observed that the performance of private export processing and marketing firms is not uniformly good but contended that this should not be expected in such a risky business environment. Some processing and export marketing enterprises *will* go bankrupt, but this is preferable to the unwillingness of governments to let their own agencies fail through inefficient and uncompetitive operations or just plain bad commercial decisions.

Placing greater responsibility on private agribusiness firms to research and develop new industries bears the risk that little activity will eventuate once public agencies depart. If that is the case, and if the macroeconomic and investment climate is propitious, one must seriously question whether much scope exists for economic development through high-value agricultural exporting—public or private.

Export-market knowledge. High-value agricultural exporters in SPINs face formidable barriers in gathering market intelligence in importing nations, doubtless harming their performance and putting a brake on consequent growth. Remoteness, small size and limited and expensive international transport and communications make it uneconomic for many export businesses to match their better-endowed foreign competitors in the ways they conduct their business affairs.

Market width. There are two dimensions to market width that might influence high-value agricultural export performance. First, a product could be exported by opening up a number of different marketing channels, usually occupied by different marketing intermediaries. There is little evidence from experiences in SPINs to suggest that performance is going to be greatly affected by the number or variety of these channels, except where governments have damaged export opportunities by endowing parastatals with monopoly buying and exporting rights.

The second issue on market width concerns diversifying export destinations to manage market risk. Governments have acknowledged the risks of sole reliance on one export destination, such as squash exports to Japan from Tonga or ginger exports to the North American market from Fiji. Also, it is generally easier and cheaper to expand into new market destinations with the same product than to penetrate an export market with a new product. This suggests a role for researchers in exploring new markets for existing high-value exports. But such research endeavors need to be tempered by recognition that it is seldom possible to find similarly remunerative market conditions in other nations that allow market diversification without some loss of profit.

Market depth. The length of marketing channels is a crucial element in getting quality and other market information back to producers, processors, and marketers of agricultural products in SPINs. This is because difficulties in communications heighten the tyranny of their remoteness from final consumers. Where there are many stages in a marketing channel be-

tween the producer and final consumer, the passage of accurate and timely market information becomes extremely difficult.

Two main actions can be taken to shorten channel length. First, final consumers can be physically brought closer to the producer by marketing more produce to tourists, either directly (handicraft producers have done this quite successfully on a small scale in a number of SPINs) or indirectly through the hospitality industries (with limited success to date). Second, greater resort can be made to vertical integration or coordination of marketing activities. This can occur from either end of the marketing chain: foreign traders and manufacturers could participate in domestic marketing and processing activities, or producers could integrate downstream by becoming involved in processing and marketing. These actions are further discussed below.

An interesting approach to shortening channel length in a couple of industries has been the use of family members overseas in export-market development. This is evident in root crop exports from Polynesian nations. Before taro leaf blight, Western Samoa had established a highly successful commercial marketing network at all stages in the marketing process for taro exports to New Zealand. Their success in this regard contrasts with the less efficient networks set up in nations such as Tonga and Niue. Fleming and Hardaker (1995) pointed to the less formal market relations established for Tongan root crop exports, which led to greater financial, quality, and delivery problems than occurred for Samoan taro exports. Thus, channel length and relations can interact in their impact on export marketing performance.

Product management

Product attributes. A number of product attributes have been shown to have a strong influence over the likely success of a high-value export from SPINs. Chief among them are nonperishability, resistance to damage in transfer, high value-weight ratio, multiple uses, storability, and relative ease of transport. They present themselves as prime areas for agricultural research when examining product suitability for export.

Grave doubts exist for those high-value exports where requirements for product characteristics in the importing nation are very stringent. Such requirements tend to make the integration of production and marketing activities very exacting, a state that is not particularly well suited to SPIN production and marketing systems. Small numbers of medium- and large-scale growers operating under formal contractual arrangements or in a nuclear estate system are preferable alternatives to large numbers of smallholders for these sorts of exports. Governments are probably better off leaving such initiatives to private enterprise and responding to the specific export needs of private marketers where it is thought to involve net public gain as well as private gain. Quarantine is the most obvious of these (see below). The use of subsidies as a form of assistance, though, should be avoided.

International product evolutionary cycle. The term “international product evolutionary cycle” (IPEC)⁷ is used here to indicate that, during this cyclical process, an exporting nation can respond to changing international market conditions by altering the product, or at least consumers’ perceptions of the product, to defend its export market share. Examples of market-defence strategies that can be employed are additional value-adding through processing and quality improvement, promotion and negotiations on market access provisions.

The importance of understanding the cycles through which high-value exports proceed was stressed by Eyzaguirre (1996, pp. 116-22) who identified the changes in research costs and profitability of a product through its life cycle. As a general rule, research costs are initially high and profitability correspondingly low (often negative in the initial stages of research). Where costs, and negative cash flows, are initially very large, as is common with applied research into the development of new agricultural products, it would be difficult for entrepreneurs in small nations such as SPINs to recoup sufficient returns to warrant the effort and risk.

Research costs tend to decline as the product passes through its growth stage and reaches early maturity, but they seldom fall to zero as there are usually some research activities associated with attempts to increase market penetration and reinforce market defence. As late maturity is approached, research costs begin to increase again and profitability declines. By this stage competition is usually intense, and exporters are confronted with more costly research options: market defence by altering product form (as is being tried with ginger exports from Fiji) or repositioning the product to lessen this competition. The other alternative is to resort to pricing strategies that “milk” as much revenue as possible from the product before it is withdrawn from export markets. These decisions are best left to private entrepreneurs.

Four main exogenous factors can have a sustained influence on the IPEC: institutional changes (both domestic and foreign), international competition, changing consumption patterns in target markets, and technological change. There are also physical factors, such as cyclones and disease and pest incidence, which are difficult or impossible to predict, but which more often than not have only a temporary influence.

Institutional changes in the international sphere of greatest worry to high-value exporters from SPINs are those that have a bearing on market access. Examples are trade restrictions (or their lifting for competitors as occurred for bananas in the New Zealand market in 1992) and quarantine restrictions.

A feature of niche markets is that exporters from other nations cannot be excluded from some of the benefits of a particular market and can thereby destroy the niche by out-competing its creator, or at least make the niche less profitable. Competition from foreign producers is the most common factor hastening an export through its IPEC, and this competition is sometimes made more intense when combined with technological change. It is something to which SPIN exporters are particularly susceptible but which so far has only

7 The international product life cycle refers to the stages through which a product goes from the time it is first exported by a nation until the time production ceases in the nation in which it originated because of the combined effects of intensified competition from other nations and changing consumption patterns in importing nations. Hence, export market withdrawal does not necessarily connote the death of the product as it may well revert to being solely a domestic activity.

occasionally been fatal to niche export industries. Nevertheless, it may well become a more potent force of high-value export decline in the future, and SPIN exporters cannot afford to take a complacent attitude. Also, improving technology is necessary to keep a competitive edge and avoid erosion of market share.

Another major way in which certain high-value exports from SPINs can be hastened towards a state of decline is through changing consumption patterns in key importing nations. The main area of concern is the consumption of traditional islands produce by expatriate Polynesian populations in New Zealand, Australia, and the USA. As younger generations become more assimilated in foreign communities, and their lifestyles and eating habits approach those of the host population, the demand for islands produce is likely to decline and the export market segment shrink. Constant attention to marketing strategies and technologies and keeping abreast of market trends (Brown 1995, p. 8) are needed to avoid this decline.

Granted these exogenous determinants, there is still considerable scope for those producing and exporting high-value products to influence and manage the IPEC through product management and the manipulation of other marketing mix variables, as described in this chapter. For example, to deal with changing consumption patterns in the destination market segment, the marketing mix variables could be manipulated to alter the positioning of the product. This could be done by appealing to the preferences of the indigenous population to try more exotic products in order to broaden the export market segment or shift to a new one. In most cases, it is best left to the private sector to grapple with such challenges. As indicated above, however, SPIN governments can support private export industries by influencing institutional change, where appropriate. They can also put in place strategies and policies amenable to export activity that influence the IPEC in a desirable direction.

Product range and new product development. Two opposing factors are at work in SPINs concerning export product range and the desirability of diversifying into a wide range of high-value agricultural exports. First, there is the issue of replacing products that, for one reason or another, come to the end of their IPEC. On the other hand, the more diverse and unrelated a high-value export portfolio, the greater the demands on the national agricultural research system (NARS) and the more elusive successful export performance becomes. Titiulu (1992) provides quantitative evidence that agricultural export performance has been negatively associated with agricultural export diversification in Solomon Islands, Fiji, and Papua New Guinea. On the other hand, competitiveness in supply was found to have the most significant positive impact on export performance.

If it is accepted that only a limited number of high-value exports can be successfully developed and defended concurrently in small nations, new product development should ideally be linked to the management of the IPEC. As existing high-value exports reach late maturity or in other ways have their "export life" threatened, research and development processes should enable new high-value exports to emerge. In practice, such a smooth process has been difficult to coordinate in SPINs as these sorts of export activities are seldom so well behaved. Market opportunities have had to be grasped by private exporters when they arise.

Niue is an extreme example of a nation that has been struggling to replace failed high-value export industries, but all SPINs have experienced a failure to assemble a solid and consistent portfolio of high-value export industries. Apart from the capricious nature of high-value ex-

port markets, two related factors largely explain this phenomenon. First, there is little evidence that the high-value export industries that are developed in any particular nation have many complementarities either in research or with other agricultural industries. Indeed, many even appear to have very little in common with each other. This observation can easily be extended to a regional basis: SPINs have achieved little in complementing each other's agricultural research and development in exporting activities. Second, there is also little evidence that much has been learned and retained by national researchers and policymakers about the successful and unsuccessful features of different high-value agricultural export industries. As a consequence, the knowledge base that can be used to build up and sustain a successful high-value export portfolio is meagre. This deficiency has been worsened by a failure to construct and use appropriate agricultural research management information systems.

Economics of processing. SPINs have suffered major handicaps when trying to diversify their export portfolio vertically through value-adding processing activities in existing export industries or by the addition of new export industries with a high value-added component. Four main handicaps have tended to interact to make the economics of processing unattractive in all but a handful of industries:

It is tempting to add a fifth handicap to this list: a shortage of affordable loan funds, as agribusiness processing industries tend to be quite capital-intensive. There might indeed be examples where lack of credit has constrained the development of these industries in SPINs (e.g., McMaster 1992), but they are difficult to discern. Also, the impact of the credit constraint is probably difficult to disentangle from the lack of profitability of the investment opportunity. There have certainly been a number of aid-funded development projects and the provision of cheap development-bank money to expand processing activities, but the success rate of such ventures has been low. This suggests a lack of profitable investment opportunities rather than shortage of affordable loans that has emasculated efforts to develop agribusiness processing.

Technological advances in agricultural processing. As implied above, SPINs are not well placed to benefit from technological advances in the processing of agricultural products in general and high-value agricultural products in particular. Advances represent market threats more often than market opportunities. A reduction in the length of off-season production in temperate nations of produce exported by SPINs is unequivocally a danger to certain niche exporters from SPINs.

On the other hand, in some circumstances there are both dangers and opportunities in that the market changes induced by a technological advance focus attention on product differentiation through high-quality exports. Innovations of processing techniques that enhance the substitution of so-called artificial products for natural products are cases in point. The substitute of artificial vanillin for natural vanilla has threatened for some time to reduce world demand for natural vanilla, only to be offset by the introduction of strict regulations governing product description in major importing nations and growing preference among consumers for buying natural products. The substitution of cheaper vegetable fats for cocoa butter in the manufacture of chocolate has eroded cocoa's world market share in this large industry. In both cases, in order to stem the attrition in market share, the imperative is increased for producers and marketers of these exports to develop the higher value end of the changed market by exploiting the advantages of the natural product.

Product quality. Product quality in marketing is clearly linked to (and contingent upon) that in production. Quality has had a bearing on the success of high-value export products in SPINs in two main ways:

- it affected their access to export markets;
- it enabled a successful export marketing strategy built on product differentiation.

Links in quality management between marketing stages and between marketing and production systems have been more tenuous than desirable in SPIN export industries. The two crucial relationships where quality has mattered are between foreign buyers and exporters and between producers and domestic rural buyers. Information flow on quality requirements between parties in these relationships has not been good for most high-value exports in the past. It has mattered least where participants at all levels in a marketing channel know the product, consumer preferences, and each other intimately, as has been the case with root crop exports to New Zealand. In the development of new products for which these conditions do not hold, quality management is much more difficult. Nonetheless, the rapid learning curve traversed by Tongans exporting squash to Japan, despite a few hiccups along the way, shows that it is possible to develop market relationships and information flow on quality to an adequate level in a short time. But this has been the exception rather than the rule until now.

