PN-ABN-469

The Ornamental Plant and Flower Industry in Sri Lanka: A Study of the Central Province

paper presented to:

The United States Agency for International Development
and
Clark Atlanta University

by
Andrea L. Henderson

TABLE OF CONTENTS

SUMMARY

1. **PURPOSE OF THE STUDY AND INTRODUCTION**

1.1 PURPOSE OF THE STUDY
1.2 INTRODUCTION

1.2.1 Goals of the Report
1.2.2 Overview of Sri Lankan Floriculture
1.2.3 Sri Lanka's agro-climatic diversity
1.2.4 Physical environment of the Central Province

2. **THE CENTRAL PROVINCE: AN EXAMPLE OF THE LOCAL INDUSTRY**

2.1 DESCRIPTION OF THE ENTERPRISES INVOLVED IN ORNAMENTAL PRODUCTION

2.1.1 Management
2.1.2 Size of Operation
2.1.3 Diversity of Enterprise
2.1.4 Location
2.1.5 Level of Production
2.1.6 Market and Market Channels

2.2 INVESTMENT REQUIREMENTS

2.2.1 Itemization of Inputs and their Respective Costs
2.2.2 Analysis of Inputs

2.3 COST OF PRODUCTION

2.3.1 Itemization of Inputs and their Respective Costs
2.3.2 Analysis of Inputs

2.4 REVENUES

2.4.1 Potted Plants
2.4.2 Cut Flowers
2.4.3 Cut Leaves
2.4.4 Rooted Cuttings and Other

2.5 EMPLOYMENT

2.5.1 Demographics of Labor Force
2.5.2 Training Requirements
2.5.3 Income Generated

2.6 FEEDBACK FROM RESPONDENTS

2.7 RECOMMENDATIONS

3. **EXPORT ORIENTED INDUSTRY**

RELEVANT DOCUMENTS

APPENDIX A. The Survey Questionnaire

APPENDIX B. Methodology

ACKNOWLEDGEMENTS

I am a Masters candidate at Clark Atlanta University in Atlanta, Georgia. My assignment in Sri Lanka is through the university's International Affairs and Development Program. To Clark Atlanta University, and to the IAD Department especially, I give thanks. I must also express appreciation to friends and neighbors who travel vicariously through my experiences and are as interested in international development as I. Most of all, I thank my loving and supportive family who have always nurtured my ambition and aspirations.

I could not have completed this project without help from the other members of the "ornamental team." Mrs. Anne Kuhnle, a student at the University of Alaska pursuing a B.A. degree in Rural Development, provided an invaluable service in locating the growers, helping to design the survey instrument and enumerating the data. Ms. Sandra Pattie, an undergraduate at Virginia Polytechnic Institute pursuing a dual degree in Urban Affairs and Planning and Political Science, was instrumental in the design of the survey and it's enumeration as well. To Mr. Lal Weerawansa, our translator, driver and all-around guide, I am grateful. Mr. M.P. Perera, Agricultural Economist at the Department of Agriculture, and Mr. Rajapakse, Director of the Royal Botanical Gardens, were both interested in the project at the outset and were consulted throughout. Finally, I am grateful to The United States Agency for International Development and Dr. Preston Pattie, Chief of Party, DARP, for selecting me to participate in this study and providing the necessary support.

I am not a horticulturalist, nor am I an economist, but I am interested in the processes necessary to further Sri Lanka's social and economic development goals and USAID's vision that Sri Lanka become a Newly Industrialized Country by the year 2001. In this vain I respectfully submit this paper to USAID, DARP and the DOA.

Note to the Reader

Project analysis rests on many assumptions that by their very nature are only approximate. For this reason, as well as the constraints listed below, this analysis should serve more as a guide than an absolute statement of fact.

Although we present this study as a 100% sample, it is difficult to know for sure since most of the businesses do not advertise and were difficult to locate.

Moreover, many of the people that we interviewed did not keep any records and we had to rely on their recollection of the information requested. In addition, the sample population was small and there was a high degree of variance. Therefore, measures of central tendency were difficult to ascertain. The statistics and figures obtained from our data are estimations which give an idea of the expenditures and revenues involved in the ornamental industry. It is very important to reference the methodology section to query the source of the figures.

Another important fact to note is that very often the team was speaking with people whose command of the English language was rudimentary. It was necessary to use a translator to get the information we needed. Consequently, the questions were not asked exactly as they were written.

SUMMARY

According to the Horticultural Assessment prepared by DARP in March 1992, horticulture appears to offer the most promise for expansion of the agricultural sector in Sri Lanka. As the ornamental industry was not included in the study, this analysis will provide information about how the industry in the Central Province is contributing to Sri Lanka's development goals.

The ornamental plant and flower industry in the Central Province is relatively small scale and fairly new. This is a 100% sample with the sample size of the study (n) equal to 26 (see Note to the Reader). Considering the small number of firms involved in ornamental production in the Central Province and their recent origin, the figures indicate that the growth potential of the industry is great.

There are a few large nurseries in this region but, for the most part, they belong to companies based in Colombo. (The figures for these operations are included here, disaggregating other nurseries owned and operated by the parent company.) Most are small-scale operations.

The enterprises are overwhelmingly owner-operated, utilize little land and sell other goods from the same property.

The growers in the Central Province primarily sell to the local market or are outgrowers for larger companies who need to supplement their own stock. The larger nurseries sell directly to the export market. The market channel of the produce determines production and revenue levels; exporters produce higher volumes and thus, earn more.

Potted plants, cut flowers and cut leaves command the largest share of the ornamental market. Rooted cuttings, seeds and tissue culture materials are also sold but there are few companies engaged in this type of trade.

It is a labor intensive industry but the small-scale grower is able to keep labor costs down by utilizing unpaid family labor. Investment and production costs are minimized for them because they are not required to produce export-quality products. The larger enterprises, who must ensure high quality standards, have high investment costs in structures, propagative materials, and equipment and tools. Production costs are also high due to the fact that many of the inputs must be imported. For the larger firms, labor is the largest outlay.

The ornamental industry commands a high market value but costs are high and the margins are slim. Yet owner-operated businesses generally command sufficient revenues to support a household. If the business is a second source of income, it is usually run by the

woman of the house who is fulfilling her domestic responsibilities at the same time. Exporters are able to obtain a good amount of foreign exchange earnings.

This segment has the potential to be quite profitable in that as Sri Lanka's per capita income rises, people will have more disposable income to spend on ornamental plants and flowers. Ornamentals are in constant demand by hotels, florists and for such special occasions weddings and religous and national festivals. Again, as the tourist industry expands, so too will the demand for these products. Moreover, the establishment of flower shops is relatively new and as this becomes more popular, demand will increase.

The importance of the small-scale enterprises in the scope of economic development should not be overlooked. Low start-up costs enable the average person with basic knowledge of floriculture to become an entreprenuer. (Only 11% of the businesses in the Central Province ornamental industry have employees with formal horticultural training.)

