CHANGING SCENARIO OF THE CUT FLOWER INDUSTRY IN CENTRAL KERALA – AN ECONOMIC ANALYSIS

By

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(2009-11-142)

THESIS

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DECLARATION

I, hereby declare that this thesis entitled **"Changing scenario of the cut flower industry in Central Kerala – an economic analysis"** is a bonafide record of research work done by me during the course of research and that the thesis has not been previously formed the basis for the award to me of any degree, diploma, fellowship or other similar title, of any other University or Society.

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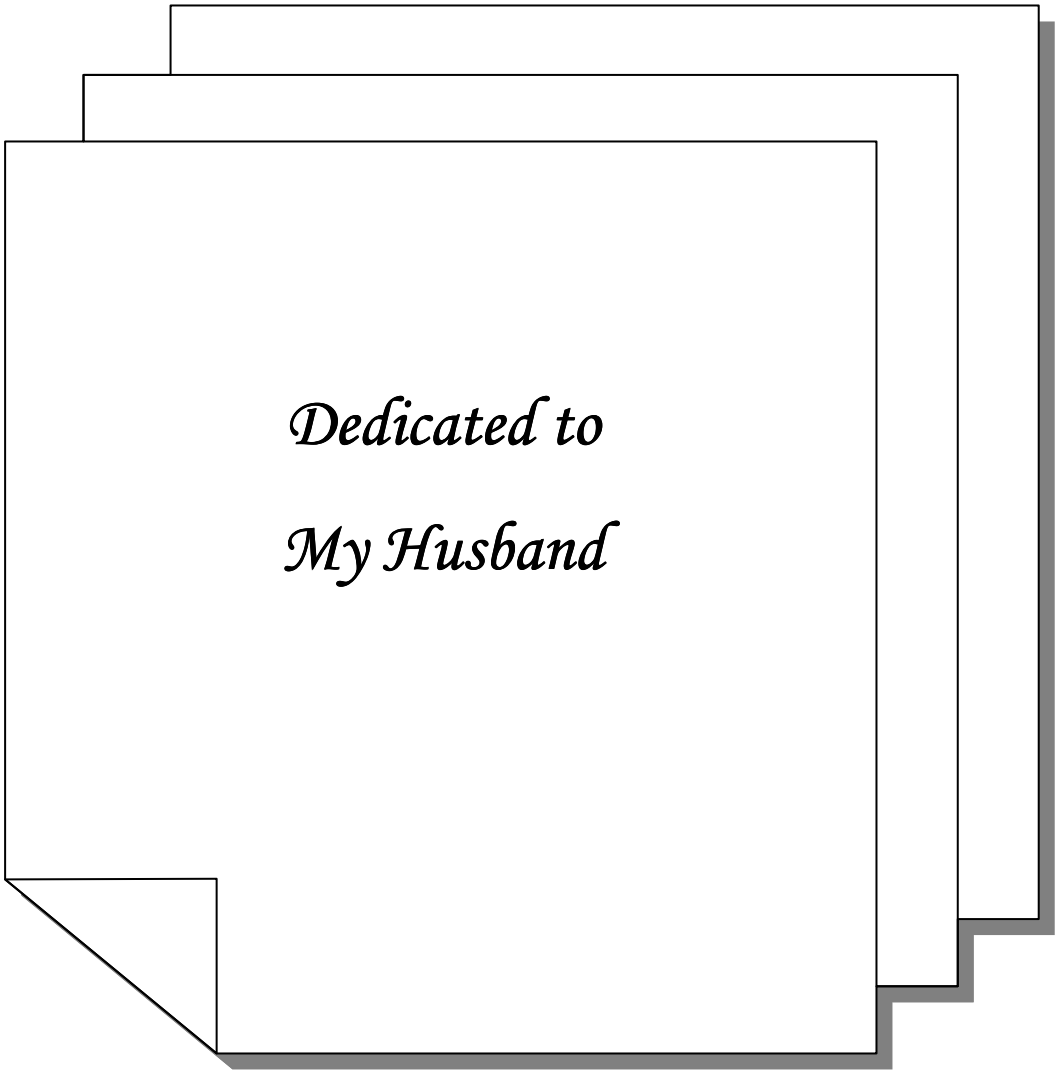
Dedicated to
My Husband

Introduction

1. INTRODUCTION

Floriculture is an activity with immense potential for generating remunerative self employment among small and marginal farmers. Today, floriculture is a lucrative profession with high potential for returns. The demand for flowers both in India and international markets is increasing at a faster rate owing to the liberalization of economy and globalization of trade.

In terms of production, floriculture in the world is growing at an average rate of 10 per cent per year. There are over 50 countries that are active in flower production on a large scale. Netherlands, United States, Japan, Italy, Germany and Canada are the largest producers of cut flowers. The major consumers of floriculture products are Europe, USA and Japan. In case of cut flowers per capita consumption in Japan is the highest, followed by Europe and US. Global exports of floriculture products stood at US$ 9.0 billion in the year 2009-10. Netherlands, Germany, Italy and Belgium are the major exporters of cut flowers to world market while Germany, France, US and UK are the major importers. Developed countries in Europe, America and Asia account for more than 90 per cent of the total world trade in floriculture products. The cut flowers which have great demand in trade are rose, carnation, chrysanthemum, gladiolus, orchids and anthurium.

Floriculture is a multi-crore industry in India which contributes 0.6 % to the global floriculture trade. Post globalization, floriculture has become one of the important commercial activities in Indian agriculture. Government of India has identified floriculture as a sunrise industry and accorded it 100 per cent export oriented status. A consistent increase in demand for cut flowers has made floriculture as one of the important commercial trades in agriculture. The liberalization of economy since 1991-92 has given an impetus to the Indian entrepreneurs for establishing export oriented floriculture units under controlled climatic conditions.

