CHAPTER - I

DESIGN OF THE STUDY

INTRODUCTION

The flower is the poetry of reproduction. It is an example of the eternal seductiveness of life. These beautiful gifts of nature have now attained the status of a real money-spinner under the aegis of the fast growing global market.

The baffling phenomenon of unusually slow growth and development of plants coupled with long life of cut flowers of Anthurium and Orchids have made them the focal point of attention everywhere in the world. The poor share of tropical flowers in the world market at present has been attributed mainly to the shortage of healthy planting material with improved flower characters and disease vulnerability, which stems from lack of scientific comprehension and technology for large-scale multiplication of these tropical flowers.

Consequent on the energy crisis, which occurred in early seventies, demand for tropical cut flowers and ornamental plants popularly known as ‘Tropical exotics’ has increased tremendously. The world consumption of floriculture products is estimated at US $ 50 billion and the trade in them alone amounts to the tune of US $ 5.24 billion. Floriculture has become a lucrative Industry in many countries of the world and encompasses trade in ornamental cut flowers, live plants, cut foliage, seed bulbs and tubers. Floriculture is a widespread activity which, of late, has assumed an international dimension. Cut flower cultivation is taking place in 145 countries of the world. In fact, flowers constitute one of the
largest trading commodities in the agricultural sector, commanding a bigger market share than that of food grains.

Floriculture-produces constitute a larger market than that of rice and wheat. Global trade in flowers has been on the increase with the additional global input of floriculture products including cut-flowers, cut foliage and live plants, fetching an amount of not less than $3,000 million. Cut flowers account for more than half of this sum. Carnation, Rose, Chrysanthemum, Orchid, Anthurium, Aster, Gladiolus, etc., are the highly valued cut flowers in the international market. The largest exporters of cut flowers include the Netherlands, Columbia, Israel, Italy, Sri Lanka, Thailand and Kenya. The developing countries, which supply cut flowers are Taiwan, Singapore, Peru, Mexico, Costa Rica, Brazil, Ethiopia, Zimbabwe, Mauritius and Malaysia. Besides this, the world imports of foliage and live plants are also on the increase. But India's share in this venture is quite negligible.

Recognising the prospects of exporting floriculture-products, Government of India has accorded high priority to their export and has identified them as a thrust area for export. The Government has already initiated steps to enable the country to grab its due share in the global floriculture market. The Commerce Ministry has identified floriculture as an "extreme focus segment" and a Committee has already been put on the job of preparing a plan of action. The National Commission on Agriculture has set up a target of 5,00,000 hectares for cultivation by the year 2002 A.D. Four States, namely, Kerala for Orchids, Maharashtra for Carnations and Roses, Karnataka, for Chrysanthemums, and Andhra Pradesh, for Roses, have been identified for organised and co-ordinated
flower production. The objective is to generate foreign exchange worth Rs. 200 crore annually by exporting flowers from the fifth year of floriculture-operations. Some floral varieties having great demand all over the world are Roses, Chrysanthemums, Carnations, Lilies and Orchids and Anthuriums.

Orchids have been occupying a pride of place in horticulture and floriculture not only for their aesthetic value but also for their therapeutic value right from the Vedic Age. Proportionately Orchids take 8 per cent of the total flower market in the world with Thailand contributing 85 per cent. Sri Lanka and Malaysia are the other major contributors. Cymbidium has the highest demand, followed by Dendrobium, Phalaenopsis, Oncidium, Vanda, Mokara and so forth. Though India is blessed with all varied climatic conditions of the world, it has not made any headway in cut flower production for both the international and the national markets. Flowers are priced beyond the reach of common man for want of competition in production and marketing. Since production has remained stagnant, the prospects of export draw a blank.

