



Pacific Horticultural and Agricultural Market Access Program (PHAMA)

Technical Report 46: Review of the Potential for Cut Flower and
Foliage Exports from Vanuatu to Australia and New Zealand
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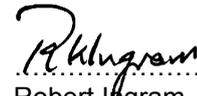
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Table of Contents

Executive Summary	v
1 Introduction	1
1.1 Background	1
1.2 Rationale	1
1.3 Methodology.....	2
2 Floriculture in Vanuatu	3
3 Pacific Island Ornamental Horticulture	4
3.1 Global Potential and Trends	4
3.2 Floriculture in Fiji.....	4
3.3 Experience from Solomon Islands	5
4 Market Opportunities	7
4.1 Phytosanitary Issues	7
4.1.1 Australia.....	7
4.1.2 New Zealand	8
4.1.3 Strategic Implications.....	8
4.2 The Australian Market	9
4.2.1 Overview	9
4.2.2 Wholesale Market.....	10
4.2.3 Retail Sector	11
4.2.4 Marketing Options	12
4.3 The New Zealand Market.....	12
5 Value Chain Analysis	14
5.1 Overview	14
5.2 Methodology and Results	15
5.2.1 Results	15
5.2.2 Anthuriums	17
5.2.3 Cordyline Foliage.....	18
6 Conclusions and Recommendations	19
6.1 Supply and Demand Issues	19

6.2 Recommendations	22
7 Limitations	24

Tables

Table 6-1 Analysis of supply issues: Anthurium and Cordyline	20
Table 6-2 Analysis of demand issues: Anthurium and Cordyline	21

Figures

Figure 5-1 Summary of value chain analysis for Anthuriums (VUV/stem) ^{a/}	16
Figure 5-2 Summary of value chain analysis for Cordyline (VUV/bunch) ^{a/}	17

Appendices

Appendix A Economic, Policy, and Agricultural Sector Background	
Appendix B The Ornamentals Industry in the Pacific	
Appendix C Value Chain Analysis for Export of Cut Flowers and Ornamental Foliage to Australia	
Appendix D Bibliography	

Abbreviations

Abbreviation	Description
A\$	Australian dollar
ACIAR	Australian Centre for International Agricultural Research
ACT	Australian Capital Territory
AFI	Associated Flowers International
AQIS	Australian Quarantine Inspection Service
AusAID	Australian Agency for International Development
CITES	Convention on International Trade in Endangered Species
CTA	The Technical Centre for Agricultural and Rural Cooperation
ESCAP	Economic and Social Commission for Asia and the Pacific
FFC	Fiji Floriculture Council
FJD	Fiji dollar
FOB	Free on board
MAQLFF	Ministry of Agriculture, Quarantine, Livestock, Forestry and Fisheries
MAWG	Market Access Working Group (PHAMA)
MTCIT	Ministry of Trade, Commerce, Industry and Tourism
NSW	New South Wales
NZ\$	New Zealand dollar
OPSP	Overarching Productive Sector Policy
PAA	Priorities and Action Agenda
PHAMA	Pacific Horticultural and Agricultural Market Access Program (AusAID)
PICs	Pacific island countries
REDI	Rural Economic Development Initiatives
SOHC	Suva Orchid and Horticulture Circle
SPC	Secretariat of the Pacific Community
SSO	South Sea Orchids (Fiji)
TPAF	Training and Productivity Authority of Fiji
URS	URS Australia Pty Ltd
US\$	United States dollar
USAID	United States Agency for International Development
USP	The University of the South Pacific
VUV	Vanuatu vatu

Exchange Rates

Australian dollars (A\$) 1.00 = Vatu (VUV) 95

New Zealand dollars (NZ\$) 1.00 = VUV 75

United States dollars (US\$) 1.00 = VUV 90

Executive Summary

Background: The Vanuatu Market Access Working Group (MAWG) requested that the Pacific Horticultural and Agricultural Market Access Program (PHAMA) conduct a review of the potential for exporting cut flowers and ornamental foliage to Australia and New Zealand to determine whether there is merit in developing this sector. A study was undertaken between November 2012 and January 2013 in Vanuatu, Australia and New Zealand to assess the commercial prospects for a number of flower and foliage species and varieties.

Objectives: The feasibility study is intended to identify species and varieties that have good prospects for commercial success, as the basis for selecting one or two floriculture products for which production and marketing pathways can be developed. Consideration of potential species and varieties was limited to items for which market access procedures are already in place, or for which there are good chances of being able to develop market access arrangements.

Floriculture in Vanuatu: The local flower market offers a range of tropical cut flowers, foliage and potted ornamental plants, some of which may have potential for export. The flowers available in Port Vila market are almost all Heliconias or gingers, none of which are approved for import (from any country) to Australia, although New Zealand has approved imports of these items from several countries. Some Anthuriums are sold as potted plants, but not as cut flowers. The quality of the offering is below the standard required for export at this stage.

There are several women's associations that specialise in producing and marketing flowers and ornamental foliage. The associations are being supported by the Ministry of Women's Affairs in their endeavour to become registered legal entities. The Agriculture Ministry is also endeavouring to provide technical support to the growers, but does not have specialised technical expertise in floriculture.

Agro-ecological conditions are generally well-suited to tropical floriculture. There is one commercial-scale floriculture operation (Rainbow Gardens), which sells direct to the public and also supplies local florists and tourism establishments. Most of the other flower growers are part-timers who produce flowers, ornamental foliage and potted plants in their home gardens for sale in the central Port Vila fresh produce market and a number of smaller markets around Port Vila and other towns.

Export markets: Eastern Australia is a large market with almost 11 million people in the three eastern capitals (Brisbane, Sydney and Melbourne), a high degree of cultural diversity, a strong exchange rate relative to the Vatu, and high domestic prices for flowers and ornamental foliage. New Zealand is a considerably smaller market but with similar characteristics otherwise. Both countries import tropical flowers and foliage from as far afield as Mauritius, East Africa and Taiwan.

Methodology: A number of species and varieties were assessed in terms of their prospects for profitable penetration of the Australian east coast market (comprising the cities of Brisbane, Sydney and Melbourne), as well as Auckland, New Zealand. A three-stage screening process was employed:

- Analysis of supply issues, including the current volume and seasonality of supply; grading, packing and transport requirements; experience in exporting; and other factors influencing Vanuatu's capacity to supply the target markets. This work was undertaken in collaboration with the floriculture associations, a commercial floriculturist, several florists supplying the domestic market, and the Ministry of Agriculture, Quarantine, Livestock, Forestry and Fisheries.

- Analysis of demand issues based on market information from the Brisbane and Sydney wholesale flower markets; review of the structure and operations of the Australian and New Zealand markets for flowers and ornamental foliage; and visits to the Brisbane, Sydney, Adelaide and Auckland markets for discussions with importers, wholesalers and retailers.
- Value chain analysis of marketing costs and margins to estimate the total gross margins available to share among growers and exporters.

Market access: Australia does not currently allow the import of *Alpinia* and *Zingiber* spp. (ginger) or Heliconia flowers or foliage from any country. This is an important issue because these items sell for high prices in Australia and there is keen interest in sourcing supplies from the Pacific Islands. Unfortunately, this quarantine regulation is considered to be extremely difficult, if not impossible, to overcome, especially for Heliconias.¹ The **best possibilities** among species currently grown in Vanuatu for export to Australia appear to be **Anthurium**, possibly gingers if market access can be established, and various **ornamental foliages** such as Cordyline, croton, cycads and palms.

The Australian market: Although insignificant on a global scale, the Australian market for flowers and ornamental foliage is very large relative to Vanuatu's production and export potential. With an East Coast population of some 11 million affluent consumers, frequent air services to Sydney, Melbourne and Brisbane, and low charges for outgoing air freight, there appear to be good opportunities for exports to Australia for several items that already have market access arrangements. However, it is a very competitive and quality-sensitive market that is increasingly being supplied with tropical products from low-cost Asian producers, as well as domestic producers from northern Australia.

Prospects for exporting flowers to **New Zealand** are less attractive on the basis of market size, transport linkages and competition from domestic suppliers and other imports.

Value chain analysis: The analysis presents a scenario of the estimated costs and revenues of a fully functional and vertically integrated system for exporting high value floriculture and ornamental foliage products from Vanuatu to Australia. It is recognised that such a system would require considerable investment and development over a number of years, probably incurring losses initially while volumes are low and the skills of the growers and exporters are developing. However, the analysis shows that there is potential to establish a profitable and sustainable floriculture export industry in Vanuatu.

Other considerations: Comparison of supply and demand issues for Anthurium flowers and Cordyline foliage carried out in conjunction with the value chain analysis shows that Anthuriums present a more attractive export opportunity, but one that is also more technically demanding for small outgrowers, more risky, and with higher investment and technical support requirements. This suggests that the approach to development of an export floriculture industry needs to be very carefully planned and conservatively phased.

Conclusions: There are sound prospects for establishing an export-oriented floriculture industry in Vanuatu based on high-value tropical varieties, preferably Anthuriums. There are also good commercial prospects for exporting Heliconia and ginger varieties to Australia, but export pathways for these have not yet been approved. The prospects of gaining access for Heliconias are remote due to

¹ In technical discussions following the completion of this activity, the Department of Agriculture, Fisheries and Forestry has reconfirmed that market access for Heliconias would be difficult due to the presence of Heliconia rust (*Puccinia heliconiae*) in Vanuatu. However, it would appear that there may be an opportunity to develop market access for gingers from Vanuatu into Australia if Vanuatu can confirm freedom from Moko disease, a serious disease of both gingers and bananas, as part of a technical market access submission.

the presence of Heliconia rust (*Puccinia heliconiae*) in Vanuatu. However, the Department of Agriculture, Fisheries and Forestry has recently acknowledged that market access for ginger may be possible if Vanuatu can confirm freedom from Moko disease as part of a technical market access submission. New Zealand does permit *Heliconia* and ginger imports from several Pacific countries, but wholesalers show little interest in importing these because of bad experiences with fumigation, adversely affecting shelf life. The prospects for lower-value items such as ornamental foliage are less attractive due to the high transaction costs and low prices in the Australian and New Zealand markets.

However, while the indications are positive, it is far too early to consider trial export shipments from small growers. A considerable amount of development work is required to establish a group of export-capable growers producing a significant volume of Anthuriums (or other high value flowers such as ginger to Australia) for export. Against this background, the recommended steps for establishment of an export-based floriculture industry in Vanuatu are:

1. Complete the formal registration of the existing grower associations in order to enable them to engage in commercial activities, which are precluded by their current un-registered status.
2. Develop a nucleus farm / outgrower scheme for floriculture production – currently, Rainbow Gardens is the only credible candidate to become the nucleus grower and eventual exporter.
3. Prepare a floriculture strategic and business plan along the lines of the ten-point plan proposed for the Fiji flower sector, but also including a detailed and fully costed business plan for the nucleus farm / outgrower scheme.
4. On the basis of the strategic and business plan, seek financial support for the capacity building and investments required, including the establishment of small-scale shadehouse facilities to be operated by the outgrowers.
5. Focus initially on the domestic market for high quality flowers, especially in the tourism sector, and consider trial export shipments once the outgrowers are consistently producing export quality flowers.

It is envisaged that the above steps would take 2–4 years to reach the point where there is a core group of export-capable outgrowers producing high quality Anthuriums of the varieties demanded in the Australian market. It is also envisaged that should the Market Access Working Group approve the development of a technical market access submission for ginger flowers to Australia, it is likely to take 2–4 years for this request to be considered. The investment necessary in export chain development will be outside the scope of PHAMA Phase 1, so opportunities for coordination with other development partners should be explored.

1 Introduction

1.1 Background

The Vanuatu Market Access Working Group (MAWG) requested that the Pacific Horticultural and Agricultural Market Access Program (PHAMA) conduct a review of the potential for exporting cut flowers and ornamental foliage to Australia and New Zealand to determine whether there is merit in developing this sector. A study was undertaken between November 2012 and January 2013 in Vanuatu, Australia and New Zealand to assess the commercial prospects for a number of flower and foliage species and varieties.

The feasibility study is intended to identify species and varieties that have good prospects for commercial success, as the basis for selecting one or two floriculture products for which production and marketing pathways can be developed. Consideration of potential species and varieties was limited to items for which market access is already in place, or for which there are reasonable prospects of being able to gain access.

1.2 Rationale

Vanuatu and other Pacific island countries (PICs) have negotiated market access arrangements with Australia and New Zealand for a number of horticultural products. However, in the case of Vanuatu this has not translated to the development of significant export business, despite good air and sea freight linkages. The main reason for this appears to be the perceived lack of profitability and lack of capacity for exporting, evidenced by the near total absence of experienced and competent horticultural exporters. Before attempting to develop export marketing pathways for flowers and ornamental foliage, it was considered appropriate to undertake a feasibility study to further assess commercial prospects.

Vanuatu produces a wide range of horticultural products for the domestic market, as well as the tourism sector (hotels, resorts and visiting cruise ships). There are several women's groups that specialise in producing and marketing flowers and ornamental foliage. There is a vibrant local flower market offering a range of tropical cut flowers and foliage, some of which may have potential for export. However, there is little information available on market demand for different flower types, potential pricing and export pathway feasibility. The Vanuatu MAWG has requested PHAMA support to further assess the potential for developing this export pathway and, if justified, to help develop exports by supporting initial trial shipments. This activity would directly build on the work of established women's groups supplying cut-flowers and potted plants to the local market.

Eastern Australia is a large market with almost 11 million people (half Australia's population) in the three eastern capitals (Brisbane, Sydney and Melbourne), a high degree of cultural diversity, a strong exchange rate relative to the Vatu (and most other currencies), and high domestic prices for flowers and ornamental foliage. New Zealand is a considerably smaller market but with similar characteristics otherwise. Both countries import tropical flowers and foliages from as far afield as Mauritius, East Africa and Taiwan.

1.3 Methodology

The study is the first stage in a process of market access development. The following activities were undertaken:

- Reviewing prior work undertaken in value chain development and market analysis for flower exports from Vanuatu, Solomon Islands and Fiji;
- Cataloguing, in consultation with the Vanuatu MAWG and flower producers, the current flowers and foliage produced in Vanuatu that may have export potential;
- Assessing local capacity and interest to supply an export trade, and assessing indicative cost of production;
- Assessing the availability of air freight into key Australian and New Zealand wholesale markets (i.e. Sydney, Melbourne, Brisbane and Auckland);
- Assessing whether there is market demand for the identified cut flowers and foliage from Vanuatu, including target markets, variety, season, potential volumes, and potential buying relationships (e.g. importer, wholesaler or retailer);
- In liaison with PHAMA Biosecurity and Quarantine Specialists, identifying potential quarantine issues, including the need for any market access work for specific flower varieties that may have proven market demand;
- Assessing indicative freight, packaging and other potential costs, including those associated with export and import clearances; and
- Evaluating the demand for Vanuatu flowers and potential returns, and preparing a cost analysis to determine whether the trade is likely to be financially viable.

A number of species and varieties were assessed in terms of their prospects for profitable penetration of the Australian east coast market (comprising the cities of Brisbane, Sydney and Melbourne), as well as Auckland, New Zealand. A three-stage screening process was employed:

- Analysis of supply issues, including the current volume and seasonality of supply; grading, packing and transport requirements; experience in exporting; and other factors influencing Vanuatu's capacity to supply the target markets. This work was undertaken in collaboration with the floriculture associations, a commercial floriculturist, several florists supplying the domestic market, and the Ministry of Agriculture, Quarantine, Livestock, Forestry and Fisheries (MAQLFF).
- Analysis of demand issues based on market information from the Brisbane and Sydney wholesale flower markets; review of the structure and operations of the Australian and New Zealand markets for flowers and ornamental foliage; and visits to the Brisbane, Sydney, Adelaide and Auckland markets for discussions with importers, wholesalers and retailers.
- Value chain analysis of marketing costs and margins to estimate the total gross margins available to share among growers and exporters.

This screening and analysis methodology provided some initial conclusions on the priority products that should be targeted for the development of new export pathways.

2 Floriculture in Vanuatu²

Vanuatu's agro-ecological conditions are well-suited to tropical floriculture. It has a well-established but small floriculture sector supplying the domestic market with cut flowers, ornamental foliage and potted plants. There is one commercial-scale floriculture operation (Rainbow Gardens), which sells direct to the public and also supplies local florists and tourism establishments. Most of the other flower growers are part-timers who produce flowers, ornamental foliage and potted plants in their home gardens to sell in the central Port Vila fresh produce market and smaller markets around Port Vila and other towns. The growers usually market their own produce and are almost exclusively women.

There are two flower grower associations that have expressed interest in expanding commercial floriculture, possibly including exporting. These are the Mauri Flower Association (which has about 20 members) and the Port Vila Flower Association (which has about 50 members, not all of whom are active). These associations are in the process of becoming registered as legal entities so that they can engage in commercial activities. Their aim is to continue growing flowers as individuals, but to engage in collective marketing, locally and possibly internationally. Neither of the associations has a formal business plan. The associations are being supported by the Ministry of Women's Affairs in their endeavours to become registered legal entities. MAQLFF is also endeavouring to provide technical support to the growers, but does not have specialised technical expertise in floriculture.

The flowers available in Port Vila market are almost all Heliconias or gingers, none of which are approved for import (from any country) to Australia, although New Zealand has approved imports of these items from several countries. Some Anthuriums are sold as potted plants, but not as cut flowers. The quality of the offering is below the standard required for export.

Rainbow Gardens, the sole commercial flower operation, is owned and operated by Cornelia Wylie, a long-time resident of Vanuatu who is also Chair of the PHAMA Vanuatu MAWG. Rainbow Gardens has a shadehouse of about 3,000 m² that is used mainly for production of Anthuriums, including about 20 patented varieties imported from the Netherlands.³ Rainbow also produces potted ornamental plants, a range of ornamental foliage, orchids and several other types of flowers. The operation has the capacity to produce about 2,000 exportable quality Anthurium stems per week (100,000 per year). Currently, most of the Anthuriums and orchids are sold locally for weddings and to the tourist sector.

Vanuatu Direct, also owned and operated by Cornelia Wylie, owns a packhouse that is used by a number of operators to grade and pack a range of horticultural produce to supply local retailers, as well as hotels and cruise ships. It is also used for processing and packaging honey. The facility is located in a former dairy factory connected to water and electricity supplies, and is well equipped with refrigeration and most of the equipment needed for grading and packing flowers. It is available to traders on a fee-for-service basis.

There is a single professional florist, Ms Cath Graham, who previously operated a successful florist business in New Zealand and is an approved florist trainer. She provides flower arrangements for 3–5 special events every week – mainly weddings, embassy functions etc. Ms Graham procures flowers in the Port Vila market or from Rainbow and a number of smaller flower growers. Unfortunately, the status of this enterprise is now uncertain and may need to undergo a change of ownership.

² See Appendix A for a more general discussion of economic, policy and agricultural sector background.

³ Rainbow Gardens has a licence to import patented Anthurium varieties from Anthura, which is a global leader in breeding and propagating Anthuriums (see www.anthura.nl).