India has the advantage of a perfect climatic and economic setting for a potentially profitable floricultural sector. Suitable agro-climatic condition, cheap labour, geographic proximity to major world markets and promising domestic market are the factors that are beneficial for the growth and development of this sector. With suitable policy support, India can make use of these factors to make a dent in the international trade. In 2009-10, the total area under floriculture in India was estimated to be 183 thousand hectare with an estimated production of 1021 metric tonnes of loose flowers and about 6667 million numbers of cut flowers. The year-wise area and production of flowers in India is furnished in Table 1.1 and same in Fig.1.

Table 1.1: Area and production of flowers in India

Year	Area	Production	
		Loose(in 000'MT)	Cut flowers (in
2001-02	106	535	2565
2002-03	70	735	2060
2003-04	101	580	1793
2004-05	118	659	2071
2005-06	129	654	2921
2006-07	144	880	3716
2007-08	166	868	4364
2008-09	167	987	4794
2009-10	183	1021	6667

Source: National Horticulture Board: Horticulture Database-2010

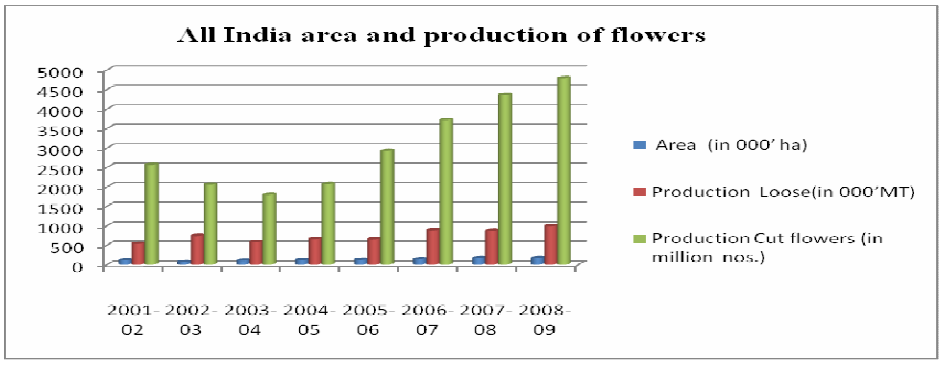

Fig. 1. Year-wise area and production of flowers in India

Rose is the principal cut flower grown all over the country. Other most important cut flowers in the country are gladiolus, tuberose, aster, anthurium, orchid, gerbera and carnation. Tamil Nadu is the largest loose flower producing state, while West Bengal is the leading cut flower producing state in India. Maharashtra, Andhra Pradesh, Karnataka, Orissa and Gujarat have emerged as major floriculture centers in recent times. The percentage share of major cut flower producing states is depicted in Fig.2.

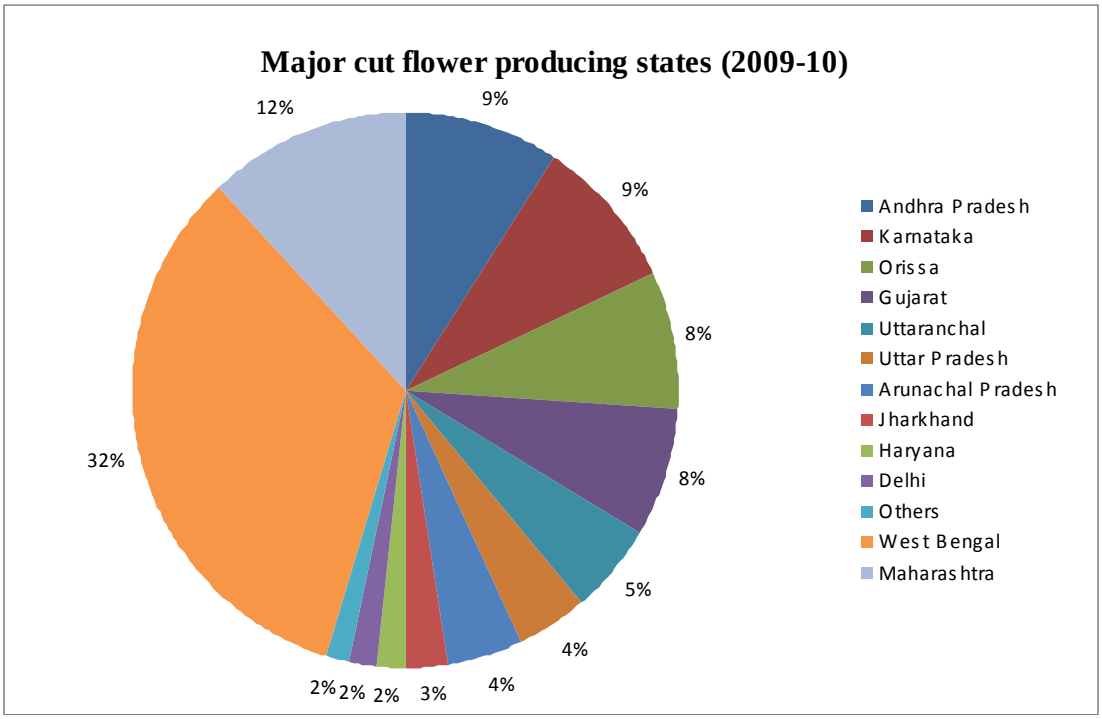

Fig. 2. Major cut flower producing states in India

Source: National Horticulture Board: Horticulture Database-2010

The year wise export data of floricultural products from India indicates that, India's export of floricultural products in the year 2009-10 decreased by 13 per cent from 2008-09 to 2009-10 and during the same period the value of exports decreased by 20 per cent (Table 1.2).