**STATEMENT OF THE PROBLEM**

Cut flower business is a multi-million dollar activity abroad and it is a multi-crore-rupee industry in India as well. In India floriculture, including cut flowers are being viewed as a high growth industry. The economic liberalisation policy initiated in July 1991 paved the way for development of export-oriented production of cut flowers. The seed policy of 1988 had already made it possible to import planting materials of international varieties that have further given an impetus to this industry. Kerala, blessed with a congenial agro-climatic condition, rich bio-
diversity and native flora, high level of literacy and access to modern technology, has yet to make a dent in the international trade in the area of floriculture products. The Government of Kerala has declared high-tech agriculture as one of its thrust areas and adopted several policy measures for the development of cut flower industry in the State. Orchids and Anthurium cultivation has gained wide popularity all over the State as cut flowers having high commercial prospects and several entrepreneurs and cut flower societies have started running their units by taking up the production and marketing of these items. Cultivation of cut flowers like Orchids and Anthuriums has also been assuming wide popularity among the people in the State not only as garden plants providing elegant flowers in alluring colours but also as flowers having high unit value realisation in the domestic and international market. The relatively smaller size of land holdings in Kerala restrains further scope for the cultivation of plantation crops in the State. Moreover, there is chronic unemployment, especially among the educated people in Kerala. The cultivation and marketing of cut flowers like Orchids and Anthuriums will not only provide ample scope for employment generation among the educated youth but also for the utilization of small land holdings in a more scientific way for the production of high unit value items having an ever increasing demand in the global market.
REVIEW OF LITERATURE

Cut flower industry has received growing research attention due to its commercial prospects as a money-spinner, especially in the international market. Several studies have been carried out in the case of Orchids and Anthuriums in India and abroad but most of the studies have focused their attention on the taxonomic aspects, in vitro propagation, seasonal variations in the yield, loss of flowers and plants due to various diseases, plans for improvement of farm management, etc. A few of the studies, in the related area such as the study by Rash Behari Ghosh, et al. (1999)\(^4\); N.S. Pathania, et al. (1998)\(^5\); K.U. Somaya, et al. (1998)\(^6\); A. Gangaprasad, et al. (2000)\(^7\); Lee, et al. (1996)\(^8\); Shehata, et al. (1990)\(^9\), A. Naseena, et al. (1997)\(^10\); are worth reviewing here to have the relevance of the present study, especially in the context of the growing research attention which has been received by the cut flower industry due to its blooming prospects not only in the domestic market but also in the international market.

Reddy, et al. (1992)\(^11\) in their study suggests that the scope for developing Orchid cut flower and production of Orchid plants in India as a cottage industry. They have estimated the profitability for a period of six years based on the assumption of cultivating 1,750 plants in pots under shade house condition in an area of 100 square meters. They have also assessed a net profit of Rs. 6,000 per month after deducting the initial cost of investment excluding the value of land.

A study by Chakrabarti, et al. (1995)\(^12\) analyses the trend in exports of Orchid plants from 1983-1992 and the domestic trade in Orchids in India. He
has identified some of the important varieties of Orchid and the destination for Indian exports. The study reveals that about 79,000 plants of 62 genera were exported during 1984. However, due to the imposition of strict control on Orchid export imposed by Indian Import and Export Policy (April 1988 – March 1991), only 4 genera of 478 Orchid plants were exported in 1988. During 1990 no export of Orchid plants was made due to the stringent measures adopted in the Indian Import and Export Policy. He also observes that under the favourable export policy of 1992, the export of Orchid has been showing a reviving trend.

A study by Samuel, et al. (1996)\textsuperscript{13} shows that once Orchid plants start flowering, it gives an annual rate of return of over 100 per cent with an initial investment of Rs. 35,000 in an area extending to 14 square meters.

The study by Rajeevan, et al. (1997)\textsuperscript{14} has estimated the cost of production of Orchids in a commercial basis as Rs. 10 million per hectare in the first year as initial investment and thereafter to Rs. 0.4 million annually. They have estimated a net profit of Rs. 2.4 million in the first year, Rs. 7.2 million in the second year, Rs. 9.6 million in the third year and 14.4 million annually, thereafter from 1 hectare of land.

Similarly in the case of Anthurium production, they have suggested that 1,000 Anthurium plants can be maintained in 150 square meter of land. The cost of establishing such a unit, in their opinion, comes around Rs. 0.1 million and the net profit expected from such a unit is projected as Rs. 30,000 per annum.