Where governments have been involved in regulating quality in the export marketing system in SPINs, their performance has been substandard and their influence on quality sometimes contrary to that desired. Specifically, problems have emerged as a consequence of inappropriate licensing procedures and their imprecise implementation, neglect of economic criteria in establishing quality guidelines, prejudicial decisions caused by political interference, lax execution of quarantine procedures, inadequate enforcement of quality regulations as they affect processors and marketers, and the ossification of quality and grading standards and their compliance in what are essentially very dynamic export industries. Some of the shortcomings listed here require organizational changes to remove them, perhaps, as indicated above, withdrawing government involvement in certain quality-control and grading practices. Most demand greater public research input into quality issues.

Pricing

Marketing margins. Reference has already been made to the difficult physical conditions, exacerbated by small export volumes, facing agricultural exporters in SPINs. These conditions cause high export marketing costs, which, for most high-value products, have been a material influence on their performance. The pervasive influence of high marketing costs, no matter which marketing channels or organizations are chosen, suggests that research into ways of lowering costs is desirable. Government has an important function here, where the cost of their marketing services of a public-good nature comprise a substantial portion of total export marketing costs.

Export pricing strategy. Export-pricing strategies assume most importance in industries that adopt following-at-a-distance, product-differentiation, and market-focus strategies or that enter a phase in their product cycle when greater pressures are exerted on their market share. Such industries are characterized by intense foreign competition and market condi-

tions that are susceptible to swift changes. They are also characterized by price-setting procedures that are less formalized and more complicated than for traditional export markets, where inability to influence world price and established price-setting procedures make the job of price negotiation more straightforward.

Strong negotiating skills are necessary in these circumstances. As private exporting firms have most at stake in price negotiations, it behoves SPIN governments to remain as aloof from them as possible—which they have not always done. There are also dangers in governments becoming too involved (as the Tongan government has been prone to do in the squash industry), for example, where forms of intervention have included the use of quotas for price maintenance and direct involvement in price setting. Prices could be badly set where government officials are not conversant with the commercial issues at stake. Quotas to limit export supply (especially if they are established or left in place when competition in a niche market is becoming more intense) might send signals to SPINs and other competing nations that they could also establish or expand in the same market niche.

Pricing for quality premiums. Poorly developed procedures for assessing returns to quality improvement have limited the successful adoption of product differentiation strategies in a number of SPIN industries. The common cry for quality improvement without considering the economics of its achievement tends to distract research from more economically justifiable pursuits of quality gains.

Price instability, forecasting future price levels, and stabilization schemes. Export-price instability is a factor that can threaten high-value industries in the early stages of their development. The failure of the passion-fruit industry in Western Samoa is partly attributable to a major drop in prices following a rapid rise in exports in the early 1980s. Price instability is of particular concern for those high-value export industries, especially spices (Vinning 1990, p. 54), which have thin markets and are characterized by oligarchic market structures.

Price stabilization schemes have been used by South Pacific governments to ease the impact of world commodity price instability, but almost exclusively in traditional crop exports. Their operations have only been of relevance to high-value export industries based on product differentiation, such as cocoa and coffee. Recent evidence shows that these schemes have proved inadequate in providing price stability in extended periods of low world prices, as none survived in the 1990s without a large government subsidy. Among a number of shortcomings (Fleming 1992a), it has proved difficult for scheme managers to forecast trends in world prices with limited resources and relatively little knowledge of world markets. The introduction of an element of public subsidy to provide temporary support at “floor prices” means that managers of these schemes have tended to bias their operations against the high-value segment of the industries by making no allowance for quality in bounty payments (e.g., McConnell, Rambaldi, and Fleming 1996).

Promotion

Promotion has played a negligible role in influencing high-value agricultural export performance in SPINs. Its relevance has been restricted to exporters operating in the high-value segments of markets for traditional export crops. These exporters wish to differentiate their

outputs from those of their compatriots in international markets where country reputation is important in determining the price received for the bulk of exports from that nation.

Because such export trade is usually conducted on a consignment basis, personal selling is the most common form of promotion employed. It has been successfully practised, for example, by certain coffee producers/exporters in Papua New Guinea. Promotion through brand packaging has also been an important form of promotion for exporters of the small quantities of roast coffee from Papua New Guinea. On the other hand, past attempts at generic promotion of Papua New Guinea coffee have proved futile (Fleming and Antony 1993, pp. 132-3).

4. Setting Agricultural Research Priorities for High-Value Agricultural Exporting

The summary of determinants of performance by high-value agricultural export industries presented in chapter 3 is used in this chapter to set some research priorities for improved performance in the future. First, the main implications of the findings in the previous chapter are explored in terms of

- the relative merits of horizontal and vertical diversification;
- variations in performance between different export product types;
- the influence on performance of general as opposed to product- and industry-specific factors;
- diagnosis of export failure according to its varied and concurrent sources;
- the relative merits of research into market penetration measures and market defence measures;
- relations between production and marketing research;
- the scope for exploiting market width.

Following these discussions, the case is put for a research-portfolio approach to improve high-value agricultural exports from SPINs. Third, suggestions are made as to the most pressing research issues for resolution, based on the six areas of institutional responsibilities for research functions outlined by Eyzaguirre (1996, p. 36). Finally, some observations are made about the need to modify the research approach across SPINs according to country size and research capability.

Implications of Findings

Horizontal or vertical diversification?

Evidence in SPINs suggests that horizontal diversification has been more successful than vertical diversification. One qualification to this finding is that some successful vertical diversification has been associated with horizontal diversification where the introduction of a new export commodity entails some simple post-harvest processing activities.

The major constraint in pursuing vertical differentiation has been in selecting processing activities suitable to the circumstances of industries in SPINs. Two dominant factors have made processing difficult:

- capital-intensive agricultural processing industries have proved unsuitable in SPINs, primarily because they require reasonably large-scale operations to succeed. Severe diseconomies of small-scale processing have meant many processing activities have been internationally uncompetitive;
- labor-intensive processing has not suited SPIN industries because of high unit costs of labor relative to many competing nations.

Consequently, vertical diversification only succeeds where relatively simple processing is involved that does not require large capital investment or labor-intensive operations, or in

processing products unique to the South Pacific. In a couple of instances, investment by foreign processors with enough capital and technological expertise has succeeded in fairly capital-intensive industries. However, this only holds where production conditions for the raw material are particularly favorable, as, for example, in the oil palm industry in Solomon Islands. Examples of suitable semi-processed export products are vanilla, kava, certain types of processed ginger products, indigenous nut kernels and oils, and cocoa. Coffee also probably qualifies, but it is of interest that this industry has only really succeeded in Papua New Guinea, where throughput is large. Some minor post-harvest activities are nevertheless successfully carried out here prior to the product reaching the factory door.

Differences in performance between traditional crop, minor food crop, and HVNT exports

No clear trend has emerged to distinguish between export performance of the different types of high-value products. Examples of successes and failures fall equally across product categories.

Agricultural export values are still overwhelmingly led by traditional crop industries, indicating that they might still be the best bet for research and development. But where these traditional export crop industries have relied on product differentiation to achieve high-value exports, success stories have been scant. Part of the blame can be attributed to inefficiency in marketing by the parastatals, which have dominated many traditional agricultural export industries. These organizations have not been interested in improved processing and marketing to achieve higher quality exports, nor provided appropriate incentives to producers or employees. Yet it would be unfair to lay all blame at the door of parastatals; private processors and marketers—and producers themselves—must share the blame.

The main difficulties have been alluded to above. Processing difficulties have been one determinant of the inability to profit from high-quality exports. So has the lack of effort and research into the economics of quality improvement, particularly where differentials in payments to producers are introduced to reward different quality grades. A further problem is that of channel length and the passage of market information on quality. It is very difficult for indigenous producers and small processors and export marketers to get accurate information on the tastes and preferences of final consumers in importing nations. Enforcement of quality guidelines is also a problem, with difficulties in policing coffee quality in Papua New Guinea a case in point (Fleming and Antony 1993). Finally, inability to control the production environment sufficiently to ensure consistency in product quality over time has played its part.

A more general concern was raised by Dommen and Hein (1985). They considered the resource endowments of small agricultural systems put them at a comparative disadvantage to large tropical nations in the production of traditional plantation crops in the long term.

General and specific factors influencing high-value export performance

A wide range of industry- and product-specific factors have influenced the performance of high-value agricultural export industries, but general factors have also been to the fore. Most general factors have been embedded in the often difficult economic environments in

which export activities are undertaken (McMaster 1992). Macroeconomic management has generally been competent, and the economic environment has not been particularly hostile. Nevertheless, obstacles to successful export are due in part to deficiencies in past economic policy making (see, for example, World Bank 1993a). They have been surmounted by industries that were vigorous and profitable enough to survive in spite of the handicaps established by an unfavorable economic environment. For other less robust industries, however, factors in the economic environment have interacted with industry- or product-specific factors to bring about their failure.

Industry-specific factors have run the gamut of production and marketing variables, from the economics of various production and marketing activities to technical, management, and organizational factors. Product-specific factors likewise cover a broad spectrum, but those relating to quality, perishability, and ease of transport and handling have been prominent. Examples of general economic factors are overvalued exchange rates, often brought on by “Dutch-disease” effects, costly bureaucracies that crowd out private industry, distortionary pricing policies that turn the terms of trade against agriculture, assistance to import-substituting industries, minimum wage laws, little public expenditure support for agriculture, inadequate economic infrastructure, high tax rates, unwarranted planning restrictions, and other obstacles to foreign investment (McMaster 1992).

Boom-bust syndrome: dealing with multiple symptoms of export failure

A number of references have been made to the boom-bust syndrome in analyzing the determinants of performance of a number of different exports in the nations under study. It is so called because a number of concurrent symptoms are associated with the failure of a high-value agricultural export, and each export failure exhibits symptoms that are different from others. The existence of such a wide range of factors influencing the performance of high-value agricultural export industries, mentioned in the previous section, can be at least partly attributed to the lack of focus and coordination in the research into (and development and defence of) export products. Successful high-value export industries owe little to any research policy to concentrate on particular characteristics of the physical production environment. Features such as production mode, spatial feature, product type, marketing infrastructure and technology, for example, have counted for little in establishing research domains, while individual private initiatives and accidents of history have tended to play major roles. Further, some industries have been split by the persistent strength of dualistic agricultural systems comprising plantations and village-based semi-subsistent smallholders.

As a testament to the merits of enterprise and opportunism of the private sector, the varied range of high-value export initiatives in the agricultural sectors in the region is commendable. But it also indicates that agricultural research institutions and policymakers have failed to provide direction to endeavors to diversify the agricultural export base into high-value products. This is not so surprising considering the amount of time available to directors of agricultural research and directors of agriculture in agricultural ministries for policy formulation and research planning—about 10 percent of their time, according to Bennell (1987). The resultant boom-bust syndrome leaves the learning process barely in motion. Lessons learned from successes and failures do not appear to have led to a significant accumulation of knowledge about how to build on any export successes, especially in niche exports where short evolutionary cycles require a regular flow of new products for

commercialization. The result, as in Western Samoa at present for example, is a hiatus (hopefully, not a terminal situation) in high-value exporting as opposed to a gradual build-up of export capacity. To some extent the situation in Western Samoa is extreme, in that exogenous factors, such as two very destructive cyclones in two years, have contributed to the current state of affairs, but it is symptomatic of the lack of progress that has been made in agricultural exporting over the past couple of decades.

Market penetration versus market defence research

Evidence suggests the continued need for research into both market penetration and market defence. Too many existing industries are failing, but the success rate in commercialization is also too low.

The difficulties faced in all nations in defending high-value export markets can be partly explained by the inherent vulnerability of many such markets—notably, niches based on market-focus strategies. Decisions therefore must be made on occasion to quit these markets when they are no longer profitable, due to either their temporary nature or a nation's reduced competitiveness in them. On other occasions, it is obvious that market share is being lost because of factors partly or fully under the control of participants in the export industry and/or the government.

Some agricultural research is undertaken in most SPINs to avoid lost market share where it is attributable to factors associated with production—notably, productivity and incidence of pests and diseases. This research work is likely to remain crucial in the future. Governments have also acknowledged a role in ensuring market access for high-value exports through quarantine services and meeting phytosanitary requirements in major export destinations. As these requirements can be expected to become more stringent in the future, enhanced capacity is needed in this area. The effective integration of control of pests and diseases in production and quality control in post-harvest activities is a research priority.

Production versus marketing research and the task of integrating production and marketing of high-value exports

Production versus marketing research. The introduction of high-value export activities into existing farming systems in SPINs brings with it new challenges and dangers with which farmers are unfamiliar. Many have implications for both production and marketing performance. Examples include the increased input marketing needs associated with more intensive farming methods, concerns about the ability of smallholders in particular to meet the more demanding supply requirements of commercial export industries, changing consumption habits of foreign consumers (e.g., growing nutritional concerns), and the uncertain effects on processing and marketing of vastly increased levels of output of a commodity. Research is needed into the impacts of these changed circumstances if high-value agricultural industries are to be durable and profitable in increasingly competitive international markets.

Public research efforts in high-value agricultural export industries have been grossly biased towards production matters to date, and research in the marketing system has been largely ignored. This appears to be at odds with evidence surveyed in this study, which shows that

marketing factors have probably been more important than production factors in influencing export performance by high-value agricultural export industries. Perhaps this reflects the fact that production research in the past has been rather successful in overcoming technical constraints to export development, but more research emphasis appears to be required in the agricultural marketing system in future.