Table 1.2: Export of floricultural products from India

Year	Total export of floricultural products	
	Quantity (in MT)	Value (Rs.lakhs)
2007-08	36240.71	34014.42
2008-09	30798.34	36881.41
2009-10	26814.52	29446.36

Source: APEDA

Orchid and anthurium are the important crops in international flori-trade. Thailand is the largest producer of orchids accounting for about 70 per cent of the world production. Out of over 30,000 species of orchids throughout the world, India alone accounts for about 1300 species. Orchids, which constitute nine per cent of the total Indian flora, are mainly distributed in north-eastern region and Western Ghats. Anthurium ranks ninth in the global flower trade. The important states cultivating anthurium are Assam, Kerala, Tamil Nadu and Karnataka, where the favourable climate exists.

The agro-ecological situation prevalent in Kerala provides great potential for flourishing of a strong floriculture industry in the state (Rajeevan, 1999). Kerala, with its humid climate, high temperature and plenty of sunshine, has been identified as the best suited place for the cultivation of tropical orchids and anthurium. 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. Orchid and anthurium cultivation has gained wide popularity all over the state as cut flowers having high commercial prospects. Several entrepreneurs and cut flower societies have started running their units by taking up the production and marketing of these items. The wide popularity, which these flowers have gained in the society, has brought a sea change in almost all the preconceived notions and concepts of Keralites regarding the cultivation, multiplication and location in which they are to be grown.

Kerala, blessed with a congenial agro-climatic situation, rich biodiversity and native flora, high level of literacy rate and access to modern technologies has yet to make a dent in the international trade of floricultural products. The relatively smaller size of land holdings in Kerala restrains further scope for cultivation in the state. The chronic unemployment, prevalent among the educated people in Kerala is yet another challenge. The cultivation and marketing of cut flowers like orchids and anthurium 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.

The government support in recent years has significantly improved this business but it still needs more attention. Any effort at analyzing the status of floriculture in Kerala would get restricted due to scarce and often unreliable nature of statistical information about the sector. In the absence of any reliable statistical information on the economics and marketing of cut flower units in the study area, this study has been undertaken with the objective to bring out a realistic picture of the commercial aspects of the industry.

The specific objectives of the study are:

a) To study the economics of cut flower enterprises, marketing channel and marketing efficiency of cut flower trade.
b) To identify the major constraints in cut flower industry.

Scope of the study

Kerala's floriculture business mostly centres round the high priced orchid and anthurium. Floriculturists are mushrooming day by day and they are doing brisk business in Kerala. However, there has not been any recent field level empirical study on the economic viability of cut flower enterprises in central Kerala. This study will

be of use to orchid and anthurium growers and entrepreneurs to get a realistic picture on the economic viability and marketing situation of these two crops.

Limitation of the study

Most of the primary data required for the study have been collected from sample respondents based on 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. The practice of record keeping is not found among the cut flower growers. Even though utmost care has been taken in verifying the reliability of data, possibility of such errors cannot completely be ruled out. Because of the stiff competition existing in marketing of cut flowers, some of the growers who exported their products were found a little reluctant in revealing any details about the market. 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 that have gained wide popularity in Kerala.

Review of literature

2. 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. A large volume of literature is available on various aspects of floriculture sector. These papers analyse the present state of affairs and future prospects and constraints of cut flower industry. The literature on floriculture is presented under three headings.

2.1 Economics of flower cultivation

2.2 Marketing of flowers

2.3 Constraints and suggestions

2.1 ECONOMICS OF FLOWER CULTIVATION

George and Joseph (1973) found out the cost and returns from tree crops namely coconut, rubber and oil palm with an establishment period of seven years and the project life period as 40 years. At the discount rate of 9 per cent the NPW of a hectare coconut garden was calculated as Rs. 8.70. The IRR was obtained as 9.5 per cent, BCR was 1.07 and PBP worked out to 16 years.

In a study on cost of cultivation of pepper in Idukki district in Kerala, Vinod (1984) found that the cost of cultivation decreased as the size of holding decreased. He observed that PBP of pepper was 10 years, BCR 1.09 and NPW was Rs.4,180 at 10 per cent interest rate. The IRR was found to be 13.48 per cent.

Shukla and Jain (1996) estimated the cost breakdown and net profit in the export oriented flower producing companies mainly rose flowers in India. On an average the net profit margin of companies was about 30 per cent. The rest 70 per cent was divided into three different cost components i.e. marketing and transport costs (30%), freight and transport cost (15%) and production cost (15%).The rest included financial charges, depreciation and other costs.

Misra (1997) had estimated the investment requirements of floriculture units in India. Capital costs for rose cultivation were worked out as Rs.111 lakhs per hectare. For carnation, capital cost was Rs.107 lakhs per hectare and for orchids it was Rs.69 lakhs.

Salvi (1997) conducted an experiment on anthurium cultivation and calculated the economics involved in cultivating 2000 plants in Kerala. The total cost of cultivation was Rs.3.37 lakhs of which Rs.1.93 lakhs was fixed component (non recurring). The net profit was Rs.4.38 lakhs. It was noted that as the age of the plant advances, the expenditure was comparatively reduced and the margin of profit could be increased to a greater extent because of the higher number of suckers and flowers.

Fitch (1998) reported that orchid flower production was considered as a high income business in and around the Kingdom of Thailand. Orchid had been considered as an important alternative because it offered high returns and there was strong domestic and export market for them. It had high retail acceptance, good resale value and it took relatively little space and cultivation time in relation to income produced.

Rajeevan (1998) had estimated cost of cultivation for a unit of 1000 orchid plants. About Rs.1 lakh was estimated as establishment cost while Rs.5,000 as the recurring costs from the second year onwards. The economic life of crop was taken as five years.

Federation of Indian Floriculturists (1997) had projected the annual returns from a unit of 500 orchid plants as Rs. 23,500 in the second year, Rs. 41,000 in third year, Rs. 42,500 in the fourth year and Rs. 78,500 in the fifth year.