There are variations with regard to the initial investment and recurring expenses in different states and regions due to several factors like the cost of land,
methods of cultivation, cost of inputs like fertilizers, labour, etc. In a study conducted by the Dept. of Horticulture in Andhra Pradesh (1999) with a plant population of 32,000 to 40,000 per hectare, the cost of 1,000 plants of Dendrobium variety of Orchids is estimated as Rs. 72,000 and the recurring cost as Rs. 11,000 in the first and second year. They have estimated a maintenance cost of Rs. 4,500 from the second year onwards and the expected net inflow during the second year is worked out to Rs. 27,900 and thereafter Rs. 49,500 during each year up to the fifth year.

Studies pertaining to cut flower business are general and other cut flowers like Jasmine, Roses, Chrysanthemum, Aster, Marigold, etc., in particular in India and abroad are available.

A study conducted by Shegade and Borude (1992) concerning the economics of flower production in Thane District of Maharashtra reveals that 60 per cent of the cultivators are from marginal, small and medium sized groups. The capital cost for establishing flower gardens, in this study, is worked out to Rs. 36,894 for Jasmine, Rs. 35,632 for Lilly and Rs. 45,547 for Kagda. The net income per hectare for these flower crops are also calculated as Rs. 76,513 for Jasmine, Rs. 37,554 for Lilly and Rs. 83,563 for Kagda.

Shukla and Jain (1996) carried out a study to estimate the break-up of the costs and the net revenue of the export-oriented flower producing companies, which are involved mainly in the export of Rose flowers. The study
indicates that on an average, the net revenues of these companies are about 30 per cent.

Sudha and Subramanyam (1992)\(^{18}\) have conducted a study by comparing the costs and returns of Aster cultivation with other compatible intercrops in the coconut orchards, in the Tumkur district of Karnataka during 1991. They found that the cost of cultivation of Aster alone in coconut groves comes to Rs. 23,223 per hectare, with a net profit margin of Rs. 11,773.

The study by Rao, et al. (1992)\(^{19}\), examining the economics of Jasmine cultivation in Andhra Pradesh, with a sample size of 120 jasmine gardens at different stages indicates that the average variable costs of cultivation of Jasmine flowers per hectare come to Rs. 35,484. This represents 73.4 per cent of the total costs of cultivation. They have also calculated the net return realised per hectare of Jasmine garden as Rs. 10,735.

H. Kumari (1992)\(^{20}\) in a study on Chrysanthemum cultivation in Andhra Pradesh has estimated the cost of cultivation of Chrysanthemum per hectare as Rs. 55,633 and an annual net returns per hectare as Rs. 14,807. The study further identifies that lack of alternative marketing channels and wide fluctuations in prices in flower markets are the major problems in the case of Chrysanthemum cultivation.

S. Bhattacharjee, et al. (1993)\(^{21}\) carried out a study to estimate the cost of cultivation, farm business income and annual net profit per acre from Rose cultivation. They have also analysed the variations in the cost of cultivation and
farm business income on the basis of different size groups, volume of business and the scale of operation.

Misra (1997)\(^{22}\) conducted a study in which the investment requirement of capital intensive floriculture units have been estimated. In his view the capital costs for the cultivation of Roses ranges from Rs. 64.7 lakhs to Rs. 157.5 lakhs per hectare depending up on the methods of cultivation. In the case of Carnation, it is estimated to vary between Rs. 56.78 lakhs and Rs. 157.5 lakhs for Orchids the same works out to Rs. 69.42 lakhs per hectare.

T. Ganguly (1998)\(^{23}\) emphasises the importance of flori-business by citing a case of Deulia bazaar, in Midnapure district in West Bengal, where various flowers are traded. According to him this market supports a livelihood to 12,000 families in the district. He also has found in his study that the daily average turnover of the market often exceeds Rs. 10 lakhs but in lean month it comes down to Rs. 1 to 1.5 lakhs and the price also varies from Rs. 7 per flower during June to November (peak period) to even Rs. 3 per flower during lean periods.