The Central Province is an important region in ornamental production. It encompasses two distinct agro-climatic zones, thus both temperate and tropical ornamentals can be grown here. For this reason it is a logical starting point for analysis.

1. PURPOSE OF THE STUDY AND INTRODUCTION

1.1 PURPOSE OF THE STUDY

Every developing country has a national plan to hasten economic growth and further a range of social objectives. Sound planning depends on the availability of a wide range of information regarding existing and potential investments and their likely effects on growth and other national objectives. The Department of Agriculture and the Diversified Agricultural Research Project (DARP), a project funded by the United States Agency for International Development (USAID), wanted to conduct a national study of the ornamental industry to make up for a dearth of national data. This study,(the first phase), which was conducted in the Central Province (Matale, Kandy, and Nuwara Eliya districts), provides a descriptive analysis of the state of the industry in this region. The supposition is that there is potential for growth in income, employment and export in this sector of agriculture in Sri Lanka.

The purpose of this document is to encourage a systematic examination of all aspects of the industry. The study depends on information from various sources and considered judgements of various specialists in different areas. Besides surveying growers in the targeted districts, consultation with exporters, the Director of the Royal Botanical Gardens, the DOA, the Export Development Board, and other technical advisors, was necessary to ensure that the information is accurate and the study is a useful guide for further inquiry.

Gathering information and presenting it so that many people can participate in providing information, defining assumptions on which it is based and evaluating how accurate it is cannot be overemphasised. It is hoped that after reviewing the results of this deliberation, a determination of the responsibilities of participants, be they growers, private sector firms, or government agencies, will follow and lead to an optimal balance of objectives.

1.2 INTRODUCTION

1.2.1 Goals of the Paper

In recent times Sri Lanka has recognized the need to diversify their agricultural production, to increase incomes in the agricultural sector and to increase revenue from agricultural exports. The production of ornamental flowers and plants is now being looked at as a desirable effort for these diversification programs.

This discussion will include the natural, financial and human elements involved in the industry beginning with a description of the physical environment of the Central Province. The study will also describe the firms/enterprises involved in the industry. It will identify the major services and inputs used, distinguishing those inputs provided locally from those that are imported. It will also estimate the investment requirements; costs of production and production levels; and revenues. Furthermore, it will look at the demographics of the labor force and corresponding income levels. Secondary impacts and distribution of benefits will then be addressed.

1.2.2 Overview of Sri Lankan Floriculture

It is estimated that the flora of Sri Lanka consists of almost 2000 species and varieties of flowering plants, which belong to 200 families and 1300 genera. For the purpose of this study floricultural crops are divided into potted plants, cut flowers (without roots), rooted cuttings (with roots but no container other than a polyurethane bag), and cut leaves (no stem or roots).

1.2.3 Sri Lanka's Agro-Climatic Diversity

Sri Lanka's agro-climatic diversity may well be it's edge against international competition. There are four distinct agro-climate zones which are demarcated by altitude and amount of rainfall. Significant variation in altitude and two monsoon seasons result in a variety of climates in which to grow assorted ornamental "crops." The very wet, wet and semi-wet zones are the most appropriate areas for the development of floriculture in Sri Lanka, with varietal specialization within these zones according to their requirements of temperature, relative humidity and intensity of rainfall.

1.2.4 Physical Environment of the Central Province

The Central Province encompasses at least two of these diverse agro-climatic zones:

1. Nuwara Eliya District

land - Steeply dissected mountainous, hilly and rolling terrain. Well to moderately well drained, moderately fine textured, medium to strong acid soils. Wide variety of crops are well suited for these soils.

mean annual temperature - approximately 15 degrees celsius

altitude - 1000 - 2500 m

mean annual rainfall - 3000-6000 mm

2. Kandy District

land - Mountainous, hilly and rolling terrain. Well drained moderately fine textured, slightly to strongly acid soils.

mean annual temperature - 20 to 22.5 degrees Celsius

altitude - 500 - 1000 m with some parts up to 2000 m

mean annual rainfall - 2000-4000 mm

3. Matale

soils - Steep rockland, rock knob plains and flat terrain. Imperfectly to well drained, moderately fine to fine textured soils.

mean annual temperature - 20 to 22.5 degrees Celsius

altitude - between 100 - 1000 m

mean annual rainfall - 2000-4000 mm

2. THE CENTRAL PROVINCE: AN EXAMPLE OF THE ORNAMENTAL INDUSTRY

2.1 DESCRIPTION OF THE ENTERPRISES INVOLVED IN ORNAMENTAL PRODUCTION

2.1.1 Management

The majority of the enterprises included in the survey were owner-operated (88.5%).

2.1.2 Size

Most of the establishments are relatively small, utilizing little land. The mean is less than 1/2 acre while 85.2% used 2 acres or less for the nursery. There are few industrial-sized producers in the Central Province. Acreage, or the amount of land utilized for the production of ornamentals, is not necessarily correlated to level of production or even revenue. When standardizing for the

amount of land, the correlation between amount of land and production is not significant. Nor is the correlation between amount of land and revenue significant when standardizing for amount of land.

2.1.3 Diversity

The majority of the enterprises are also involved in other commercial ventures such as selling spices and fruit from the property.

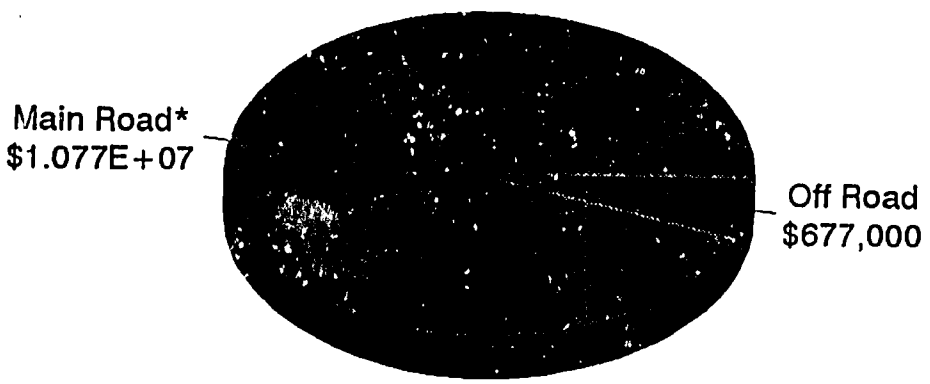
2.1.4 Location

The breakdown of firms by district is contained in the following chart:

Firms By District

District	Number of Firms	Percent Market Share (Central Prov.)
Nuwara Eliya	5	19.2
Kandy	19	73.1
Matale	2	7.7
TOTAL	26	100.0

Mean Revenue (Gross) by Location



revenue in rupees
*actual value = $10,770,000

A significant number of growers were not located on a main road. This seems to have a great deal of influence on their sales volume and creates a problem for transportation of inputs and of products to market.

2.1.5 Level of Production

This study does not include any growers who had less than 1500 plants on the premises at the time of the interview (see methodology). Of those that met this minimum, the mean number of ornamentals on the property was 100,000.