Gajanana and Subrahmanyam (1999) had estimated the establishment costs of 1000 anthurium plants in the Coorg district of Karnataka, based on a study of 33 anthurium growers. It was found out that for small-scale growers the establishment cost was Rs. 1.27 lakh and for large-scale growers it was Rs. 1.03 lakh.

Karn (1999) estimated the economics of orchid and anthurium cultivation in Kerala. The economic life considered was five years. The total cost of cultivation for 100 orchid plants worked out to Rs.19, 902 for G-1 (<500 plants), Rs.19,114 for G-11 (500-1000 plants) and Rs.16,508 for G-111 (>1000 plants). Per unit cost of cultivation was showing a decreasing pattern towards larger groups. For anthurium, the total cost of cultivation for 100 plants was estimated as Rs.21,921 for G-1, Rs.19,535 for G-11 and Rs.18,064 for G-111. The establishment cost for 100 anthurium plants worked out to Rs. 11,980 for group 1 (<500 plants), Rs.11,046 for group 11(500-1000 plants) and Rs. 10,792 for group 111(>1000 plants). Recurring costs were estimated as Rs.9,941 in group 1, Rs.8,489 in group 11 and Rs.7,272 in group 111.

Nimbalkar and Tilekar (1999) estimated the production costs of rose cut flowers in Indian polyhouses. It was observed that the average minimum size of each polyhouse owned by entrepreneurs was one hectare with total number of polyhouses owned ranging from 7 to 10. The average cost of production of roses per polyhouse was estimated as Rs.46 lakhs per annum. Of these costs, fixed costs constituted 36 per cent while operating costs shared nearly 64 per cent. The average cost of production per flower was estimated as Rs.6.85 with an average of 2500 flowers produced per day per polyhouse for a period of 9 months.

Samuel (1999) indicated that once orchid starts flowering after one year, it would give an annual rate of return of over 100 per cent with an initial investment of Rs. 35,000 from an area of 14 square meters.

Tilekar and Salunkhe (2001) estimated the costs of production of major cut flowers grown under open conditions and in poly houses in three districts of Maharashtra. The study revealed that the actual expenditure on account of human labour was maximum followed by planting material, plant protection chemicals and value of land in both types of cultivation.

Somasundaran (2002) observed that in the case of in-vitro propagated orchid plants; per plant cost was Rs.14, while in the case of anthurium it was Rs.8. He concluded that it was profitable to produce and market anthurium plants in vases or containers because per unit profitability was maximum i.e. Rs.2.15, when compared to orchid plants where the margin of profit per plant was Rs.1.17 only.

John (2003) reported that the cost of cultivation and processing of vanilla for a bankable project as assessed by the NABARD, during the late 1990s worked out to Rs.50,000 per hectare over a period of 3 years and its annual maintenance cost was Rs. 12,000 per hectare. The economic analysis gave a BCR of above 1.5 and IRR above 50 per cent.

Kiyuna *et al*. (2004) estimated the cost and evaluated the investment in the production of anthurium in a greenhouse of an experimental farm in Brazil. The feasibility of the investment was evaluated using indicators such as Internal Rate of Return, Net Present Value and Pay Back Period. It was concluded that the investment was feasible at an IRR of 25 per cent. The results of the research indicated that anthurium cultivation near the metropolis could be an attractive option for small and average producers, as an alternative to the use of land and capital.

Sen and Raju (2006) conducted a survey of all households in one major flower growing village in Muzaffarnagar district in Uttar Pradesh. Their study found out that though the profitability of cut flowers was substantially higher than that of the traditional crops, the participation of the smaller farmers in flower cultivation was lower compared to most of the other farm size categories, primarily because of weak linkages with the market.

Guledgudda *et al.* (2008) in a study on a sample of 60 anthurium growers from the organized and unorganized sector in Coorg district of Karnataka showed that anthurium cultivation was capital intensive for both the organized and unorganized sectors, and that the income in the unorganized sector was comparatively lower due to the lower price they received for their produce.

A study was carried out by Muthoka and Muriithi (2008) to analyse the profitability of small holder flower enterprises in Kenyan economy. The study revealed that most of the farmers had no indication of the return on the amount of capital utilized. They were aware only about their day to day costs such as labour, fertilizer and chemical use.

Biswas *et al.* (2009) reported that floriculture was scale neutral and capable of providing employment at various levels namely villages, market place, urban and peri urban towns and cities. Mostly the poor and the marginal people were engaged in growing flower for commercial purposes. The per hectare cost of cultivation of rose was estimated as Rs.26,400 and net profit as Rs.1,89,600 per hectare.

Haridas (2010) estimated the economics of anthurium cultivation in Wayanad District. The total cost of cultivation is Rs.47,392 in Group I (<500 plants), Rs.82,609 in Group II (500-1000 plants), Rs.1,36,318 in Group III (1000-2000 plants) and Rs.1,48,927 in group IV (2000-3000 plants).She pointed out that majority of cultivators used organic fertilizers and biofertilizers with small quantity of chemical fertilizers for anthurium cultivation.

Horarueong *et al.* (2010) carried out a study to develop the business database of orchid industry in the central region and neighboring areas in Thailand. The data, which were collected by means of questionnaires and in-depth interviews, were drawn from 129 respondents who registered as orchid producers and entrepreneurs with the department of agricultural extension in 2007. The study revealed that 99 per cent of the survey respondents operated business as sole proprietorships. New entrepreneurs would need an initial capital worth 3, 74,744 baht for the farming area of one rai. The most popular species of orchid grown was *Red Bomjo*. On average, the cost for making flask orchids to seedling was 1, 42,820 baht per rai, while the cost for cut-flower orchids were 3,98,966 baht per rai. In terms of product distribution, 62 percent of orchid entrepreneurs used the exporter channel. They recommended that

the government and related sectors must launch a price guarantee scheme to help orchid entrepreneurs.