Salvi (1997)\(^{24}\) carried out an experimental study in Anthurium cultivation in an area of 400 square meters with 1,975 plants and has estimated the total cost of cultivation as Rs. 3,37,972 of which Rs. 1,93,950 constitute the fixed expenses. The net inflow in this case was worked out to Rs. 4, 38,200. It is also observed that about 6 suckers per plant were produced during this period. It is also mentioned in this study that as the age of the plant advances expenditure
incurred on plant will comparatively be reduced and the margin of profit will increase to a considerable extent due to the higher number of flowers and suckers.

Singh (1987)\textsuperscript{25} in a study has observed that on an average 61,750 Anthurium plants can be grown per hectare and each plant, on an average, produces 5 spikes annually. Thus altogether 3,08,750 spikes can be produced annually from 1 hectare of land, which yields an annual gross income of Rs.3,08,750.

Kaur (1999)\textsuperscript{26} observed that the Indian floriculture industry has suffered a setback, which has been estimated at 30 per cent due to the dwindling trends in production. The declining trends in production due to cloudy weather have resulted in missing the 4 auction days in Holland by the Indian exporters. This has led to a loss of Rs. 1 crore to the industry. He has also concluded that even though the industry is facing the severe threats in the international market, chances are bright for the cut flower industry in the domestic market.

**SIGNIFICANCE OF THE STUDY**

The identification of floriculture as a potential growth area seems to be logical and a step in the right direction. Some countries of South East Asia, viz., Thailand, Singapore and Malaysia earn millions of dollars every year by exporting their Orchids and other flowers\textsuperscript{27}. In 1985 Thailand exported US dollars 1.6 million worth of Orchids, which increased to an estimated US $ 8.48 million and subsequently Orchid exports, totaled US $ 14 million in 1991. Malaysia's export of floriculture products in 1984 was to the tune of US $ 2.39 million, while in 1987 it
increased to US $4.87 million. Indeed for Thailand, Singapore and Malaysia, the cultivation of Orchids has become a multi-million dollar industry. The rapid industrialisation of South East Asian Countries has resulted in scarcity of land and labour. The lands once used for Orchid cultivation have been sold for the purpose of building factories, with the result that the Orchid Industry has met with a tremendous fall in Singapore and Thailand.

At present, the requisite conditions are ripe enough for India to enter the field of cut flower industry since she has the prime resources of land and labour, the effective utilisation of which, in the short run, can very well make her highly competitive among other countries. Moreover, the farms in European Countries have to be closed down during the period of biting winter from November to April and to tide over the off-season scarcity, those countries turn towards India for sufficient supply of flowers. Besides, the business potential remains untapped even though the population is comparatively large. Such an existing situation, from the financial point of view, is conducive to the growth of cut flower Industry. India being a peninsular sub-continent has got all the agro-climatic requirements for the cultivation of both the temperate and the tropical Orchids and Anthuriums. Orchids form 9 per cent of our flora constituting the largest botanical family of higher plants in India. It is estimated that about 1,300 species (140 genera) of Orchids are found in our country with the Himalayas as their habitat. Kerala, Sikkim, Arunachal Pradesh and Himachal Pradesh are the most suitable regions for the commercial cultivation of Orchids. Research on Orchids and Anthuriums is going on at four centres in India, viz., Tropical Botanical Gardens, Thiruvananthapuram, Orchid
Research Centre, Topi; Indian Institute of Horticulture Research, Bangalore and North Eastern Hill University, Shillong. The Indian Council of Agricultural Research (ICAR) has decided to set up a National Centre for Orchids at Kalimpong. Today the country possesses such knowledge, skills and inputs regarding Orchids and Anthuriums as to ensure its easy entry into the international flower market, especially as a second global cut flower centre. All that is needed is the provision for necessary assistance and developmental facilities.

**IMPORTANT OF THE STUDY**

Kerala is one of the few places in the world where the Orchids, of which about 200 varieties flourish in Nature. Kerala’s floriculture business is mostly concentrated on the Orchids. The cultivation has become a popular project with the involvement of both the public and private sectors and the readiness of some banks to advance financial aid. But production centres are scattered widely apart from one to the other with an assorted group of planters cultivating only a small number of plants\(^{28}\). The first Floriculture Development Centre in the country is in Kerala. An Orchid village has been established in Vypeen, the first of its kind in India. It is launched by the State Horticultural Department.