2.1.6 Market and Market Channels

The majority of potted plants are sold to final consumers, while the remainder goes to local companies. Most of the cut flowers and cut leaves produced are exported, with a small amount sold to local companies and final consumers. Rooted cuttings and tissue culture are mainly exported as well.

2.2 INVESTMENT REQUIREMENTS

2.2.1 Itemization of Inputs and Respective Costs

Mean Investment Costs

Description	Mean Cost*
Structures	143,770**
Propagative Materials	74,510
Equipment and Tools	9,930
Well and Pump	3,850

*cost in rupees
5% Trim
**Correlation analysis indicates diseconomy of scale with regard to structures. As acreage increases, investment in structures increases.

2.2.2 Analysis of Inputs

Structures:

Structures include screen houses, greenhouses, tool sheds, employee housing, storage facilities, water pipes and irrigation equipment, for example.

Few growers had tool sheds, storage facilities or employee housing. Many had to invest in water pipes and irrigation equipment, which are costly. The materials used are locally manufactured.

Depending on the type of plant or flower grown, the cost of shade structures could constitute a significant percentage of the

investment costs. For example, Anthurium, which needs to be grown in shade and whose quality cannot be ensured if grown under a tree, requires the use of a shade structure. Many of the small-scale farmers built their structures themselves with whatever material was most economical. Below is a description of the most common shade houses:

a. "Lath houses"- hard wood structure with uprights made of concrete or iron. This is locally procured and relatively inexpensive.
b. Coir mesh enclosures- Coir mesh is a material which is practical for use as a shade enclosure. It is easily available locally but is not very durable.
c. Saran enclosures- Saran is a plastic fibre screen fastened over a concrete, iron or wooden frame. This can last for many years, but the Saran must be imported.
d. Bamboo Tat Enclosures- Tats made out of split bamboo stems are available locally and form good shading material. They must also be fastened to some type of frame. Its durability can be extended by using a wood preservative.
e. Fibre glass or glass- Although this type of enclosure is expensive it provides the correct amount of filtered sunlight for certain plants. These materials are generally imported.

Propagative Materials:

The investment in propagative materials varies a great deal from enterprise to enterprise. Many of the smaller growers started growing ornamentals as a hobby. They may have purchased a few mother plants for propagation and produced a significant number from them. When they retired or realized that they could earn money with this hobby, they began formally as a business. If a grower intended to begin a business venture at the outset, or if the business has a high sales volume, then the investment in propagative materials is quite high.

Because of intense competition new varieties are always being sought. This, and the demand for quality mother plants, requires that much of the material is imported. Those who sell exclusively to the local market are less concerned with these factors and utilize indigenous mother material.

Equipment and Tools:

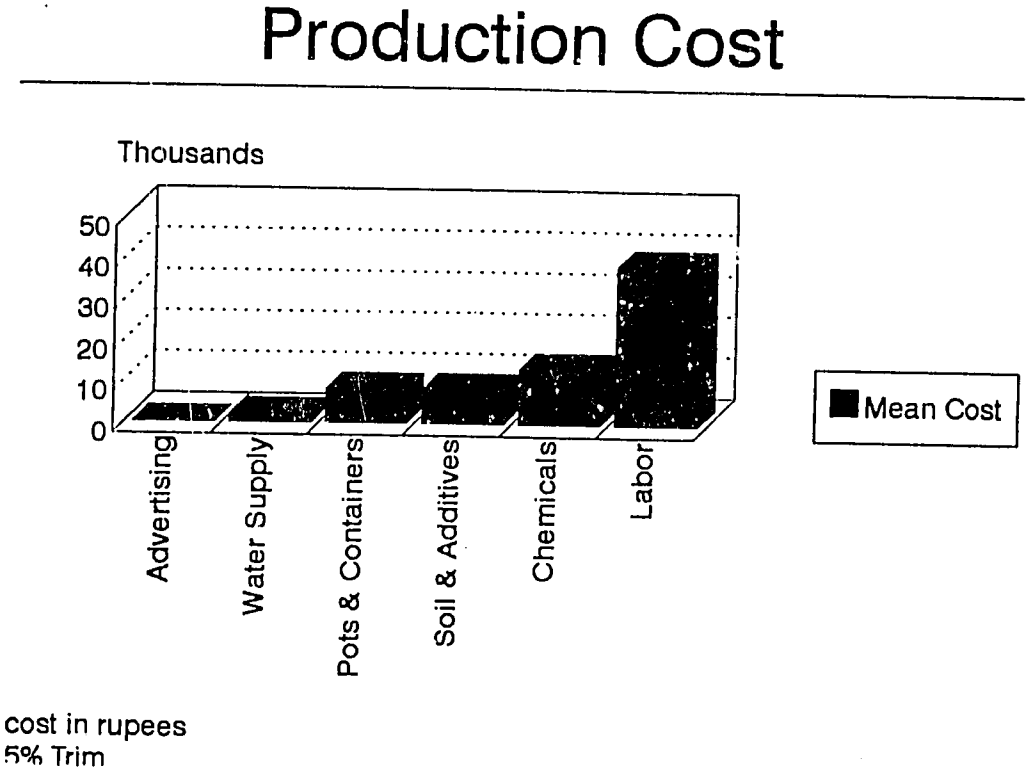
It seems relatively little is invested in equipment and tools. Sprayers, garden hoses, spades, rakes and the like are not a significant percentage of the total investment cost. These items are available locally.

Well and Pump:

The investment cost of a well and pump depends on whether the grower has access to municipal water or has irrigation equipment to tap water from a natural source. Some built wells themselves with stones and other inexpensive materials, others made a large investment, using more expensive materials and hired labor. The necessary goods are also locally available.

2.3 PRODUCTION COSTS

2.3.1 Itemization of Inputs and Respective Costs



	Actual Values
Advertising	22.72
Water Supply	1,870.45
Pots and Containers	8,116.95
Soil and Additives	8,218.90
Chemicals	13,431.68
Labor	38,553.41

*cost in rupees
5% Trim

The two most expensive production costs include labor, because this is a labor intensive industry, and chemicals, because they are imported.

2.3.2 Analysis of Inputs

Advertising:

Advertising is the smallest expenditure with 76.9% choosing not to do so. They say demand exceeds supply as it is and they feel that production must be on a larger scale to warrant such an expenditure. Many do not even have signs stating that they are in business. The rationale is that word of mouth is the best form of advertising.

Water supply:

The cost of water can also be costly, especially if the grower does not have a well or irrigation facilities. For municipal water there is a monthly fee whereas for a well with a pump, an electricity bill must be paid. For those with irrigation equipment, there is usually a gravity feed from a nearby water source and therefore there is no cost involved.

Pots and Containers:

For those enterprises which sell potted plants, the cost of pots and containers can be high. The clay pots are locally procured, while the polyurethane used to protect the roots when a pot is not used is imported and fairly expensive.