3 Pacific Island Ornamental Horticulture

3.1 Global Potential and Trends

The potential of the ornamentals industry in the Pacific was assessed by McGregor *et al.* in 2008.⁴ The principal findings of the report are summarised in Appendix B. Key points are summarised below:

- The last 20 years have seen a major increase in exports of horticultural and floricultural products from developing countries. Ethiopia, Kenya, Uganda, Columbia, Malaysia, Taiwan and Thailand have become major flower exporters alongside the traditional leader, the Netherlands.
- The major flower importers are Europe, the United States and Japan, with China, Russia and India growing in importance.
- PICs have not participated in this change despite having suitable agro-ecological conditions – flower exports are minimal, and imports to the region actually exceed exports.
- Globally, the value of floriculture output is about US\$125 billion, of which around 10% is internationally traded. The value of flowers traded internationally is growing at around 3.5% per annum.
- Tropical floriculture products are estimated to make up 4–5 percent of the total floriculture trade, valued at approximately US\$500–600 million annually. Orchids and Anthuriums make up 90 percent of this trade. Other internationally traded tropical flowers are ginger and Heliconias.
- Holland dominates world trade in Anthuriums, producing over 50 million stems annually. The Dutch Anthurium industry is characterised by extremely high productivity, with growers achieving over 100 stems annually per square meter. The other major Anthurium exporters are Mauritius (15 million stems annually) and Hawaii (10 million stems). The emerging Anthurium producers are in Latin America, the Caribbean and China. The main markets for Anthuriums are Germany, Italy, Japan and the United States.
- Tropical foliage is a fast growing segment of the world floriculture industry.
- In the Oceania region, Australia and New Zealand dominate both the export and import of floriculture products. Ornamental horticulture exports from the region are more than four times ornamental horticulture imports. In 2005, exports from the region stood at US\$45 million and imports at US\$11 million.

3.2 Floriculture in Fiji

Among the PICs, commercial floriculture is most advanced in Fiji. The Fiji experience has been documented in several publications produced by South Sea Orchids (SSO) and McGregor *et al.*⁵ A brief summary is provided below, with further detail presented in Appendix B.2.

Floriculture in Fiji is a small industry but with a relatively large number of participants. The vast majority of the participants are women. The driving force behind the industry's development has been SSO, which has established an outgrower-based production operation focussing on Anthuriums and Dendrobium orchids. SSO, together with its contracted outgrowers and marketing outlets, now constitutes the core of Fiji's ornamental horticulture industry. The operation is made up of 82 growers, who have a combined total of 20,000m² under shadehouses (average 385m² per grower), with an

⁴ McGregor, AM, Styce, K, Burness, A, and Taylor, M 2008, Developing the Ornamentals Industry in the Pacific: an Opportunity for Income Generation. Final Report, Australian Centre for International Agricultural Research.

⁵ SSO 2007, Floriculture in Fiji as a Small and Micro-Business, and SSO 2007, Small-holder Flower Production in Fiji: a Pictorial Handbook.

estimated 180,000 flowering plants. SSO provides the market outlet, technical support and sometimes financing to its outgrowers and also imports planting material on their behalf. With the large supply of flowers provided by its growers, SSO now has the capability to confidently market to local florists and tourist resorts. Wholesale cut flower markets have also been established in both Nadi and Suva, through which SSO outgrowers are required to sell their production.

SSO is poised to enter the export market when conditions are suitable, although it should be noted that to date almost all production has been for the domestic market.

Financial analysis by McGregor *et al.* shows that a “micro-scale” Anthurium enterprise with 200 plants could generate a net cash flow of around FJD1,200 per annum in 2006, equal to around VUV81,000 in today’s values.⁶ The return per day of family labour was estimated to be FJD11.40 per day (VUV770). The equivalent returns for a “small-scale” Anthurium enterprise with 2,000 plants were FJD6,250 per annum (VUV422,000) and FJD55.00 per day (VUV3,700).

In addition to the SSO operation, there are around 100 Heliconia and ginger growers in Fiji that operate independently of SSO.

The Hawaii floriculture industry provides a model of the potential for a floriculture industry built around the tourism sector, encompassing supply to resorts and restaurants, as well the ‘carry-on’ trade. The wholesale value of floriculture and nursery products in Hawaii exceeds US\$1.0 billion. Even after accounting for differences in total population and tourist arrivals, there is considered to be significant potential for Fiji to further grow its sales into a flower-oriented tourism industry.

McGregor *et al.* propose ten recommendations for enhanced development of the floriculture sector in Fiji. These are further elaborated in Appendix B.2 and include:

1. Revitalisation of the Fiji Floriculture Council.
2. Creating a “flower culture” within the tourism sector.
3. Becoming a consistent niche exporter of floriculture products.
4. Increasing income-earning opportunities from floriculture.
5. Enhancing skill levels and professional standards.
6. Increasing the flow of information to the industry.
7. Improving the quality of ornamental horticulture products.
8. Improving quarantine arrangements for imports and exports.
9. Improving stakeholder understanding of the Convention on International Trade in Endangered Species (CITES).⁷
10. Advising and coordinating new starters in the industry.

Given that Vanuatu is well behind Fiji in the development of a commercial floriculture sector, the actions recommended above for Fiji would appear to be a minimum requirement for establishing floriculture exports from Vanuatu.

3.3 Experience from Solomon Islands

The status of the floriculture sector in Solomon Islands is similar to that of Vanuatu, although there are no commercial growers similar to Rainbow Gardens. In late 2011, PHAMA undertook an assessment

⁶ Conversion from FJD to VUV based on 35% inflation adjustment for the period 2006–2012 and an exchange rate of VUV50 = FJD1.00.

⁷ CITES imposes strict conditions in the trade of indigenous plant species where these are considered to be endangered.

of the potential for exporting cut flowers and ornamental foliage to Australia.⁸ The study identified a number of constraints to the establishment of cut flower and foliage exports from Solomon Islands, including limited air freight capacity, the non-existence of cool storage to ensure preservation between harvesting and export, CITES conditions surrounding the export of indigenous orchids, limited availability of packing materials (especially cardboard cartons), and quarantine barriers for Heliconia and ginger species. The study undertook a preliminary assessment of the feasibility of establishing an export trade based on four products: Vanda orchids, spider orchids, crotons and Cordyline foliage. Although Heliconia and ginger varieties were keenly sought by Australian importers, they were excluded from the feasibility study because of the quarantine issue.

Three trial shipments of Vandas, spiders and crotons were subsequently sent to Brisbane in early 2012 to test the export pathway and market.⁹ A significant loss was incurred for all three product groups. The main conclusion that can be drawn from the trials is that PICs cannot expect to be competitive with low-cost high volume suppliers from Asia for items selling in the vicinity of A\$1.00 per stem (net price after commission), especially for small shipments which incur heavy overhead costs. **The lesson for Vanuatu is the clear need to target high value products** such as Anthuriums that have the potential to sell for around double this amount, and to aggregate produce from a number of growers in order increase volumes and keep unit costs low. A range of other technical lessons were also identified, as listed in Appendix B.3.

⁸ PHAMA January 2012, Technical Report 16: Potential for Cutflower and Foliage Exports from Solomon Islands to Australia.

⁹ PHAMA June 2012, Technical Report 23: Evaluation of Trial Shipments of Cutflowers and Foliage from Solomon Islands to Australia.

4 Market Opportunities

4.1 Phytosanitary Issues

Access to the Australian and New Zealand markets is constrained by quarantine regulations. Below is a summary of the current regulations, together with conclusions on their strategic implications.

4.1.1 Australia

Australia does not currently allow the import of *Alpinia* and *Zingiber* spp. (ginger) or Heliconia flowers or foliage from any country. This is an important issue because these items sell for high prices in Australia and there is keen interest in sourcing supplies from the Pacific Islands. Unfortunately, this quarantine regulation is considered by PHAMA biosecurity experts to be extremely difficult, if not impossible, to overcome for Heliconia due to the presence of Heliconia rust (*Puccinia heliconiae*) in Vanuatu. However, it would appear that there may be an opportunity to develop market access for gingers into Australia. It is likely that attempting to gain market access for gingers into Australia would involve the development of a detailed submission by Vanuatu authorities and the conduct of a pest risk assessment by Australian authorities before exports could begin. It is anticipated that this process would take 2–4 years to complete.

There is a long list of flower and foliage species permitted for import to Australia, but the majority are temperate species that are unlikely to be grown in Vanuatu. Tropical species of flowers and foliage approved for importation include the following:

- Amaranths (*Amaranthus* spp.)
- *Anthurium* spp.
- *Cordyline* spp (leaves only)
- Croton (*Codiaeum variegatum*) – leaves do not require devitalisation, whereas stems require devitalisation
- Cycads (Cycadophyta) – only leaves and fronds are permitted
- *Dracaena*, dragon plant (*Dracaena surculosa*) – only leaves are permitted and only of the species *Dracaena surculose*. The leaves of other *Dracaena* species are permitted into Australia from Indonesia, Malaysia, Mauritius, Singapore and Thailand only
- Ferns (*Pteridopsida*) – all fern species are permitted, except for all *Asplenium* species other than *Asplenium nidus*. Maidenhair fern (*Adiantum* spp.) and the bird's nest fern (*Asplenium nidus*) are permitted. However, only leaves and fronds of permitted fern species are permitted
- Gloriosa lily, glory lily, climbing lily (*Gloriosa* spp.)
- *Monstera* spp. – only leaves are permitted
- Orchids
- Palms – only leaves and fronds are permitted. *Raphis* spp. leaves and fronds are permitted without devitalisation, but leaves attached to a basal stem from sources other than Canada, the United States, New Zealand, and European Union countries require devitalisation
- *Philodendron* spp. – only leaves are permitted
- Pothos (*Epipremnum aureum*, *E. pinnatum*) – only leaves are permitted.

Importation Procedures for Australia

- All cut flower and foliage consignments are subject to inspection on arrival in Australia.
- All flower consignments are subject to mandatory fumigation, unless exempted through an Overseas Accreditation Scheme.
- If disease symptoms or pathogens are found, the consignment undergoes treatment if possible, or alternatively has to be re-exported or destroyed at the importer's expense.
- If insects or other species of quarantine concern are found, the consignment undergoes fumigation and mandatory re-inspection or alternatively has to be re-exported or destroyed at the importer's expense.
- Attached berries or fruits to cut flower and foliage imports are not permitted, except for *Hypericum x indorum* Flair).
- All propagatable flowers and foliage additionally are subject to devitalisation treatment in the country of origin (see Box 1 below).
- There are also other conditions, e.g. regarding packaging, carton specifications, Phytosanitary certificates, whether cooling packages are permitted, whether vials of water attached to stems are permitted, etc.

Box 1: Devitalisation

Currently, all imported flowers and plants that can be propagated from cuttings must be devitalised in the country of origin. This involves immersion in glyphosate solution to render the plants non-viable. However, there are concerns in the Australian cut flower industry that devitalisation is not being carried out strictly in accordance with the requirements as set out by the Australian Quarantine Inspection Service (AQIS). This is seen to bring into question Australia's compliance with plant breeder rights, as well as presenting a biosecurity threat. The Australian Flower Council is therefore seeking a review of AQIS regulations to ensure that effective devitalisation is carried out on arrival in Australia.

4.1.2 New Zealand

Current market access from Vanuatu is permitted only for *Anthurium* spp., and cut foliage and branches of *Cordyline* spp. and *Dracaena* spp. Anthurium cut flowers are subject to inspection. New Zealand allows import of Heliconia and ginger flowers from Fiji, French Polynesia, Samoa, Australia, Singapore, Malaysia, Thailand and Mauritius but not from Vanuatu. For Cordyline and Dracaena leaves and branches, access to New Zealand is dependent on a survey regarding absence/presence of an extensive list of pests and diseases, as this information is needed for export certification. All foliage and branches of Cordyline and Dracaena require visual pest inspection by the New Zealand Ministry of Primary Industries on arrival. In addition, all propagatable flowers, foliage and branches require devitalisation.

4.1.3 Strategic Implications

Floriculture in Vanuatu is currently dominated by a small number of species, principally *Heliconia* spp, gingers, *Anthurium* spp. and various ornamental foliages. Heliconia and gingers present good market opportunities in the Australian market, particularly for the corporate and special event sectors. However, no country has succeeded in developing a market access procedure for these species yet.

The chances of Vanuatu being able to negotiate market access for Heliconia are considered remote. There is a chance that gingers may gain access into Australia, but this process is likely to take 2–4 years, as it is a new market access request. The best possibilities in the Australian market among species currently grown in Vanuatu therefore appear to be Anthurium, various ornamental foliages (such as Cordyline, croton, cycads and palms) and possibly gingers (subject to a successful market access request).

The implications for the New Zealand market are similar. Although the prospects of obtaining access for Heliconia and ginger flowers are somewhat better, on the basis that New Zealand already accepts imports of these species from a number of countries (including Fiji and Samoa), Anthurium and ornamental foliages offer the best opportunities in the short term. Moreover, New Zealand flower importers and wholesalers have little interest in importing Heliconias and gingers because previous attempts to import these from Asia have been disappointing as they do not tolerate fumigation well.

4.2 The Australian Market

4.2.1 Overview

Although insignificant on a global scale, the Australian market for flowers and ornamental foliage is very large relative to Vanuatu's production and export potential. With Australia's East Coast population of some 11 million affluent consumers, frequent air services from Vanuatu to Sydney, Melbourne and Brisbane, and low charges for outgoing air freight, there appear to be good opportunities for exports to Australia for several items that already have market access arrangements. However, it is a very competitive and quality-sensitive market, which is increasingly being supplied with tropical products from low-cost Asian producers, as well as domestic supplies from northern Australia.

Flowers are regarded in Australia as a highly discretionary and income-sensitive product (unlike consumer staples), with demand heavily dependent on consumer sentiment, which has been weak in the last few years. The market is divided into four sectors:

- Corporate – this mainly consists of large arrangements, often including tropical species such as Heliconia, Anthurium, orchids and palm leaves.
- Special Occasions – mainly Mother's Day, Valentine's Day, Easter and Christmas.
- Celebratory – mainly birthdays, weddings and funerals.
- Household – supplied mainly by the supermarkets and other non-florist outlets, mainly on the weekends.

Imported flowers targeting the corporate sector need to have completed clearance and be ready for collection early on Monday mornings. For the other sectors, demand increases towards the end of the week and on weekends and florists like to have supplies available on Wednesday or Thursday mornings. Later deliveries run the risk of not being sold on Friday or Saturday and having to be held over to the following week.

Marketing of imported floriculture products involves three main actors: importers, wholesalers and retailers. Each of these tends to conduct one basic function, although some importers also wholesale, some wholesalers retail, and some retailers also import. However, these cross-roles tend to be exceptions. Retailers are generally not interested in importing because it is too much trouble and too expensive to process small imported consignments to suit their own needs. They invariably use an importer/wholesaler who can handle larger consignments and on-sell to a number of retailers. Large

consignments are important because customs and quarantine clearance costs are generally flat rates “per consignment” or based on minimum inspection times.

4.2.2 Wholesale Market

Retail florists procure their supplies either directly from flower growers, through wholesalers, or some combination of the two. Some wholesalers operate from their own premises in the major cities and have arrangements to procure flowers from growers and on-sell them to retailers. However, the majority of the wholesale trade in flowers and ornamental foliage takes place through the key wholesale markets in Brisbane, Sydney and Melbourne, of which Sydney is the largest. The Sydney wholesale flower market (see Box 2 below) is the hub of the Australian flower market, drawing supplies from the whole of Eastern Australia and supplying retail outlets in Sydney, Melbourne, Canberra and Brisbane. This is highly convenient for potential exporters from Vanuatu, since there are daily flights from Port Vila to Sydney.

Box 2: Sydney Flower Market

Sydney Flower Market is Australia’s largest flower market for fresh cut flowers. The diverse group of growers at the Sydney Flower Market primarily supply florists in the Sydney area, regional NSW and the ACT, but the market is also open to the general public. It is estimated that the Sydney Flower Market has an annual turnover in excess of A\$150 million and accounts for approximately 75% of the wholesale cut flower trade in NSW. Potted plants and florist supplies such as ribbon, wrap, foam and other sundries are also sold.

Today, approximately 170 traders hold stands in the market. All traders in the Sydney Flower Market must be flower growers; however, many traders also act as wholesalers or agents for other growers throughout Australia. Some flowers are also imported, particularly when local supplies are low. All traders are shareholders of Sydney Markets Limited. The Sydney Flower Market has become the key price indicator for fresh cut flowers, since the extensive variety of flowers stocked in the markets represents a comprehensive cross-section of growers.

Source: www.sydneymarkets.com.au/flowers

There are several ways in which wholesalers deal in imported flowers. Some work as importers and distributors who buy at negotiated prices from the exporters, organise customs and quarantine clearance, and on-sell to retailers. These distributors bear all of the risk associated with paying a fixed price and on-selling to the market. The second category is the commissioned agents who receive supplies from exporters (or domestic growers) and sell for a commission, usually 15%, after deducting customs and quarantine clearance costs. In this case, the supplier bears the price risk. If the produce fails to sell, the exporter/supplier receives nothing. Two of the largest wholesalers in the sector are Associated Flowers International (see Box 3) and Tesselaar Flowers (see Box 4).

Box 3: Associated Flowers International (AFI)

AFI has imported fresh cut flowers for more than 30 years. Soon after operations started in 1978, the business concentrated on tropical flowers – in particular, orchids from Hawaii. A variety of ornamental products also formed part of the range. After four years, Anthuriums from Mauritius were added. In 1989, AFI decided to focus on orchids, Anthuriums and roses, cut flowers only. Later, a wide variety of greens were added to the range. Dedicated customer service and supply of quality fresh products are the main factors contributing to the success of the business. Flower supply can be tracked back to growers, ensuring high quality standards. AFI conducts its business with leading suppliers, guaranteeing year round supplies.

Source: www.afi.net.au

Box 4: Tesselaar Flowers

Tesselaar Flowers has been supplying wholesale flowers to the leading retail florists in Australia over a 70-year period, as well as offering general public consumers a complete floral solution for all types of events, especially weddings. Tesselaar Flowers has grown to become Australia's largest wholesale florist, servicing more customers with more wholesale flowers than any other domestic wholesaler.

Its position is made possible by the long-term relationships Tesselaar nurtures with the country's best wholesale flower growers, and also because Tesselaar Flowers only employs highly efficient, talented and qualified staff members. In this way, Tesselaar is a market innovator, understanding that the wholesale flower business is as much about people as it is about supplying the highest quality of flowers available. Tesselaar operates an online ordering system and supplies customers from depots in Sydney, Melbourne, Brisbane, Gold Coast and Adelaide.

Source: www.tesselaars.com

4.2.3 Retail Sector

The total value of retail sales in Australia was estimated to be A\$926 million in 2011–12¹⁰ and is growing at around 3.0% per annum in nominal terms, or about flat in real terms. The retail sector is highly fragmented, with almost 2,000 flower retailing businesses. However, florist shops only handle about half of the cut flowers retailed. The other half is sold through alternative retail outlets such as supermarkets, online stores, roadside stalls, greengrocers, service stations and convenience stores. There is strong price competition between these retail outlets. Many florists have established web pages that offer online shopping facilities and internet florist affiliations such as Interflora (www.interflora.com.au). The sector is highly fragmented, with most enterprises only owning one establishment. However, most participants benefit from being members of Interflora. This gives them greater marketing power due to affiliation with this trusted brand, and home delivery sales generated by Interflora advertising.

¹⁰ IBIS World Industry Report G5254 (August 2011), Flower Retailing in Australia.

The product profile of the retail sector is continuing to evolve as operators offer a wider range of gift products such as wine, chocolate, gourmet foods, gift cards and soft toys. About 15% of turnover represents Australian wildflowers and most of the remainder consists of traditional items such as roses, chrysanthemums, carnations, tulips and lilies. Tropical flowers are a minor part of the sector and are mainly targeted to high-income consumers and the corporate sector. Among the tropicals, orchids are the most widely available.