Development programmes, which are implemented by the Government and the new venture, are expected to generate both direct and indirect employment to thousands of people in the State. The agro-climatic conditions of the State are ideal for growing many dollar minting cut flowers such as Orchids, Anthuriums, Roses and a host of other ornamental flowering plants. There is also a good potential for the setting up of Orchidariums and Anthurium
nurseries. Ernakulam being declared as a biotechnology district, cultivation of Orchids and Anthuriums calls for special consideration. The National Bank has already sanctioned a scheme to Ernakulam District Co-operative Bank involving a financial outlay of Rs. 10.88 lakhs for assisting 45 farmers for Orchid and Anthurium cultivation. It is understood that two schemes for Orchid and Anthurium cultivation involving loan assistance to the tune of Rs. 40 lakhs have already been sanctioned by a commercial bank.

As a result of the joint venture of A.V. Thomas & Co. and 'Vanitha', a fortnightly magazine, some "AVT - Vanitha Orchid Clubs" - have come into being. These clubs mark the dawn of a new flower culture in Kerala. The Government is also playing an active part in this field. In co-operation with the Kerala Horticultural Development Corporation, the Government is envisaging a project costing Rs. 50 lakhs to produce export quality Orchids and Anthuriums. A National Orchid Centre will be established in Thiruvananthapuram, which comprises the following: modern scientific technology to produce Orchid plants, research on Orchids, training regarding cultivation, library facilities, etc. Four Satellite Centres will be established in four Districts namely, Kollam, Ernakulam, Thrissur and Kozhikode to supply flowers directly to consumers. As a first step in Orchid development, a programme called 'Spot - 1993-94' had already been chalked out in Thiruvananthapuram, which was the joint venture of the State Bank of India and the Kerala Horticultural Development Corporation. Since Orchid and Anthurium cultivation are the most attractive one in the field of floriculture, several banks
including the S.B.I. and the Federal Bank Ltd. are advancing finance to the cultivators.\(^{30}\)

Moreover, on a common decision, the State Bank of India, NABARD and New India Assurance Company have come forward to provide loan facility as well as insurance coverage to the Orchid and Anthurium cultivators. The Central Government also has advanced Rs. 21 crore for the development of floriculture in Kerala. The first Floriculture Centre will be established in Thiruvananthapuram. For the preservation of fruits and flowers produced, cold storage facilities will be set up in 14 Districts. Further, cold storage facilities will be established in Thiruvananthapuram, Cochin and Kozhikode airports.

Moreover, the ‘Kudumbasree’ project implemented in the State of Kerala has also accorded high priority to popularise the cultivation of Orchids and Anthuriums through the formation of self help women groups. The Cochin International Airport constructed at Nedumbassery in Ernakulam District will also open up new vistas for the export of Orchids, Anthuriums and other cut flowers. If adequate arrangements for quarantine and other facilities for Import or Export of Orchids and Anthuriums are provided in the Cochin International Airport, these will give a boost to Orchid and Anthurium cultivation in the State of Kerala. Lastly, the study also assumes importance because no similar studies concerning the commercial aspects of in vitro propagation, the cost and profitability related aspects of Orchid and Anthurium cultivation and the socio-economic conditions of cut flower growers in Kerala have so far been made either at the academic level or at the official level to the best of the investigator's knowledge and belief.
SCOPE AND COVERAGE OF THE STUDY

Even though the study can be made from the stand point of cultivators, traders, consumers, the Government or at the initiative of an institution, the present study is intended to throw light on the mechanics of in vitro propagation and assessment of cost and profitability of Orchid and Anthurium cultivation in Kerala from the point of view of the producers of seedlings, cultivators and traders only.

For a detailed analytical study of Orchid and Anthurium growers in the State, a sample survey has been conducted covering both the Orchid and Anthurium cultivators. An earnest attempt is also made to identify the production and marketing problems of Orchid and Anthurium growers in Kerala State.