2.2 MARKETING OF FLOWERS

Sindhu (1997) identified six marketing channels for cut flowers in Thiruvananthapuram district. The results revealed that the most important channels utilised by the cut flower growers were 1) Producer → Collection centre → Florishop → Consumers and Producer → Collection centre → Consumers.

In a marketing study conducted in South Indian (Chennai) flower markets by Ghosh (1998) it was observed that growers realized only 31-36 per cent of the consumers price. However, in rose it was about 50 per cent. Analysis of composition of cost price of rose showed that labour, propagation material, fuel and materials covered 33 per cent, 26 per cent, 26 per cent and 4 per cent of total cost respectively.

Karn (1999) identified four marketing channels for cut flowers in Kerala which were 1) Producers ⟶ Local florists ⟶ Consumers 2) Producers ⟶ Exporters Florists(outside) ⟶ Consumers 3) Producers ⟶ Florists (outside) ⟶ Consumers 4) Producers ⟶ Consumers. Out of the four marketing channels identified, the most important was the first channel through which majority of producers sold their produce.

Nimbalkar and Tilekar (1999) evaluated the existing marketing practices of rose cut flowers in Maharashtra. The study revealed that the average price received for sale of cut flowers in export markets were Rs.10 per flower with substantial margin of Rs.4 per flower. With regard to grading, bunching of 20 cut flowers of equal stalk lengths (45cm, 45-60cm and >60 cm) were done systematically and then packed and transported in refrigerated vans to export point (Mumbai). The time of sale and stalk lengths had direct influence on the prices of rose cut flowers in

European markets. The average price received for sale of roses was highest during Valentine day and Christmas.

Jadhav *et al.* (2000) studied the marketing of rose, gerbera, gladiolus and aster in Karnataka. The results showed that transportation was the highest marketing cost item for rose, gerbera and gladiolus while for aster it was retailer's expenses. The analysis revealed that as the number of intermediaries increases, the producers' share in consumer rupee decreases. Producers' share in consumers' rupee was different for different flowers because of various values and demand.

Tilekar and Salunkhe (2001) estimated the costs of marketing of major cut flowers grown under open conditions and in poly houses in three districts of Maharashtra. Season, grades and size of area of both types of cultivation were identified as the factors influencing the price of cut flowers. The commission agent-cum-wholesalers and retailers were the major traders accounting for more than 50 per cent of net profit of producers.

Khushk and Lashari (2002) studied the marketing system of cut flowers in Sindh.They collected primary data through in-depth semi-structured interviews from hundred producers and respective market intermediaries. The marketing channels had been identified as producer, contractor, kanthy wallah, wholesaler and retailer. The producers 'share of the retail price was calculated to be 55 per cent. It was found that large number of buyers and sellers participated in the market process. There was competition at each stage of the marketing chain. No strong evidence was found on collusion among market agencies. The spread of information regarding quantity and price were rapid amongst all marketing agencies.

Tale *et al*. (2003) examined the economics of marketing of different flowers in Nagpur district of Maharashtra. It was observed that the producer had 52-62 per cent shares in consumer's price. The share of commission agent in consumer price varied from 31-40 per cent, while the share of retailer varied from 4.2-9.3 per cent. It

was concluded that market intermediaries like commission agents and retailers earned huge profit over cost incurred. As the number of market functionaries increases, they added value to the commodity in the marketing channel resulting in a fall in the producer's share on consumer rupee.

Kumar *et al*. (2004) examined various aspects of marketing of marigold, rose and jasmine in Varanasi district of Uttar Pradesh. Only one marketing channel had been identified, which included only retailers as intermediaries between producers and consumers. Cost incurred by the retailers in the marketing of marigold, rose and jasmine was Rs.0.69, Rs.1.19 and Rs.1.08 respectively. Spoilage and transportation were the major costs incurred by the retailers in marketing. Marketing cost of marigold was comparatively less due to the lower spoilage costs.

Thakur *et al.* (2004) in their pointed out that in the absence of regulated markets for cut flower in Himachal Pradesh, the growers were found selling their produce through unorganized channels having no set norms for conducting sale proceeds and charging commissions. The prices were arbitrarily fixed by the traders instead of open auction method. Along with that growers did not get sufficient information.

Sangeetha (2005) examined the marketing of anthurium in Thrissur and Palakkad districts of Kerala. Three marketing channels which were identified are 1) Producers→ Pushpakrishi Vikasana Samithi / Cutflower society → Consumers 2) Producers → Local florists→ Consumers 3) Producers → Florists (outside state) → Consumers. Marketing efficiency index was found out as 14, 12.33 and 11.63 for Channel I, Channel II and Channel III respectively. She also estimated the marketing efficiency indices for orchids for the same channels were 21.73, 19 and 18.23.

A study was conducted by Gowda *et al.* (2006) to determine the marketing pattern of cut flowers in Belgaum District, Karnataka. The results showed that 70 per cent of the respondents sold their produce through commission agents and 30 per cent

of the respondents sold their flowers through retail outlets. The major problem in production and marketing of cut flowers were pests and diseases, high investment, exploitation by middle men, fluctuation in prices and low price of the flowers.

Rajeevan *et al.* (2006) estimated the costs and returns associated with market sale and field sale of consignments of two hundred anthurium stems. The study revealed that the cost of marketing works out to Rs.2.46 per stem. Packing and transport were the major components of marketing cost accounting for 41 and 59 per cent respectively. Marketing of anthurium in the distant markets involve additional expenditure, but the net returns were higher than the returns from selling in the local market.

A study was carried out by Muthoka and Muriithi (2008) to analyse the profitability of small holder flower enterprises in Kenyan economy. The analysis revealed that most of the farmers had on the market, because the marketing and logistics were handled by a marketing agent.