Imported flowers are estimated to account for just 3% of domestic demand, sourced mainly from Singapore (36.3%), Kenya (10.5%), Thailand (8.5%), the United States (6.2%) and Malaysia (6.1%). In 2011–12, imports of cut flowers are expected to reach A\$14.8 million.

Due to the fragmented nature of the sector, there are no dominant participants. Sole proprietorships have long characterised the industry and most stores are small, privately owned operations. A number of florists have several branches in one city or state. For example, Pearson’s Florists Pty Ltd, a family-owned business established more than 30 years ago, has 11 retail shops in Sydney, and the Flower Factory has 10.

Many retailers are members of Interflora, which acts as a clearing house for long-distance flower deliveries. Some of the most successful businesses are internet retailers such as Roses Only (www.rosesonly.com.au) and All Hours Florist (www.allhoursflorist.com.au). These generate high turnover, with the majority of sales transacted over the internet. Most of the online retailers were originally conventional florists who converted partly or wholly to online. Because they turn over high volumes, many of them buy direct from growers in order to bypass the wholesale sector.

4.2.4 Marketing Options

Several options are available to potential exporters from Vanuatu. These are detailed below, together with an assessment of their advantages and disadvantages.

Option	Advantages and disadvantages
<ul style="list-style-type: none"> Option 1: Supply direct to one or more florists who specialise in exotic and tropical flowers 	<ul style="list-style-type: none"> Likely to generate higher prices than the other two options Customer requirements are very specific with regard to timing, quantities, quality, varieties etc. Most retail florists do not wish to import directly – they prefer to buy imported material from specialist importers Higher business risk associated with a single customer (or small number of customers)
<ul style="list-style-type: none"> Option 2: Supply to one or more importer/distributors at a negotiated schedule of prices 	<ul style="list-style-type: none"> The importer/distributor bears the price risk The importer/distributor can access a large number of flower retailers However, to compensate for risk, contract prices are generally lower
<ul style="list-style-type: none"> Option 3: Sell through an importer/wholesaler who on-sells on a commission basis 	<ul style="list-style-type: none"> Flexible arrangement with regard to quantity and timing Agents have an incentive to get the best price possible The exporter bears the price risk if prices are depressed or the produce fails to sell

4.3 The New Zealand Market

New Zealand’s floriculture sector differs from Australia’s in several significant ways. It is only about 20% of the size of the Australian market, it is more open to competition from imports, and it is also more export-oriented. The industry is highly competitive and highly quality-conscious. Prices have

been declining over the past decade as a result of increasing competitive pressures. As a small market, prices can be rather volatile, as relatively small increases in availability can easily saturate the market. Although official statistics are limited, the total domestic market is estimated to be worth about NZ\$50 million, of which no more than NZ\$1 million is imported (excluding tropical products such as Thai orchids). Exports of flowers and foliage are worth about NZ\$36 million, the majority of which is orchids. About 20 exporters are active, although the bulk of exports are handled by eight large exporters who are members of the New Zealand Flower Exporters Association. There is also a New Zealand Flower Growers Association, but no importers association.

There are about 800 flower growers in New Zealand, of which fewer than 15 have one hectare or more of greenhouse space. The industry is roughly divided into two sectors: growers who are predominantly export focused, and those who are predominantly domestic market focused. The majority of growers are quite small scale and many supplement their incomes from other sources. While there are not many large growers, most are highly skilled and technologically aware.

There are two basic methods of selling flowers in New Zealand: Flower **auctions** are held on Monday and Thursday mornings (Turners and Growers) or Monday, Wednesday and Friday mornings (United Flower Auction). There are two auction markets in Auckland, two in Wellington, and one each in Hamilton, Palmerston North, Christchurch and Dunedin. Most of the imported flowers are sold in the Auckland markets. Growers send flowers to the auction markets to be sold on a commissioned basis. The top ten cut flowers on the basis of auction sales are: roses, chrysanthemums, tulips, lilliums, gerberas, dianthus, cymbidiums, freesias, alstromerias and gypsophilias. The second selling method is through **wholesalers** who buy from growers and sell to retailers, often in prepared arrangements. There are five or six major flower wholesalers, all Auckland-based, most of which import some items. As with Australia, the supermarkets, convenience stores and online retailers are increasing market share at the expense of the specialised florists.

Wholesalers, wholesale markets and auctions provide retailers with a large range of flowers, and provide growers with a means to sell flowers to a wide range of customers. Most of the wholesalers also import some flowers when local supplies are not available, and some imported flowers are sold through the auction markets.

5 Value Chain Analysis

5.1 Overview

The value chain analyses in Appendix C present a scenario of the estimated costs and revenues of a fully functional and vertically integrated system for exporting high value floriculture and ornamental foliage products from Vanuatu to Australia. It is recognised that such a system would require considerable investment and development over a number of years, probably incurring losses initially while volumes are low and the skills of the growers and exporters are developing. However, the analysis shows that there is potential to establish a profitable and sustainable floriculture export industry in Vanuatu. The model envisaged is similar to the South Sea Orchids operation in Fiji, which is based on a nucleus flower farm working in partnership with a number of outgrowers (see Appendix B.2 for details). Such arrangements are successfully used for industrial crops such as oil palm, sugar, coffee, tea etc. in a number of countries. Outgrower arrangements work best where there is a single obligatory marketing channel, which would be the case with exports of ornamentals from Vanuatu. Where there are multiple marketing channels, the outgrower model often breaks down when growers seek alternative market outlets in pursuit of opportunistic prices.

The key elements of an export floriculture industry of the type envisaged for Vanuatu include the following:

- A commercial floriculture operation as the nucleus farm, which is able to provide planting material and technical support to outgrowers;
- Around 50–100 outgrowers, each with a small shadehouse, growing flowers on a part-time basis under a contractual arrangements with the nucleus farm;
- A Ministry (in this case, the Ministry of Women’s Affairs) that supports the creation and operation of one or more Flower Growers Associations to serve as a conduit for business skills training and to arrange for supply of inputs and collection of the product;
- A Ministry (in this case, MAQLFF) that provides training and extension services to the outgrowers, preferably making use of low cost grower-to-grower learning methods based on the Farmer Field School approach;
- An exporter, probably the same business entity as the nucleus flower farm, that collects flowers from the outgrowers, grades and packs them for export, arranges the necessary export inspection and certification, and consigns the flowers to an importer. This will require access to a packhouse facility with appropriate cold storage capacity;
- The Vanuatu Quarantine Service (part of MAQLFF), which will be required to inspect, devitalise and certify material for export as required by the importing country;
- A freight forwarding business to arrange air freight to Sydney, together with the necessary export documentation;
- A flower importer based in Sydney (or possibly Brisbane or Melbourne) that can arrange customs and quarantine clearance, transport and storage of the flowers in the appropriate conditions, and sale to retail customers; and
- An independent auditor to verify that all transactions between the partners are fully transparent and properly documented.

5.2 Methodology and Results

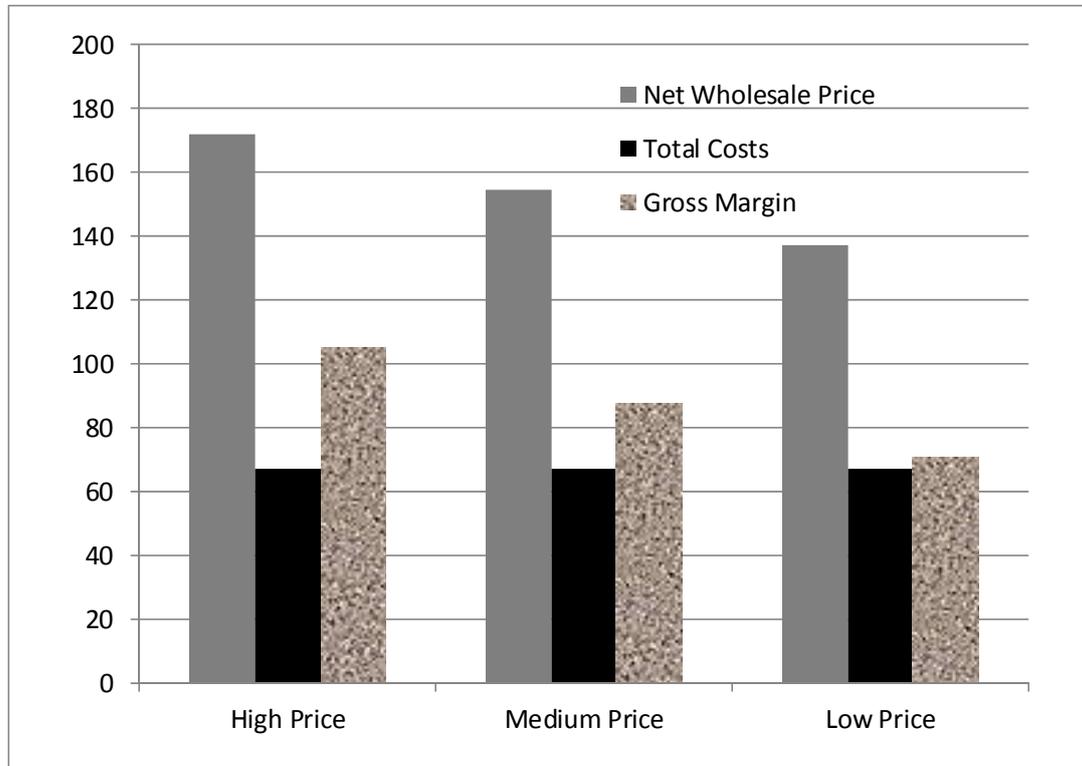
To assess the commercial feasibility of exporting flowers and ornamental foliage from Vanuatu, two value chain analyses have been conducted (see Appendix C). The first is for Anthuriums, which are the most promising of the floriculture species in that they are already approved for export to Australia, are a high value product, and already have an established commercial production base in Vanuatu. Among ornamental foliage options, the analysis is conducted for Cordyline foliage, because it is widely available in Australian wholesale markets, and is easily grown in home gardens in Vanuatu. It is intended to be representative of a number of possible ornamental foliage species, such as crotons, palm leaves, cycads etc.

The analyses estimate the costs incurred at the various stages along the value chain, including: (i) on-farm production costs (based on crop budgets provided by SSO, Fiji); (ii) collection and transport costs from farm to packhouse; (iii) costs of grading, washing and packing; (iv) cost of transport from Vanuatu to Australia by air and the cost of quarantine inspection and clearance in Australia; and (v) wholesale market revenue after allowance for product losses and agent's commission. This information is used to estimate the total gross margins available to Vanuatu growers and exporters based on high, medium and low wholesale prices, with the high and low range being around 20% above/below the medium price. The analyses are based on air freight to Sydney, although similar results would be obtained for airfreighting to other Eastern Australian cities.

5.2.1 Results

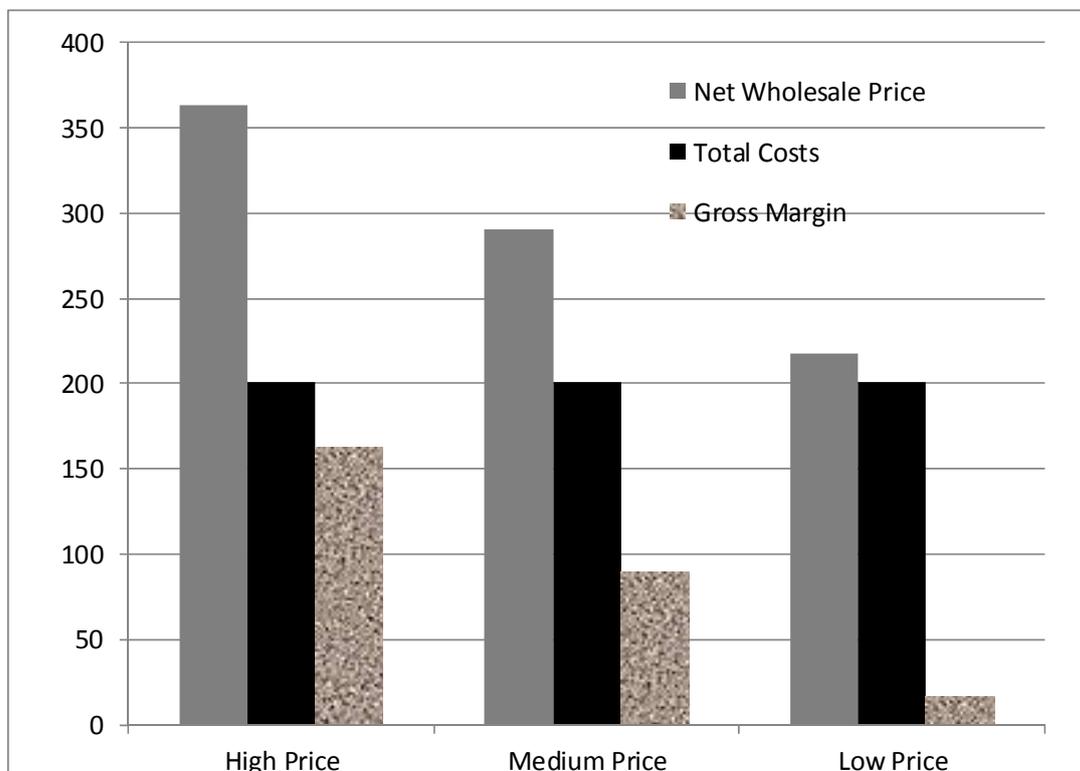
Results of the analysis are summarised in Figure 5-1 and Figure 5-2 below and detailed in Appendix C, together with all of the key assumptions on costs and revenues.

Figure 5-1 Summary of value chain analysis for Anthuriums (VUV/stem) ^{a/}



a/ Based on wholesale prices in Sydney Flower Market, 24 stems/carton

Figure 5-2 Summary of value chain analysis for Cordyline (VUV/bunch) ^{a/}



a/ Based on wholesale prices in Sydney Flower Market, bunches of 10 leaves

5.2.2 Anthuriums

The Anthurium value chain analysis shown in Appendix C Table C-1 to Table C-10 is based on the nucleus estate/outgrower model with about 100 outgrowers, each with a 2,000 plant / 125 m² production unit. The analysis applies only to the Anthuriums produced by outgrowers and excludes those produced by the nucleus grower.

Figure 5-1 shows the costs, revenues and gross margins per stem shipped over the entire value chain. Total gross margin would be in the range of VUV70–105 per stem, to be shared between the outgrowers and the exporter. After paying the outgrowers VUV40–50 per stem collected (average VUV61 per stem shipped), this would generate a net margin to the exporter ranging between VUV9–43. This is equivalent to a profit of between VUV86,400 (A\$910) and VUV410,730 (A\$4,320) per consignment of 9,450 stems. The mid-point between these two extremes suggests a profit to the exporter of about VUV248,600 (A\$2,620) per consignment, or about A\$262,000 per annum based on 100 consignments per year.

The returns to the outgrowers on the basis of VUV40–50 per stem collected also seem reasonably attractive. The investment costs (see Appendix C, Table C-1) for a small scale Anthurium unit (2,000 plants / 125 m² shadehouse) are around VUV1.03 million (A\$10,800). Once fully productive, this would generate a net cash flow of around VUV286,000 per annum (A\$3,010), or VUV575,000 (A\$6,050) if all the work is done by family members.

5.2.3 Cordyline Foliage

The Cordyline foliage value chain analysis shown in Appendix C Table C-11 to Table C-20 is based on the nucleus estate / outgrower model with about 200 outgrowers, each with a 1,120 plant / 125 m² production unit. The analysis applies only to the foliage produced by outgrowers and excludes that produced by the nucleus grower.

Figure 5-2 above shows the costs, revenues and gross margins per Cordyline bunch shipped over the entire value chain. Total gross margin would be in the range of VUV17–162 per bunch, to be shared between the outgrowers and the exporter. After paying the outgrowers VUV150 per bunch collected (VUV167 per bunch shipped), this would generate a negative net margin to the exporter at all three price levels.

6 Conclusions and Recommendations

6.1 Supply and Demand Issues

An analysis of supply and demand issues for Anthurium flowers and Cordyline foliage is presented in Table 6-1 and Table 6-2 below. In conjunction with the value chain analysis results presented in Chapter 5, this indicates that Anthuriums present a far more attractive opportunity for exporting to Australia compared with Cordyline foliage. However, developing this opportunity is likely to be more technically demanding for small outgrowers, more risky, and will have higher investment and technical support requirements.

This suggests that the approach to developing an export floriculture industry needs to be very carefully planned and conservatively phased. The Australian market should be given priority over New Zealand because of its larger absorptive capacity and better transport linkages.

Table 6-1 Analysis of supply issues: Anthurium and Cordyline

Supply Issues	Anthurium	Cordyline	Comments
Production volume	<ul style="list-style-type: none"> Moderate 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> There is one commercial Anthurium grower (Rainbow Gardens). Many home gardeners grow Anthurium pot plants and Cordyline. Anthuriums are sold in the local market. Cordyline leaves are not generally sold in Vanuatu.
Production system	<ul style="list-style-type: none"> Commercial 	<ul style="list-style-type: none"> Home gardens 	
Annual or perennial	<ul style="list-style-type: none"> Perennial 	<ul style="list-style-type: none"> Perennial 	<ul style="list-style-type: none"> Anthuriums require several years to reach full production. Cordyline is much quicker to establish.
Ease of propagation	<ul style="list-style-type: none"> Difficult 	<ul style="list-style-type: none"> Easy 	<ul style="list-style-type: none"> Propagation of patented Anthurium varieties is not permitted under plant variety rights laws. Cordyline varieties are not generally patented and are easily propagated by cuttings.
Investment requirements (grower level)	<ul style="list-style-type: none"> Approximately VUV1.03 million 	<ul style="list-style-type: none"> Approximately VUV0.67 million 	<ul style="list-style-type: none"> Both for small scale backyard unit of 125 m² shadehouse. Investment costs are higher for Anthuriums because of the need to buy patented planting material.
Financing needs	<ul style="list-style-type: none"> Most growers may need loans 	<ul style="list-style-type: none"> Some growers able to self-finance 	
Technical difficulty of production	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Specialised skills required for commercial Anthurium production. Most home gardeners already grow Cordyline.
Technical difficulty of marketing	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Moderate 	<ul style="list-style-type: none"> Anthurium buyers are very specific about varieties, quality and specifications.
Seasonality	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Both species experience a slow-down during the cooler months.
Established export	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> No 	<ul style="list-style-type: none"> Neither species has been exported from Vanuatu in recent years.
Production risk	<ul style="list-style-type: none"> Moderate 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Anthuriums are susceptible to some diseases. Cordyline is very robust and easy to grow.