Soil and Additives:

These production costs include, for example, sand, coir dust, cow dung, bricks, charcoal, and soil. The cost of soil and additives is minor. Many have these items at their disposal for little or no cost. In those instances where soil quality is poor, it must be purchased.

Chemicals:

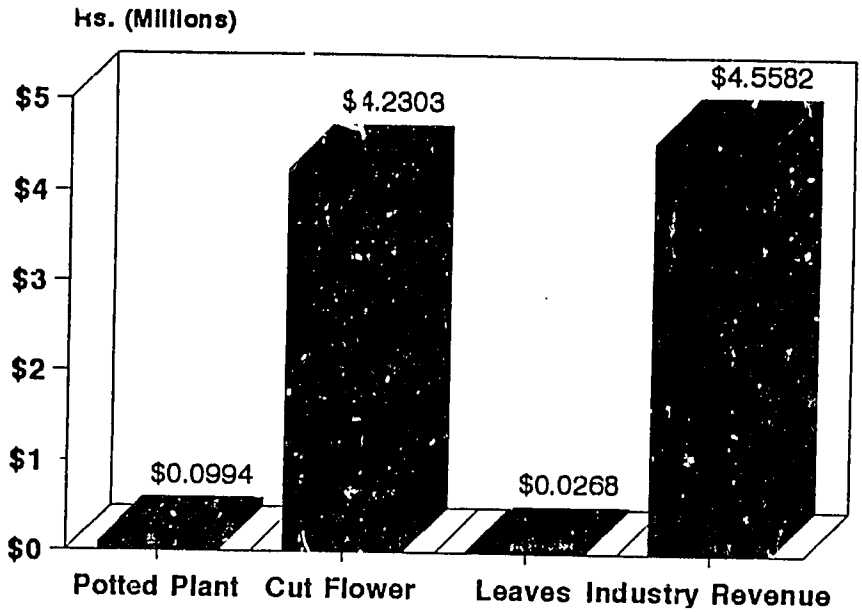
Chemicals consist of chemical fertilizers, insecticides, and fungicides. Although these goods are often packaged locally, the bulk of the ingredients are imported and therefore they are pricey. These chemicals are necessary in order to protect the plants and flowers from pests and disease. Surprisingly, some growers who sell to the local market do not use chemicals at all. They may employ other methods of prevention (ie. using tobacco as a pesticide).

Labor cost:

Because the ornamental industry is labor intensive, the expenditure on labor in the Central Province is very high. This, however, is not representative of the industry as a whole due to high incidence of unpaid family labor. Generally, wage levels are on par with other agricultural laborers.

2.4 REVENUES

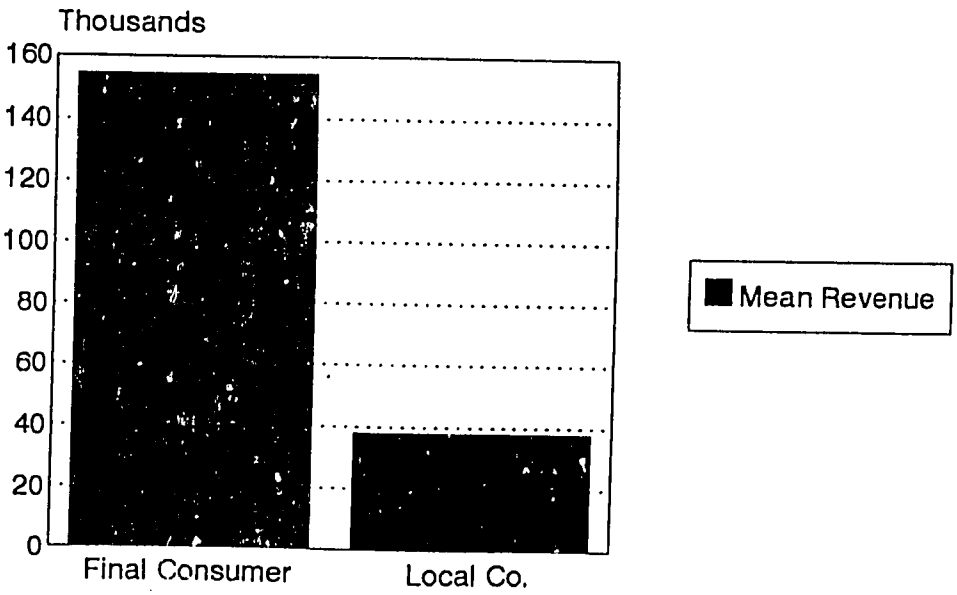
Revenue by Product



Revenue is heavily dependent on the market channel of the product. Those who sell to the export market usually generate higher revenues than those who sell to local companies (nurseries), individual traders, retail shops (florists), or final consumers.

2.4.1 POTTED PLANTS

Potted Plants Revenue by Market Channel

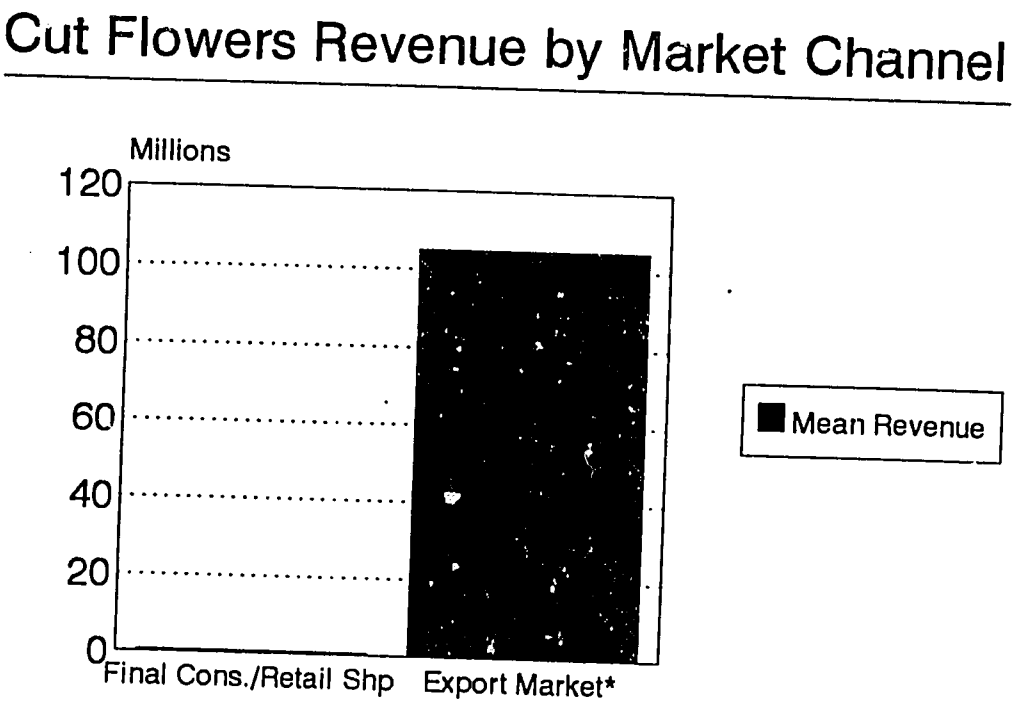


*revenue in rupees

There is virtually no export market for potted plants because the freight cost is too high. The market channel for potted plants consists of sales to final consumers or to local companies. Since these are generally not high volume sales, the revenue generated by this product is low. As Sri Lanka's middle class expands, though, more disposable income will enable consumers to purchase potted plants. At this time the domestic market will be sufficient to allow growers to earn lucrative profits.