The issue is: who should undertake most marketing research in SPINs? Understanding agricultural export marketing systems is challenging because of their unique cultural, political and institutional arrangements, their risky nature and differences in competitive structure between and within systems (Sonka and Hudson 1990). Partly because of these factors, the record in public agricultural marketing research to date has hardly been promising (Fleming 1992b). This suggests that either a major effort be made to raise both the volume and quality of public agricultural marketing research or it be left to the private sector. Two factors recommend that applied forms of marketing research be best left to the private sector:

- the nature of high-value exports, especially the fact that their market conditions are prone to rapid change, disadvantaging the inherently less flexible operations of public institutions;
- a conspicuous lack of skilled and experienced personnel capable of undertaking timely and pertinent marketing research within the public sector of a small developing country.

Even if it were desirable to improve public research in the agricultural marketing system, the ability to achieve this switch in emphasis would depend on the room to manoeuvre in altering the resource mix in public research institutes (especially in trained personnel) to accommodate a shift to greater research in economics and marketing. It is likely to be very limited in the short run and may take quite some time to achieve. There are, nonetheless, legitimate research functions for government agencies in facilitating agricultural marketing research that should be fostered. They are addressed below when considering a research portfolio approach.

Management issues in integrating production and marketing of high-value exports.

The inference is drawn above that high-value export performance in SPINs is seldom a question of either production or marketing factors; it is usually a function of both. The link between production and marketing is largely a function of channel relations between marketing intermediaries and producers. Successful high-value agricultural exporting relies on the integration of production and marketing activities in terms of getting enough commercial-minded growers to supply regular quantities of consistently high-quality produce for export. This has been a crucial obstacle to the development of a number of high-value export industries in SPINs. Some of the more important, and disregarded, aspects of relations between marketing intermediaries and producers have been management related. They include failure to establish an efficient market information and dealer network with adequate feedback to producers of the needs and responses of users elsewhere in the marketing channel, failure to satisfy quarantine regulations in tandem with effective pest and disease control measures at the farm level, and poor integration of product management functions throughout the production and marketing systems (notably in packaging, grading and quality control).

An encouraging step in overcoming these sorts of failure has been the collaboration between EU and ACP nations in the export of fruit and vegetables from ACP nations to the EU. COLEACP has played a positive role in assisting ACP nations develop their fruit and vegetable export industries by gaining a better understanding of the EU market. This might be a useful model for a similar form of collaboration between SPINs and Pacific-rim nations.

The preservation of attributes that enable a niche export market to be defended goes beyond producer-buyer relations, requiring consistent effort from everybody in the marketing channel from the agricultural producer to the overseas distributors and retailers. Yet power and stability of relations within a marketing channel can vary enormously between participants at different marketing stages. The domestic importance of marketing relative to production in the export of high-value agricultural products should be a function of the degree to which domestic forces are capable of influencing the totality of the final product consumed overseas, and the profitability of exerting that influence. While each case needs to be considered on its merits, as a general rule exporters should make their marketing-mix decisions on the basis of exchange relations—and their stability—with overseas buyers to whom they sell products. The further the final overseas consumers are from domestic exporters in the marketing channel, the less concerned are those exporters with satisfying consumers' wants as the more attenuated is their control over the final product that is consumed.

Three alternatives exist for improving the probabilities of success in high-value exporting through marketing initiatives aimed at extending channel control. First, greater channel control can likely be exercised by domestic producers, processors, and exporters if they integrate downstream. This is part of the rationale for the imperative, as seen by most SPIN governments, to get into value-adding processing and marketing activities. It is an approach that has achieved some degree of success in, for example, the high-quality segment of the coffee industry in Papua New Guinea and in the squash export industry in Tonga (Fleming and Hardaker 1992; Fleming and Antony 1993). There is a need to ensure that forward integration enables overall profit levels to be maintained in the domestic sector of the marketing system. Dangers lurk in the form of widespread comparative disadvantages in downstream value-adding activities in SPINs and the risk of facing trade barriers imposed by importing nations on more highly processed products.⁸ Greater pressures are also placed on resources in the NARS. Opportunities have already been exploited, and further limited openings still exist, for off-shore forward integration using expatriate populations in importing nations. Establishing forward integration off-shore without using such networks can be costly.

A second approach is to encourage backward integration through foreign investment. This brings with it greater knowledge of marketing and processing methods, skilled personnel and finance as well as influence in the export sector of the marketing channel for the high-value export of concern. It would probably entail less risk than forward integration to the overall profitability of the domestic sector. The main danger is in losing channel control in the domestic sector to foreign corporations.

The third alternative is to reduce channel length and exploit channel width by taking greater advantage of the presence of tourists in SPINs, at least in those nations where they are numerous, by marketing more high-value products to them when they visit. This is discussed in the following section.

⁸ This is a risk facing Papua New Guinea in further processing coffee beans, for example (Fleming and Antony 1993).

Exploiting market width: integrating research into high-value products across the export, tourist, and domestic markets

The small size of domestic markets for high-value agricultural outputs produced for export can retard the development of an export market. This is because of the unfamiliarity of producers and exporters with the wants and preferences of consumers, and because reliance on a sole export market over which exporters usually exert no control can be risky. Some export success is reported above for products such as root crops and kava (as a beverage) for which a large domestic market exists and with which both producers and exporters have an intimate knowledge in terms of attributes and consumers' wants and preferences. The importance of market research is manifest for less familiar products.

Some SPINs are in the favorable situation where agricultural producers have a large number of potential overseas consumers "on their doorstep" in the guise of tourists (McGregor 1990). Receipts from tourism in the South Pacific overtook those from primary exports during the 1980s and potential for further expansion is considerable, if unevenly distributed across nations (World Bank 1995, p. 28). Yet little progress has been made in raising the agricultural value-added component of tourist expenditure, resulting in large food import leakages.

A market-research program aimed at increasing the sales of locally produced foodstuffs to tourists can yield three main advantages:

- there is an obvious extension to the local market for high-value produce, enabling a greater volume of domestic sales, which bring in foreign exchange in a manner similar to direct exports;
- enlarging the local market for certain fresh produce partly helps overcome its thinness, reducing price volatility and encouraging more regular supply;
- the learning process in catering to the wants of tourists is valuable in developing export marketing skills.

Research Priorities and Adoption of a Research Portfolio Approach

One interpretation that could be placed on the country evidence amassed in chapter 2 is that the task of generating a consistent supply of high-value agricultural exports is conceivably beyond most, if not all, SPINs. For some of the very small nations this does seem likely, and in these cases, there is little purpose in attempting to shore up public support for industries producing them. But there have been sufficient success stories among these industries to justify the alternative view that they are worth persevering with. If this alternative view is accepted, then improving public support to high-value export industries is an urgent government responsibility. An innovative approach to providing an essential plank of this support—in the field of agricultural research—is a research portfolio approach, expounded by Eyzaguirre (1996).

Eyzaguirre (1996) called for an approach to agricultural research in small developing nations such as SPINs that recognizes the difficult environment in which such research is undertaken. He highlighted two factors counting against agricultural research efforts in one

particular SPIN, Fiji. These factors are even more pronounced in other SPINs that do not have Fiji's quite strong history of agricultural research (Eyzaguirre 1996, pp. 66-9):

- the agricultural sector is by and large a “research orphan”—few of its activities (perhaps only plantain, bananas, taro, and sweet potato) can benefit greatly from the results of international agricultural research;⁹
- it is difficult for most SPINs to maintain long-term research programs to develop new technologies on a national basis, because they rely heavily on aid funds to finance research projects.

The strains these two factors introduce are augmented by two others that have been especially pertinent in the South Pacific:

- the imperative to diversify into high-value exports adds another dimension of uncertainty to research outcomes because a low success rate in commercialization has led to experimentation with numerous possible activities to achieve the few commercial successes;
- as Eyzaguirre (1996, p. 45) observed, small research systems are vulnerable to technical and financial biases introduced by external agencies, particularly when, as in SPINs, their agricultural research activities depend so heavily on project aid for funding. These biases become stronger as the reliance on aid funds for research work becomes heavier (which usually means as nations become smaller).

The following quote neatly sums up the experiences, recounted in chapter 2, of NARS attempting to assist in the expansion of exports of high-value agricultural products in SPINs while maintaining their other research activities:

We may expect small [national agricultural research] systems to appear fragmented as they try to ensure that suitable structures are in place to support all their research priorities. Indeed, some small systems come under such extreme stress as a result of these forces that they risk losing all coherence and can hardly be said to constitute a single system at all.

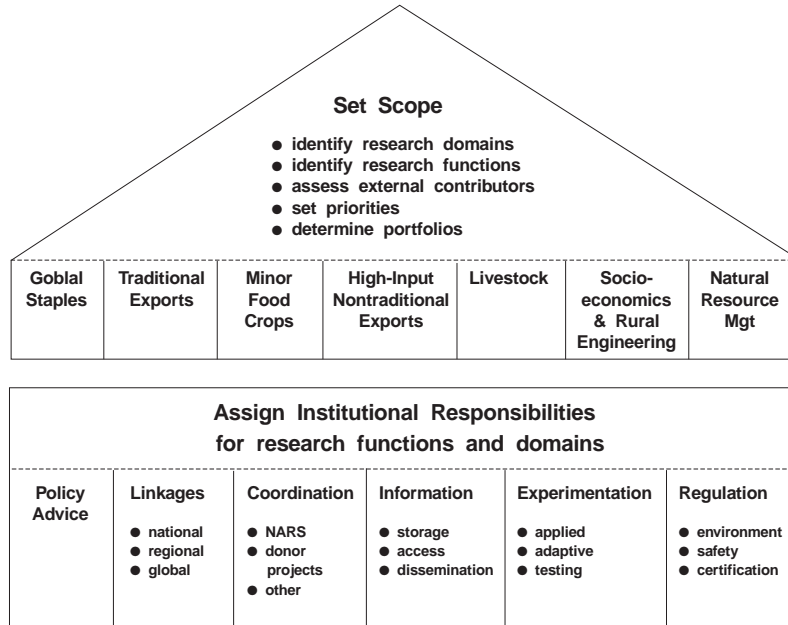
(Eyzaguirre 1996, p. 46)

Eyzaguirre (1996, p. 46) concluded from this observation that a research-portfolio approach can be used “as a template upon which priorities and decisions to invest in research are made.” Its use helps avoid the worst excesses of fragmentation of the research system, emanating from small size and fortified by the additional pressures from reliance on external funding and a desire to diversify into high-value exports. The chances of successful adoption of a research portfolio approach can be enhanced by more effective regional research collaboration, which can improve commercialization prospects and reduce susceptibility to funding decisions made outside the region.

Description

A skeletal hierarchy of public research priorities can be constructed for the development of high-value agricultural exports, bearing in mind past binding constraints on performance of

⁹ This constraint might apply for technical research, but it is not so evident for certain types of economic research.



Source: Eyzaguirre (1996, p. 36)

Figure 4.1 Setting the scope in a research portfolio

these exports and the resource limitations under which governments of all small developing nations must operate. This hierarchy, presented in figure 4.1, is taken from Eyzaguirre (1996, p. 36). It is largely determined by the comparative advantage of public and private sectors in conducting research into agricultural export production, processing and marketing.

The primary task is setting the research scope, which entails identifying research domains and functions, assessing external contributors to research, establishing priorities, and creating research portfolios. Once these tasks are achieved, institutional responsibilities can be assigned for each of the following research functions and domains (alluded to in various places above) in respect of high-value exports in SPINs: policy advice, linkages, coordination, information, experimentation, and regulation. To establish a research portfolio, it is necessary to concentrate on developing a collaborative basis for research activities.

Shortages of public research resources in SPINs require that private resources—farm household members, private firms, universities, and nongovernment organizations—are fully utilized in performing agricultural research functions. To this end, complementarities in research and development in high-value agricultural export industries need to be understood and exploited at every opportunity.

Exploiting complementarities in agricultural research and development

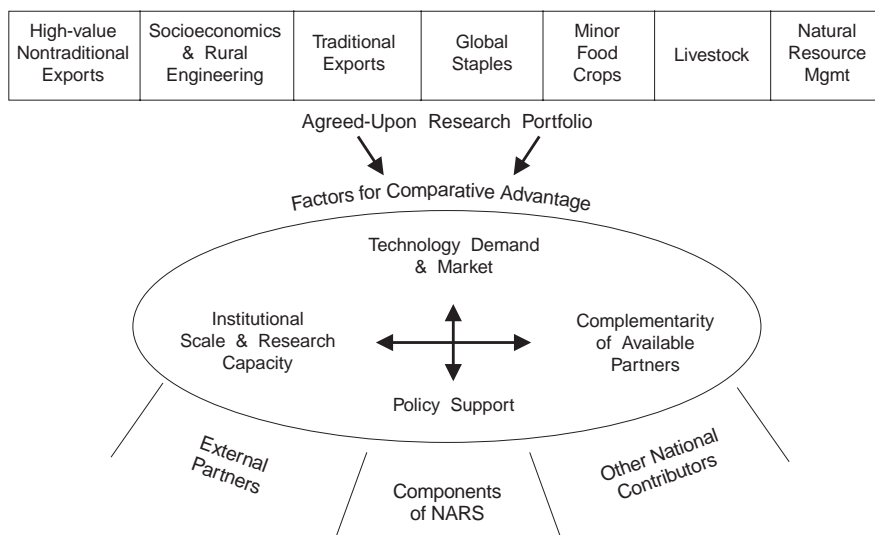
Complementarities in research. Following a research portfolio approach implies there are complementarities in research activities that can yield efficiency gains. Merely identifying complementarities is not sufficient: enlisting linkages, networks, and support from export market governments, together with research collaboration, is crucial to their successful exploitation.