Table 6-2 Analysis of demand issues: Anthurium and Cordyline

Demand Issues	Anthurium	Cordyline	Comments
Target markets	<ul style="list-style-type: none"> • Sydney wholesale flower market 	<ul style="list-style-type: none"> • Sydney wholesale flower market 	<ul style="list-style-type: none"> • Transport connections favour Sydney as the primary market. It is also the commercial hub of the flower industry in Australia.
Market size	<ul style="list-style-type: none"> • Small 	<ul style="list-style-type: none"> • Moderate 	<ul style="list-style-type: none"> • Anthuriums are a small and specialised sector of the Australian flower market targeting the high value and special occasions sector. Cordyline and other foliage species are more widely traded and used.
Domestic competition	<ul style="list-style-type: none"> • Moderate 	<ul style="list-style-type: none"> • Moderate 	<ul style="list-style-type: none"> • Most of the competition for tropical flowers and foliage is from Asian exporters, but there are some domestic producers in northern Australia.
Import competition	<ul style="list-style-type: none"> • Strong 	<ul style="list-style-type: none"> • Strong 	
Marketing risk	<ul style="list-style-type: none"> • High 	<ul style="list-style-type: none"> • High 	<ul style="list-style-type: none"> • There is a significant risk for both species associated with supply chain logistics, quarantine interventions, quality failures, oversupply etc.
Estimated Gross Margin ^{a/}			<ul style="list-style-type: none"> • Value chain analysis shows that gross margins for Anthuriums are adequate to provide reasonable returns with prices in the mid-range or above. • However, Cordyline leaves are a low-value commodity that is unlikely generate attractive returns for exporters or growers.
High price	<ul style="list-style-type: none"> • VUV 98 per stem (57%) 	<ul style="list-style-type: none"> • VUV 143 per bunch (39%) 	
Medium price	<ul style="list-style-type: none"> • VUV 81 per stem (52%) 	<ul style="list-style-type: none"> • VUV 70 per bunch (24%) 	
Low price	<ul style="list-style-type: none"> • VUV 63 per stem (46%) 	<ul style="list-style-type: none"> • VUV -3 per bunch (-1%) 	
Price seasonality	<ul style="list-style-type: none"> • High 	<ul style="list-style-type: none"> • Moderate 	<ul style="list-style-type: none"> • Anthurium prices peak during key special occasions: mother's day, Valentine's day etc. Cordyline foliage less so.

^{a/} Percentages are % of net wholesale price

6.2 Recommendations

There are sound prospects for establishing an export-oriented floriculture industry in Vanuatu targeting the Australian market, based on high-value tropical varieties such as Anthuriums and possibly gingers (if market access is gained).

Prospects for Heliconias and gingers to New Zealand are also good, but importers show little interest in importing these species.

Prospects for lower-value items such as ornamental foliage are less attractive for both Australia and New Zealand due to the high transaction costs and low prices.

The factors contributing to the positive assessment for Anthuriums include the following:

- Vanuatu has good agro-ecological conditions for growing a range of tropical flowers, and Rainbow Gardens has demonstrated that it is possible to produce export quality Anthuriums.
- High value (patented) Anthurium varieties, sourced from the world's leading breeder (Anthuria) are readily available via Rainbow Gardens, which has a licensing agreement with Anthuria.
- Australia and New Zealand have approved the importation of Anthuriums from Vanuatu, subject to the usual inspection and fumigation procedures.
- The value chain analysis suggests that attractive financial returns should be available to both growers and the exporter.
- Air freight capacity is readily available between Port Vila and Sydney or Brisbane at reasonable prices. It is current Government policy to maintain low air freight rates on Air Vanuatu to encourage the development of fresh produce exports, although this can of course change at any time.
- There are a number of flower importers operating in the Sydney and Brisbane wholesale markets who are interested in handling Anthuriums from Vanuatu on a 15% commission basis.
- There are a number of skilled semi-commercial, part-time flower growers who currently supply the domestic market and have expressed interest in exporting. With appropriate training, these growers should be able to produce export quality flowers.
- It should be possible to develop an outgrower scheme, similar to SSO (Fiji), working through the two existing flower grower associations.

However, while the indications are positive, it is far too early to consider trial export shipments from the small growers. Rainbow Gardens is currently producing export-quality Anthuriums for the local market and could export successfully at any time. However, smaller growers mainly produce potted plants, and other items that are not approved for export to Australia or New Zealand. A considerable amount of development work is required before there is a group of export-capable growers producing a significant volume of Anthuriums (or other high value flowers) for export.

Against this background, the recommended steps for establishment of an export-based floriculture industry in Vanuatu are:

1. Complete the formal registration of the existing grower associations to enable them to engage in commercial activities, which are precluded by their current un-registered status.
2. Develop a nucleus farm / outgrower scheme for floriculture production. Currently, Rainbow Gardens is the only credible candidate to become the nucleus grower and eventual exporter. The key elements of such as scheme are given in section 5.1.

3. Prepare a floriculture strategic and business plan along the lines of the ten-point plan proposed for the Fiji flower sector by McGregor *et al.*, but also including a detailed and fully costed business plan for the nucleus farm / outgrower scheme.
4. On the basis of the strategic and business plan, seek financial support for the capacity building and investments required, including the establishment of small-scale shadehouse facilities to be operated by the outgrowers.
5. Focus initially on the domestic market for high quality flowers, especially in the tourism sector, and consider trial export shipments once the outgrowers are consistently producing export quality flowers.

It is envisaged that the above steps would take 2–4 years to reach the point where there is a core group of export-capable outgrowers producing high quality Anthuriums of the varieties demanded in the Australian market. The investment necessary in export chain development will be outside the scope of PHAMA Phase 1. Potential opportunities for coordination with other development partners should be explored.

Should the MAWG approve the development of a technical market access submission for exporting ginger flowers to Australia, it is likely to take 2–4 years for this request to be considered.

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Appendix A

Appendix A Economic, Policy, and Agricultural Sector Background

A.1 The Economy

Overview: Vanuatu has a relatively small, open economy with many development and structural constraints. But the nation also possesses some important advantages, including a strong traditional culture that promotes social stability and family welfare, as well as fertile land, natural resources and pristine environment. Livelihoods are based primarily on subsistence or small-scale agriculture, which provides a living for more than 70% of the population, which is dispersed across more than 80 islands.

Vanuatu's economic growth over the period 2000–2010 has been impressive, averaging 3.45% per annum, the best performance among the Pacific island countries (PICs). Earlier this decade, average income per capita was about the same as it was 25 years earlier, but despite the high population growth rate (average 2.3% between the 1999 and 2009 population censuses), this situation is being turned around by high and sustained growth. By 2011, Vanuatu's gross national income per capita reached US\$2,870. Tourism has been a major driver of recent growth. Between 2006 and 2010, visitor arrivals have increased by 86% and day visitors on cruise ships have almost doubled. In 2009 (latest data available), the structure of the economy was dominated by the service sector (68%), followed by agriculture (21%) and a smaller industry sector (11%).

Trade balance: Despite Vanuatu's economic success, it runs a significant trade deficit, with imports being six times higher than exports. As a small, open economy, where almost all manufactured goods and increasing amounts of food and fuel are imported, foreign exchange earnings are vital. While the trade deficit is large (29% of gross domestic product), the current account is balanced by tourism receipts, inflow of private capital, and development assistance. Agricultural products make up the bulk of exports and are dominated by five products: coconut oil, copra, kava, beef and cocoa. But Vanuatu has also developed small volume exports of premium grade spices and coffee, sawn timber, and marine products. What is needed now is to improve quality in order to increase export volumes and prices for these key products in higher value markets. Domestic (inter-island) transport and handling costs constitute a major share of FOB (free on board) prices. It is important to improve efficiencies in this area in order to raise export competitiveness. Strengthening export performance and forming stronger linkages with the growing tourism sector is also important to contain pressure on the balance-of-payments and reduce dependence on external grants.

A.2 National Development Strategy

The Priorities and Action Agenda (PAA) articulates the Government's high level development priorities and strategies to achieve the goal of creating "an educated, healthy and wealthy Vanuatu". The PAA integrates and prioritises policies and initiatives outlined in the Comprehensive Reform Programme, Business Forum Outcomes, and the Rural Economic Development Initiatives (REDI) Plans for the period 2006–2015. The PAA identifies seven Strategic Priorities, which were reviewed in 2011 and slightly amended to the following:

1. Private sector development and employment creation.
2. Macro-economic stability and equitable growth.
3. Good governance and public sector reform.
4. Primary sector development, environment, climate change, and disaster risk management.
5. Provision of better health services, especially in rural areas.

Appendix A

6. Education and human resource development.
7. Economic infrastructure and support services.

With a population growth rate of around 2.3%, it is estimated that the number of young people entering the labour force averages around 3,500 each year. Private sector development and employment creation, including in tourism, agriculture and fisheries, is therefore a top priority. This means creating an environment in which economic opportunities can be generated. The PAA has gone some way towards a macro-level approach, and includes a range of performance targets. The PAA provides broad guidance for development programs, but specific time-bound strategic plans and medium-term expenditure frameworks are needed to better identify funding gaps to be addressed by development partners. In this context, the government has recently finalised an Overarching Productive Sector Policy (OPSP) framework that focuses on achieving PAA Priorities 1 and 4.

The OPSP establishes a coherent policy framework to guide strategic actions and investments over the coming years. The policy proposes strategic thrusts in eight priority areas, most of which also reflect Pacific Horticultural and Agricultural Market Access Program (PHAMA) priorities: sustained **market access**; improved **product quality and safety**; increased production and productivity; more processing and **value adding**; environmental services and resilience; infrastructure development; **capacity building**, training and **entrepreneurship**; and policy development, coordination and monitoring. The OPSP is intended to strengthen linkages between PAA policies, sub-sector strategies and corporate plans, and budget programs and narratives. It should lead to better clarity on priority actions and outcomes for the line ministries: the Ministry of Agriculture, Quarantine, Livestock, Forestry and Fisheries (MAQLFF), and the Ministry of Trade, Commerce, Industry and Tourism (MTCIT).

A.3 The Agricultural Sector

Overview: Agriculture directly supports about 75% of total population, with an estimated 41% of land (12,190 sq km) suitable for cultivation but with limited use of its 200 nautical mile Exclusive Economic Zone. More than 90% of land is under customary tenure, but farming systems consist of both subsistence and large commercial farms, mainly producing copra, kava, cocoa and beef. Vanuatu's fertile soil and favourable climate provide potential comparative advantage in organically grown low-volume/high-value agriculture. In 2010, agricultural exports were close to US\$50 million, while imports were US\$285 million. Farming infrastructure (abattoir, quality control and veterinary inspection systems) is well established, but meat handling and quality control needs attention. Vanuatu's fishery is under-explored, with limited local participation and inadequate coastal management. Local artisanal fishing can make a greater contribution to rural incomes, nutrition and self-reliance. Forestry is slowly developing, with areas of cyclone resistant whitewood being established. Sandalwood is also important, with export earnings estimated to be more than US\$2 million for the period 2007–09.

Domestic food market: The domestic market for local food products (including a limited range of processed foods) is growing, with the urban centres of Port Vila and Luganville expanding. Products with a good demand on local markets include kava, beef, fish, roots and tubers, coconuts and a wide variety of fruits and vegetables, nuts, eggs and some small livestock (chicken and pigs). Cut flowers, ornamental foliage and potted ornamentals are sold in these markets. Tanna Coffee has also developed a substantial domestic market share. The main Port Vila fresh produce markets (Central, Marobe and Fresh Water) provide a sales outlet for producers around Efate and the near shore islands of Emau, Moso, Lelepa, Pele, and Nguna. They also provide a market outlet for major producers of food crops from as far as Sanma in the North and Tafea in the South. Following the

Appendix A

completion of the upgraded Efate Ring Road, an increased number of roadside markets have also been established.

Agricultural sector policy framework: The authorities do not implement any regular market surveys and there are few studies for use by planners. There has not been an agricultural census for many years and data on exports and domestic market volumes are almost non-existent. These are serious limitations for strategic planning and evidence-based policy making – as well as for private sector planning and investment. There are growing demands on fresh produce markets due to rapid urban population growth, but also to some extent from increased demands from the tourist sector and high global food prices. A system for a quarterly market survey has been prepared that is designed to collect quantity of produce (crops, fruits, vegetables, flowers, firewood, and livestock) brought to market, quantity sold and prices. However, this has not been implemented because of insufficient resources.

Linkages between agriculture and tourism: Forging linkages between tourism and agriculture can help create economic opportunities, build resilience in rural communities, and enhance sustainable development. The most obvious area for strengthening linkages is in the supply chain for tourist consumption products – foods and beverages, crafts, cosmetics, flowers and ornamentals, essential oils, massage oils and spa products etc. – thus reducing dependence on imported goods to supply tourists' needs. To service the tourist market, local producers need to find profitable and competitive ways to meet tourism industry demand for volume, quality, regularity and safety requirements. The ability of local agri-food systems to meet these requirements is dependent both on supply factors (natural resource base, farming systems, agro-processing and marketing capacity) and the type of tourism development (mass tourism, high end niche, health and wellness, eco-tourism, cruise ship etc.).

The tourist market shares similarities with the export market in its requirements for quality (including food safety) and consistency in produce supply. Quality assurance and certification in terms of food safety requirements represents part of the value addition process. Such certification is becoming essential for accessing high value markets (including the tourist market). Some industries (e.g. beef) have managed to develop robust quality assurance systems to meet export market requirements, while progress with other commodities has been minimal. At present, monitoring of quality is problematic due to the absence of an operational food testing laboratory. Support is also needed to improve the capacity of producers to access niche market opportunities through improved quality control, product traceability and management skills. This applies as much to flowers and ornamental plants as it does to food commodities.

Regulatory framework: The legal and regulatory environment for food is fragmented. Meat, fish and food are handled under separate legislation and enforcement structures. The food legislative framework includes: the Food Control Act no. 21 of 1993, which is the principal food safety law; the Food Control regulation no. 37 of 2007, which provides specific standards of mostly hygiene, food handler requirements and some labelling requirements; and the Food Penalty Notices No. 54 of 2010, which provides the authority under which fines may be issued for non-conformance. But implementation of the regulations is difficult given the limited number of well-trained inspectors to enforce them, the dispersed island geography of the country, and the lack of equipment and budget.

Agricultural development partners: The European Union is the principal donor to the agriculture sector through the Primary Sector Growth Support Programme. This programme is designed to deliver results in three areas: (i) improved policy processes and strengthened institutional capacity; (ii)

Appendix A

reinforced public policies in support of the Private Sector; and (iii) improved delivery of public goods that are critical to the sustainability of the primary sector. The four key activity areas are: (i) effective performance of staff in MAQLFF and MTCIT; (ii) effective biosecurity and export quality services; (iii) effective research and extension systems; and (iv) contracting private sector / non-governmental organisation service providers to deliver public goods. The European Union is also providing funding for climate change adaptation activities. Australia is providing support through the Australian Centre for International Agricultural Research (ACIAR) to research-oriented activities and PHAMA in areas of market access.

Appendix B

Appendix B The Ornamentals Industry in the Pacific

B.1 Overview

McGregor *et al.* (2008)¹¹ provide an assessment of the potential of the ornamentals industry in the Pacific with particular reference to Fiji. The principal findings of the McGregor report are summarised in this Appendix, with comments on their strategic implications for Vanuatu.

Background

A revolution is occurring in the export of horticultural and floriculture products from developing countries. Overall, high value products (including horticulture, livestock, fish, cut flowers and organic products) now make up 66% of all developing country agricultural exports. This is significantly more than the 21% accounted for by traditional tropical products (United Nations Commodity Trade Statistics Database). The real value of traditional commodities fell dramatically from 1980 to 1990. Since then, recovery has been marginal, with the total export value remaining lower than the 1980 value. In contrast, the value of horticultural and other high value commodity exports has grown rapidly over the last two decades. Developing countries have gained market share at the expense of developed countries. In 2005, developing countries held a 56% share of world trade in fruit and vegetables (excluding bananas and citrus). In 2005, the value of exports from the fruit, vegetable and floriculture group accounted for 30% of all developing country agricultural exports. This was a marked increase from the 1980 figure of 16%.

This horticulture revolution is widely recognised as a mechanism for poverty reduction. Specifically, floriculture has been a lead sector in Ethiopia, Kenya and Columbia. East African exports to the European Union include Kenya (US\$200 million annually) and Uganda (US\$36 million annually). One Kenyan grower ships 1.5 million rose stems daily, and Ugandan growers ship 500,000 roses for Valentine's Day. South East Asia exports primarily to Japan, including Thailand (US\$50 million annually), Malaysia and Singapore (US\$10 million annually).

Pacific island countries (PICs) are not yet part of this horticultural revolution. This is despite often having suitable agro-ecological conditions. The total value of PIC non-commodity agricultural exports in 2005 was around A\$66 million. In the same year, the region's total exports to Australia stood at A\$2,640 million. Taro, squash, noni juice and vanilla beans are the most important non-commodity agricultural export products. This overall poor export performance is particularly disappointing in the context of the following:

- These are agriculturally based economies;
- Highly suitable agro-ecological conditions can often be found for the products (e.g. the Highlands of Papua New Guinea for temperate fruit and vegetables and floriculture products; in Fiji, western Viti Levu for tropical fruit);
- The impressive global growth performance by developing countries in the export of horticultural and other high value agricultural products; and
- The comparative advantage in the production and export of these products.

Floriculture product exports from the region are miniscule – around A\$8,000 in 2005. The PICs are also found to have a significant net trade deficit in floriculture products. This situation is surprising,

¹¹ McGregor, AM, Styce, K, Burness, A & Taylor M April 2008, Developing the Ornamentals Industry in the Pacific: an Opportunity for Income Generation. Final Report, Australian Centre for International Agricultural Research.

Appendix B

given the ability of PICs to produce floriculture products and the apparent demand in Pacific Rim markets. The poor floriculture trade performance of PICs contrasts markedly to that observed for the comparable regions of East Africa, Central America and the Caribbean. These countries have a substantial trade surplus in floriculture products.

The global floriculture industry

The value of world production of floriculture products was estimated at approximately €100 billion in 2006. Around 10% of this production enters international trade; this is increasing by around 3.5 percent annually. The main importers of cut flowers and pot plant products in 2004 were Germany and the United Kingdom, with the United States following close behind. Emerging floriculture markets have been established in Russia, India and China.

By far the leading exporter of floriculture products is the Netherlands, followed by Colombia and Taiwan. East African producers are the leading emerging suppliers. Annual Kenya and Uganda exports to the European Union are now around US\$200 and US\$36 million respectively. The Netherlands is notably also the fifth largest importer of floriculture products. Furthermore, the Netherlands is a major player in the export trade of tropical flowers, being the world's largest producer and exporter of Anthuriums.

Trade in tropical ornamental products

Most tropical floriculture products are exported for sale. Hawaii and the Pacific Islands floriculture industry are an exception in this respect. Tropical products are estimated to make up 4–5 percent of the total floriculture trade, valued at approximately €400–500 million annually. Orchids and Anthuriums make up 90% of this trade. Potential growth areas for tropical floriculture products include travel and tourism, luxury hotels, resorts and restaurants. However, a study by Rikken (2006) on the market for tropical flowers and foliage in the European Union presents quite a different picture. The conclusions of the report were: (i) a noted worldwide overproduction of tropical flowers; (ii) quality requirements in the European market becoming more stringent; and (iii) decreasing prices and demand resulting in lowered imports of tropical flowers.

World trade in **orchids** exceeds €110 million annually. This trade is approximately divided between cut flowers (80%) and potted orchids (20%). Asian countries dominate trade in orchids, with Taiwan and Thailand being the largest exporters. The value of Taiwan's orchid exports in 2005 was €52 million (mainly potted *Phalaenopsis* and *Paphiopedilum* and *Oncidium* cut flowers). Thailand's annual orchid exports are around €36 million (mainly *Dendrobium* cut flowers to Japan). Singapore and Malaysia export around €7.3 million in orchids, again mainly to Japan. The farm value of Hawaii's orchid production in 2005 was €17 million, most of which was sold within the State in the form of potted plants. There is also a growing orchid trade from the Caribbean and Central America, namely from Costa Rica, Panama, Colombia, Jamaica and Trinidad & Tobago.