2.4.2

CUT FLOWERS

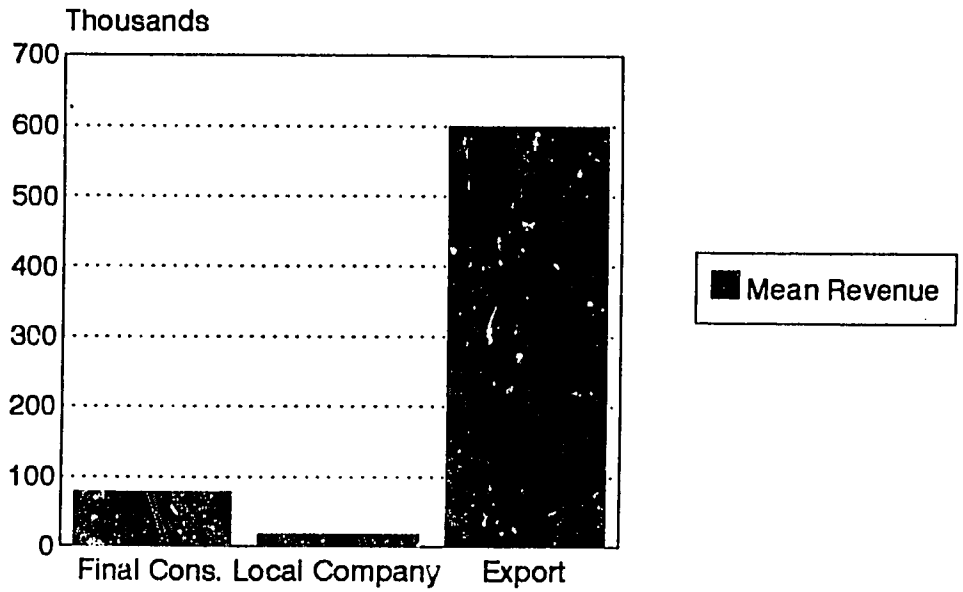


*actual value = $105,000,000
revenue in rupees

Because of extremely costly greenhouse expenses, overseas nurseries (mainly European) import large quantities of cut flowers from Sri Lanka. This accounts for the towering revenues, compared to other ornamental products. Cut flowers are also sold locally, but again, not to the same extent.

2.4.3

CUT LEAVES



*revenue in rupees

Cut leaves are exported, sold to local companies and final consumers. They are used as "fillers" in floral arrangements such as gyspophila (Baby's Breath) in wedding bouquets. Few firms in the Central Province sell cut leaves.

2.4.4 Rooted Cuttings and Other

Rooted cuttings and the "other" catagory are ommitted from this analysis due to the fact that there were too few cases for a meaningful analysis.

2.5 EMPLOYMENT

2.5.1 Demographics of Labor Force

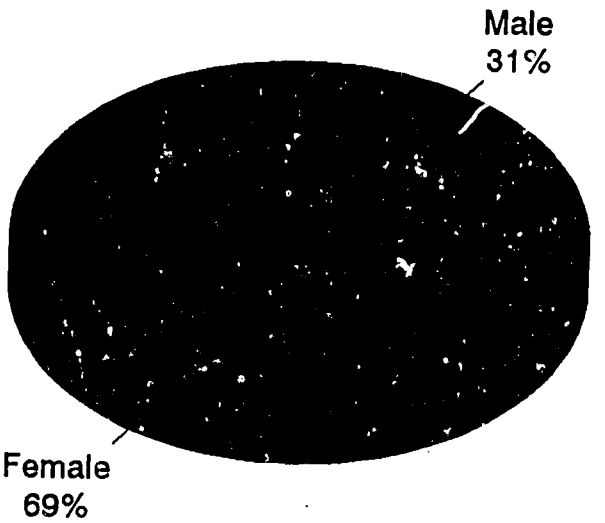
The enterprises in the Central Province are generally small, and as it was stated earlier, predominantly family-run. These businesses have few employees, if any, outside of the family.

Those that have hired employees generally employed women between the age of 18 and 45. On occasion there were cases where school-aged boys were hired a few hours a week for manual labor, but the majority of the labor force in this region are women. Many of these women are in management positions, responsible for the daily activities involved in operating the business.

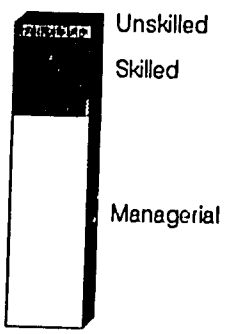
Although there is a need for unskilled labor, the major labor requirement is for skilled workers who can graft and determine fertilization requirements, etc.. (In the chart below, the managerial catagory includes skilled laborers who also manage the business.)

Since the Central Province industry is primarily geared towards local market sales, there are few employees involved exclusively in handling and packaging. The goods are not transported to market, but rather the local consumer will buy the product and take it away himself.

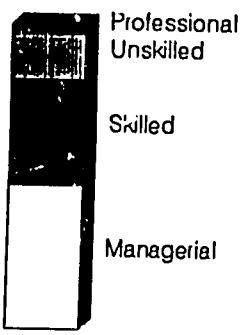
Workforce



Workforce Demographics



Female



Male

*no professional females

2.5.2 Training Requirements

It is obvious from the workforce distribution chart above that it is not essential to have formal horticultural training (see methodology) to be successful in this industry, as can be seen by the small percentage of persons having university-level training in this discipline. Many, though, have taken 3 month courses at the Royal Botanical Gardens, or have some professional affiliation with the Department of Agriculture. After administering the survey, it became evident that university-level training is not a good indicator of how much someone knows about ornamental production.