Eyzaguirre (1996, p. 44) promulgated a strategic research framework that

. . . encourages research institutions to set their priorities based not only on what they can do, but also on what others are doing or are able to do. Policymakers may identify a particular agricultural constraint as the most important problem for research to solve, yet allocate few public resources to it. Often another organization is better able to do the work, or, information and technology from past research elsewhere is readily available . . .

The way in which the system is structured will reflect these choices: the technical conditions under which the research is carried out and the availability of partners. The objectives of this approach are (a) to identify the comparative advantages of different institutions to work in the various domains of the national research portfolio, (b) to guide decisions about the allocation of responsibility for research, and (c) to promote complementarity between the actors in the system.

Figure 4.2, taken from Eyzaguirre (1996, p. 45), shows how the research domains, functions and institutions that play a significant role in decision making about the allocation of research activities are brought together to achieve comparative advantage in a NARS.



Source: Eyzaguirre (1996, p.45)

Figure 4.2 Factors in determining the comparative advantage of institutions

A different approach is probably needed for each component of the agricultural research portfolio as it pertains to high-value exporting. The following proposals borrow heavily from Eyzaguirre (1996, p. 47).

- *Global staples.* History suggests there is negligible potential for the export of global staples. SPINs are therefore unlikely to benefit from the wealth of research work done on these products elsewhere in the world.
- *Traditional exports.* The high-value end of markets for traditional exports can be exploited by a research strategy of breeding for quality and crop protection in particular, as well as for yield increases and cost reductions. Research skills are required in the functions of breeding, post-harvest technologies, plant protection, economics of quality grading, FSR, and MSR. Research sources are especially to be found in the agribusiness sector, but also in parastatals, commodity institutes, and producer and commodity associations.
- *Minor food crop exports.* Minor food crop exports to high-value markets are best helped by a research strategy focusing on the screening of imported varieties. Such a strategy requires skills and the discharge of functions in information management, crop protection, quarantine, MSR, and FSR. Concentration on production by the typical small farmers in SPINs should suffice.
- *HVNT exports.* Research goals for exports of HVNT crops focus on product quality, agronomic practices, timing for “market windows,” and new product development. These crops need a research strategy targeted at specialized farmers and based on vertically integrated, or at least closely coordinated, operations centered on post-harvest operations and integrated farming, FSR, and MSR (with a strong emphasis on the last). Research sources are most likely found in agribusiness and universities. The need for skills in the collection and interpretation of up-to-date market intelligence strongly suggests a tie-up with private industry.
- *Livestock exports.* High-value livestock exports are likely to remain of negligible concern in most SPINs. Where they are profitable (e.g., Vanuatu), they need to be concentrated in high-input, high-quality segments in livestock industries, suggesting a research strategy that is directed towards animal health, regulation and post-harvest operations, and targeted at commercial producers. Market and veterinary research are critical functions that require skilled research personnel.
- *Natural resource management.* Research for natural resource management is aimed at developing an appropriate national policy for the rural environment, especially for fragile agroecosystems, and targeted at policymakers and planners. This is one area where regional research in the South Pacific has been active in recent years under the South Pacific Regional Environmental Programme (SPREP). It is of particular concern in SPINs where the introduction or expansion of high-value export industries leads to an intensification of the farming system and heightened risk of degradation of the agroecosystem. A research strategy has as its main dimensions (a) access to the environmental research strategies and policies of other nations, (b) land-use surveys, and (c) recommendations on regulations pertaining to agricultural resource use. Functions requiring research skills are information management, policy analysis, regulation, on-farm research, land-use planning, farm planning, and geographic information systems research.

- *Socioeconomics.* Socioeconomic research is aimed at easing economic constraints on high-value exporting and the development of appropriate research and development policies in agriculture. Research strategies encompass the domains of national strategic planning down to farm-level planning. They include technology assessment through screening and testing in both production and marketing systems—very important research functions in nations such as SPINs (see the discussion below of the relative merits of testing compared with applied and adaptive research). Sources of research information can be expected to be numerous. Skill requirements are in macroeconomic and agricultural sector policy analysis, farming and marketing systems economics and management, rural sociology, and anthropology.

Complementarities within high-value export activities and between high-value export and other agricultural activities. Potential complementarities also exist (and are likely to be quite strong) within a portfolio of high-value agricultural export activities, and between high-value export activities and other agricultural activities, including non-high-value exports. As pointed out above, little success has thus far been achieved in exploiting these complementarities, as most high-value export activities have been undertaken independently of each other. With careful planning, they could be better exploited to achieve economies in research work in future.

Complementarities between high-value export activities and other agricultural activities include the following:

- Multi-market crops offer scope for complementarity in production (see previous section). High-value exports have already been successful for some such crops—root crops and kava, for instance—while others have experienced success only to find their markets destroyed by a cavalcade of unfortunate episodes (bananas are the best example here).
- Jointness in production, where cost-following and high-value agricultural exporting of the same product, notably traditional crop and livestock exports (Bonte-Friedheim 1992), are obvious candidates for complementary activities. Export performance can be enhanced in SPINs by removing existing obstacles imposed by the dualistic systems that separate smallholder and estate production and marketing. Nucleus estate production of oil palm in Papua New Guinea is one activity where a dualistic structure has largely been avoided. Multiple end-uses of HVNT crops have not yet been exploited to any great extent. Most efforts entailing the export of a combination of fresh, canned, juiced, and pulped products from the same raw material have been unsuccessful.
- Some activities can take advantage of the same marketing infrastructure, which is relatively expensive to build and maintain in SPINs. Again, in the past, dualistic agricultural systems have tended to militate against this where infrastructure has been historically developed for plantation agriculture for export, and most food production was for subsistence purposes.
- Integration of high-value export crops into existing farming systems can help achieve a tighter focus in research work. For example, vanilla has been well integrated into the farming systems in Tonga in large part as a result of sound agricultural research and extension work.

Opportunities to exploit complementarities between high-value agricultural export activities themselves can arise where they (1) use similar technologies, (2) fit into the same farming system, (3) are exported to the same market destination, and (4) use the same domestic marketing infrastructure. In respect of the last point, circumstances in agricultural marketing have changed dramatically since colonial days, requiring a conscious effort by government planners to redirect their development of infrastructure. The historical development of infrastructure for exports from plantation agriculture might have made good economic sense when almost all agricultural exports were from the plantation system. In post-war years, however, smallholder exports have rapidly overtaken those from plantations.

Special Functions of Concern in a Research Portfolio Approach for High-Value Agricultural Exports

Eyzaguirre (1996, p. 36) outlined six areas of institutional responsibilities for research functions. For each of these functions, issues of particular strategic concern need attention for improved high-value agricultural exports from SPINs:

- improving economic policy research;
- enhancing coordination and support of regional research;
- improving the coordination of aid funding for research activities to exploit diversity;
- incorporating information from elsewhere in research activities;
- encouraging a role in experimentation by agribusiness firms, especially foreign investors, combining research on farming systems with that on marketing systems, and choosing between applied research, adaptive research and testing;
- tightening enforcement procedures for quarantine regulations.

Each of these areas is now spelt out in some detail.

Policy advice: upgrading economic and marketing research

Economic research, covering macroeconomic policies as well as agriculture, is critical in establishing a favorable economic environment in which export industries can operate. Its improvement stands at the apex of special research functions for high-value agricultural exporting because of past deficiencies and because it falls naturally in the public domain. To highlight its importance, consider estimates by Islam (1990, p. 83) for some horticultural exports, that 50 to 70 percent of final retail costs come from processing and marketing activities.

If the research emphasis in SPINs in future is to be placed on testing rather than applied research (see below), the imperative for good economic analysis will become greater. This is in part because testing is more amenable to economic analysis as research outcomes are more certain than in the case of applied research. Technical research capabilities, while still obviously important, are relatively less vital for testing than for applied research as economic and marketing constraints become more binding.

That economic and marketing research have been sorely lacking is due largely to funding problems and shortage of trained and experienced personnel to undertake such research. As is clear from the material in chapter 2, inappropriate economic policies and inattention to

marketing details have unduly encumbered the export of many high-value agricultural products from SPINs beyond the industry- and product-specific obstacles they already face. Alleviating these additional burdens through improved research staffing of sections responsible for economic policy making should therefore be a priority to increase the likelihood of success of these exports.

Linkages: the prospects for extending a research portfolio approach to the regional level

According to Eyzaguirre (1996, p. 176), the three institutional supporting blocks for the regionalization of agricultural research are NARS, regional organizations, and international agricultural research centers. In the absence of spillovers from international agricultural research, the most obvious external source of institutional support for NARS in SPINs is likely to be the work of regional research agencies and, through regional linkages, national agricultural research institutions in other SPINs that face similar production and marketing situations.

In the early 1980s, ISNAR undertook a review of agricultural research systems in SPINs with a view to strengthening regional coordination (Gamble, Bourke, and Brookson 1981; ADB/ISNAR 1983). The response to this proposal throughout the region was lukewarm, although some support was expressed for greater informal cooperation. The rejection of two options by both SPINs and the ISNAR team—an international center serving the region and a regional center—was both understandable and wise. However, the preferred option of the ISNAR team—a combination of a regional approach among nations and support to national programs—made sense and still does. At a recent FAO Technical Consultation on Sustainable Development in Agriculture, Forestry and Fisheries for small developing nations, the idea of strengthening collaboration among national agricultural research institutions based on the regional activities of IRETA and SPC was strongly supported (FAO 1996, p. 7). Gijsbers and Contant (1996) provide a good overview of the issues involved in the regionalization of agricultural research. They examined differences in scope and intensity that could be chosen and identified the main benefits and costs that could be expected.

Gamble, Bourke, and Brookson (1981, p. 29) identified four areas suitable to a regional approach: information, plant and animal quarantine, marketing, and transport. Of these, most progress in regional cooperation has been made in quarantine and related plant protection research, unsurprising given the strong common interest that nations have in this work. Four areas that Gamble, Bourke, and Brookson considered suitable for a national approach supported by effective networks among scientific programs are planning, agronomic research, socioeconomic research, and environmental research.

It could be argued that progress has been made in the intervening years and that a good deal of regional research work is currently carried out by institutions such as IRETA and SPC, and through programs such as the EC-funded Pacific Regional Agricultural Program (PRAP) and SPREP. While this is true, regional research activities remain too fragmented to fit the original vision of Gamble, Bourke, and Brookson (1981). One factor counting against a more cohesive regional approach to research in respect of high-value exports is the fear by individual SPINs of it fostering greater competition in their export markets. The key issue here is the extent to which it is possible to overcome the stance taken by SPINs in seeing themselves as competitors in the various markets for high-value exports—notably in niche markets. This discourages regional research cooperation, and such fear of competition

would have to be dealt with in any initiative to create a more coordinated approach to research in the region. Regional cooperation has mostly been in production research, yet marketing research is equally if not more desirable and urgent. McMaster (1992, p. 21) suggested the formation of a "Pacific Islands Trade Commission." However, difficulties experienced so far in regional trade cooperation (World Bank 1995, p. 93) are likely to impede progress in that direction.

Another problem area, characteristic of current regional initiatives and likely to be encountered in any future attempts at regional research, is the high level of establishment and transaction costs that are incurred. Summarizing data from Fernando (1987), it is evident that IRETA was compelled to spend around one-third of its budget between 1980 and 1987 on housing, buildings, equipment, and library in getting itself established. A further 10 percent was allocated to administration, regional travel, and workshops. Research, consultancy, and technical assistance accounted for less than 30 percent of total expenditure. In recent years, IRETA has managed to devote more of its budget to regional research activities, and it is essential that any future cooperative regional research initiatives are introduced with a mind to keeping capital expenditure and transaction costs to a minimum.

Coordination: making more effective use of aid funds for agricultural research activity and nongovernment research resources to exploit diversity

It is tempting, but wrong, to draw the conclusion that a high degree of specialization is essential for research into high-value agricultural exporting from SPINs on the grounds that the resource base is narrow and research and development capacity is extremely limited. Diversity in exports and research institutions are desirable features, even though both can be difficult to achieve in very small agricultural economies. Diversity in research can be crucial given the many, often interacting, obstacles to export success identified in chapter 2 that are manifested in the boom-bust syndrome. Their removal commonly requires a variety of skills and different ways of looking at, and tackling, production and marketing problems.