Holland dominates world trade in **Anthuriums**, producing more than 50 million stems annually. The Dutch Anthurium industry is characterised by extremely high productivity, with growers achieving more than 100 stems annually per square meter. The other major Anthurium exporters are Mauritius (15 million stems annually) and Hawaii (10 million stems). The emerging Anthurium producers are in Latin America, the Caribbean and China. The main markets for Anthuriums are Germany, Italy, Japan and the United States. The wholesale price for Hawaiian Anthuriums on the Tokyo and Osaka markets ranges from €0.60 to €0.85, depending on colour.

Appendix B

Other internationally traded tropical flowers are **gingers and Heliconias**. World trade in these products can be divided into broad geographic groupings:

- The Caribbean and Central America (Costa Rica and Ecuador) are the leading exporters. Brazil, Jamaica, Dominican Republic, Colombia, Mexico and Guatemala supply the United States market. Hawaii also supplies the United States mainland.
- Africa (Canary Islands, Ivory Coast, Cameroon, Tanzania) and Sri Lanka supply the European Union.
- Hawaii supplies the Japanese market and Malaysia supplies the Singapore market.

The European Union market for Heliconias and other tropical flowers is relatively small and sensitive to oversupply.

In this very characteristic niche market, only specialised importers/wholesalers are able to make money. There are about 10–15 specialised importers in Europe. Therefore, exporters are advised to differentiate their offer and create aggressive marketing campaigns to tackle the existent but limited opportunities in this market

Tropical foliage (palms, Eracaena, Philodendron, Aglaonema, Dieffenbachia, Bromeliads and ferns) are a fast growing segment of the world floriculture industry. The value of United States consumption of these products in 2005 was €465 million, with domestic production from Hawaii and Florida and main imports from Costa Rica, Dominican Republic and Guatemala. Bangladesh, India, Cameroon and the Ivory Coast are significant exporters of foliage to the European Union. The demand for new foliage varieties in the European Union has seen a brighter spot for tropical ornamental products.

The emergence of China on international floriculture markets

China is emerging as a major player in international floriculture markets – both as a consumer and producer. Flower consumption is reported to be increasing by more than 20 percent per year. Substantial growth in tropical flowers is occurring in tropical Hainan Province. However, industry watchers are paying the most attention to Yunnan province, where there are more than 30,000 growers and two auction houses have recently opened. Japanese buyers have seats at both these auctions. There is increasing Dutch and German investment in China's ornamental horticulture industry, and China is seen as the sleeping giant of international floriculture trade. However, there are a number of issues and constraints that are holding back the Chinese industry before they make a major mark on the world floriculture market. These include: (i) lack of intellectual property protection; (ii) inadequate horticultural training; (iii) low product quality; (iv) poor post-harvest knowledge and practices; and (v) high freight costs and airline preference for non-perishables. The expectations are that most of the weaknesses will be overcome in a relatively short period of time.

Oceania floriculture trade

Available floriculture trade data was analysed for Australia, New Zealand, Fiji, New Caledonia, French Polynesia, Papua New Guinea, Samoa, Vanuatu, Solomon Islands, and Tonga. Australia and New Zealand, not surprisingly, dominated both the export and import of floriculture products from the region. Ornamental horticulture exports from the region are more than four times ornamental horticulture imports. In 2005, exports from the region stood at US\$45 million and imports at US\$11 million. Thus the Oceania region had ornamental horticulture trade surplus of US\$34 million.

Appendix B

Exports: New Zealand is by far the largest exporter of floriculture products from the region, with the value of shipments over the period 2002–2005 being nearly US\$1 billion. Australia’s floriculture exports over the same period were approximately US\$70 million. However, to put these floriculture exports in perspective, they are substantially less than those of Kenya, Thailand, Costa Rica and Ecuador.

Amongst the PICs, only French Polynesia approached anywhere near significant exports of floriculture products, with the value of exports over the period 2002 to 2006 totalling around US\$330,000. Most of these exports are to France. Over the same period, Fiji and the Cook Islands each exported around US\$60,000 of floriculture products. Fiji sporadically exports small quantities of Anthuriums and Heliconias to New Zealand, along with the occasional shipment of foliage. The Cook Islands exports are made up of maile leaf exports to Hawaii for use in traditional leis.

Imports: Australia is by far the region’s largest importer of floriculture products, with imports over the period 2002–2006 totalling US\$26.4 million. New Zealand’s imports over the same period were US\$4.7 million. The French territories of New Caledonia and French Polynesia also had significant imports of floriculture products – US\$2.5 and US\$1.5 million respectively over the period 2002 and 2006. United Nations Statistics Division Comtrade Data base showed that Fiji, Cook Islands, Papua New Guinea and Samoa all import floriculture products. While these volumes are small, they are significantly more than the value of floriculture products they export. As such, while the Oceania region collectively has a substantial trade surplus in floriculture products, the PICs have a significant net trade deficit in floriculture products. This trade deficit is surprising given the ability of the PICs to produce floriculture products that are in demand in Pacific Rim markets. The floriculture trade deficit for the Pacific islands contrasts markedly to that observed for the comparable regions of East Africa, Central America and the Caribbean.

B.2 Floriculture in Fiji

Overview

Floriculture in Fiji is a small industry but with a relatively large number of participants. It is estimated that more than one thousand people are directly involved in the industry. Most of the participants are located on the main island of Viti Levu and concentrated around the main urban centres of Suva in the east and Nadi in the west. The vast majority of these participants are women. The survey found:

- Approximately 200 semi-commercial cut flower growers and a few small commercial growers. It is estimated that these growers employ around 50 people;
- One cut flower wholesaler, supplying florists and hotel buyers with orchids, Anthuriums and some Heliconias. This wholesaler employs six full-time workers;
- 26 florists that are registered as businesses – of these, about half operate out of a shop, with the balance operating out of private residences. On average, it was estimated that florists employ 1.5 persons each;
- 40–50 informal flower arranging businesses that operate out of their homes;
- Several hundred women sell floricultural products in the main municipal markets;
- Three exporters who sporadically ship small volumes of floriculture products;
- 12 retail nurseries that sell a range of potted plants and garden supplies; and
- Several hundred small growers of a wide range of potted plants and trees for sale.

Appendix B

South Sea Orchids

The driving force behind the development of Fiji's commercial floriculture industry has been South Sea Orchids (SSO). Don and Aileen Burness, the owners of SSO, established and managed the "Land of the Sleeping Giant" orchid farm near Lautoka for the actor Raymond Burr in 1960. The farm was for collector and display orchids. Revenue was generated from tourist visits that continue to this day. This provides the first example of linking floriculture development to tourism in Fiji.

In the mid-1970s, the Burnesses purchased Raymond Burr's property at Saweni Beach and created SSO. Shade houses for commercial cut flower *Dendrobium* orchids were established for the first time in Fiji. *Dendrobium* planting material was sourced from the University of Hawaii, together with technical advice. The University continues to provide ongoing advice to the Fiji floriculture industry, as well as to Samoa and Solomon Islands.

In early 1995, SSO undertook a feasibility study for extending its *Dendrobium* operation to small outgrowers in the surrounding area. The study, jointly funded by the United Nations Development Programme and the Fiji-New Zealand Business Council, concluded that it was feasible to establish an outgrower program for *Dendrobium* orchids. The study also recommended that *Anthuriums* be added to the program to spread the overheads of services required to support outgrowers.

In 1997, a permit was issued to SSO to import *Anthurium* planting material from Dutch based supplier, Anthura Inc. Dutch nurseries, unlike those in Hawaii and Australia, could supply plantlets certified free of *Anthurium* leaf blight. In the early 1990s, this disease had devastated the Hawaii industry. Despite this status, it took nearly two years for SSO to negotiate with the Fiji Quarantine Service a protocol under which these plants could be imported. In 1998, 30 village growers who joined the SSO program were financially assisted into the industry through grants under the Ministry of Agriculture's Commodity Development Framework Scheme. These funds were used for the purchase of materials to construct small shade houses and purchase orchid and *Anthurium* planting material. Commodity Development Framework funds were also allocated to SSO to operate a small extension service to support the outgrowers for a period of two years. SSO assisted other non-village growers to prepare business plans that enabled them to secure small business loans from the Fiji Development Bank to establish their floriculture operations. In addition, SSO secured a Fiji Development Bank loan to relocate and expand their operations to Nasau, near Nadi.

The SSO Outgrower Feasibility Study identified that a major constraint to small business involvement in the industry was the absence of a wholesale market for flowers, where the small growers could sell their cut flowers and the small florists could readily source their supplies. It was pointed out that both groups were spending a lot of time and energy trying to find each other and there was no market growth. To overcome this marketing constraint, two wholesale cut flower markets (*Anthuriums* and *Dendrobium* orchids) were established in Nadi (1999) and Suva (2001). Under their contractual arrangements, all of the SSO outgrowers are required to sell through these wholesale markets.

SSO, together with their contracted outgrowers and marketing outlets, now constitute the core of the Fiji ornamentals horticulture industry. This group is made up of 82 growers, who have a combined total of 20,000 m² under shade (average 385 m² per grower). This group commands an estimated 180,000 flowering plants.

As well as this, more than 100 *Heliconia* and ginger growers operate independently of SSO. Of these growers, only Roi Ltd. at Navua is of commercial scale, with 6–8 ha of gingers and *Heliconias* under

Appendix B

cultivation. However, Fiji has not developed a flower export business, and almost all production continues to supply the domestic market.

The Anthurium sector

Anthuriums are renowned for their wide range of colours and types and their exceptionally long vase life. The common pink “local” variety of Anthurium has long been grown in Fiji and is a regular feature in wreaths and flower arrangements.

Improved variety Anthuriums have been especially bred for colour, size, productivity and vase life. The first improved variety Anthurium plants were imported from Australia and planted at Colo-i-Suva near Suva some 25 years ago. The plants thrived in the warm, wet conditions of the area. More recently, Anthurium plants were imported from Florida by the Golden Cowrie Complex at Navua, approximately 30 kilometres from Suva. At its peak, the Golden Cowrie Complex had an estimated 20,000 plants under shade.

The most recent importation of Anthuriums has been by SSO from Holland, the world leader in the production of Anthurium planting material. The Dutch plants were distributed to 33 small growers located mainly around Suva. SSO now has 43 outgrowers of improved variety Anthuriums, ranging in size from 200 to 1,500 pots. These growers command a total of around 60,000 flowering plants. These are mainly located around Suva. In addition, SSO currently has more than 35,000 improved variety Anthurium plants at their Nadi operation.

Anthurium sales through the SSO wholesale market have increased steadily from around 20,000 stems in 2001 to more than 60,000 stems in 2006. Over that period, the wholesale value of these sales increased from FJD10,000 to FJD46,000. It is notable that Anthurium sales in 2006 did not drop, whereas Dendrobium orchids did. This reflects the greater marketing discipline and loyalty among the larger Anthurium outgrowers.

Financial analysis by McGregor *et al.* shows that a “micro-scale” Anthurium enterprise with 200 plants could generate a net cash flow of around FJD1,200 per annum in 2006, equal to around A\$1,620 in today’s values.¹²

Industry organisation

A feature of the Fiji floriculture industry is the numerous support groups and associations. These include:

- SSO Floriculture Project
- Suva Orchid and Horticulture Circle
- Note Horticulture Women’s Group
- Davuilevu Floriculture Group
- Tebara Greenfingers Group
- Fiji Cut Flowers and Growers Association
- Suva Cut Flowers Association
- Nakasi Cut Flowers Association
- Passionate Blooms
- Tailevu Evergreen.

The SSO Floriculture Project with its 70 outgrowers has been instrumental in developing the industry into what it is today. SSO provides the market outlet, technical support and sometimes financing to its outgrowers and also imports planting material on their behalf. With the large supply of flowers provided by its growers, SSO now has the capability to confidently market to local florists and resorts. When the opportunity arises, SSO is also poised to enter the export market.

¹² Conversion based on 35% inflation adjustment for the period 2006–2012.

Appendix B

The Suva Orchid and Horticulture Circle (SOHC) is a servicing group that has been in existence since 1953. There are currently 300 active members. SOHC offers a range of classes in floral art and holds meetings once a month with guest speakers. The SOHC holds local annual flower shows and also sends members to the Auckland flower show to compete.

In the late 1990s, the Fiji government embarked on a policy to establish industry councils as a mechanism to promote private sector development of the agricultural sector. During this period, Industry Councils were established for ginger, root crops, kava, dairying and floriculture. However, none of these Councils proved to be sustainable beyond the initial establishment grants provided by government.

The Fiji Floriculture Council (FFC) was established in early 1999. The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) provided technical assistance to the newly formed Floriculture Council in the preparation of a Strategic Plan for the Council. This Strategic Plan was endorsed by a General Meeting of the FFC in May 2000 (ESCAP, 2000). The Vision, Mission and Underlying Philosophy of the Council were articulated as follows:

- Industry Vision: A competitive world-class floriculture industry that contributes substantially to the prosperity of the people of Fiji.
- Council Mission: To provide sound industry leadership in the areas of policy formulation, dealing with government and other agencies, education and information, setting standards, and promotion.
- Underlying Philosophy: The individual stakeholders (flower growers, nurseries, wholesalers, florists, and exporters) are the driving force of the industry – the role of the Council being only to facilitate the prosperity of these stakeholders for the common good of the Fiji floriculture industry.

The FFC had ten specific goals:

- Creating a “flower culture” within the tourism sector
- Fiji becoming a major exporter of floriculture products
- Increasing income-earning opportunities from floriculture
- Enhancing skill levels and professional standards in the industry
- Increasing the flow of information to the industry
- Improving the quality of floriculture products sold on domestic and export markets
- Improving quarantine arrangements for imports and exports
- Advising and coordinating new starters in the industry to minimise failures
- Achieving independence and increasing financial self-reliance of the FFC
- Securing technical and other assistance for the industry.

The adoption of the FFC Strategic Plan coincided with the 2000 political crisis, which stifled the formation of the FFC. The initial seed money promised by government to finance the establishment of FFC was not forthcoming. The intention was to obtain European Union support to fund the position of Chief Executive Officer of the FFC for an initial period of three years. Such a request failed to materialise. The foundation Board of the FFC was predominantly people with commercial involvement in the floriculture or associated industries. Their orientation was in keeping with the industry goals that constituted the Strategic Plan. In 2002, a new FFC Board was elected, dominated by people with a hobbyist orientation to floriculture. This Board was unable to move forward the ambitious floriculture agenda that was the Strategic Plan. The FFC, as with the other Industry Councils, has become moribund with meetings no longer held. However, the FFC does provide an institutional framework that could be used to move the industry forward toward achieving the vision of having “a competitive

Appendix B

world-class floriculture industry that contributes substantially to the prosperity of the people of Fiji". There remains scope for the revitalisation of the FFC along the lines envisaged in the 2000 Strategic Plan. The vision, mission and philosophy, together with the ten strategic goals listed above, provide a framework for analysing the opportunities, constraints and requirements for the development of Fiji's floriculture industry.

The Hawaii model of tourism-based floriculture

The Hawaii floriculture industry provides a model of the potential for a Fiji floriculture industry built around supplying the tourism sector. The wholesale value of floriculture and nursery products produced in Hawaii exceeds US\$1.0 billion. This compares to around US\$1.0 million estimated as the value added of the Fiji floriculture industry. Hawaii has a resident population of around 1.3 million, compared with some 900,000 for Fiji. However, Hawaii has nearly 8 million visitors arrivals annually, compared with 545,000 for Fiji (2006).

Hawaii, like Fiji, is an island economy whose main industry is tourism. Hawaii has certain advantages in comparison to Fiji, particularly being an integral part of the United States economy, having better transportation links and enjoying a much higher level of agribusiness investment. Political stability has afforded greater surety to tourism growth in Hawaii and thus its links with the floriculture industry are stronger than is the case in Fiji. However, Hawaii has some relative disadvantages in terms of high labour costs and land prices.

Hawaii provides a guide to the demand for flowers that can be generated from a flower-oriented tourism industry. Around 4.8 million dendrobium sprays and 17.3 million Dendrobium blossoms are sold in the State of Hawaii annually. This represents an average of around 10 orchid blossoms per visitor (assuming 90% of local sales are to the tourist sector). On this basis, Fiji, with 545,000 tourist arrivals in 2006, has a potential market of 5.45 million Dendrobium orchid blossoms (or 420,000 spray equivalents) annually. This compares with Fiji's current Dendrobium orchid sales of around 100,000 sprays. A similar comparison can be made for Anthuriums. There is a potential market of 472,000 Anthurium stems at the 2006 level of tourist arrivals, based on Hawaii's Anthurium consumption per tourist arrival. This compares with Fiji's actual Anthurium consumption of around 65,000 stems.

In recent years, there has been a decrease in Hawaii's cut flower consumption and a substantial increase in imports of cut flowers from Thailand and Singapore. The structural change for the local industry has been to move from cut flower to pot plant rentals, especially orchids and Anthuriums supplied to the hotels. In 2005, pot plant rental increased by nearly 50%. Pot plant rentals to the hotel sector remain a virtually untapped market opportunity for the Fiji floriculture industry.

Hawaii has shown the potential of the carry-on trade with departing tourists. Substantial volumes of macadamia nuts, papaya, and flowers are sold to departing tourists, particularly from Japan. In 2001, the value of "Hawaii Food Products" (including cut flowers) sold to departing tourists was \$102 million. Cut flowers are permitted into most of the source countries for Fiji's tourists, although for Australia and New Zealand these have to be fumigated, which reduces vase life and is an inconvenience for travellers. Dendrobium orchids and Anthuriums are an ideal carry-on purchase. They are lightweight, have a beauty associated with a sophisticated lifestyle and have a long vase life.

The key to Fiji developing a significant tourism-based floriculture industry is for a "culture" to develop in the tourism sector that places priority on the use of high value flowers. Hawaii's tourism image and flowers are intertwined at all levels. In Fiji, there is a general lack of appreciation for the value of

Appendix B

flowers in the enhancement of the Fiji tourism product in most hotels and resorts. In part, this might be excused by the inadequate supply of flowers. The present lack of a “flower culture” is perhaps no better reflected than in the greeting of tour groups with shell necklaces imported from the Philippines, rather than with flower leis, which is commonly the case in Hawaii. The FFC Strategic Plan makes recommendations for the encouragement of the development of a flower “culture”.

In order to assess the tourism industry in terms of current consumption of ornamental horticultural products, and future demand for these products, a survey was undertaken. The survey involved a sample of 35 hotels on Viti Levu and Vanua Levu. Only 17 of the surveyed hotels purchased floriculture products on a regular basis. Seven others indicated that they only purchase on demand or as requested. Eight of the surveyed hotels indicated that they never purchase floriculture products. The Fiji tourism sector clearly has a long way to go before it approaches the situation found in the Hawaii industry.

The majority of the hotels listed their own nursery or landscape as the primary source of their cut flowers, foliage, potted and landscape plants. Although the larger four and five star resorts recorded the highest usage, these hotels relied primarily on products produced internally. Only eight of the seventeen hotels that regularly purchase floriculture products spend more than \$50 per week on these products.

On the question of in-house florist services, a remarkable 100 percent of the hotels surveyed responded that they had an in-house florist, or staff that provided this service. Housekeeping and restaurant staff are identified as serving the function of in-house florist.

The strict purchasing requirements of hotels was shown in that over half of the surveyed hotels required credit of between 30–90 days and 80% of the hotels required delivery to their premises. Of the 17 hotels that regularly purchase floriculture products, nine deal exclusively with one florist and/or wholesaler, and a further six hotels purchase from private individuals, either solely or combined with the florist/wholesaler.