OBJECTIVES OF THE STUDY

The following are the main objectives of the study:

1. To highlight the cultivation of Orchids and Anthuriums in a historical perspective.

2. To make an overview of the world production, consumption and trade in floriculture.

3. To estimate the comparative cost and profitability of the in vitro propagation of Orchid and Anthurium plantlets.

4. To make an in depth analysis of the socio-economic conditions of the cut flower growers in Kerala.

5. To estimate the comparative cost of cultivation of Orchids and Anthuriums by different categories of cultivators adopting alternative methods of cultivation.
6. To assess the economic viability on adopting different methods of Orchid and Anthurium cultivation.

7. To assess the annual profitability of an average commercial cut flower grower in Kerala.

8. To identify the problems confronted by the major players in the cut flower industry such as the biotechnology labs, cut flower growers and traders of cut flowers in Kerala.

9. To make suitable suggestions and recommendations based on the findings of the study

METHODOLOGY

The study is an empirical one, which is based mainly on primary data. Secondary data required for the study have been collected from various books, reports and journals wherever it is found necessary.

The study is an empirical one based on primary data. The data required for the study have been collected from both primary and secondary sources. Secondary data required for the study have been collected from books, reports and journals related to the topic.

Primary data required for the study have been collected by means of structured schedules administered among cultivators of cut flowers. Other information related to the marketing aspects of cut flowers have been collected by means of interviews and discussions with traders, office bearers of cut flower societies and federation of cut flower societies and officials of Krishi Bhavans, Agricultural Universities, the Tropical Botanical Gardens and Research Institute.
(TBGRI) and the major auction centres of Orchids and Anthuriums. Since the main consumers of cut flowers are widely scattered all over the country and outside India, consumers coming under the purview of this industry have not been taken into account.

COLLECTION OF DATA

A. Primary Data

The primary data required for the study have been collected from the cut flower growers in the State of Kerala by means of structured schedules, discussions, observations, interviews with expert persons and the information elicited from the results of experiments carried out in bio-technology lab with their assistance. Experienced persons such as Professors of Kerala Agricultural University, Vellayanikkara, officials of A.V.Thomas & Co., Hybrids Bio-tech, Kalady and several other cut flower growers and traders have provided invaluable information required for the study.

Field Work and Data Collection Tools

Structured schedules were used to collect primary data required for the study by conducting a field survey in all the fourteen Districts in the State. Before the actual field survey, a pilot study was carried out to include only the appropriate questions and to eliminate unnecessary ones.

Sample Design

Since the population to be covered spreads over a wide geographical area of the State, a census method is found to be quite impractical. Hence a stratified random sampling technique is used for the purpose of the present study.
The State of Kerala for the purpose of the study is divided into three zones, viz., Southern Zone, Central Zone and Northern Zone. From each District coming fewer than three zones, six respondents (three Orchid cultivators and three Anthurium cultivators) have been contacted for the purpose of administering the schedules. Cultivators have also been categorised into three main groups for the purpose of eliciting information. They are Small-scale cultivators, Medium-scale cultivators and Large-scale cultivators. Persons having less than 1,000 plants are categorised as Small-scale cultivators. Those who are having more than 1,000 and less than 5,000 plants are included in Medium-scale cultivators and persons having more than 5,000 plants are taken as Large-scale cultivators. Thus altogether 84 respondents (3 x 2 x 14, i.e., three respondents each from two categories of cut flower producers in all the fourteen Districts of the State) have been selected for the purpose of field survey.
STRUCTURE OF SAMPLE DESIGN

Respondents
(84 Nos.)
(42 Orchid cultivators and 42 Anthurium cultivators each)

Orchid Cultivators
(42 Nos.)

Anthurium Cultivators
(42 Nos.)

Small-scale cultivators
(2 x 14 Nos. each)
(Less than 1,000 plants)

Medium-scale cultivators
(2 x 14 Nos. each)
(1,000 - 5,000 plants)

Large-scale cultivators
(2 x 14 Nos. each)
(More than 5,000 plants)

In Southern Zone

Trivandrum (3 Nos.)
Quilon (3 Nos.)
Alleppey (3 Nos.)
Pathanamthitta (3 Nos.)