2.5.3 Income Generated

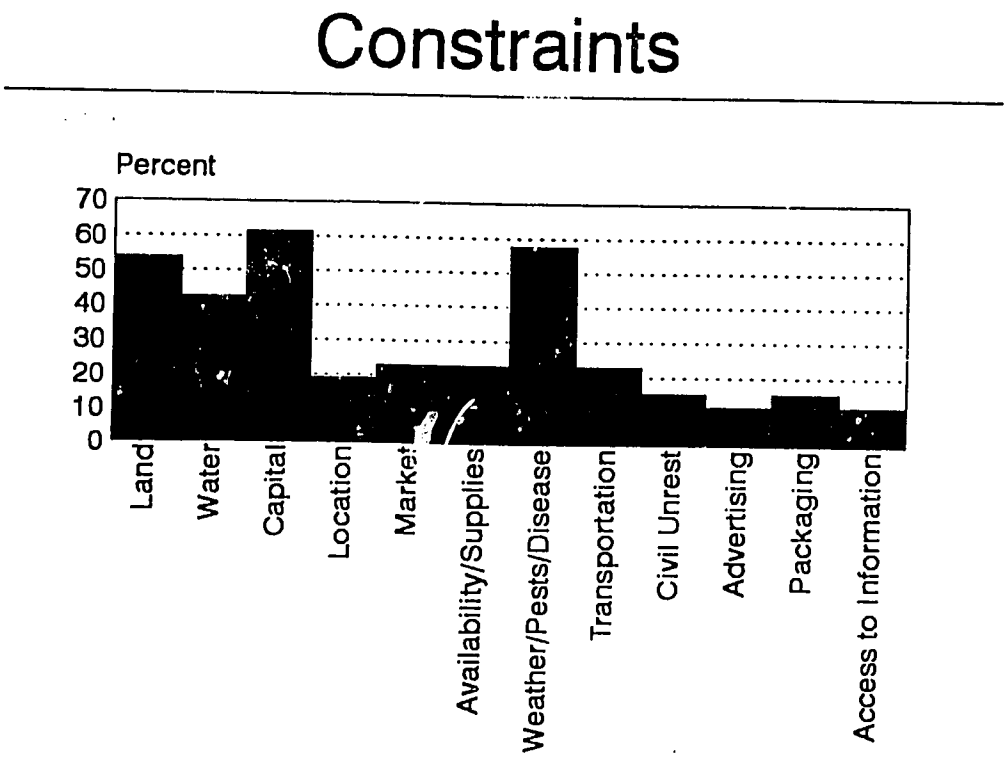
Salary levels are low and are generally different for men and women. The rationalization is that men do most of the heavy, cumbersome work.

Mean Wages

Level	Rs. per day
Professional	80*
Managerial	166
Skilled	104
Unskilled	85

*distorted value to to small # cases

2.6 FEEDBACK FROM RESPONDENTS



53.8% said that land was a problem.

* Government ownership of land leads to insecurities about the future
* Not enough land to operate the business at the desired level
* Land difficult to obtain even if you have the money
* When able to purchase land, the plot is not adjascent to existing plot

42.3% said water was a problem

* Municipal water too expensive
* Difficult to get water during the drought - well water is low and municipal water is rationed. Drought devastated those who depend on irrigated water from a natural water source.
* Inconsistent water supply is a problem. Some nurseries get well water or water from pipes run from a natural source which is piped down to them. Others use municipal water and still others that are outside the municipality obtain their supply of water from the Water Board. The municipal water source is the most reliable.

61.5% said operating capital was a problem

* Need more money to expand business
* Loans are difficult to obtain. One needs two guarantors (cosigners) who pay taxes and makes above a certain salary level. In addition the applicant must have had a bank account for at least 2 years. If loan is for less than 25,000 the bank does not require collateral.

19.2% said location was a problem

* Transportation of inputs or of goods to market is a problem
* Location inaccessable to potential custmers

23.1% said market is a problem

* Wants to export but doesn't know how

23.1% said availability of supplies is a problem

* Quality insecticide is not available on the local market

57.7% said weather/ pests/ or disease was a problem

* Problem with insects eating leaves of plants
* Has problems with pests/disease but manageable with chemicals
* Drought destroyed crops

23.1% said transportation was a problem

* Expensive to hire vehicle to transport goods to market
* Land is in an inaccessible location so transportation becomes difficult

15.4% said civil unrest a problem

* JVP stole plants, harassed owners, scared employees away, disrupted the normal operation of the business
* police steal plants/flowers

11.5% said advertising is a problem

* would like to, but expensive

15.4% said packaging was a problem

* Doesn't know proper technique

11.5% said access to information on horticultural practices is a problem

* Doesn't know where to get information
* Would like information about growing specific varieties or on cultural practices

Most of the growers get their information about horticultural practices from either the DOA or the Botanical Gardens.

When asked who can help and how, the respondents almost invariably cited the government first. Many want government supports like subsidies or price supports. They feel government should regulate the industry in order to stabilize it, provide a market for goods, import new varieties for low prices. The majority of respondents are not market-economy minded.

2.6 RECOMMENDATIONS

Below are my recommendations. Of course there must be some flexibility and, inevitably, overlapping of responsibilities and resources between government, private industry and foreign assistance agencies.

1. Conduct a careful analysis of the proposed markets for the product to ensure effective demand at renumerative prices.

2. Select varieties which offer good market potential with least amount of competition from other countries.
   *Anthurium
   *Orchids
      Dendrobium
      Vanda
      Cymbidium
      Arachnis

3. Analyze market channels for inputs and determine if import-substitution is a viable option to alleviate the high costs of imported goods.

4. Arrange for growers to secure supplies of fertilizer, pesticides, high yield seeds, and other planting materials at

a reasonable price.

5. Compensation for families for its own labor, management skills and capital through the Village Reawakening Program or Janasaviya poverty alleviation program (JSP).

6. Develop system to bring new information or teach new skills. An extension program where the extension officer would serve as liaison between the small grower and larger growers or potential foreign investors.

7. Export promotion.

8. Determine the degree of satisfaction obtained from income.

9. Select priority ares for investment.

10. Organize growers: establish communication network and business arrangements.

11. Set up an Ornamental Research Institute, similar to the Sugar Research Institute, where specialists could devote their efforts exclusively to studying ornamental plants and flowers. Their findings should be presented to growers and a communication network should be maintained.

12. Make capital available for small growers to expand and operate under optimal conditions. Again, this could be facilitated through a social development program or one of the various loan schemes;

    Village Reawakening Program
    Janasaviya Program
    Self Employment Loan Sceme
    Agricultural Loan Scheme
    Group Lending Loan Scheme
    Loan Scheme for Janasaviya Beneficiaries
    Rural Development Program Loans sponsored by UNICEF
    Small Farmers and Landless Credit Project
    Small and Medium Scale Credit Scheme

13. Small firms could form cooperatives to preclude abuses from the larger growers. Prices would be more competitive, and the exporters would have alternatives too. One such example is Markfed. It buys food crops from small farmers. The same could be done for ornamental growers.

    As it stands, larger growers will buy smaller quantities and include them in their sales to the exporters. The larger growers benefit from having a diverse source of supply. Prices are kept low. Smaller growers have no choice but to sell to the larger growers at whatever prices the sizable customer desires.

14. Establish a collection center outside Colombo in the main floricultural production areas. Continuous supply of plants and flowers are maintained throughout the year.

3. Export Oriented Industry

It is impossible to conclude this study without a discussion of exporters and the export industry. Although this is essentially a study of the ornamental industry in the Central Province, the ultimate goal is to assess the potential for the ornamental industry to contribute to Sri Lanka's development goals. The most feasible means of achieving the economic objectives is to increase exports (because the local market is finite), thereby increasing production which will subsequently increase revenues, income, employment and foreign exchange earnings.