Based on the Hawaii experience, the tourism market for floriculture products in Fiji remains significantly under-realised and provides the basis for a major industry. The key for Fiji developing a significant tourism-based floriculture industry is for a “culture” to develop in the tourism sector that places priority on the use of high value flowers.

Recommendations for development of the Fiji floriculture sector

McGregor *et al.* proposed ten recommendations for enhanced development of the floriculture sector in Fiji.

Recommendation 1: Revitalisation of the Fiji Floriculture Council. A key recommendation of the FFC Strategic Plan was that a professional secretariat be established to implement policies and work Council programs, as well as manage day-to-day operations. It is unrealistic, and probably undesirable, for Board members to be directly involved in implementing activities and in day-to-day operations. It was noted that the success of the Council would depend on the appointment of a full time Executive Director. It was recommended that it would not be possible for the industry to fund an Executive Director of the calibre required and that external funding would be required. It is recommended that the Executive Director position be fully funded for a two-year period, with the option of a one-year extension. This was the approach followed by USAID in providing support for the establishment of the Fiji Ginger Council. AusAID recently funded a similar position for the Fiji

Appendix B

horticulture export industry with the establishment of an industry extension service by Nature's Way Cooperative (Fiji). The European Union expressed interest in funding this position, with the view of having a Dutch national appointed. A funding proposal was prepared. Unfortunately, this proposal was "lost" in the political turmoil of 2000 and never submitted by the responsible Ministry. This proposal now needs to be reactivated and a suitable donor sought.

It was intended that the FFC was to represent all stakeholders in the industry – commercial flower growers, nurseries, wholesalers, florists, and exporters. In 2002, a Council Board was elected that was dominated by floriculture hobbyists and was ineffective in achieving its commercial objectives. In time, this Board became inactive. The Council now needs to be reactivated with a Board that ensures representation of all segments of the industry, with adequate representation of commercial actors.

Recommendation 2: Creating a "Flower Culture" Within the Tourism Sector. The Strategic Plan recommended that activities be directed at creating awareness of what the flower industry has to offer in terms of enhancing the quality of Fiji's tourism product. Some suggested activities included (with the entities involved in parenthesis):

- Promoting and organising floriculture industry capability awareness events in conjunction with tourism organisations, e.g. displays and presentations at the annual Fiji Tourism Convention. (FFC, Fiji Hotel Association; Fiji Visitors Bureau.)
- Coordinating Fiji flowers promotion in Air Pacific in-flight material (videos and magazines). (FFC, Air Pacific, Fiji Visitors Bureau.)
- Advertising flowers on the Fiji Visitors Bureau website and speciality tourism websites such as those promoting Fiji as a destination for weddings.

None of these recommendations have been acted upon and they remain equally valid today. These measures are probably now of greater priority given that the development of the ornamental horticulture industry in Fiji is heavily dependent on expanding linkages with tourism.

Recommendation 3: Fiji Becoming a Consistent Niche Exporter of Floriculture Products. It was never envisaged that the FFC would have any direct involvement in the export of floriculture products. The Strategic Plan outlines a facilitating role for the Council with respect to developing exports. Some of the activities proposed included:

- Negotiating competitive air freight rates on behalf of the industry. (FFC, Air Pacific.)
- Providing up-to-date information on the quarantine requirements of importing countries. (FFC, Fiji Quarantine and Inspection Service.)
- Establishing a database and website of the Fiji industry's exporting capability. (FFC, ITC providers.)

Such activities are just as appropriate for niche export development as they are for the larger scale exports that were originally envisaged by the Strategic Plan. Providing up-to-date information on the quarantine requirements of importing countries is seen as a particularly important requirement.

Recommendation 4: Increasing Income-Earning Opportunities from Floriculture. The FFC's role in improving income opportunities was seen by the Strategic Plan as providing realistic information on income-earning opportunities from various aspects of floriculture and the requirements for success.

Good progress in this area has been made with the publication by SSO of the manual "Floriculture in Fiji as a Small and Micro Business".

Applied research could also make a significant contribution to achieving this goal. This study identified "red ginger decline" as a problem warranting priority research attention. The Australian Centre for

Appendix B

International Agricultural Research (ACIAR) is seen as well placed to contribute to resolving a problem that adversely affects numerous small growers in the Suva, Nausori, and Navua areas.

Recommendation 5: Enhancing Skill Levels and Professional Standards. The SSO outgrower project has shown that smallholders can successfully grow demanding cut flowers if the right training, supervision and direction are provided. However, current skill levels, across the industry, are inadequate. To provide the required training and supervision for an expanded industry, additional professionals are required. As a first step, ornamental horticulture needs to be included as a part of the Fiji College of Agriculture curriculum. Landscaping and nursery trades, together with a floral art certificate course, need to be included in the Training and Productivity Authority of Fiji (TPAF) curriculum. The industry also needs at least two or three people to be trained in floriculture from an appropriate overseas institution, such as the University of Hawaii College of Tropical Agriculture.

The Strategic Plan identifies a number of specific activities in which the FFC would be involved to enhance the skills and professional standards of the industry. These recommendations, which still need to be actioned, include:

- Working with the University of the South Pacific (USP), Fiji College of Agriculture and TPAF in the design of the floriculture / ornamental horticulture curriculum, and initially assisting with the implementation of the teaching program;
- Facilitating donor and technical support for the development of training materials for the industry;
- Coordination of workshops and short-term industry training programs for the industry (the Council would also be involved in finding funding for such short-term training programs); and
- Identifying appropriate overseas training (and supporting funding) for the industry.

Recommendation 6: Increasing the Flow of Information to the Industry. A basic requirement is the establishment of a database of all participants in the industry. The maintenance of this database should be an ongoing activity for the Council. With a database established, a regular industry newsletter could be prepared and distributed by the Council. The newsletter would contain regular features on issues such as production, marketing, quarantine and the Convention on International Trade in Endangered Species (CITES). This newsletter could well become the banner of the Council and become an important source of revenue.

Radio is widely distributed throughout Fiji and for many people it remains the most important source of information. Thus it offers a powerful extension tool for the Council. It would be an appropriate activity for the Council to develop a regular “Fiji Flowers” radio feature.

It was recommended that the Council establish a “Fiji Flowers” website to disseminate information about the Fiji floriculture industry to buyers and other interested parties. Over time it was anticipated that the website would be increasingly used to disseminate information to members of the Fiji industry.

Recommendation 7: Improving the Quality of Ornamental Horticulture Products. International markets are likely to be only interested in the products of small producers like Fiji when they have something special to offer – be it a seasonal window, premium quality or a unique product. This will certainly be the case for Fiji’s floriculture products. The floriculture industry must be at the top end of the quality scale if it is going to compete – there is no place for grade 2 flowers in international markets. The high cost of packing, shipping, and handling are the same regardless of the quality of the product shipped. Furthermore, the premiums paid for quality are usually large. Thus, the net gains to growers attributed to quality can be huge and likely represent the difference between profitability and non-viability.

Appendix B

Quality is just as important for flowers sold on domestic markets – particularly if the focus is on tourism. Furthermore, the domestic market provides the foundation upon which possible export markets are developed. If good quality flowers are produced for the domestic market, then it will be relatively easy to extend sales to meet export standards. However, it will be extremely difficult to produce good quality flowers just for export markets.

Facilitating improvement in quality should be one of the most important goals of the Council. It will also likely be one of the most challenging. The Council could be empowered by law to enforce industry quality standards. However, this would first require the enactment of legislation. This would be a drawn out process extending over several years and is not realistic in Fiji's present political circumstances. Furthermore, even with legislative backing, it is unlikely that these quality standards could be enforced. The Fiji Ginger Council, as an example of a council with legislative backing, has made no use of its powers to enforce quality standards. This is despite the fact that it had long been recognised that one exporter of poor quality ginger adversely affects the prices of all Fiji exporters. The essential problem is that it is difficult to dictate market-determined quality standards to large numbers of relatively small businesses. The determination of quality and grading standards is a matter between the sellers and buyers at the various stages in the marketing chain. Encouragement to improve quality is a more realistic, and probably more effective, approach than the negative enforcement of quality standards. This would focus on two main areas:

- Obtaining, presenting and disseminating information on the quality requirements of various markets; and
- Providing quality certification that will enhance marketability of those who achieve the standard.

Activities in the first area would include the preparation of quality standard manuals, posters etc., of the type developed by SSO in collaboration with the Technical Centre for Agricultural and Rural Cooperation (CTA). These materials would be used for training and for the everyday use of growers, wholesalers, florists, and exporters. A standards manual would also be an essential ingredient in any quality certification program undertaken by the Council.

Quality certification is more demanding and would take time and significant resources to implement. It is envisaged that FFC would establish a "Fiji Flowers" quality assurance and certification scheme. Businesses selling Fiji flowers, which are able to meet the code of practices and quality standards established by the Council, would receive the "Fiji Flowers" seal of approval. This certification and its accompanying logo could then be used in the marketing efforts of the business. There would be no compulsion to meet the quality standards required to obtain the Council's seal of approval. The incentive to obtain the certification is the marketing advantage and increased revenue it offers. The certification scheme is seen as an important source of revenue to fund the activities of the Council. The development of a certification program will require technical assistance in which ACIAR / the Secretariat of the Pacific Community (SPC) could have an important role to play.

Recommendation 8: Improving Quarantine Arrangements for Imports and Exports. Quarantine issues have been identified as a major constraint to the development of ornamental horticulture in Fiji. Quarantine significantly impinges on production and export marketing.

A relatively favourable pest and disease status has been listed as one of Fiji's competitive advantages. However, this could change rapidly with the introduction and spread of a major pest and/or disease. The rapid spread of Anthurium bacterial blight (*Xanthomonas campestris*) in Hawaii a decade ago was presented as an example. The continued unexplained proliferation of new flowers

Appendix B

and ornamentals in Fiji suggests that the smuggling of plants remains an ongoing problem. This is despite severe penalties (including jail terms) being in place.

Quarantine procedures for issuing import permits were seen as unnecessarily rigid, inconsistent and often unreasonable. This in part explains why there is apparently a high incidence of plant smuggling, which puts ornamental horticulture and other agriculture industries at considerable risk. An effective FFC, as the representative of the industry, could play a key role in alerting the industry to the dangers of smuggling and to exert moral suasion to desist from this activity.

Major inconsistencies were also identified in quarantine requirements and procedures for the commercial importation of floriculture planting material. As the recognised representative of the industry, the FFC would be expected to play a key role in resolving these inconsistencies that hold back the development of the industry.

Fiji Quarantine has been agonisingly slow in negotiating quarantine “pathways” for fresh produce exports and having them approved by importing countries. The FFC, as the representative of the industry, could play a key role in facilitating the process. This might include finding external funding for pest and disease surveys.

A comprehensive review of Fiji’s quarantine regulations and procedures as they relate to floriculture is required. Technical assistance would be needed for such a review and here SPC and ACIAR may have a role to play. An effective Council is required to articulate the concerns and requirements of the industry during the process of the review, and to promote and assist with the implementation of the findings.

Recommendation 9: Improving Stakeholder Understanding of CITES. CITES is vitally important to preserving the biodiversity of Fiji’s ecosystems. The good intentions of CITES can, however, be lost when stakeholders are ill-informed regarding its provisions and what they are intended to achieve. An example discussed is the annual and transaction fees for hybrid orchids sourced from the University of Hawaii. In Fiji, there seems to be a very poor understanding of CITES at all levels. Growers and exporters often only see it is an unreasonable hindrance and expense to doing business with no obvious benefits in terms of the preservation of endangered species. The CITES authorities, on the other hand, often do not have the technical expertise to properly assess proposed transactions and determine whether or not they should be subject to the convention. Furthermore, neither party realises the potential for using the CITES convention to their benefit; to protect the biodiversity of the islands while using the resources for income-generation purposes.

FFC is seen as a likely organisation to represent the interests of its members in CITES-related issues and to provide information to the industry on the requirements of CITES and on the potential opportunities it creates. A member of FFC with proven expertise should also serve in this capacity to advise the CITES authorities in Fiji on cases specific to the ornamental horticulture industry.

An FFC-sponsored CITES seminar would be an appropriate starting point for improving understanding of CITES as it relates to the ornamental horticulture industry. Such a seminar presented by an international CITES representative, the CITES authorities in Fiji, an ecologist, and other related stakeholders would be very valuable in improving stakeholder understanding of CITES. USP is seen as a likely potential partner in coordinating such a seminar, considering its involvement with the Regional Herbarium.

Recommendation 10: Advising and Coordinating New Starters in the Industry. The growing smallholder-based floriculture industry has attracted a lot of interest, which has been fuelled by a

Appendix B

considerable amount of media attention. Not a month passes without a feature on a flower grower or seller appearing in a newspaper or magazine. Floriculture has been rightly perceived as an excellent way for households to generate income and employment. However, it is a demanding industry, where success requires considerable effort, skill and linkages to the market. Ill-informed new entrants without these essential ingredients face a high risk of failure. SSO's recently published floriculture business manual is a response to this problem and provides an excellent resource for existing and potential industry participants. However, much more is required in providing realistic information about industry opportunities and the requirements for success. The Council also has a "marriage broker" role to play in bringing together potential growers and marketers. The Council could also provide a service in small business training in floriculture and in the preparation of business plans for floriculture enterprises. It is anticipated that this work would be undertaken in collaboration with the National Centre for Small and Medium Enterprise Development.

B.3 Solomon Islands Experience

Status of the industry

The status of the floriculture sector in Solomon Islands is similar to that of Vanuatu, although there are no commercial growers similar to Rainbow Gardens. In late 2011, the Pacific Horticultural and Agricultural Market Access Program (PHAMA) undertook an assessment of the potential for exporting cut flowers and ornamental foliage to Australia.¹³ It found that there were more than 50 flower growers selling flowers in the Honiara Central Market on a regular basis and around 500 households involved in flower growing for commercial purposes. Honiara has about 30 part-time florists but only one full-time operator. There is some inter-island trade in indigenous orchids but no exports. Floriculture in Solomon Islands is ideal for small-scale production because it requires little capital, land availability or tenure is not an issue, most Solomon Islanders have some knowledge of floriculture, and there is a widespread appreciation of flowers throughout the country. However, all production is household-based; there is no systematic selection of planting material, little understanding of market needs, and limited control of pests and diseases; and harvesting is done on a same-day sale basis, so vase life is not an important consideration. In addition, the business skills of most growers are rather limited.

The PHAMA study identified a number of constraints to the establishment of cut flower and foliage exports from Solomon Islands, including limited air freight capacity, the non-existence of cool storage to ensure preservation between harvesting and export, CITES conditions surrounding the export of indigenous orchids, limited availability of packing materials (especially cardboard cartons), and quarantine barriers for Heliconia and ginger species. The study undertook a preliminary assessment of the feasibility of establishing an export trade based on four products: Vanda orchids, spider orchids, crotons and Cordyline foliage. Heliconia and gingers are keenly sought by importers but were excluded from the feasibility study because of the quarantine issue. The study recommended that there be a trial export shipment of Vandas, spiders and crotons to Australia in early 2012. Brisbane was identified as the preferred market, since it is the smallest of the three main east coast markets and has direct air links to Solomon Islands.

¹³ PHAMA January 2012, Technical Report 16: Potential for Cutflower and Foliage Exports from Solomon Islands to Australia.

Appendix B

Trial export shipments

The report¹⁴ on the trial shipment indicates that the trial was not particularly successful. PHAMA organised three shipments in early 2012 by providing support in post-harvest handling and marketing activities (field heat reduction, cool storage, development and provision of packaging, development of packing and handling techniques, transport and marketing), with emphasis on developing the capacity of producers and exporters to sustain a commercial operation if the trial proved successful. Support to growers for necessary improvements in production activities was provided under a separate ACIAR-funded project (HORT/2011/065) that was designed to complement the PHAMA activity.

Analysis of the trial results shows that a significant net loss was incurred for all three product groups. In the first of the three shipments, the Vanda orchids suffered refrigeration damage during storage in Brisbane, although there was only minor damage to the spiders and no impact on the crotons. However, the wholesaler, Realtime Flowers (www.rtfb.com.au), did not offer either of the flowers for sale due to concerns about their quality. The second shipment was stored at the wholesaler's premises under good conditions, but the Vandas were found to be discoloured due to moisture accumulation inside the packing sleeves and were not offered for sale.

The trial shipments all incurred financial losses, with the smallest losses incurred on the Vandas and the largest on the crotons. Moreover, the analysis shows that even with a number of cost-cutting measures, small shipments of this type would struggle to break-even. The trials highlighted a number of important lessons about the technical difficulties of exporting flowers and foliage from Pacific island countries to Australia or New Zealand:

- Use of the DHL courier service provides for door-to door service but is very expensive, costing around A\$20 per kg (VUV1,900 per kg). This compares with VUV110 per kg offered by Air Vanuatu for airfreight from Port Vila to Sydney and about VUV 90per kg from Nadi to Sydney. Much cheaper freight forwarding options are available.
- The first shipment of spiders was picked too close to full maturity. The second and third shipments were picked with an increased number of buds, i.e. further away from full maturity.
- In the first shipment, only 15 orchid bunches were packed per carton – based on the assumed fragility of the flower. The wholesaler's advice was to increase the number of bunches because: (i) it will not damage the flowers; (ii) it will reduce movement within the carton and thus the potential for damage; and (iii) it will lower the per unit transport cost. For the second and third shipments, bunch numbers were increased to 25 per carton, and could possibly go higher.
- The cellophane sleeves that caused condensation and damage to the Vandas in the first shipment were replaced by perforated sleeves in the subsequent shipments.
- It was found that rainwater is a satisfactory moisture medium compared with more expensive alternatives.
- Monday is the peak sales day for the corporate sector of the market, so the flowers have to be stored over the weekend. This means that flowers are required to have a shelf life of at least nine days.
- A more proactive marketing approach is needed as Solomon Islands cannot depend on the wholesaler doing its marketing promotion.
- Care needs to be exercised in the timing of deliveries to wholesalers. Flower wholesalers begin trading around 3.00 am and close around midday, so early morning deliveries are mandatory.

¹⁴ PHAMA June 2012, Technical Report 23: Evaluation of Trial Shipments of Cutflovers and Foliage from Solomon Islands to Australia.

Appendix B

The main conclusion that can be drawn from the Solomon Islands export trial is that PICs cannot expect to be competitive with low-cost high-volume suppliers from Asia for items selling in the vicinity of A\$1.00 per stem (net price after commission), especially for small shipments, which incur heavy overhead costs. The **lesson for Vanuatu is the clear need to target high value products** such as Anthurium that have the potential to sell for around double this amount, and to aggregate produce from a number of growers in order to increase volumes and keep unit costs low.