Kohno (2009) pointed out that despite the expansion of the final consumption market for floriculture products in Japan during the early 1990s, demand for these products had declined since the late 1990s.The retail sale shares of florists, which were the major conventional retail channel for flowers, have been decreasing, while the shares of mass retail channels, such as super markets and home improvement centers, have shown an increase. Therefore, in terms of demand for flowers by usage, household consumption demands have increased.

2.4 CONSTRAINTS AND SUGGESTIONS

Sindhu (1997a) recommended that the production technology of flowers in India must reach the grass root level through effective extension network. Since floriculture industry was capital intensive, the provision of bank loans at lower rate of interest could encourage many floriculturists to take up production of flowers and plants for export. Marketing procedure of flowers should be channelized under the

control of Government of India. She suggested that some incentives in providing basic facilities, marketing, cargo space and cold chain must be given to the growers.

Sindhu (1997b) identified the major constraints of cut flower industry in Thiruvananthapuram district of Kerala. The major marketing constraints were inability of small growers to find market, unorganized marketing channel, unhealthy competition among growers and lack of co-ordination among florists. Non availability of quality planting materials and high initial investment were found as the major production constraints.

Joglekar (1998) identified the major marketing constraints in floriculture industry as non availability of organized marketing and monitoring system, market surveys, lack of sales promotion activities and insufficient cold storage facilities.

Gajanana and Subrahmanyam (1999) have studied the marketing practices and identified the constraints in production and marketing of anthurium in Coorg district of Karnataka. Primary data pertaining to the year 1997-98 were collected from 33 anthurium growers by interview method. About 40 per cent of the respondents expressed non-availability of required quantity and quality planting materials as the major production constraint. Unorganized marketing, transportation and absence of regular buyers were the most important marketing problems faced by these growers.

Karn (1999) identified the major constraints of cut flower industry in Kerala as lack of institutional support for small growers, high initial investment, high level of intra-farm varietal diversity and irregular market.

Kaur (1999) has reported that the Indian floriculture industry suffered a setback estimated at 30 per cent due to fall in production. The delay in production due to cloudy weather resulted in Indian exporters missing the four auction days in Holland which led to a loss of one crore rupees to the industry. The study emphasized

that though the industry is facing hard time in export market, chances are bright on the domestic front.

Alsagoff (2000) has examined the enormous potential for growth in terms of market share for orchid in Southeast Asia. Asia's economic crisis and a growing preference for other flower types amongst consumers were identified as the major constraints in orchid industry. Reducing production costs, responding to changing customer tastes, developing new markets and products and exploring the benefits of electronic commerce were suggested as measures to boost the orchid trade.

Kumar (2000) opined that various problems associated with the marketing of flowers created hurdles in expansion of area and production of flowers. Hence it was necessary to have an in-depth knowledge of the marketing system for development of the industry.

Dadlani (2002) stated that for a highly perishable produce like flowers, marketing was of key importance. Creation of appropriate infrastructure, improving growers' access to market intelligence and assisting them to adopt simple accounting system would help them to obtain high returns. Producers must be guided to sell their products at near-by markets, rather than sending to distant markets where they may fetch lower prices because of quality loss.

Kazi (2002) stated that the agro climatic diversity of India provided an economic fortune for floriculture business. For the development of export trade of floriculture there should be regular interaction between researchers' and floriculturists engaged in export.

Somasundaran (2002) in his study on cut flower industry in Kerala found out the major production problems of cut flowers as high cost of plants, non availability of disease resistant and high yielding planting materials, lack of training, high initial investment, high cost of maintenance and incidence of pests and diseases and the major marketing problems as lack of procuring agency, inadequate market

information, erratic fluctuation in price, delay in payment of sale proceeds and low internal demand.

Tale *et al*. (2003) opined that unorganized marketing, high cost of transportation, absence of regular buyers, exploitation by the florists in the form of delayed payment were the major constraints of floriculture industry in Maharashtra. The growers association could start a procurement centre at the production areas which would help in collection of flowers and the government should make proper efforts to minimize marketing cost through regulatory authority. Effort should be made for development of low cost technology for maximizing yield at minimum cost and also proper guidance regarding grading, packing and maintenance of keeping quality should be provided regularly through agricultural universities and government departments so as enhance the export of the produce.

Khan (2004) reported that apart from fruits and vegetables, floriculture industry had a major stake in horticulture. Liberalization of economy in 1991-92 led to large scale adoption of commercial floriculture as an enterprise. Emphasis shifted from traditional flowers to cut flowers for export purpose. Cultivation of flowers under controlled conditions in green houses provided better results for the export oriented units.

Kumar *et al*. (2004) pointed out that price fluctuation was the major problem faced by majority of flower cultivators in Uttar Pradesh. Illegal deduction from the receipts of the farmers, inadequate transport facilities, improper weighment, and lack of institutional credit were the other major constraints faced by farmers during the marketing of flowers in study area.

Mahalakshmi (2004) pointed out that poor performance by the floriculture units in the last few years was on account of high cost of finance, increase in freight cost, absence of proper infrastructure for export facilitation and discrimination for Indian exporters with the European Union import duty.

Ahmed (2005) suggested that with improvements in the quality of planting material, infrastructure, training programmes in production, harvesting and post harvest management techniques, backed by adequate marketing support, there was ample scope for even small and marginal entrepreneurs in India to exploit the global demand of flowers. Since the main objective of Indian cut flower production is to export, growers should focus their efforts on developing export quality produce and expanding into profitable international market.

Sangeetha (2005) in her study on marketing of commercial flowers in Thrissur and Palakkad districts of Kerala reported that non availability of quality planting materials was the major problem in orchid and anthurium cultivation. Other important problems in marketing of flowers were lack of assistance from government and exploitation by the intermediaries. She suggested that the floriculturists have to be organized under a strong government organization which guarantees all assistance in tackling of production problems and marketing problems like timely and guaranteed payment.