The key to achieving diversity, without compromising the NARS to the point where it fragments, lies in minimizing diseconomies of small size, especially by involving as many actors as possible in research. It also lies in lessening the trade-offs between specialization and diversification by exploiting complementarities within the system, as spelt out above. The means of achieving diversity through complementarity are effective coordination of research activities and institutions, a broadening of research functions, flexibility, suitable phasing of institutional responsibilities through the research and development process, and institutional accountability (Eyzaguirre 1996, pp. 28-32, 120, 192-4). Ability to take full advantage of research information currently available domestically and overseas is also critical (see next section).

A heavy reliance on aid funds to finance agricultural research in SPINs can militate against a coordinated approach to agricultural research activity. A lot of the blame for this situation could be laid in the past at the doors of international aid agencies. Many of them funded research projects in a way that discouraged a long-term approach to problem-solving and distorted and weakened the relations between different research activities. Whatever the reasons for the current disjointed nature of research effort, a greater commitment to a coordinated national research program is needed. International aid agencies can play a significant role in its realization by providing researchers in NARS access to the most suitable

sources of assistance (and not just those dictated by aid agencies) and by reducing institutional vulnerability imposed by policy changes in donor nations (Eyzaguirre 1996, pp. 5-6).

In order to make more effective use of aid funds, the right balance is needed in educational attainment among research staff. Eyzaguirre (1996, p. 32) stressed the importance of a corps of high-quality staff to counter-balance the limitations imposed by small scale on the discharge of research functions. Existing distributions between BSc, MSc, and PhD qualifications in SPINs are grossly biased towards BSc degrees (well over one-half) on Eyzaguirre's reckoning (see chapter 2 for details of educational qualifications of research staff in some SPINs). It is difficult to ascertain whether these distributions represent a serious problem. It will only be so if researchers with BScs prove incapable of carrying out high-quality research.

Information: processing research information from foreign sources

Gamble, Bourke, and Brookson (1981) listed information first among the research areas demanding a regional approach, although their concern appears to be mainly with production information. Eyzaguirre (1996, pp. 43) considered the need to secure access to information as the main reason for creating external linkages:

Scanning, selecting relevant external sources, and directing useful information to producers and policymakers is a major way for research systems to perform their tasks, without necessarily generating new technologies or conducting extensive experimentation.

There are five outstanding issues in respect of information flow and its relevance to high-value agricultural exports that are worth pursuing or are in need of urgent attention by SPIN governments. First, greater discernment is desirable in working out which institutions should be given responsibility for collecting different sorts of information. When it comes to market information, it was pointed out above that skills in the collection and interpretation of up-to-date market intelligence—so crucial to high-value agricultural exports—mostly reside in the private sector. Public institutions (not just in the South Pacific but throughout the world) have shown themselves to be woefully inadequate in keeping abreast of changes in export-market information needs and supply. A NARS has to develop strong informational linkages between private industry—domestically and abroad—and public research institutes if full advantage is to be taken of both production and marketing information that exists outside the system. There are now quite a few international and regional organizations capable of providing export market assistance that individual SPINs could use, so long as they have the internal capability to process the information provided through this assistance (see, for example, the list provided by the World Bank (1990, Annex 9, pp. 7-8).

Second, the imperative for producers, processors and exporters to be sensitive to foreign consumers' wants in adding to their export portfolio and altering components within it accentuates the crucial role of timely and accurate market information. The four means of improving information flow have already been mentioned above. Three entail efforts to shorten channel length: forward integration, backward integration, and concentration on the tourist market. The value of developing backward integration is enhanced by the difficulties in getting timely market information for many high-value products. This is illustrated by the following observation in relation to horticultural exports:

The availability of market intelligence and information on world horticultural trade is still rather undeveloped, compared with what is available for other commodities such as raw materials or tropical beverages. Also, the ability to respond to export market opportunities and to adjust to changes therein requires close, intensive contact with the marketing and distribution systems in importing countries.

(Islam 1990, p. 90)

The fourth means of making producers and domestic marketing intermediaries better informed about marketing opportunities for their exports is to concentrate specifically on improving information flow between domestic exporters and foreign buyers. The underlying assumption here is that the link between the foreign buyer and the domestic exporter is the link in the marketing system where information flow is most likely to fail and messages become distorted. By concentrating on this nexus, changes in the preferences and wants of final consumers overseas should flow back to overseas buyers in the form of incentives that the buyers then communicate more clearly, quickly, and effectively to domestic exporters and so on, back to producers. Hence, channel relations between exporters and foreign buyers are of overriding importance in matching final consumers' wants with producers' ability to supply. This approach is likely to be the simplest and cheapest option. Also, it has the advantage of improving research in the NARS by strengthening external linkages in a way usually neglected by production-engrossed research-system managers.

Third, access to up-to-date information on trends in demand and supply in international markets for high-value agricultural products, and their segments, is going to become ever more relevant to SPIN exporters. A trend is emerging of large numbers of small developing nations chasing the same high-value markets in efforts to expand the values of their agricultural exports through diversification. The example of a flood of supply onto the world cardamom market following high prices in the early 1980s, mentioned above and described by Eyzaguirre (1996, p. 113), is instructive. It is a situation that is likely to be repeated many times for high-value exports in the future.

Fourth, indigenous technical knowledge remains a largely untapped source of agricultural production information for agricultural research in developing nations (Eyzaguirre 1996, pp. 152-4) and SPINs in particular. It needs to be more carefully cultivated. This lack of attention to what already is known is revealed in a plea for greater attention to this area in Vanuatu. In an observation that could be equally well applied to other SPINs, Weightman (1989, p. 205) expressed despair about the tendency not to consolidate research and development work on commercial, or potentially commercial, agricultural activities that had already shown themselves to be well adapted to local edaphic conditions.

But here again we had the same phenomenon of credibility that a new breed, whether plant or animal, could solve the problems—even though what was already in Vanuatu had never been developed or managed to realize its potential.

Finally, information on strategies and methods followed by other successful high-value agricultural exporting nations is also an under-utilized source. Israel and Chile are two middle-income examples while, closer to home, New Zealand and Hawaii (McGregor 1990), and also Australia, have had successes in tapping into niche markets.

Experimentation: combining FSR and MSR processes and choice between applied research, adaptive research, and testing

A research role for foreign agribusiness investors? Eyzaguirre (1996, p. 31) warned of the dangers in handing over too many agricultural research functions to the private sector in small developing nations in order to take advantage of the sector's flexibility and responsiveness relative to the public sector. The main danger with which he was preoccupied is that the private sector is unlikely to be interested in research activities that are privately unprofitable but that nonetheless may be valuable. The point is a valid one and forces governments to consider who is best placed to discharge each research function. However, there are still numerous opportunities in SPINs to encourage private-sector research in high-value agricultural exports. A major obstacle is the limited domestic private capacity for agribusiness research in SPINs, but this can be offset by encouraging foreign investment.

The role of agribusiness firms is greatest in the development phase of the research and development sequence. Nevertheless, direct foreign investment by agribusiness firms also holds out considerable hope for boosting capacity for research into high-value agricultural exports where that research provides benefits that are appropriable, especially in marketing and processing. The scope is certainly greater than in other areas of agricultural research in SPINs and may even be a more powerful engine for expanding research capacity than regional initiatives. Given the small size of SPINs (with the possible exception of Papua New Guinea), high-value agricultural export opportunities are most unlikely to attract large transnational agribusiness corporations, but they may well be attractive to small to medium-size agribusiness firms in Pacific-rim nations.

Combining FSR and MSR processes. The risky and dynamic nature of high-value exporting and the close links between production and marketing determinants of export performance, alluded to above, point to the need for integrating research in high-value agricultural export production and marketing systems. An example of a systematic research process that combines FSR with MSR was provided by Fleming and Hardaker (1993). However, two potential dangers must be heeded. First, Fleming and Hardaker (1993) observed that integrated FSR/MSR is not easy to achieve, as the two processes have a tendency to pull lines of inquiry and research efforts in different directions in many situations. A research activity that looks appealing from a production standpoint may be far removed from what marketing researchers see as a high priority. Second, such an approach depends on the availability of staff adequately qualified in marketing research.

Choosing between applied research, adaptive research, and testing. The typical approach to agricultural experimentation in SPINs to date has been the wasteful and frequently ineffective approach of starting with applied research and sometimes not proceeding beyond it. Eyzaguirre (1996, p. 44) suggested that the approach to choosing the most suitable type of experimentation in small developing nations needs to be from the bottom up. That is, experimentation should begin with testing known technologies, and move "into adaptive and even applied research as the conditions and capacity warrant." The adoption of this approach is crucial for developing high-value agricultural exports in SPINs where resolution of marketing problems, or a combination of marketing and production problems, through in-market testing is often the most pressing task. It is also consistent with the parsimonious approach of drawing innovations from many different sources to maximize use of knowledge that already exists.

In addition to production and marketing, there are often key processing activities undertaken in high-value export industries. Research and training in processing technology (especially food processing and conditioning for shelf life and transportation) need to be integrated with the MSR and FSR approaches where this is the case.

Regulation: the critical importance of quarantine and satisfying phytosanitary requirements

One of the most disappointing aspects of high-value agricultural exporting from SPINs has been the failure to penetrate off-season fresh-produce markets in Pacific-rim nations (root crops, squash, and ginger being distinguished exceptions). Among the obstacles faced in developing such export industries, few loom larger than entry restrictions imposed through quarantine and phytosanitary regulations in potential importing nations. The upgrading of domestic quarantine regulations and means of their enforcement, concurrent with progress in collaboration with quarantine services in these importing nations to meet established protocols and define new ones, is crucial, especially with increasingly stringent entry standards in prospect. This recommends itself as a crucial role that can only be performed by SPIN governments and requires considerable research effort to be performed well. These research efforts would need to be coupled with those in crop protection.

Progress is being made in this area, and its importance is being increasingly recognized by SPIN governments. The introduction of HTFA treatment of fruit and vegetable exports and establishment of quarantine protocols—between SPINs (e.g., SPC 1996, p. 23), and with quarantine services in key Pacific-rim importing nations such as New Zealand—are enhancing market entry prospects for high-value exports. The SPC Plant Protection Service Project (SPC 1996, p. 23) is a further positive step in reinforcing quarantine measures through better plant protection methods. A Pacific Plant Protection Organization was established in February 1996 as a semi-autonomous body under the aegis of SPC, to help SPINs work towards meeting the standards of the International Plant Protection Convention.

Catering for Diverse Research Capabilities among SPINs

The vastly different capabilities of NARS in SPINs to undertake research to benefit high-value agricultural export industries calls for a tripartite approach to agricultural research. It is suggested that nations are classified on the basis of their size and their capability to do agricultural research:

- those with populations greater than 750,000—Fiji and Papua New Guinea—with considerable national research capability, defined as a research complement in excess of 40 researchers;
- those with populations between 100,000 and 750,000—Solomon Islands, Tonga, Vanuatu, and Western Samoa—with very limited national research capability to undertake agricultural research, defined as a research complement between 10 and 40 researchers;
- those with populations less than 100,000—Cook Islands, Kiribati, Niue, and Tuvalu—defined as having a research complement of less than 10 researchers, which bestows virtually no capacity to do substantive research into high-value agricultural exports.

The outline of the research portfolio approach above takes as its point of departure a SPIN with research capability in the first category. Research ambitions in smaller SPINs would need to be trimmed according to their more restricted circumstances and lesser needs. For the middle group, in particular, size is likely to be important in influencing the most desirable balance between diversity and specialization in high-value research and export activity. While it may be desirable to have diverse research portfolios and export bases, the limitations imposed by very small size may well mean that a high degree of specialization is inevitable. Islam (1990, p. 90) warned in respect of horticultural export crops that the need to achieve a critical research mass will require some degree of specialization (even following an innovative small-country research approach, one suspects).

In respect of the smallest group, their research capacity appears to be below the minimum required for a critical mass. Some years ago, Mosher (n.d., p. 7), considered a minimum research complement for productive agricultural research to be at least two scientists from between five and eight disciplines; that is, perhaps as many as 16 researchers. Allowing for some regional assistance and improved communication networks in the intervening years, a minimum complement of 10 researchers would seem reasonable. At the extreme in this group, it is probable that nations like Kiribati and Tuvalu would be best served by doing no research at all on high-value agricultural exports and concentrating their scarce research resources on staple food production and in other sectors.

5. Conclusion

Summary

High-value exports of agricultural and other primary commodities are being increasingly seen by governments of small developing nations as important means of boosting foreign exchange earnings for economic development. This study has focused on the performance of high-value agricultural exports and their contributions to agricultural development in SPINs, but the findings are relevant to all small developing nations that share most of the difficulties experienced by SPINs in exporting high-value agricultural exports. Mixed success experienced in these nations to date in developing these industries has prompted governments to improve their intervention processes to overcome past failures and build on the few successful industries that have achieved sustained profitability.