Appendix C

Appendix C Value Chain Analysis for Export of Cut Flowers and Ornamental Foliage to Australia

Value Chain Analysis: Anthurium Exports

Table C-1: Investment costs for Anthurium production units, micro and small scale

Table C-2: Cash flow, Anthurium micro-enterprise, 200 plants / 12.5 m²

Table C-3: Cash flow, Anthurium small enterprise: 2,000 plants / 125 m²

Table C-4: Production costs and revenues: Anthuriums

Table C-5: Collection and transport costs: Anthuriums

Table C-6: Cost of grading and packing: Anthuriums

Table C-7: Cost of transport, inspection, quarantine and clearance: Anthuriums

Table C-8: Sales revenue through Sydney Flower Market: Anthuriums

Table C-9: Value chain analysis: Anthuriums

Table C-10: Summary of value chain analysis: Anthuriums

Value Chain Analysis: Cordyline Foliage Exports

Table C-11: Investment costs for Cordyline production units, micro and small scale

Table C-12: Cash flow, Cordyline micro-enterprise, 110 plants / 12.5 m²

Table C-13: Cash flow, Cordyline small enterprise: 1,120 plants / 125 m²

Table C-14: Production costs and revenues: Cordyline foliage

Table C-15: Collection and transport costs: Cordyline foliage

Table C-16: Cost of grading and packing: Cordyline foliage

Table C-17: Cost of transport, inspection, quarantine and clearance: Cordyline foliage

Table C-18: Sales revenue through Sydney Flower Market: Cordyline foliage

Table C-19: Value chain analysis: Cordyline foliage

Table C-20: Summary of value chain analysis: Cordyline foliage

Appendix C

C.1 Anthurium Value Chain Analysis

The Anthurium value chain analysis shown in Table C-1 to Table C-10 is based on the nucleus estate / outgrower model with about 100 outgrowers, each with a 2,000 plant / 125 m² production unit. The analysis applies only to the Anthuriums produced by outgrowers and excludes those produced by the nucleus grower.

Table C-1: Investment costs for Anthurium production units, micro and small scale

Table C-1 shows the estimated investment costs for micro and small-scale Anthurium production units. These models are based on those presented by South Sea Orchids (SSO) in the publications “Floriculture in Fiji as a Small and Micro Business” and “Small-holder Flower Production in Fiji: a Pictorial Handbook.”

The micro-scale unit is a shadehouse of 12.5 m² containing about 200 Anthurium plants (16 per m²). The small-scale unit is 125 m² and contains about 2,000 plants. Both would be regarded as backyard units operated on a part-time basis with some hired labour used by the larger units. They would be planted with modern patented Anthurium varieties costing about Euro 2.00 each imported from the Netherlands. Total investment costs would be about VUV144,000 (A\$1,500) for the micro-scale unit and VUV1.03 million (A\$10,800) for the small scale unit.

Table C-2: Cash flow, Anthurium micro-enterprise, 200 plants / 12.5 m²

Table C-2 shows the cash flow expected to be generated by the micro-enterprise. The Anthuriums are expected to reach full production of about 100 stems per m² in the third year, selling for between VUV25 per stem for small blooms up to VUV50 per stem for large ones. The smaller and lower quality blooms would be offloaded in the domestic market and the larger / high quality ones kept for export. Sales would reach VUV57,500 per annum (A\$600) from year 3 onwards and the plants are expected to be productive for about eight years. It is envisaged that only family labour would be used for an hour or two every day. This could be regarded as a hobby-scale enterprise suitable for urban backyards.

Table C-3: Cash flow, Anthurium small enterprise: 2,000 plants / 125 m²

Table C-3 shows the cash flow expected to be generated by the small-scale enterprise. Productivity levels and prices would be the same as for the micro-enterprise. Sales would reach VUV575,000 per annum (A\$6,050) from year 3 onwards and the plants are expected to be productive for about eight years. It is envisaged that about 200 person-days of labour per annum would be required, composed of a mixture of family labour and part-time hired staff. This scale of operation would also be suitable for either rural areas or urban backyards, especially on the larger housing blocks in the outlying areas of Port Vila.

Table C-4: Production costs and revenues: Anthuriums

Table C-4 shows estimated production costs and revenues at full production, based on the small enterprise model shown in Table C-3. All labour used, whether from family members or hired, is valued at VUV1,200 (A\$12.60) per day. This would generate a gross margin of VUV286,100 per annum (A\$3,010). However, if all labour is provided by family members at zero cash cost, the gross cash surplus would be VUV575,000 (A\$6,050). This represents an attractive income-generating activity compared to the available alternatives.

Appendix C

Table C-5: Collection and transport costs: Anthuriums

A nucleus estate / outgrower operation would include a system of regular flower collection, in this case assumed to be twice a week, allowing for two air freight consignments per week. Collection would be undertaken in the cool early morning, with the flowers placed in stackable plastic crates and loaded onto a light (2-tonne) truck with a sun-protecting roof. On the basis of the loading and vehicle operating cost assumption shown in Table C-5, collection and transport costs from the grower to the packhouse would amount to only VUV1.06 per Anthurium stem collected.

Table C-6: Cost of grading and packing: Anthuriums

Table C-6 assumes that the Anthuriums would be graded, packed and stored in the facility owned by Vanuatu Direct, with rental (excluding electricity and water) paid to the owners at the rate of VUV36,000 per shift (A\$380). The packhouse would employ about 20 casual workers per shift plus a supervisor/foreman. The Anthuriums would be packed in cellophane sleeves in the standard Anthurium carton type (90 cm x 15 cm x 10 cm) at the rate of 24 stems per carton. It is assumed that 25% of the stems collected would be unsuitable for export and offloaded into the local market. Cartons would be sourced from Fiji.

Table C-7: Cost of transport, inspection, quarantine and clearance: Anthuriums

The packed Anthurium cartons would be forwarded to Sydney on Air Vanuatu twice per week. Air Vanuatu charges a standard rate of VUV110 per kg for all cargo, regardless of its bulk density. Packed cartons are estimated to weight 1.2 kg each, which means that air freight costs only VUV5.50 (A\$0.06) per stem. The major costs incurred in moving the Anthuriums to the importer/wholesaler are the the Australian Quarantine Inspection Service (AQIS) inspection and fumigation fees (A\$800 per shipment¹⁵) and the fees paid for customs clearance. In total, the transport, inspection, quarantine and clearance charges amount to around VUV29.72 per stem. This is significantly lower than the equivalent costs from other Pacific Island countries due to the concessional/subsidised air freight rates charged by Air Vanuatu, which are matched by other Airlines as well.

Table C-8: Sales revenue through Sydney Flower Market: Anthuriums

Table C-8 shows the calculation of net wholesale prices through the Sydney flower market. Anthuriums from Taiwan currently sell at wholesale for A\$2.50–3.00 per stem for flowers of the highest quality. Making allowance for slightly lower quality and the need to be price competitive against the Taiwanese product, the wholesale prices for Vanuatu products are assumed to be in the range of A\$2.00, 2.25 and 2.50 per stem for low, medium and high quality respectively. After making allowance for 15% losses and 15% agent's commission, this is equivalent to VUV137, 154 and 172 per stem.

Table C-9: Value chain analysis: Anthuriums

Table C-10: Summary of value chain analysis: Anthuriums

Table C-9 and Table C-10 show the costs, revenues and gross margins per stem shipped over the entire value chain. Total gross margin would be in the range of VUV70–105 per stem, to be shared between the outgrowers and the exporter. After paying the outgrowers VUV40–50 per stem collected (average VUV61 per stem shipped), this would generate a net margin to the exporter ranging between VUV9 per stem and VUV43 per stem. This is equivalent to a profit of between VUV86,400 (A\$910)

¹⁵ This is regarded as an average. Actual charges may be higher in the case of possible pest interventions and treatments, weekend and overtime charges etc. Importers advise that it is prudent to make due allowance for surcharges such as these.

Appendix C

and VUV410,730 (A\$4,320) per consignment of 9,450 stems. The mid-point between these two extremes is a profit of about VUV248,600 (A\$2,620) per consignment or about A\$262,000 per annum, based on 100 consignments per year.

Appendix C

Table C-1 Investment costs for Anthurium production units, micro and small scale

	Micro (200 plants)/12.5m ²		Small (2,000 plants)/125m ²	
	Quantity and Prices	Cost VUV	Quantity and Prices	Cost VUV
Shade House				
Pine posts	4 posts (5m x 155mm) @ V7,500/post	30,000	30 posts	225,000
No 8 wire	2kg @ V210/kg	420	15kg	3,150
Shade cloth (50% or 80% shade)	0.15 roll (385m x 1.5m) @ V53,000	7,950	1 roll	53,000
Gravel for potting and floor	0.25m ² @ V4,400/m ²	1,100	3.5m	15,400
Galvanized mesh sheets for benches (1.2m x 2.4m)	4 @ V2,000 each	8,000	30 sheets	60,000
Concrete blocks (15cm)	24 @ V85	2,040	180 blocks	15,300
Nails	1kg @ V300/kg	300	7.5kg	2,250
2.5cm chicken wire	1/3 of a roll @ V5,300/roll	1,770	2.5 rolls	13,250
Labour cost a/	skilled supervisor for 2 days @ V2,750/day	5,500	5 days	13,750
Total Shade House Cost		57,080		401,100
Other Costs				
Anthurium plants	220 @ V230 each (Euro 2.00/plug)	50,600	2,200	506,000
Plastic potting bags	200 @ V3.90 each (V3,900/1,000 bags)	780	2,000	7,800
Coconut husks for potting media	10 bags @ V270/bag	2,700	100 bags	27,000
1 year fertiliser requirement	3 x 500g packets of foliar NPK @ V600	1,800	23 packets	13,800
	1 x 500g packet of slow release @ V540	540	8 packets	4,320
1 year fungicide/pesticide requirement	1 x 500g packet of Lansan @ V1,000	1,000	5 packets	5,000
Bleach (fungicide and for cleaning gravel)	2 x 4.5L @ V270	540	15 containers	4,050
Clippers	1 x V1,750	1,750	2 clippers	3,500
Watering can	1 x 5L @ V1,350	1,350	2 cans	2,700
Pressure spray			1 x 5L	5,000
Hand tools (shovels etc)	Set of 3 items	12,000	Set of 5 items	20,000
Wheelbarrow	1 wheelbarrow	7,500	1 wheelbarrow	7,500
Hose	25 metres @ V180/m	4,500	100 metres	18,000
Protective clothing for spraying		1,750	2 x V1,750	3,500
Total Other Costs		86,810		628,170
Total Investment Costs		143,890		1,029,270

a/ Plus household labour supplied at no cost

Appendix C

Table C-2 Cash flow, Anthurium micro-enterprise, 200 plants / 12.5 m²

Revenue	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Small blooms	No	300	200						
Revenue @ V25/stem	V	7,500	5,000	0	0	0	0	0	0
Medium blooms	No		400	500	500	500	500	500	500
Revenue @ V40/stem	V		16,000	20,000	20,000	20,000	20,000	20,000	20,000
Large blooms	No		200	750	750	750	750	750	750
Revenue @ V50/stem	V		10,000	37,500	37,500	37,500	37,500	37,500	37,500
Total Revenue	V	7,500	31,000	57,500	57,500	57,500	57,500	57,500	57,500
Investment Costs									
Shade house	V	57,080							
Plants	V	50,600							
Other capital items	V	36,210							
Total Investment Costs	V	143,890	0						
Recurrent Costs									
Fertiliser and agro-chemicals	V		4,050	4,050	4,050	4,050	4,050	4,050	4,050
Coconut husk replacement	V		1,080	1,080	1,080	1,080	1,080	1,080	1,080
Total Recurrent Costs	V	0	5,130						
Total Costs	V	143,890	5,130	5,130	5,130	5,130	5,130	5,130	5,130
Net Cash Flow	V	-136,390	25,870	52,370	52,370	52,370	52,370	52,370	52,370
Labour Utilisation (person-days)									
Cutting coconut husks for media	Days	2	2	2	2	2	2	2	2
Mixing media and planting	Days	2	2	2	2	2	2	2	2
Daily husbandry (watering, fertilising etc.) a/	Days	50	50	50	50	50	50	50	50
	Days		7	7	7	7	7	7	7
Total Labour Utilisation	Days	54	61	61	61	61	61	61	61
Gross margin per labour day	V/day	-2,526	424	859	859	859	859	859	859

a/ Average 1.5 hours per day

Appendix C

Table C-3 Cash flow, Anthurium small enterprise: 2,000 plants / 125 m²

Revenue	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Small blooms	No	3,000	2,000						
Revenue @ V25/stem	V	75,000	50,000	0	0	0	0	0	0
Medium blooms	No		4,000	5,000	5,000	5,000	5,000	5,000	5,000
Revenue @ V40/stem	V		160,000	200,000	200,000	200,000	200,000	200,000	200,000
Large blooms	No		2,000	7,500	7,500	7,500	7,500	7,500	7,500
Revenue @ V50/stem	V		100,000	375,000	375,000	375,000	375,000	375,000	375,000
Total Revenue	V	75,000	310,000	575,000	575,000	575,000	575,000	575,000	575,000
Investment Costs									
Shade house	V	401,100							
Plants	V	506,000							
Other capital items	V	122,170							
Total Investment Costs	V	1,029,270	0						
Recurrent Costs									
Fertiliser and agro-chemicals	V		38,800	38,800	38,800	38,800	38,800	38,800	38,800
Coconut husk replacement	V		10,100	10,100	10,100	10,100	10,100	10,100	10,100
Total Recurrent Costs	V	0	48,900						
Total Costs	V	1,029,270	48,900						
Net Cash Flow	V	-954,270	261,100	526,100	526,100	526,100	526,100	526,100	526,100
Labour Utilisation (person-days)									
Cutting coconut husks for media	Days		5	7	10	10	10	10	10
Mixing media and planting	Days		5	7	10	10	10	10	10
Daily husbandry (watering, fertilising etc.)	Days	150	150	150	150	150	150	150	150
Harvesting, grading and marketing	Days		30	30	30	30	30	30	30
Total Labour Utilisation	Days	150	190	194	200	200	200	200	200
Gross margin per labour day	V/day	-6,362	1,374	2,712	2,631	2,631	2,631	2,631	2,631

Appendix C

Table C-4 Production costs and revenues: Anthuriums

Unit: 2,000 plants/125 squ metres

Gross Income	Unit	VUV/Unit	No Units	VUV
Medium flowers	Stem	40	5,000	200,000
Large flowers	Stem	50	7,500	375,000
Total Gross Income			12,500	575,000
Variable Costs				
Fertiliser and agro-chemicals	Lump sum			38,800
Coconut husk replacement	Lump sum			10,100
Labour	Days	1,200	200	240,000
Total Variable Costs				288,900
Gross Margin per Unit				286,100

Table C-5 Collection and transport costs: Anthuriums

Cost of Collecting Flowers	
Deliver field crates in afternoon and collect next morning	
Collection rounds per week	2 days
Distance travelled per collection run	150 km
Field crates 70cm x 40cm x 30cm = 85 litres	85 L
No of Anthurium stems per field crate	200 stems
Field crates per load	90 crates
Full load of Anthuriums	18,000 stems
Vehicle Operating Costs for 2 tonne truck	
Fuel: 15,000 km/year @ 15L/100 km x V 140/L	315,000 V/year
Insurance	150,000 V/year
Registration	70,000 V/year
Driver salary: 12 months x V 35,000	420,000 V/year
Servicing: 4 services per year @V 28,000	112,000 V/year
Tyres: 6 tyres x V25,000 every second year	75,000 V/year
Repairs and maintenance V 150,000 per year	150,000 V/year
Depreciation: V 450,000 over ten years	45,000 V/year
Total Annual Operating Cost	1,337,000 V/year
Operating Cost per km	89 V/km
Average loading factor (per cent of full load)	70 %
Cost of collecting Anthuriums	1.06 V/stem collected

Appendix C

Table C-6 Cost of grading and packing: Anthuriums

Packhouse Labour Costs		
Cost per worker	1,200	V/shift
No of field crates washed and packed	3.1	crates/worker/shift
Grading losses (% of stems discarded)	25	%
Stems packed per worker	473	stems packed
Total stems packed per shift (20 workers)	9,450	stems packed
Cost of labour per stem packed	2.54	V/stem packed
Packaging Costs		
Cartons: 90cm x 15cm x 10cm	13.5	Litres/carton
Stems per carton	24	stems
Cartons and cellophane wrappers	120	V/carton
Cost of cartons and wrappers per stem packed	5.00	V/stem packed
Other Packhouse Costs (per shift)		
Supervisor/foreman	3,000	V/shift
Electricity and water	10,000	V/shift
Packhouse rental	36,000	V/shift
Other costs per stem packed	5.19	V/stem packed
Total packhouse costs	12.72	V/stem packed

Appendix C

Table C-7 Cost of transport, inspection, quarantine and clearance: Anthuriums

Exchange rate: V/A\$	95	V/A\$
Carton weight	1.2	kg/carton packed
Cartons per consignment	394	cartons
Cubic capacity per consignment	5.3	m ³
Total weight per consignment	473	kg
Vanuatu Inspection and Fumigation		
Inspection fee (per inspection)	1,500	V/consignment
Fumigation fee @ V 1,500/m ³		V/consignment
Total inspection and fumigation per consignment	1,500	V/consignment
Transport Costs per Consignment		
Air freight @ V 110/kg	51,975	V/consignment
Fuel surcharge @ V 10/kg	4,725	V/consignment
Air waybill charge	3,500	V/consignment
AQIS fee	3,200	V/consignment
Customs clearance	1,800	V/consignment
X-ray fee	2,000	V/consignment
Vanuatu Transit Service handling fee @ V 20/kg	9,450	V/consignment
Total transport costs per consignment	76,650	V/consignment
Inspection, Fumigation and Clearance Costs in Australia		
AQIS inspection and fumigation in Sydney	800	A\$/consignment
Customs agent fee	550	A\$/consignment
Total inspection, fumigation and clearance costs	1,350	A\$/consignment
Total inspection, fumigation and clearance costs	128,250	V/consignment
Total Cost of Transport, Inspection, Quarantine and Clearance		
Cost per consignment	206,400	V/consignment
Cost per stem shipped	21.84	V/stem shipped

Table C-8 Sales revenue through Sydney Flower Market: Anthuriums

	Price Range		
	High	Medium	Low
Wholesale price (A\$/stem)	2.50	2.25	2.00
Less allowance for 15% losses	0.38	0.34	0.30
Price per stem shipped (A\$/stem)	2.13	1.91	1.70
Price per stem shipped (V/stem)	202	182	162
Less wholesale agent's commission (15%)	30	27	24
Net wholesale price per stem shipped (V/stem)	172	154	137

Appendix C

Table C-9 Value chain analysis: Anthuriums

Farm Production Costs		
Variable costs of production	3.91	V/stem collected
Labour costs	19.20	V/stem collected
Total farm production costs	23.11	V/stem collected
Total production costs (after packhouse losses)	30.82	V/stem shipped
Cost of collection and transport		
	1.06	V/stem collected
Total collection and transport costs	1.41	V/stem shipped
Packhouse Costs		
Labour	2.54	V/stem shipped
Packaging	5.00	V/stem shipped
Other packhouse costs	5.19	V/stem shipped
Total packhouse costs	12.72	V/stem shipped
Transport, Inspection, Quarantine and Clearance		
Vanuatu inspection and fumigation	0.16	V/stem shipped
Transport costs	8.11	V/stem shipped
Inspection, fumigation and clearance in Australia	13.57	V/stem shipped
Total transport, inspection, quarantine and clearance	21.84	V/stem shipped
Net Wholesale Price (after losses and commissions)		
High price	172	V/stem shipped
Medium price	154	V/stem shipped
Low price	137	V/stem shipped
Total Gross Margin		
High price	105	V/stem shipped
Medium price	88	V/stem shipped
Low price	70	V/stem shipped

Appendix C

Table C-10 Summary of value chain analysis: Anthuriums

		Price Range		
		High	Medium	Low
Net wholesale price (V/stem shipped)		172	154	137
Less:				
Production cost	V/stem shipped	30.82	30.82	30.82
Collection cost	V/stem shipped	1.41	1.41	1.41
Packing cost	V/stem shipped	12.72	12.72	12.72
Transport, inspection, fumigation etc	V/stem shipped	21.84	21.84	21.84
Gross margin	V/stem shipped	105	88	70
Gross margin a/	Percent	61	57	51
Less amount paid to outgrowers	V/stem shipped	61	61	61
Net margin to exporter	V/stem shipped	43	26	9
Net margin to exporter	V/consignment	410,730	248,574	86,418
Net margin to exporter	AUD/consignment	4,323	2,617	910

a/ Percent of net wholesale price

C.2 Cordyline Value Chain

The Cordyline value chain analysis shown in Table C-11 to Table C-20 is based on the nucleus estate / outgrower model with about 200 outgrowers, each with a 1,120 plant / 125 m² production unit. The analysis applies only to the Cordyline leaves produced by outgrowers and excludes those produced by the nucleus grower.