A study was conducted by Gowda *et al.* (2006) to identify the constraints in cultivation and marketing of cut flowers in Belgaum District, Karnataka. The analysis revealed that the major problem in production and marketing of cut flowers were pests and diseases, high investment, exploitation by the middle men, fluctuation in prices and low price of the flowers.

Sen and Raju (2006) conducted a survey of all households in one major flower growing village in Muzaffarnagar district, Uttar Pradesh, India. The results indicated that risk aversion was an important impediment to crop-diversification, particularly for the land poor category of farmers. It was argued that schemes to diversify crops were likely to face serious constraints unless resource related and institutional barriers like access to markets were overcome.

Singh (2006) discussed the major problems in Indian floribusiness. Improper handling after harvest, unavailability of optimum temperature and moisture conditions during storage and transportation, under or over packaging leading to damage and wilting were a few factors which have an adverse impact on the quality of Indian flowers reaching the consumer, both domestic and international. The study provided insight into the reasons for the failure of export oriented units such as lack of experience, inadequate research support, inadequate market knowledge and infrastructural and procedural problems.

Jiunshong *et al.* (2009) have observed the influences of different factors on orchid production and marketing workers' willingness to share knowledge in Taiwan. A survey was conducted on 66 orchid production and marketing teams, amounting to a total of 152 workers. Their findings revealed the influence of trust and interpersonal relationship in orchid production and marketing workers' willingness and behaviour to share knowledge. The study suggested the government must promote research to look at cooperation between orchid production and marketing teams. By promoting the technical advancement of orchid production and marketing teams, the domestic orchid industry would become more competitive in Taiwan.

Anefalos *et al*. (2010) examined the production and commercialization of tropical flowers particularly anthurium, in order to magnify the socioeconomic impact of this sector and highlight the participation of Brazil in international markets. In 2008 a survey was conducted in an important fair, in the city of Holambra. Statistical analysis showed that new technologies such as organic cultivation have been adopted through education or the engagement of consulting services. Their findings revealed that the prospects for anthurium, in particular, in terms of production, commercialization or consumption in the domestic and international market, are positive. They suggested that to promote the productivity of tropical flowers, access to new technology and marketing in the domestic market have to be intensified.

The review of similar work done in the floribusiness with regard to its economic aspects, marketing and constraints indicated that most of the studies pertained to other states and other flower crops. A critical analysis of the economics of cut flower trade especially with regard to two major cut flowers, orchid and anthurium are scanty barring some studies here and there and no systematic attempts have been made. This indicates the relevance of this study.

Methodology

3. METHODOLOGY

The design of the study undertaken and methods followed are discussed in this chapter. The sampling design, the method of collection of data and empirical analysis are covered in order.

3.1 Sampling design

This study entitled "Changing scenario of the cut flower industry in Central Kerala-an economic analysis" was conducted in Thrissur and Ernakulam districts of Kerala. Floriculture business is well flourishing in Central Kerala as the climatic conditions prevailing in the area are favourable for the cultivation of orchids and anthurium. Thrissur and Ernakulam districts are logistically better situated with regard to export. These two districts can easily avail transportation facilities through Nedumbassery airport, Cochin seaport and rail. The cut flower traders and farmers in these areas utilize these facilities easily. During the last fifteen years these districts have witnessed a mushroom growth of cut flower enterprises.

For a detailed analytical study of cut flower industry a sample survey was conducted in Thrissur and Ernakulam districts. Orchid and anthurium were the major cut flowers included in the study. From these two districts 120 cut flower growers were randomly selected. Besides twenty cut flower traders were also selected based on the marketing channels identified. Primary data were collected by means of structured schedules administered among growers and traders of these two districts. The list of cut flower growers were taken from the Departments of Agriculture and Cut flower societies. From the list, 40 orchid and 80 anthurium growers who have at least three years of experience in floribusiness was selected. The sample growers were post stratified into small-scale, medium-scale and large-scale cultivators based on the number of plants cultivated by each grower. Classification was as below:

Category 1 (symbolised as C-1) - less than 500 plants (small scale)

Category 11 (symbolized as C-11) - 500 to 1000 plants (medium scale)

Category 111 (symbolized as C-111) - above 1000 plants (large scale)

3.2 Collection of data

Collection of data was carried out during the period of January 2011 to March 2011. A pilot study was conducted among cut flower growers as well as various intermediaries involved in the marketing of the cut flowers. Based on the indications obtained from the pilot study, interview schedules were prepared. The required primary data were collected from the growers by personal interview method using well-structured and pretested schedule. The information on socio-economic characteristics and on various aspects of orchid and anthurium cultivation were obtained. Information relating to production and marketing aspects, inputs, cost structure and returns were also collected. The collected data were tabulated and analysed to arrive at results and to draw conclusions. Simple tabular and percentage analyses were carried out to work out costs and returns of cut flower cultivation. Capital productivity analysis was done to find out the economic viability of cut flower enterprises. Marketing efficiency was worked out using Shepherd's formula and price spread. The concepts used in the study, their measurement and valuation are discussed below.

3.3 Cost concepts

3.3.1 ABC cost

ABC cost concept was used to work out the cost of cultivation. Both input wise and operation wise costs of cultivation were worked out separately for each crop. For each category average cost of inputs was taken. The Estimation Committee on Cost of Cultivation (Government of India, 1981) has categorized farm costs into six groups viz., Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1 and Cost C_2. Cost C_3 has

been added later in 1991 to account for the management input of the farmer (Acharya and Agarwal, 1987). The various components of the above costs are outlined below.

(i) Cost A_1

Cost A_1 approximates all actual expenses in cash and kind incurred in production by the owner operator. It includes the following items.

a) Value of hired human labour and machine labour

b) Value of material inputs

c) Interest on working capital

d) Land Revenue

e) Depreciation on farm implements/machinery

(ii) Cost A_2

Cost A_2 is equal to Cost A_1 plus rent paid for leased in land

(iii) Cost B_1

Cost A_1 plus interest on own fixed capital, including iron and wood implements, machinery such as diesel and electric motors.