Improvements are likely to come in three ways, aided by better research processes and other forms of government intervention. The first way is through higher success rates in the commercialization of high-value export industries, which expands the export base and helps counteract decline in niche industries that cannot maintain market share. Second, improved policy making can make the economic environment more favorable for successful high-value exporting. Finally, research should help establish which high-value export industries are most likely to add value to domestic economic activity.

Government intervention is likely to be of limited effect unless it is accompanied by private-sector involvement and a style of intervention in which marketing research is closely integrated with production research. A government's ability to contribute to high-value export development is limited by the special problems of smallness in carrying out agricultural research in small developing nations: diseconomies of institutional development, small production bases and the vulnerability of public institutions. Yet the evidence from SPINs shows that the domestic private sector is also often incapable of providing the impetus to establish high-value export industries. This means it is often necessary to encourage foreign investment in these industries through incentives, joint ventures and setting a favorable and stable macroeconomic environment.

In respect of the need to pay attention to marketing issues, a boom-bust syndrome has been shown to feature prominently in high-value agricultural exporting in SPINs. It has been demonstrated in this study that neglect of marketing in favor of an almost complete preoccupation with the production side of exporting has been a major cause of this syndrome. Entry into new niche export markets and establishing downstream value-adding processes for existing export industries (and sustaining a profitable market share) are difficult and risky ventures that require considerable attention to marketing detail from the beginning.

An Illustrative Case Study

The recent example of an attempt to establish a ginger export industry in Western Samoa, discussed in chapter 3, illustrates the above point about the need to examine carefully the strategy of entering a new high-value export market. The initial failure of what could be termed a "shot-in-the-dark" approach to enter the export market called for a rethink. This

led to a consultancy, the results of which were presented to a roundtable meeting of Ministry representatives, growers, and exporters. The consultancy findings provide an excellent basis for establishing a process for developing a high-value agricultural export industry and determining if indeed scope exists for one. The point here is not to go into detail on how these strategic options were arrived at or evaluated in this particular case. Rather, it is to highlight the process adopted: first, in collaboration with private actors, developing a potential set of sound export marketing strategies, then linking these strategies back to what is feasible and profitable in production and processing, then establishing research needs and how the private actors would fit into any strategy considered suitable for implementation. Too often in the past, SPIN governments have focused solely on production and, in their deliberations, excluded the private sector from all but the final implementation stage.

This approach is clearly seen in the latest agricultural sector review of the Ministry of Agriculture, Fisheries and Forests (1996). As pointed out in chapter 2, this review provides a thorough and logical coverage of high-value export opportunities, requirements that need to be fulfilled, and a strategy for expanding high-value export. It represents easily the most impressive approach to developing a strategy for expanding high-value agricultural exports in the region, and its implementation warrants scrutiny over the next few years to provide guidelines to other SPINs to improve their high-value agricultural exporting performance. Yet research capacity and the approach adopted by the Ministry will be critical to its successful implementation.

Research Approach

In most SPINs, there is evidence that agricultural research capacity has not expanded over the past decade, and may actually have declined, in terms of overall numbers, expenditure per researcher, and researcher qualifications. This trend makes it vital that research resources are not wasted in developing high-value export industries. A case is put in this study for a research portfolio approach and suggestions are made as to the most pressing research issues for resolution, based on institutional responsibilities for research functions. This research approach should entail mechanisms for constant reassessment of marketing strategies that enables exporters of high-value exports to retain their competitive edge. It is acknowledged, however, that the research approach might need to be modified according to the size and research capability of a particular SPIN.

The principal high-value agricultural export industries in SPINs have been reviewed to establish research priorities for their improved performance. Major findings from this review with research implications are presented in terms of the relative merits of horizontal and vertical diversification, variations in performance between different export product types, the influence on performance of general as opposed to product- and industry-specific factors, causes of export failure, the relative merits of research into market penetration measures and market defence measures, relations between production and marketing research, and the scope for exploiting market width.

6. References

- AACM. 1983. *National Survey of Potential Non-Traditional Agricultural Exports from the Solomon Islands*. London: Commonwealth Secretariat.
- Abeysinghe, A. 1981. *The Solomon Islands: A Commodity Marketing Report*. London: Commonwealth Fund for Technical Cooperation, Commonwealth Secretariat.
- ACC. 1985. *Ginger Profile: A Programme for the Commercial Development of the Ginger Industry*. Suva: Agricultural Commodities Committee.
- ADB. 1985. *Western Samoa Agriculture Sector Study: Volume II Background and Sector Review*. Manila: Asian Development Bank.
- ADB. 1992. *Project Completion Report of the Rural Services Project in the Solomon Islands*. Manila: Asian Development Bank.
- ADB. 1988. *Economic Survey of Western Samoa*. Manila: Asian Development Bank.
- ADB. 1992. *Kiribati Country Survey*. Manila: Asian Development Bank.
- ADB/ISNAR. 1983. *Strengthening Agricultural Research for National Development in the South Pacific*. The Hague: Asian Development Bank and International Service for National Agricultural Research.
- Agrisystems. 1992. *Stabex Study: Solomon Islands*. Honiara: Ministry of Finance and Economic Planning.
- AIDAB. 1994. *The Western Samoan Economy: Paving the Way for Sustainable Growth and Stability*. Canberra: International Development Issues 35.
- 'Akolo, L.A. 1992. Restructuring the Tonga Commodities Board. In *Agricultural Export Marketing in the South Pacific: The Future Role of Marketing Authorities*, edited by E. Fleming and H. Coulter. Canberra: National Centre for Development Studies.
- Anderson, D. 1978. Pyrethrum. In *Agriculture in the Economy: A Series of Review Papers*, Volume 2, edited by D.R.J. Densley. Konedobu: Department of Primary Industry.
- Anglo-French Condominium. 1964. *New Hebrides 1961 and 1962*. London: HMSO.
- Anglo-French Condominium. 1968. *New Hebrides 1965 and 1966*. London: HMSO.
- Anon. 1973. Cook Islands 1971. *South Pacific Bulletin* 23(3), 29.
- Arthur, W.A. 1978. Tea. In *Agriculture in the Economy: A Series of Review Papers*. Volume 2. Edited by D.R.J. Densley. Konedobu: Department of Primary Industry.
- Banana Working Committee. 1979. *A Review of the Banana Export Industry in the Kingdom of Tonga*. Nuku'alofa: Planning Unit, Ministry of Agriculture, Forests and Fisheries.
- Barr, J.J.F. 1992. *Technical Report on Coconut Research in Kiribati 1990-1992*. Bairiki: Agriculture Division, Ministry of Environment and Natural Resource Development.
- Bennell, P. 1987. Discussion of results of questionnaire. In *The Planning and Management of Agricultural Research in the South Pacific: Report of a Workshop*, edited by ISNAR. The Hague: Service for National Agricultural Research.
- Bertram, I.G. and R.F. Watters 1985. The MIRAB economy in South Pacific microstates. *Pacific Viewpoint* 27(1), 47-59.
- Bonte-Friedheim, C.H. 1992. ISNAR and its service to NARS in small countries. Paper presented at the International Workshop on Management Strategies and Policies for Agricultural Research in Small Countries. Reduit.
- Brown, M.W. 1995. *Quality Standards and Marketing of Selected South Pacific Root Crops*. Alafua: Institute for Research, Extension and Training in Agriculture.
- Bureau of Statistics. 1986. *Overseas Trade, Fiji 1986* (and previous issues). Suva.
- Carter, J. (ed.). 1981. *Pacific Islands Yearbook*, 14th edn. Sydney: Pacific Publications.

- Central Planning Department. 1991. *Kingdom of Tonga: Sixth Development Plan 1991-1995*. Nuku'alofa.
- Central Planning Office. 1985. *Fiji's Ninth Development Plan 1986-1990*, Government Printer. Suva.
- Chandra, S. 1983. *Agricultural Development in Fiji*. Canberra: AUIDP.
- Charles, A.E. 1982. History of organization of agricultural research in Papua New Guinea. In *Review of the Program and Organization for Crops Research in Papua New Guinea: Report to the Government of Papua New Guinea*. The Hague: International Service for National Agricultural Research.
- Chase, L.D.C. 1986. The development of the cocoa industry in Solomon Islands. In *Proceedings of the Cocoa Research Seminar, 12-14 February, 1985*, edited by P.R. Linton, J.B. Abington, and P. Walton. Honiara: Dodo Creek Research Station, Ministry of Agriculture and Lands.
- Christensen, J. and D.R.J. Densley. 1978. Oil palm. In *Agriculture in the Economy: A Series of Review Papers*, Volume 2, edited by D.R.J. Densley. Konedobu: Department of Primary Industry.
- Cole, R.V. 1992. External economic relations of Pacific island states. Paper presented at a conference on The Future of Asia-Pacific Economies: Pacific Islands at the Crossroads? Brisbane: November.
- Colonial Office. 1966. *Fiji: Colony Annual Report 1965*. London: HMSO.
- CPD. 1976. *Mid-Term Review — Third Development Plan 1975-1977*. Nuku'alofa: Central Planning Department.
- CPO. 1975. *Fiji's Seventh Development Plan 1976-1980*. Suva: Central Planning Office.
- CPO. 1980. *Fiji's Eighth Development Plan 1981-1985*. Suva: Central Planning Office.
- CPO. 1985. *Fiji's Ninth Development Plan 1986-1990*. Suva: Central Planning Office.
- DAL. 1992. *Agricultural Strategy 1993*. Volume 1. Konedobu: Department of Agriculture and Livestock.
- DAL. 1994. *Agricultural Strategy 1995*. Volume 1. Konedobu: Department of Agriculture and Livestock.
- Daniells, J. 1995. *Illustrated Guide to the Identification of Banana Varieties in the South Pacific*. ACIAR Monograph No. 33. Canberra: Australian Centre for International Agricultural Research.
- Decloitre, P. 1995. Kava—the next boom industry? *Pacific Islands Monthly* 65(4), 44-5.
- Densley, D.R.J., G.L. Rady, and C.E.W. Arnold. 1978. Rubber. In *Agriculture in the Economy: A Series of Review Papers*. Volume 2, edited by D.R.J. Densley. Konedobu: Department of Primary Industry.
- Department of Economic Development. 1984. *Western Samoa's Fifth Development Plan 1985-1987*. Apia: Government of Western Samoa.
- Department of Economic Development. 1987. *Western Samoa's Sixth Development Plan 1988-1990*. Apia: Government of Western Samoa.
- Department of Statistics. 1982. *Annual Statistical Abstract 1982* (and previous issues). Apia: Government of Western Samoa.
- De Taffin, G. 1993. Report of visit to Kiribati: from 29th October to 4th November 1992. Paris: CIRAP.
- Dommen, E. and P. Hein. 1985. Foreign trade in goods and services. *States, Microstates and Islands*, edited by E. Dommen and P. Hein. Sydney: Croom Helm.
- Durant, N. and H. Blades. 1990. An agricultural action plan for the Caribbean in light of the present world market situation. In *Agricultural Diversification in the Caribbean*. CARDI/CTA Seminar Proceedings. Ede.

- Economic Development Department. 1980. *Western Samoa's Fourth Five-Year Development Plan 1981-1984*. Volume 1. Apia: Government of Western Samoa.
- Economics Section. 1990. *The Agricultural Economy 1990: Vanuatu*. Port Vila: Department of Agriculture, Livestock and Horticulture.
- Economics Section. 1992. *The Agricultural Economy 1991: Vanuatu*. Port Vila: Department of Agriculture, Livestock and Horticulture.
- Edwards, S. and K. Trewren. 1992. Coconut production on coral atolls. In *Review of Agricultural Development in the Atolls, Invited Papers Presented to the Workshop on Developing an Agricultural Research Program for the Atolls, Pacific Harbour, Fiji, 19-23 November 1990*, edited by R.G. Chase. Apia: University of the South Pacific Institute for Research, Extension and Training in Agriculture.
- Elek, A. 1992. South Pacific economies in a changing international environment. Paper presented at a conference on The Future of Asia-Pacific Economies: Pacific Islands at the Crossroads? Brisbane: November.
- Ernst and Young. 1990. *Privatisation and Commercialisation Policies and Strategies Project in Solomon Islands: Final Report*. Arlington.
- Eyzaguirre, P.B. 1991. *The Scale and Scope of National Agricultural Research in Small Developing Countries: Concepts and Methodology*, ISNAR Small-Countries Study Paper No. 1. The Hague: International Service for National Agricultural Research.
- Eyzaguirre, P.B. 1996. *Agriculture and Environmental Research in Small Countries: Innovative Approaches to Strategic Planning*. Chichester: Wiley.
- Fairbairn, T.I.J. 1985. *Island Economies: Studies from the South Pacific*. Suva: Institute of Pacific Studies.
- Fairbairn, T.I. 1993. Recent developments. In *The Papua New Guinea Economy: Prospects for Sectoral Development and Broad Based Growth*. International Development Issues No. 30, edited by AIDAB. Canberra: Australian International Development Assistance Bureau.
- FAO. 1996. Programme for the sustainable development of Pacific island countries in agriculture, forestry and fisheries. Unpublished paper of the Technical Consultation of South Pacific Small Island Developing States on Sustainable Development in Agriculture, Forestry and Fisheries. Apia.
- Felemi, I.M.N. 1991. *Evaluation of the Banana Export Scheme in Tonga*. Occasional Paper 16. South Pacific Smallholder Project. Armidale: University of New England.
- Fernando, L.H. 1987. Resource commitments to agricultural research in the South Pacific: preliminary findings. In *The Planning and Management of Agricultural Research in the South Pacific: Report of a Workshop*, edited by ISNAR. The Hague: International Service for National Agricultural Research.
- Fintrac. 1986. *Agricultural Marketing Support Services Project: Papua New Guinea*. Singapore: Fintrac Consultants Asia Pte Ltd.
- Fleming, E.M. 1988. Short-run supply responsiveness for long-run crops in the South Pacific: a comparative study. *Economic Bulletin for Asia and the Pacific* 39(2), 21-30.
- Fleming, E.M. 1990. Proposal for a marketing systems research approach in agricultural development planning. *Agricultural Systems* 32(2), 97-111.
- Fleming, E.M. 1992a. Strategic agricultural export marketing in South Pacific island nations: some implications for strategy selection in small developing countries. *Journal of International Food and Agribusiness Management* 4(3), 77-105.
- Fleming, E.M. 1992b. Marketing research activities of marketing authorities in South Pacific island countries. In *Agricultural Export Marketing in the South Pacific: The Fu-*