Table C-11: Investment costs for Cordyline production units, micro and small scale

Table C-11 shows the estimated investment costs for micro and small-scale Cordyline production units. These models are based on those presented by SSO in the publications “Floriculture in Fiji as a Small and Micro Business” and “Small-holder Flower Production in Fiji: a Pictorial Handbook.” Planting density is assumed to be nine plants per square metre with cuttings costing VUV90 each. Other investment costs are similar to those in the Anthurium model

The micro-scale unit is a shadehouse of 12.5 m² containing about 110 Cordyline plants (9 per m²). The small-scale unit is 125 m² and contains about 1,120 plants. Both would be regarded as backyard units operated on a part-time basis, with some hired labour used by the larger units. They would be planted with recognised Cordyline varieties propagated by cuttings costing VUV90 each. Total investment costs would be about VUV104,000 (A\$1,100) for the micro-scale unit and VUV670,000 (A\$7,050) for the small scale unit.

Table C-12: Cash flow, Cordyline micro-enterprise, 110 plants / 12.5 m²

Table C-12 shows the cash flow expected to be generated by the micro-enterprise. The Cordylines are expected to reach full production of about 20 leaves per plant or 180 leaves per m² in the third year, selling for around VUV15 per leaf. Sales would reach VUV44,000 per annum (A\$460) from year 3 onwards and the plants are expected to be productive for about eight years. It is envisaged that only

Appendix C

family labour would be used for an hour or two every day. This could be regarded as a hobby-scale enterprise suitable for urban backyards.

Table C-13: Cash flow, Cordyline small enterprise: 1,120 plants / 125 m²

Table C-13 shows the cash flow expected to be generated by the small-scale enterprise. Productivity levels and prices would be the same as for the micro-enterprise. Sales would reach VUV336,000 per annum (A\$3,540) from year 3 onwards and the plants are expected to be productive for about eight years. It is envisaged that about 120 person-days of labour per annum would be required, composed of a mixture of family labour and part-time hired staff. This scale of operation would also be suitable for either rural areas or urban backyards, especially on the larger housing blocks in the outlying areas of Port Vila.

Table C-14: Production costs and revenues: Cordyline foliage

Table C-14 shows estimated production costs and revenues at full production, based on the small enterprise model shown in Table C-13. All labour used, whether from family members or hired, is valued at VUV1,200 (A\$12.60) per day. This would generate a gross margin of VUV143,000 per annum (A\$1,500). However, if all labour is provided by family members at zero cash cost, the gross cash surplus would be VUV287,000 (A\$3,020). This represents an attractive income-generating activity compared to the available alternatives.

Table C-15: Collection and transport costs: Cordyline foliage

A nucleus estate / outgrower operation would include a system of regular foliage collection, in this case assumed to be twice a week, allowing for two air freight consignments per week. Collection would be undertaken in the cool early morning with the leaves placed in stackable plastic crates and loaded onto a light (2-tonne) truck with a sun-protecting roof. On the basis of the loading and vehicle operating cost assumption shown in Table C-15, collection and transport costs from the grower to the packhouse would amount to only VUV0.35 per Cordyline leaf collected (or VUV3.54 per bunch of ten leaves).

Table C-16: Cost of grading and packing: Cordyline foliage

Table C-16 assumes that the Cordyline leaves would be graded, packed and stored in the facility owned by Vanuatu Direct, with rental (excluding electricity and water) paid to the owners at the rate of VUV36,000 per shift (A\$380). The packhouse would employ about 20 casual workers per shift plus a supervisor/foreman. The leaves would be packed in bunches of ten in cellophane sleeves in a standard produce carton type (50 cm x 40 cm x 30 cm) at the rate of 45 bunches per carton. It is assumed that 10% of the leaves collected would be unsuitable for export and offloaded into the local market. Cartons would be sourced from Fiji.

Table C-17: Cost of transport, inspection, quarantine and clearance: Cordyline foliage

The packed Cordyline cartons would be forwarded to Sydney on Air Vanuatu twice per week. Air Vanuatu charges a standard rate of VUV110 per kg for all cargo regardless of its bulk density. Packed cartons are estimated to weight 15.0 kg each, which means that air freight costs only VUV36.67 (A\$0.39) per bunch. The major costs incurred in moving the Cordyline foliage to the importer/wholesaler are the AQIS inspection and fumigation fees (A\$800 per shipment¹⁶) and the fees paid for customs clearance. In total, the transport, inspection, quarantine and clearance charges

¹⁶ This is regarded as an average. Actual charges may be higher in the case of possible pest interventions and treatments, weekend and overtime charges etc. Importers advise that it is prudent to make due allowance for surcharges such as these.

Appendix C

amount to around VUV88 per bunch of ten leaves. This is significantly lower than the equivalent costs from other Pacific Island countries, due to the concessional/subsidised air freight rates charged by Air Vanuatu, which are matched by other Airlines as well.

Table C-18: Sales revenue through Sydney Flower Market: Cordyline foliage

Table C-18 shows the calculation of net wholesale prices through the Sydney flower market. Cordyline leaves from Malaysia currently sell at wholesale for A\$4.00–6.00 per bunch for leaves of the highest quality. Making allowance for slightly lower quality and the need to be price competitive against the Malaysian product, the wholesale prices for Vanuatu products are assumed to be in the range of A\$3.00, 4.00 and 5.00 per bunch for low, medium and high quality respectively. After making allowance for 10% losses and 15% agent's commission, this is equivalent to VUV218, 291 and 363 per bunch.

Table C-19: Value chain analysis: Cordyline foliage

Table C-20: Summary of value chain analysis: Cordyline foliage

Table C-19 and Table C-20 show the costs, revenues and gross margins per bunch shipped over the entire value chain. Total gross margin would be in the range of VUV17 to VUV162 per bunch, to be shared between the outgrowers and the exporter. After paying the outgrowers VUV150 per bunch collected (VUV167 per bunch shipped), this would generate a negative net margin to the exporter at all three price levels.

Appendix C

Table C-11 Investment costs for Cordyline production units, micro and small scale

	Micro (110 plants)/12.5 m ²		Small (1,120 plants)/125m ²	
	Quantity and Prices	Cost VUV	Quantity and Prices	Cost VUV
Shade House				
Pine posts	4 posts (5m x 155mm) @ V7,500/post	30,000	30 posts	225,000
No 8 wire	2kg @ V210/kg	420	15kg	3,150
Shade cloth (50% or 80% shade)	0.15 roll (385m x 1.5m) @ V53,000	7,950	1 roll	53,000
Gravel for potting and floor	0.25m ² @ V4,400/m ²	1,100	3.5m	15,400
Galvanized mesh sheets for benches (1.2m x 2.4m)	4 @ V2,000 each	8,000	30 sheets	60,000
Concrete blocks (15cm)	24 @ V85	2,040	180 blocks	15,300
Nails	1kg @ V300/kg	300	7.5kg	2,250
2.5cm chicken wire	1/3 of a roll @ V5,300/roll	1,770	2.5 rolls	13,250
Labour cost a/	skilled supervisor for 2 days @ V2,750/day	5,500	5 days	13,750
Total Shade House Cost		57,080		401,100
Other Costs				
Cordyline cuttings	120 @ V90 each	10,800	1,200	108,000
Plastic potting bags	120 @ V3.90 each (V3,900/1,000 bags)	470	1,200	46,800
Coconut husks for potting media	10 bags @ V270/bag	2,700	100 bags	27,000
1 year fertiliser requirement	3 x 500g packets of foliar NPK @ V600	1,800	23 packets	13,800
	1 x 500g packet of slow release @ V540	540	8 packets	4,320
1 year fungicide/pesticide requirement	1 x 500g packet of Lansan @ V1,000	1,000	5 packets	5,000
Bleach (fungicide and for cleaning gravel)	2 x 4.5L @ V270	540	15 containers	4,050
Clippers	1 x V1,750	1,750	2 clippers	3,500
Watering can	1 x 5L @ V1,350	1,350	2 cans	2,700
Pressure spray			1 x 5L	5,000
Hand tools (shovels etc)	Set of 3 items	12,000	Set of 5 items	20,000
Wheelbarrow	1 wheelbarrow	7,500	1 wheelbarrow	7,500
Hose	25 metres @ V180/m	4,500	100 metres	18,000
Protective clothing for spraying		1,750	2 x V1,750	3,500
Total Other Costs		46,700		269,170
Total Investment Costs		103,780		670,270

a/ Plus household labour supplied at no cost

Appendix C

Table C-12 Cash flow, Cordyline micro-enterprise, 110 plants / 12.5 m²

Revenue	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Cordyline leaves	No	1,100	2,200	2,200	2,200	2,200	2,200	2,200	2,200
Revenue @ V15/leaf	V	16,500	33,000	33,000	33,000	33,000	33,000	33,000	33,000
Total Revenue	V	16,500	33,000						
Investment Costs									
Shade house	V	57,080							
Plants	V	10,800							
Other capital items	V	35,900							
Total Investment Costs	V	103,780	0						
Recurrent Costs									
Fertiliser and agro-chemicals	V		4,050	4,050	4,050	4,050	4,050	4,050	4,050
Coconut husk replacement	V		1,080	1,080	1,080	1,080	1,080	1,080	1,080
Total Recurrent Costs	V	0	5,130						
Total Costs	V	103,780	5,130	5,130	5,130	5,130	5,130	5,130	5,130
Net Cash Flow	V	-87,280	27,870						
Labour Utilisation (person-days)									
Cutting coconut husks for media	Days	2	2	2	2	2	2	2	2
Mixing media and planting	Days	2	2	2	2	2	2	2	2
Daily husbandry (watering, fertilising etc.) a/	Days	33	33	33	33	33	33	33	33
Harvesting, grading and marketing	Days		7	7	7	7	7	7	7
Total Labour Utilisation	Days	37	44	44	44	44	44	44	44
Gross margin per labour day	V/day	-2,359	633						

a/ Average 1.0 hour per day

Appendix C

Table C-13 Cash flow, Cordyline small enterprise: 1,120 plants / 125 m²

Revenue	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Cordyline leaves	No	11,200	22,400	22,400	22,400	22,400	22,400	22,400	22,400
Revenue @ V15/leaf	V	168,000	336,000	336,000	336,000	336,000	336,000	336,000	336,000
Total Revenue	V	168,000	336,000						
Investment Costs									
Shade house	V	401,100							
Plants	V	108,000							
Other capital items	V	161,170							
Total Investment Costs	V	670,270	0						
Recurrent Costs									
Fertiliser and agro-chemicals	V		38,800	38,800	38,800	38,800	38,800	38,800	38,800
Coconut husk replacement	V		10,100	10,100	10,100	10,100	10,100	10,100	10,100
Total Recurrent Costs	V	0	48,900						
Total Costs	V	670,270	48,900						
Net Cash Flow	V	-502,270	287,100						
Labour Utilisation (person-days)									
Cutting coconut husks for media	Days		5	7	10	10	10	10	10
Mixing media and planting	Days		5	7	10	10	10	10	10
Daily husbandry (watering, fertilising etc.)	Days	80	80	80	80	80	80	80	80
Harvesting, grading and marketing	Days		20	20	20	20	20	20	20
Total Labour Utilisation	Days	80	110	114	120	120	120	120	120
Gross margin per labour day	V/day	-6,278	2,610	2,518	2,393	2,393	2,393	2,393	2,393

Appendix C

Table C-14 Production costs and revenues: Cordyline foliage

Unit: 1,120 plants/125 squ metres

Gross Income	Unit	VUV/Unit	No Units	VUV
Bunches of 10 leaves	Bunch	150	2,240	336,000
Total Gross Income			2,240	336,000
Variable Costs				
Fertiliser and agro-chemicals	Lump sum			38,800
Coconut husk replacement	Lump sum			10,100
Labour	Days	1,200	120	144,000
Total Variable Costs				192,900
Gross Margin per Unit				143,100

Table C-15 Collection and transport costs: Cordyline foliage

Cost of Collecting Cordyline Leaves		
Deliver field crates in afternoon and collect next morning		
Collection rounds per week	2	days
Distance travelled per collection run	150	km
Field crates 70cm x 40cm x 30cm = 85 litres	85	L
No of Cordyline bunches per field crate	60	bunches
Field crates per load	90	crates
Full load of Cordyline bunches	5,400	bunches
Vehicle Operating Costs for 2 tonne truck		
Fuel: 15,000 km/year @ 15L/100 km x V 140/L	315,000	V/year
Insurance	150,000	V/year
Registration	70,000	V/year
Driver salary: 12 months x V 35,000	420,000	V/year
Servicing: 4 services per year @V 28,000	112,000	V/year
Tyres: 6 tyres x V25,000 every second year	75,000	V/year
Repairs and maintenance V 150,000 per year	150,000	V/year
Depreciation: V 450,000 over ten years	45,000	V/year
Total Annual Operating Cost	1,337,000	V/year
Operating Cost per km	89	V/km
Average loading factor (per cent of full load)	70	%
Cost of collecting Cordyline bunches	3.54	V/bunch collected

Appendix C

Table C-16 Cost of grading and packing: Cordyline foliage

Packhouse Labour Costs		
Cost per worker	1,200	V/shift
No of field crates washed and packed	3.1	crates/worker/shift
Grading losses (% of leaves discarded)	10	%
Bunches packed per worker	170	bunches packed
Total bunches packed per shift (20 workers)	3,402	bunches packed
Cost of labour per bunch packed	7.05	V/bunch packed
Packaging Costs		
Cartons: 50cm x 40cm x 30cm	60.0	Litres/carton
Bunches per carton	45	bunches
Cartons and cellophane wrappers	100	V/carton
Cost of cartons and wrappers per bunch packed	2.22	V/bunch packed
Other Packhouse Costs (per shift)		
Supervisor/foreman	3,000	V/shift
Electricity and water	10,000	V/shift
Depreciation: V 1.75 million over 10 yrs, 100 shifts/yr	1,750	V/shift
Other costs per bunch packed	4.34	V/bunch packed
Total packhouse costs	13.61	V/bunch packed

Appendix C

Table C-17 Cost of transport, inspection, quarantine and clearance: Cordyline foliage

Exchange rate: V/A\$	95	V/A\$
Carton weight	15.0	kg/carton packed
Cartons per consignment	76	cartons
Cubic capacity per consignment	4.5	m ³
Total weight per consignment	1,134	kg
Vanuatu Inspection and Fumigation		
Inspection fee (per inspection)	1,500	V/consignment
Fumigation fee @ V 1,500/m ³		V/consignment
Total inspection and fumigation per consignment	1,500	V/consignment
Transport Costs per Consignment		
Air freight @ V 110/kg	124,740	V/consignment
Fuel surcharge @ V 10/kg	11,340	V/consignment
Air waybill charge	3,500	V/consignment
AQIS fee	3,200	V/consignment
Customs clearance	1,800	V/consignment
X-ray fee	2,000	V/consignment
Vanuatu Transit Service handling fee @ V 20/kg	22,680	V/consignment
Total transport costs per consignment	169,260	V/consignment
Inspection, Fumigation and Clearance Costs in Australia		
AQIS inspection and fumigation in Sydney	800	A\$/consignment
Customs agent fee	550	A\$/consignment
Total inspection, fumigation and clearance costs	1,350	A\$/consignment
Total inspection, fumigation and clearance costs	128,250	V/consignment
Total Cost of Transport, Inspection, Quarantine and Clearance		
Cost per consignment	299,010	V/consignment
Cost per bunch shipped	87.89	V/bunch shipped

Table C-18 Sales revenue through Sydney Flower Market: Cordyline foliage

	Price Range		
	High	Medium	Low
Wholesale price (A\$/bunch)	5.00	4.00	3.00
Less allowance for 10% losses	0.50	0.40	0.30
Price per bunch shipped (A\$/bunch)	4.50	3.60	2.70
Price per bunch shipped (V/bunch)	428	342	257
Less wholesale agent's commission (15%)	64	51	38
Net wholesale price per bunch shipped (V/bunch)	363	291	218

Appendix C

Table C-19 Value chain analysis: Cordyline foliage

Farm Production Costs		
Variable costs of production	21.83	V/bunch collected
Labour costs	64.29	V/bunch collected
Total farm production costs	86.12	V/bunch collected
Total production costs (after packhouse losses)	95.68	V/bunch shipped
Cost of collection and transport		
Total collection and transport costs	3.54	V/bunch collected
	3.93	V/bunch shipped
Packhouse Costs		
Labour	7.05	V/bunch shipped
Packaging	2.22	V/bunch shipped
Other packhouse costs	4.34	V/bunch shipped
Total packhouse costs	13.61	V/bunch shipped
Transport, Inspection, Quarantine and Clearance		
Vanuatu inspection and fumigation	0.44	V/bunch shipped
Transport costs	49.75	V/bunch shipped
Inspection, fumigation and clearance in Australia	37.70	V/bunch shipped
Total transport, inspection, quarantine and clearance	87.89	V/bunch shipped
Net Wholesale Price (after losses and commissions)		
High price	363	V/bunch shipped
Medium price	291	V/bunch shipped
Low price	218	V/bunch shipped
Total Gross Margin		
High price	162	V/bunch shipped
Medium price	90	V/bunch shipped
Low price	17	V/bunch shipped

Appendix C

Table C-20 Summary of value chain analysis: Cordyline foliage

		Price Range		
		High	Medium	Low
Net wholesale price (V/bunch shipped)		363	291	218
Less:				
Production cost	V/bunch shipped	95.68	95.68	95.68
Collection cost	V/bunch shipped	3.93	3.93	3.93
Packing cost	V/bunch shipped	13.61	13.61	13.61
Transport, inspection, fumigation etc	V/bunch shipped	87.89	87.89	87.89
Gross margin	V/bunch shipped	162	90	17
Gross margin a/	Percent	45	31	8
Less amount paid to outgrowers	V/bunch shipped	167	167	167
Net margin to exporter	V/bunch shipped	-4	-77	-150
Net margin to exporter	V/consignment	-15,007	-262,247	-509,488
Net margin to exporter	AUD/consignment	-158	-2,760	-5,363

a/ Percent of net wholesale price

Appendix D

Appendix D Bibliography

IBIS World Industry Report G5254 August 2011, *Flower Retailing in Australia*

McGregor, AM, Styce, K, Burness, A, and Taylor, M April 2008, *Developing the Ornamentals Industry in the Pacific: an Opportunity for Income Generation*. Final Report, Australian Centre for International Agricultural Research

Pacific Horticultural & Agricultural Market Access Program (PHAMA) January 2012, *Technical Report 16: Potential for Cutflower and Foliage Exports from Solomon Islands to Australia*

PHAMA June 2012, *Technical Report 31: Evaluation of Trial Shipments of Cutflowers and Foliage from Solomon Islands to Australia*

South Seas Orchids 2007, *Floriculture in Fiji as a Small and Micro-Business*

South Seas Orchids 2007, *Small-holder Flower Production in Fiji: a Pictorial Handbook*



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