Climatic conditions, availability and cost of air and sea freight, production cost and demand in the target markets determine which products are best to produce for export. It is essential to choose products in which the exporting country has an advantage over other supplier countries.

The Netherlands is one of the most important markets for ornamental plants and decorative cut foliage, importing from a large number of countries all over the world.

Developing countries command a significant market share of foreign imports. (For example, the Netherlands is one of the most important markets for ornamental plants and decorative cut foliage, importing from a number of countries all over the world.) This can be attributed to low wage levels and good climatic conditions for the cultivation of mother material. They are in a position to offer competitive prices.

Sri Lankan exporters should consider exporters of other developing countries their main competitors, as they are able to supply species similar to those grown in Sri Lanka.

Constraints:

1. For small growers, quality control is a problem. In order to export there must be a minimum amount of bruises and minimal damage to the flower.

2. The flowers must also be uniform.

   Uniformity cannot be achieved through seed propagation. Only through vegetative means. For example, tissue culture or suckle production for flowers.

   One solution to this problem would be to specialize. Each grower could concentrate on producing the quantity and quality necessary for export. To create a buffer in cases of crop failure, growers should organize into cooperatives and set up a special fund for this purpose.

3. Transportation is a problem. There is a limited amount of air cargo leaving Sri Lanka, so many ornamentals must be transported by boat. A potted plant cannot be stored in a dark hull for 3 weeks- they will die in the meantime. Cut

flowers have a short life and must be transported by plane. Rooted cuttings should also be transported by air. These take up little space and can therefore be transported easily by aircargo.

4. Cut foliage is exported for floral arrangements. Fern leaves, banana leaves and palm leaves are examples.

LITERATURE CONSULTED

1. Economic Analysis of Agricultural Projects, Second Edition. J. Price Gittenger. Published for the Economic Development Institute of the World Bank, The Johns Hopkins University Press, Baltimore, 1982.

2. The National Atlas of Sri Lanka. National Atlas Committee. Survey Department, Sri Lanka, 1988.

3. Handbook for Cut-Flower Growers. P.W. Hagen and D.T. Ekanayake. Lankapradipa Printing Works. Kandy, Sri Lanka, 1977.

4. Market Survey of Ornamental Plants and Cut Foliage. R.H.J. Jansen. EDB/CBI Technical Trade Cooperation Agreement. Rotterdam, 1991.

5. Sri Lanka; Profile on Gypsophila and Statice. U. Feldt. International Trade Centre UNCTAD/GATT, 1988.

6. National Export Development Plan; 1990-1994. Vols I, II

7. Horticultural Assessment: Commodity and Program Recommendations. Harold J. Mannion, Franklin W. Martin and Andrew A. Duncan. March 1992. DARP Project

APPENDIX A

THE SURVEY QUESTIONNAIRE

ORNAMENTAL FLOWERS SURVEY

I **DESCRIPTION OF THE FIRM/ ENTERPRISE**

What is the name and address of the owner/business?

_____ Respondent and Position:

_____ _____

_____ _____

_____

1. Questionnaire number A._____ District B._____

2. How many years have you been growing ornamentals as a business?

   _____years

3. Who oversees the day to day activities of the business?
   1. owner/owners
   2. hired manager
   3. other please specify _____

4. Is this business your only source of income?
   1. yes
   2. no

5. How much land is involved in growing ornamental plants?

   _____ acres

6. What other products are sold on the property? (Maximum of 2 answers)

   1. Spices
   2. Fruit
   3. Animals
   4. Crafts
   5. Tea
   6. Other please specify _____

7. Is the business on a main road?
   1. yes
   2. no

8. How many plants do you have on the premises now? (in even thousands)

II INVESTMENT COSTS

Description of **STRUCTURES** (ie. size, type of structure, materials used, number, ...)

9. (Examples: care takers house, storage facility, water pipes, irrigation equipment,...)

	Year Built	Cost of Structure	1992 Cost	1=Imp 2=Loc
frame:	A._____	B._____	C._____	D._____
cover:	E._____	F._____	G._____	H._____
fence:	I._____	J._____	K._____	L._____
tool shed:	M._____	N._____	O._____	P._____
_____:	Q._____	R._____	S._____	T._____
_____:	U._____	V._____	W._____	X._____
_____:	Y._____	Z._____	AA._____	BB._____

10. What is the investment you have made in **PROPAGATORY MATERIALS** during the first 5 years?

Year of Investment	Amount Invested	1992 Rp Value
A._____	B._____	C._____
D._____	E._____	F._____
G._____	H._____	I._____
J._____	K._____	L._____
M._____	N._____	O._____

11. Are the propagative materials:
    1. local
    2. imported

12. What is the total investment you have made in **EQUIPMENT AND TOOLS**?

    Rps _____

13. What is the value of the well and pump?

    Rps _____

III PRODUCTION COSTS **Note: YEARLY FIGURES**

14. What is the cost of soil and additives (other than chemical fertilizers)?

	rupees per load	x	loads per year	=	TOTAL
sand:	_____	x	_____	=	_____
coir dust:	_____	x	_____	=	_____
cow dung:	_____	x	_____	=	_____
bricks and charcoal:	_____	x	_____	=	_____
other: _____:	_____	x	_____	=	_____
			TOTAL	=	_____

15. Are the soil and additives (other than chemical fertilizers):
    1. local
    2. imported

16. What is the yearly cost of:

    pots/containers: _____ = _____

    polybags: _____ = _____

    TOTAL = _____

17. What is the cost of chemicals?

	rps/container	x	containers/year	=	TOTAL
fertilizer:	_____	x	_____	=	_____
insecticide:	_____	x	_____	=	_____
fungicide:	_____	x	_____	=	_____
other: _____:	_____	x	_____	=	_____
			TOTAL	=	_____

18. Is the fertilizer mostly:
    1. local
    2. imported

19. Are the other chemicals (other than the fertilizer):
    1. local
    2. imported

20. What is your cost of advertising per month?

    Rps _____

21. What is the yearly cost of water supply?

    municipal source: Rps_____

    well source: Rps_____

    TOTAL: Rps_____

IV REVENUES

22. What type of plants do you sell?
    1. Potted Plants
    2. Cut Flowers
    3. Rooted Cutting
    4. Cut leaves
    5. Other _____

** How do you determine the sale price of your product?

POTTED PLANTS

23. Who do you sell the most to?
    1. final consumers
    2. retail shops
    3. individual traders
    4. local company
    5. export market

If answer is 3 or 4

24. Who do they sell the most to?
    1. final consumer
    2. retail shops
    3. individual traders
    4. local companies
    5. export market

25. How many potted plants do you sell per year?

    _____per wk X 52 weeks = _____ PER YEAR

26. What is the average price of a potted plant?

    Rps _____

CUT FLOWERS

27. Who do you sell the most to?
    1. final consumers
    2. retail shops
    3. individual traders
    4. local company
    5. export market

If answer is 3 or 4,

28. Who do they sell the most to?
    1. final consumer
    2. retail shops
    3. individual traders
    4. local companies
    5. export market