- ture Role of Marketing Authorities*, edited by E. Fleming and H. Coulter. Canberra: National Centre for Development Studies.
- Fleming, E.M. 1995. Social costs of rent-seeking in agriculture-based rural development projects in developing countries. Unpublished paper. Armidale: Department of Agricultural and Resource Economics, University of New England.
- Fleming, E. and G. Antony. 1993. *The Coffee Economy in Papua New Guinea: Analysis and Prospects*. Port Moresby: Institute of National Affairs.
- Fleming, E.M. and J.B. Hardaker. 1992. Analysis of diversification of agricultural exports in South Pacific island nations. Paper presented at an international conference on Islands 2000. Naxos-Giardini, Italy.
- Fleming, E.M. and J.B. Hardaker. 1993. Integrating farming and marketing systems research approaches in agricultural development project planning. *Agricultural Systems* 42(3), 227-44.
- Fleming, E. and J.B. Hardaker. 1994. *Strategies for Melanesian Agriculture for 2010: Tough Choices*. Canberra: National Centre for Development Studies.
- Fleming, E.M. and J.B. Hardaker. 1995. *Polynesian Agricultural Development Strategies*. Canberra: National Centre for Development Studies.
- Foreign Commonwealth Office. 1970. *Fiji Annual Report 1969*. London: HMSO.
- Forum Secretariat. 1995a. *Trends and Developments*. No. 4. 1 November 1994-28 February 1995. Suva.
- Forum Secretariat. 1995b. *Trends and Developments*. No. 5. 1 March-30 June, 1995, Suva.
- Forum Secretariat. 1996. *Trends and Developments*. No. 7. 1 November 1995-29 February 1996, Suva.
- Fowler, M.H. 1985. Cocoa in Vanuatu. In *Cocoa Growers' Bulletin* 36, 17-22.
- Gamble, W.K., R.M. Bourke, and C.W. Brookson, 1981. *South Pacific Agricultural Research Study: Consultants Report to the Asian Development Bank*. The Hague: International Service for National Agricultural Research.
- Ghodake, R.D. and B.M. Wayi. 1994. *Research Management Information System: Research Programme [1994-95]*. Konedobu: Agricultural Research Division, Department of Agriculture and Livestock.
- Gibson, J. 1995. Rice, import substitution and employment in Papua New Guinea. *Pacific Economic Bulletin* 9(1), 46-52.
- Gijsbers, G. and R. Contant. 1996. *Regionalization of Agricultural Research: Selected Issues*, Briefing Paper No. 28, International Service for National Agricultural Research, The Hague.
- Gimbol, K.C. G.E. Battese, and E.M. Fleming 1996. Technical efficiencies of smallholder cocoa producers in Papua New Guinea: a stochastic frontier analysis. *Quarterly Journal of International Agriculture* 34(4), 337-57.
- Gollifer, D.E. 1972. 'The introduction of spice crops into the British Solomon Islands', *Proceedings of a Conference on Spices*, Tropical Products Institute, London, 94-102.
- Government of Niue. 1979. *Niue National Development Plan 1980-1985*. Alofi.
- Green, C.L. 1985. *Report on a Mission to the Solomon Islands: An Advisory Mission on Spice Development*. London: Tropical Development and Research Institute.
- GRM International, 1994. *Niue Limes Rehabilitation Project: Marketing Strategy*. Canberra: Australian International Development Assistance Bureau.
- Gyles, A. and H. Petelo (eds). 1988. *Proceedings of the Workshop on Farming Systems Research and Extension: Tonga*, South Pacific Smallholder Project/Ministry of Agriculture, Fisheries and Forests. Armidale and Nuku'alofa.

- Gyles, A. et al. 1989a. *Farm Management Handbook for Tonga*. Technical Bulletin. Nuku'alofa: Ministry of Agriculture, Fisheries and Forestry.
- Gyles, A. et al. 1989b. Keeping research relevant: experiences with on-farm trials in Tonga. Paper contributed to the 33rd Annual Conference of the Australian Agricultural Economics Society. Lincoln.
- Hassall and Associates. 1983. *National Survey of Non-Traditional Export Crops*. London: Commonwealth Secretariat.
- Hawkes, R. 1992. Priorities for atoll research: the case for a focus on self-sufficiency in food stuffs. In *Review of Agricultural Development in the Atolls, Invited Papers Presented to the Workshop on Developing an Agricultural Research Program for the Atolls, Pacific Harbour, Fiji, 19-23 November 1990*, edited by R.G. Chase. Apia: University of the South Pacific Institute for Research, Extension and Training in Agriculture.
- Ilala, S. 1989. *Coconut Industry in Solomon Islands*. Jakarta: Asian and Pacific Coconut Community.
- IMF. 1993. *International Financial Statistics Yearbook*. Washington, DC: International Monetary Fund.
- Inder, S. (ed.). 1977. *Pacific Islands Yearbook*. 12th edn. Sydney: Pacific Publications.
- Inder, S. (ed.). 1978. *Pacific Islands Yearbook*. 13th edn. Sydney: Pacific Publications.
- IRETA. 1996. *IRETA's South Pacific Agricultural News* 13(2). Apia.
- Islam, N. 1990. *Horticultural Exports of Developing Countries: Past Performance, Future Prospects, and Policy Issues*. Research Report 80. Washington, DC: International Food Policy Research Institute.
- ISNAR. 1983. *The Agricultural Research System in Western Samoa: Report to the Government of Western Samoa*, The Hague: International Service for National Agricultural Research.
- ISNAR. 1992. *Review of the Program and Organization for Crops Research in Papua New Guinea*, The Hague: International Service for National Agricultural Research.
- Ivarami, M. and H.C. Coulter. 1992. Regulatory functions and the performance of marketing authorities in the South Pacific. In *Agricultural Export Marketing in the South Pacific: The Future Role of Marketing Authorities*, edited by E. Fleming and H. Coulter. Canberra: National Centre for Development Studies.
- Ivarami, M. and S. Yarbrow. 1992. Cocoa grading and quality control in Papua New Guinea. In *Agricultural Export Marketing in the South Pacific: The Future Role of Marketing Authorities*, edited by E. Fleming and H. Coulter. Canberra: National Centre for Development Studies.
- Jaffee, S. with P. Gordon, 1994. *Exporting High-Value Food Commodities*, Washington, D.C.: World Bank.
- Jones, S. E.M. Fleming, and J.B. Hardaker. 1988. *Smallholder Agriculture in Solomon Islands: Report of the South Pacific Smallholder Project in Solomon Islands, 1985-86*. South Pacific Smallholder Project. Armidale: University of New England.
- Kingdom of Tonga. 1970. *Development Plan 1970-1975*. Nuku'alofa.
- Kufinale, K. 1994. An assessment of the impact of the Y1 and Y2 grading system on coffee price and quality in Papua New Guinea/. Unpublished paper. Goroka: Coffee Industry Corporation.
- Kwamillon, D. 1981. *Exports of Important Agricultural Products: Quantity, Value and Average Price Per Unit*. Rural Statistics Bulletin 1981/1. Konedobu: Department of Primary Industry.
- Liew, J. 1992. Promoting food production in atolls: the integrated atoll development project. In *Review of Agricultural Development in the Atolls, Invited Papers Presented to*

- the Workshop on Developing an Agricultural Research Program for the Atolls, Pacific Harbour, Fiji, 19-23 November 1990*, edited by R.G. Chase. Apia: University of the South Pacific Institute for Research, Extension and Training in Agriculture.
- Linton, P.R. 1986. Discussion of future cocoa research requirements in Solomon Islands. In *Proceedings of the Cocoa Research Seminar, 12-14 February, 1985*, edited by P.R. Linton, J.B. Abington, and P. Walton. Honiara: Dodo Creek Research Station, Ministry of Agriculture and Lands.
- London, T. 1996. Conservation-based enterprises: business development and product marketing. In *South Pacific Indigenous Nuts*, edited by M.L. Stevens, R.M. Bourke, and B.R. Evans. ACIAR Proceedings No. 69. Canberra: Australian Centre for International Agricultural Research.
- MAFF. 1981. *Report of the Ministry of Agriculture for the Year 1981*. Nuku'alofa: Government of Tonga.
- MAFF. 1991. *Compendium of Agricultural Statistics 1985-1989*. Nuku'alofa: Government of Tonga.
- MAFF. 1994. *Managing Agricultural Resources*. Suva: Ministry of Agriculture, Fisheries and Forests.
- MAFF. 1996. *Fiji Agricultural Sector Review: Strategy for Growth and Diversification*. Suva: Ministry of Agriculture, Fisheries and Forests.
- McGregor, A. 1988. *The Fiji Fresh Ginger Industry: A Case Study in Non-Traditional Export Development*. Research Report Series No. 10. Pacific Islands Development Program. Honolulu: East-West Center.
- McGregor, A. 1990. *Marketing Horticultural and Niche Commodities from the Pacific Islands: Opportunities and Constraints*. Pacific Islands Development Program. Honolulu: East-West Center.
- McGregor, A. 1996. *Western Samoan Ginger Industry: Possible Options for Future Development*, Consultant's Report to the Ministry of Trade, Commerce and Industry. Apia.
- McKillop, R.F. (n.d.), Smallholder beef cattle development: the Melanesian experience. Unpublished paper. Melbourne: Shedden Agribusiness.
- McMaster, J. 1992. Strategies to stimulate private sector development in the Pacific island countries. Paper presented at a conference The Future of Asia-Pacific Economies: Pacific Islands at the Crossroads. Brisbane: Griffith University.
- Mataio, N. 1991. Scope for sustainable development in the context of the MIRAB hypothesis: the case of the Cook Islands. M.Ec. dissertation. Armidale: University of New England.
- McConnell, C. A. Rambaldi, and E. Fleming. 1996. *New Guinea Gold or Bust: Detection of Trends in the Quality of Coffee Exports in Papua New Guinea*. Working Paper No. 85. Working Papers in Econometrics and Applied Statistics. Armidale: Department of Econometrics, University of New England.
- Menz, K.M. and E.M. Fleming. 1989. *Economic Prospects for Vanilla in the South Pacific*. ACIAR Technical Reports 11. Canberra: Australian Centre for International Agricultural Research.
- Ministry of Primary Industries, Forestry and Cooperatives. 1993. *Report of the Fiji Ginger Industry Conference*. Suva.
- Mosher, A.T. (n.d.) *Some Critical Requirements for Productive Agricultural Research*. The Hague: International Service for National Agricultural Research.
- MPI. 1993. *Annual Report 1993*. Suva: Ministry of Primary Industry.
- Munnell, J.P. 1973. *Survey Report on Smallholder Tea*. Konedobu: Department of Agriculture, Stock and Fisheries.