In Central Zone

Kottayam (3 Nos.)
Idukki (3 Nos.)
Ernakulam (3 Nos.)
Trichur (3 Nos.)

In Northern Zone

Kasargode (3 Nos.)
Kannur (3 Nos.)
Vayanadu (3 Nos.)
Calicut (3 Nos.)
Malappuram (3 Nos.)
Palakkadu (3 Nos.)

Contents of the Schedule

The Schedule consists of 7 blocks.

Block I Contains General Information.

Block II Contains details of Cultivation.

Block III Contains details regarding the Pattern of Labour Utilisation and Employment Generation.

Block IV Contains Cost of Cultivation.
Block V Contains details regarding Source of Finance
Block VI Contains details of Marketing.
Block VII Contains Other Information.

B. Secondary Data

The relevant secondary data for the study have been collected mainly from various Books, Thesis, Reports, Journals and Periodicals relating to the subject.

DATA ANALYSIS

Statistical techniques such as scaling and scoring techniques are used for the analysis of data. Scoring technique is used for identifying the cultivation and marketing problems of Orchid and Anthurium growers and also for the interpretation of information elicited from the sample respondents. Scaling technique is used to analyse the opinion of respondents regarding various aspects of cultivation and marketing. Economic viability of Orchid and Anthurium cultivation have been carried out by means of the criteria such as the Pay Back method (Pay Back Period, Discounted Pay Back Period, Post Pay Back Profitability, Discounted Post Pay Back Profitability) Net Present Value method, Benefit - Cost Ratio and Internal Rate of Return method. Marginal Costing and Break-Even analysis are also carried out in this study in the case of Small-scale (Low category), Medium-scale (Medium category) and Large-scale (High category) growers of Orchids and Anthuriums who are adopting alternative methods of cultivation. The results of the analysis are presented by means of Tables, Charts and Diagrams, wherever it is found necessary.
LIMITATIONS OF THE STUDY

Most of the primary data required for the study have been collected from sample respondents based on sample survey method. As such, it is subject to the normal errors inherent in such social surveys due to the natural bias in the reporting of data by respondents. Even though utmost care has been taken in verifying the reliability of data, possibility of such errors cannot completely be ruled out. Although there are several types of cut flowers grown on a commercial basis, the present study is limited to the analysis of two commercially important cut flowers, viz., Orchids and Anthuriums that have gained wide popularity in Kerala. The protocol in case of in vitro propagation of Orchids and Anthuriums are different and this will also vary from variety to variety, resulting in variations in the elements of cost at each stage. The present study is limited to the analysis on the basis of the laboratory results obtained in case of in vitro propagation of the dendrobium variety of Orchid and the andreanum variety of Anthurium plants only. The study is also limited to the analysis from the points of view of the biotechnology labs, cut flower growers and traders only and as such the generalisation of the findings is also limited to that extent.

PRESENTATION OF THE STUDY

The study is presented in NINE chapters.

1. In Chapter ONE, the Introduction, Statement of the Problem, Review of Literature, Significance, Importance, Scope, Objectives, Methodology, Data analysis, Limitation and Presentation of the study are given.
2. Chapter TWO deals with an overview of the history of Orchids and Anthuriums.

3. Chapter THREE is devoted to highlight the uses of Orchids and Anthuriums, their classifications and techniques of propagation, cultivation, and preservation.

4. Chapter FOUR analyses the cost and profitability related aspects of in vitro propagated Orchid and Anthurium plants.

5. Chapter FIVE deals with the socio-economic conditions and other aspects of cut flower growers in Kerala.

6. Chapter SIX is devoted to make an in depth analysis of the economic viability and the cost and profitability related aspects of alternative methods of Orchid and Anthurium cultivation.

7. Chapter SEVEN deals with the marketing of Orchids and Anthuriums.

8. Chapter EIGHT presents the problems and prospects of cut flower industry in Kerala.

9. Chapter NINE presents the findings and conclusions of the study and the suggestions and recommendations based on the findings of the study.
REFERENCES