29. How many cut flowers do you sell per year?

    _____ per wk X 52 weeks = _____ PER YEAR

30. What is the average price of a cut flower?

    Rps _____

ROOTED CUTTINGS

31. Who do you sell the most to?
    1. final consumers
    2. retail shops
    3. traders
    4. local company
    5. export market

If answer is 3 or 4,

32. Who do they sell the most to?
    1. final consumer
    2. retail shops
    3. individual traders
    4. local companies
    5. export market

33. How many rooted cuttings do you sell per year?

    _____ per wk X 52 weeks = _____ PER YEAR

34. What is the average price of a rooted cutting?

    Rps _____

CUT LEAVES

35. Who do you sell the most to?
    1. final consumer
    2. retail shops
    3. individual trader
    4. local company
    5. export market

If answer is 3 or 4,

36. Who do they sell the most to?
    1. final consumer
    2. retail shops
    3. individual traders
    4. local companies
    5. export market

37. How many cut leaves do you sell per year?

    _____ per wk X 52 weeks = _____ PER YEAR

38. What is the average price of a cut leaf (or branch)?

    Rps _____

OTHER _____

39. Who do you sell the most to?
    1. final consumers
    2. retail shops
    3. traders
    4. local company
    5. export market

If answer is 3 or 4.

40. Who do they sell the most to?
    1. final consumer
    2. retail shops
    3. individual traders
    4. local companies
    5. export market

41. How many do you sell per year?

    _____ per wk X 52 weeks = _____ PER YEAR

42. What is the average price?

    Rps _____

V EMPLOYMENT

43. How many employees do you have?

    _____

44. How many of your employees are under 18?

    _____

45. How many from 18 to 45?

    _____

46. How many 45 and older?

    _____

47. How many of your employees have had formal horticultural training? (Professional)

    male _____ female _____

48. How many of your employees have had informal horticultural training (ie. apprenticeship)? (Skilled)

    male _____ female _____

49. How many of your employees have had no training? (Unskilled)

    male _____ female _____

50. How many of your managers are:

    male _____ female _____

51. How many employees are involoved exclusively in handling and packaging?

EMPLOYMENT CHART

PROFESSIONAL: Person with formal Horticultural training
MANEGERIAL: Person that runs day to day activity
SKILLED: Person that has informal horticultural training
UNSKILLED: Person with no training

* Unpaid employees included in the above categories.

	Number of Employees			Person Days of Labor per Year	Rupees per Day
PROF	P1_____	_____ Hr/D	_____ D/Wk Mo	= P2_____	P3_____
	P4_____	_____ Hr/D	_____ D/Wk Mo	= P5_____	P6_____
	P7_____	_____ Hr/D	_____ D/Wk Mo	= P8_____	P9_____
MNGRL	M1_____	_____ Hr/D	_____ D/Wk Mo	= M2_____	M3_____
	M4_____	_____ Hr/D	_____ D/Wk Mo	= M5_____	M6_____
	M7_____	_____ Hr/D	_____ D/Wk Mo	= M8_____	M9_____
SKLD	S1_____	_____ Hr/D	_____ D/Wk Mo	= S2_____	S3_____
	S4_____	_____ Hr/D	_____ D/Wk Mo	= S5_____	S6_____
	S7_____	_____ Hr/D	_____ D/Wk Mo	= S8_____	S9_____
UNSKLD	U1_____	_____ Hr/D	_____ D/Wk Mo	= U2_____	U3_____
	U4_____	_____ Hr/D	_____ D/Wk Mo	= U5_____	U6_____
	U7_____	_____ Hr/D	_____ D/Wk Mo	= U8_____	U9_____

VI PROBLEMS / SUGGESTIONS

53. What are some problems/constraints you have encountered in operating your business? (please describe)

    1. land

    2. water

    3. operating capital

    4. location

    5. market

    6. availability of supplies

    7. weather/ pests/ disease

    8. transportation

    9. civil unrest

    10. advertising

    11. packaging

    12. access to information on horticultural practices

    13. other

What are your sources of information on horticultural practices (ie. propagation, plant diseases, marketing)

Do you have any suggestions as to who can help you and how?

APPENDIX B

METHODOLOGY

III. Data and Methods

This study of the ornamental sector was conducted in the Central Province, which includes the Matale, Kandy and Nuwara Eliya districts. Although we hoped to reach a 100% sample, it is difficult to know for sure since most of the small-scale producers do not advertise.

The following information refers to the survey questionnaire, explaining all but the most direct questions.

Question Number(s)	
8	We were looking for production levels. We also used this question as a criteria for to distinguish hobbiests who sold ornamentals occasionally, from those who were in business. We asked for the number in even thousands but chose to limit our study to those growers having 2,000 plants or more. In effect, anyone with over 1500 plants was surveyed.
23,24	Questions pertaining to market channels by product: The enumerator asked the grower, "Who do you sell the greatest quantity of flowers to?" Then the enumerator checked one and assigned the total revenue to that category. If the grower could not decide among two or more, the categories listed were checked and the total divided into equal portions. It was necessary to determine where the product is going so as not to count the revenue twice.
3	The distinction between owner-operated and hired manager helped us to decide if this is a family-run business or if it operates on a larger, more professional scale.
5	We asked if the business is the only source of income to determine if this is a hobby or if it is intended to provide support for the family.
9	To determine the cost of shade structures, the costs of frames and covers for were separated and space was allotted to allow for other structures. To

determine the 1992 cost, we asked for the year the structure was built and calculated cost adjusting for 1.15% inflation per year.

Question Number(s)	
9,15, 18,19	We try to determine if these materials were local or imported to pinpoint those inputs manufactured/ procured locally and those that were imported.
14	To determine the cost of soil and additives we created a worksheet to calculate the separate categories of sand, coyer dust, cow dung, bricks and charcoal and other. We then asked for the price per unit and the quantity used.
17	To determine the cost of chemicals, we divided this category into fertilizer, insecticide, fungicide and other. Again, we asked for the price per unit and the quantity used over a specific period of time.
22	We decided to divide ornamentals into four categories; potted plants, cut flowers, rooted cuttings, other. (We realize that this does not include seeds or tissue culture but due to the small number of firms involved in these two areas we could not logically include them in our analysis.)
23,24 27,28 31,32 39,40	We asked about local sales as opposed to export sales so that an inference about export earnings (ie. foreign currency) could be made. Local sales includes sale to a final consumer, retail shops, traders, or local companies. Export sales are those made directly to a foreign company. We also identified the market channels so as not to duplicate the reported revenues in the various stages.
44-50	Here we were looking for the demographics of the labor force and the level of educational attainment in horticultural science.
47	We operationalized the variable "formal horticultural training" by asking if the respondent has university-level training in this discipline.

52

This is a worksheet to estimate labor cost, average salaries for each category, and man-days per year to estimate employment levels. We included non-paid workers and family members. We calculated person-days per year by multiplying hours per day times days per week times 50 (allowing for holidays) and dividing by 8 (based on an 8 hour day).