- NCDS. 1995. *South Pacific Economic and Social Database*. Canberra: National Centre for Development Studies.
- NPSO. 1983. *Agricultural Census 1983*. Port Vila: National Planning and Statistics Office.
- NPSO. 1992. *DP3 1992-95*. Port Vila: National Planning and Statistics Office.
- Pakoa, F. 1996. Kava in Vanuatu: demand-led growth. In *Agricultural Development Strategies for Melanesian Countries: Some Furphies and Evidence of some Home Truths*, edited by E.M. Fleming and J.B. Hardaker. Canberra: National Centre for Development Studies. (forthcoming).
- Pardey, P.G. and J. Roseboom. 1989. *ISNAR Agricultural Research Indicator Series: A Global Data Base on National Agricultural Research Systems*. Cambridge University Press.
- Pardey, P.G. J. Roseboom, and J.R. Anderson. 1991. *Agricultural Research Policy: International Quantitative Perspectives*. Cambridge University Press.
- Pelomo, P.M. 1991. Agriculture marketing in Solomon Islands. Paper presented at the SPRAD/IRETA Workshop on Agricultural Marketing in the South Pacific Region. Nuku'alofa.
- Pelomo, P.M. 1992. Regulations affecting the Solomon Islands cocoa industry. In *Report on the Proceedings of the Cocoa Seminar*, edited by D.J. Bick. Honiara: Ministry of Agriculture and Lands.
- Pelomo, P.M. et al. 1996. Canarium nut and oil marketing in Solomon Islands. *South Pacific Indigenous Nuts*, edited by M.L. Stevens, R.M. Bourke, and B.R. Evans. ACIAR Proceedings No. 69. Canberra: Australian Centre for International Agricultural Research.
- Peter, R. 1993. *Evaluation of comparative advantage in producing sugar under the current industry structure in Papua New Guinea*. Unpublished M.Ec. dissertation. Armidale: University of New England.
- Porter, M.E. 1980. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press.
- QDPI. 1993. *Papua New Guinea Cocoa Quality Improvement Project: Progress Report Related to Research and Cocoa Marketing in Papua New Guinea*. Brisbane: Queensland Department of Primary Industries.
- Rathey, R. 1984. *Agriculture in the Economy of the Kingdom of Tonga: Constraints, Resources, Farm Economics*. Final Report of the Agricultural Economist. Nuku'alofa: Planning Unit, Ministry of Agriculture, Fisheries and Forestry.
- Rathsmann, P. 1981. *Evaluation of Competitive Powers of Selected Crops for Export Purposes with Respect to Individual Farms in the Kingdom of Tonga*. Nuku'alofa: German Agency for Technical Cooperation, Eschborn/Ministry of Agriculture, Fisheries and Forests.
- Research Division. 1995. *Annual Report for July 1994-June 1995*. Apia: Ministry of Agriculture, Forests, Fisheries and Meteorology.
- Rural Statistics Division. 1996. Statistics on chilli volume and values of exports. Mimeo. Konedobu: Department of Agriculture and Livestock.
- Rural Statistics Section. 1988. Statistics on major export crops 1982-1986. Unpublished paper. Konedobu: Department of Agriculture and Livestock.
- Sevele, F. 1980. How successful is small holding farming in the South Pacific islands? *South Pacific Bulletin* 30(1), 3-10.
- Shaw, B. 1982. Smallness, islandness, remoteness, and resources: an analytical framework. *Regional Development Dialogue*. Special Issue. 95-109.
- Singh, M. 1994. Sugar: the challenge. *The Review: The News and Business Magazine of Fiji*. July 1994, 25-44.

- Sivan, P. 1992. Improvement of root crops in the atolls. In *Review of Agricultural Development in the Atolls, Invited Papers Presented to the Workshop on Developing an Agricultural Research Program for the Atolls, Pacific Harbour, Fiji, 19-23 November 1990*, edited by R.G. Chase. Apia: University of the South Pacific Institute for Research, Extension and Training in Agriculture.
- Sonka, S.T. and M.A. Hudson. 1990. Research issues and opportunities affecting the competitiveness of agribusiness firms. *Agribusiness* 6(2), 87-96.
- SPC. 1989. *Overseas Trade 1989* (and earlier issues). Noumea: South Pacific Commission.
- SPC. 1996. *SPC Agricultural News* 4(2). Noumea.
- Statistics Department. 1987. *Statistical Abstract 1987*. Nuku'alofa: Government of Tonga.
- Statistics Department. 1993. *Statistical Abstract 1993*. Nuku'alofa: Government of Tonga.
- Statistics Office. 1978. *1978 Statistical Yearbook*, (and previous issues). Honiara: Ministry of Finance.
- Statistics Office. 1979. *Copra and Cocoa: Production and Exports 1946 to 1978*. Honiara: Ministry of Finance.
- Statistics Office. 1980. *Cook Islands Quarterly Statistical Bulletin, June 1980*, (and previous issues). Rarotonga.
- Statistics Office. 1982. *Quarterly Statistical Bulletin December 1982*. Rarotonga: Government of the Cook Islands.
- Statistics Office/DALH. 1991. *Report on the Smallholder Agricultural Survey 1990*. Port Vila: Department of Agriculture, Livestock and Horticulture.
- Statistics Office/DAH. 1993. *Report on the Smallholder Agricultural Survey 1992*. Port Vila: Department of Agriculture and Horticulture.
- Statistics Section. 1973. *Compendium of Statistics for Papua New Guinea*. Canberra: Department of External Territories.
- Statistics Unit. 1993. *Niue's Annual Abstract of Statistics 1992*. Alofi: Administrative Services Department.
- Stein, L. 1991. *Papua New Guinea: Economic Situation and Outlook*. International Development Issues No. 16. Canberra: Australian Development Assistance Bureau.
- Talake, K. 1992. Attempt to export local produce from Tuvalu. In *Review of Agricultural Development in the Atolls, Invited Papers Presented to the Workshop on Developing an Agricultural Research Program for the Atolls, Pacific Harbour, Fiji, 19-23 November 1990*, edited by R.G. Chase. Apia: University of the South Pacific Institute for Research, Extension and Training in Agriculture.
- Thaman, R.R. 1992. Cultural constraints to sustainable atoll agricultural development. In *Review of Agricultural Development in the Atolls, Invited Papers Presented to the Workshop on Developing an Agricultural Research Program for the Atolls, Pacific Harbour, Fiji, 19-23 November 1990*, edited by R.G. Chase. Apia: University of the South Pacific Institute for Research, Extension and Training in Agriculture.
- Titilulu, R. 1992. An analysis of demand and supply factors in agricultural and primary exports in Fiji, Papua New Guinea and Solomon Islands. Unpublished M.Ec. dissertation. Armidale: University of New England.
- Toelupe, F.V. and H. Coulter. 1992. Cocoa and copra marketing in Western Samoa. In *Agricultural Export Marketing in the South Pacific: The Future Role of Marketing Authorities*, edited by E. Fleming and H. Coulter. Canberra: National Centre for Development Studies.
- Tokalau, F. 1993. An assessment of the production and marketing of export ginger in Fiji 1986-92. Unpublished M.Ec. dissertation. Armidale: University of New England.

- Treadgold, M. 1992. *The Economy of Fiji: Performance, Management and Prospects*. Canberra: Australian International Development Assistance Bureau.
- Trewren, K. 1983. *The Development of the Coconut Resource of Kiribati*. Bairiki: Division of Agriculture, Ministry of Commerce and Natural Resources.
- Tudor, J. (ed.). 1963. *Pacific Islands Yearbook and Who's Who*. 9th edn. Sydney: Pacific Publications.
- Tudor, J. (ed.). 1968. *Pacific Islands Yearbook and Who's Who*. 10th edn. Sydney: Pacific Publications.
- Tudor, J. (ed.). 1972. *Pacific Islands Yearbook*. 11th edn. Sydney: Pacific Publications.
- Umar, M. and L.G.G. Yapa. 1996. Submission from IRETA/SOA. Presentation of Development Agencies Programmes in the South Pacific. Technical Consultation of South Pacific Small Island Developing States on Sustainable Development in Agriculture, Forestry and Fisheries. Apia.
- UN. 1972. *Statistical Yearbook for Asia and the Pacific 1972*. Bangkok: United Nations.
- UN. 1982. *Statistical Yearbook for Asia and the Pacific 1982*. Bangkok: United Nations.
- Varnakulasingam, M. 1991. *Niue: Post-Harvest Utilization of Coconuts*. Port Vila: ESCAP Pacific Operations Centre.
- Vinning, G. 1990. *Marketing Perspectives on a Potential Pacific Spice Industry*. ACIAR Technical Reports 15. Canberra: Australian Centre for International Agricultural Research.
- Walker, L.A. 1976. *A Guide to the Revitalization of the Banana Industry in the Cook Islands, Tonga and Western Samoa*. Suva: South Pacific Bureau for Economic Co-operation.
- Ward, R.G. 1982. Dilemmas in South Pacific agriculture. *South Pacific Journal of Natural Science* 3, 9-30.
- Ward, R.G. 1983. Agriculture, size and distance in South Pacific island futures. Invited paper. 15th Pacific Science Congress. Dunedin.
- Ward, R.G. and Proctor, A. (eds). 1980) *South Pacific Agriculture: Choices and Constraints*. Manila: Asian Development Bank.
- Warr, P.G. 1994. Comparative and competitive advantage. *Asian-Pacific Economic Literature* 8(2), 1-14.
- Weightman, B. 1989. *Agriculture in Vanuatu: A Historical Review*. UK: British Friends of Vanuatu, Cheam.
- West, G.W. 1992. Smallholder production. In *Report on the Proceedings of the Cocoa Seminar*, edited by D.J. Bick. Honiara: Ministry of Agriculture and Lands.
- World Bank. 1980. *The Solomon Islands: An Introductory Economic Report*. Washington, DC: World Bank, East Asia and Pacific Regional Office.
- World Bank. 1982. *Papua New Guinea: Selected Development Issues*. Washington, DC: World Bank, East Asia and Pacific Regional Office.
- World Bank. 1988. *Papua New Guinea: Agricultural Assessment Review—Volume 2 Annexes*. Washington, DC: World Bank, Asia and Regional Office.
- World Bank. 1990. *Kingdom of Tonga: Agricultural Sector Strategy Review*. Washington, DC: World Bank, East Asia and Pacific Regional Office.
- World Bank. 1991a. *Pacific Island Economies: Toward Higher Growth in the 1990s*. Country Study. Washington, DC: World Bank.
- World Bank. 1991b. *Western Samoa: Agricultural Sector Strategy Review*. Washington, DC: World Bank, East Asia and Pacific Regional Office.
- World Bank. 1992. *Papua New Guinea: Revitalizing Agriculture—Issues and Options*. Washington, DC: World Bank.

- World Bank. 1993a. *Pacific Island Economies: Toward Efficient and Sustainable Growth—Volume 1 Overview*. Washington, DC: World Bank, East Asia and Pacific Region.
- World Bank. 1993b. *Pacific Island Economies: Toward Efficient and Sustainable Growth—Volume 2 Fiji: Country Economic Memorandum*. Washington, DC: World Bank, East Asia and Pacific Region.
- World Bank. 1993c. *Pacific Island Economies: Toward Efficient and Sustainable Growth—Volume 3 Kiribati: Country Economic Memorandum*, Washington, DC: World Bank, East Asia and Pacific Region.
- World Bank. 1993d. *Pacific Island Economies: Toward Efficient and Sustainable Growth—Volume 5 Solomon Islands: Country Economic Memorandum*. Washington, DC: World Bank, East Asia and Pacific Region.
- World Bank. 1993e. *Pacific Island Economies: Toward Efficient and Sustainable Growth—Volume 6 Tonga: Country Economic Memorandum*. Washington, DC: World Bank, East Asia and Pacific Region.
- World Bank. 1993f. *Pacific Island Economies: Toward Efficient and Sustainable Growth—Volume 7 Vanuatu: Country Economic Memorandum*. Washington, DC: World Bank, East Asia and Pacific Region.
- World Bank. 1993g. *Pacific Island Economies: Toward Efficient and Sustainable Growth—Volume 8 Western Samoa: Country Economic Memorandum*. Washington, DC: World Bank, East Asia and Pacific Region.
- World Bank. 1995. *Pacific Island Economies: Building a Resilient Economic Base for the Twenty-First Century*. Washington, DC: World Bank, East Asia and Pacific Region.
- Wright, J.P. S. Marzin, and D. Crucefix, 1991. *Solomon Islands Agricultural Production Support Project: Identification Mission*. Honiara: Solomon Islands Government.
- Wyatt, S.L. 1978. Spices. In *Agriculture in the Economy: A Series of Review Papers*, Volume 2, edited by D.R.J. Densley. Konedobu: Department of Primary Industry.
- Wyrley-Birch, E.A. 1986. Cocoa planting in Vanuatu. In *Proceedings of the Cocoa Research Seminar, 12-14 February, 1985*, edited by P.R. Linton, J.B. Abington, and P. Walton. Honiara: Dodo Creek Research Station, Ministry of Agriculture and Lands.



Covers: Chlorine-free paper
Inside pages: Recycled paper

Produced by ISNAR Publications Services

Text editor: Jan van Dongen

Printer: Rapporten Service Drukkerij B.V., Rijswijk, The Netherlands

ISSN 1021-4429
ISBN 92 9118 030 0

Research Options for High-Value Agricultural Exports in South Pacific Island Nations

isnar

International Service for National Agricultural Research

Headquarters

Laan van Nieuw Oost Indië 133, 2593 BM The Hague, The Netherlands

Correspondence

P.O. Box 93375, 2509 AJ The Hague, The Netherlands

Communications

Tel: (31) (70) 349-6100, Fax: (31) (70) 381-9677, Telex: 33746
Email: ISNAR@CGNET.COM World Wide Web: <http://www.cgiar.org/isnar>