(iv) Cost B_2

Cost B_1 plus rental value of own land plus rent paid for leased in land gives Cost B_2.

(v) Cost C_1

Cost B_1 plus imputed value of family labour

(vi) Cost C_2

Cost B_2 plus imputed value of family labour gives Cost C_2

(v) Cost C_3

It is equal to Cost C_2 plus 10 per cent of Cost C_2 to account for the value of management input of the farmer.

3.3.2 Cost of material inputs

Expenditure on all material inputs like planting materials, potting media, manures, fertilizers, plant protection chemicals and growth hormones was estimated on the basis of actual prices paid by the sample farmers.

3.3.3 Value of human labour

Human labour was measured in terms of man-day equivalents. Family labour and hired labour were treated alike and converted into a common physical unit in terms of man-day equivalent. Eight hours of labour is equivalent to one man day. Both hired and family labour are valued at the prevailing wage rates in the area. The wage rates prevailing in the area were on an average Rs. 350 per day for men and Rs.200 per day for women. Hired human labour was used only for potting and planting.

3.3.4 Interest on working capital

Interest on working capital was worked out at the rate of 7 per cent per annum which was the interest rate charged by commercial banks on short-term agricultural loans for less than three lakhs rupees.

3.3.5 Land revenue and land rents

Since these crops are grown in residential premises – on terraces/backyards, land revenue and land rents do not seem to be relevant cost component and have been

excluded from the analysis. No case of leasing-in of land was observed in the samples selected.

3.3.6 Depreciation

Depreciation was worked out by the straight-line method at the rate of 15 per cent for shade house and 10 per cent for irrigation system, tools and equipments

3.4 Capital Productivity Analysis

Capital productivity analysis is the most important tool for evaluating the financial feasibility of enterprises. It brings out the efficiency of capital use in production. There are various methods to measure the capital productivity. The four measures used in this study were:

a) Pay Back Period (PBP)
b) Benefit Cost Ratio (BCR)
c) Net Present Value (NPV) and
d) Internal Rate of Return (IRR)

The cost of cultivation and returns obtained over the economic life of orchid and anthurium was used for these computations. Excepting PBP, all others are discounted measures of economic appraisal. For estimating these parameters costs and returns are discounted at 13 per cent rate of interest, being the rate at which medium term and long term credit could be obtained from commercial banks.

3.4.1 Pay Back Period

It is an undiscounted measure of the worth of an endeavor, which measures the efficiency of cultivation by indicating the period within which the returns offset the investment. PBP has two major draw backs as a measure of investment worth: a)

it does not consider earnings after this period and b) it fails to take into consideration difference in the timing of earnings during the pay back period. Given the expected life of the project, the shorter the pay back period, the greater is the profitability. The Pay Back Period can be estimated by estimating the progressive total of returns and costs. The year at which progressive total of returns exceeds progressive total of costs is considered as pay back period.

3.4.2 Benefit Cost Ratio

The benefit cost ratio indicates the return on a rupee of investment. It is the ratio between the present worth of benefits and that of costs (Gittinger,1984). A project with benefit cost ratio greater than unity is considered viable.

$$BCR = \frac{\sum \{Bt / (1+ i)^{t}\}}{\sum \{Ct / (1+ i)^{t}\}}$$

Where, t = 1…….n years

(n = Total no of years of the project)

B_t = Benefits in t^{th} year

C_t = Costs in the t^{th} year

i = Discount rate

3.4.3 Net Present Value

This is the most straight forwarded discounted cash flow measure of project worth. This is simply the present worth of the net cash flow stream (Gittinger, 1984). In other words it is the difference between present worth of benefits and present

worth of costs. The formal selection criteria for the NPV measure of project worth is to accept all projects with a positive net present value when discounted at the opportunity cost of capital.

Symbolically, Net Present Value (NPV) is

$$NPV = \sum \frac{(B_t - C_t)}{(1 + i)^t}$$

Where, t = 1……n years

(n = Total no. of years of the project)

Other symbols are same as mentioned above.

3.4.4 Internal Rate of Return

Another way of using discounted cash flow for measuring the worth of a project is to find that discount rate which just makes the net present value of the cash flow equal to zero. This discount rate is termed the Internal Rate of Return and it represents the average earning power of money used in the project life (Gittinger, 1984). Based on this criterion, a project is considered worth to be accepted if the IRR is above the opportunity cost of capital.

Symbolically, internal rate of return (IRR) is that discount rate 'i' such that,

$$NPV = \frac{\sum (Bt - Ct)}{\sum (1+ i)^t} = 0$$

Where t = 1…….n years

(n = total no. of years of the project)

Other symbols are as mentioned above.

3.5 Marketing Concepts

3.5.1 Market

Kotler (1989) viewed the concept of market from two angles – that of an economist and that of a marketer. For an economist the term market referred to the aggregation of buyers and sellers interested or potentially interested in a product group. For a marketer, the market embraces all persons or business units who buy or induce to buy a product or service. Thus market would indicate an organization or an institution that performs the function of marketing which in turn is a process by which goods and services are directed from the primary producer to the ultimate consumer.

3.5.2 Marketing

Marketing is defined as a social and managerial process by which individuals and groups obtained what they needed through creating offering and exchanging products of value with others (Kotler, 1989).

3.5.3 Marketing channel

Marketing channel are routes through which agricultural products move from producers to consumers (Acharya and Agarwal, 1987)

3.5.4 Marketing costs

Marketing costs are the actual expenses required in bringing goods and services from the producers to the consumers. It includes commission charges, transport cost, market fee and miscellaneous charges (Acharya and Agarwal, 1987).

3.5.5 Marketing margin

Marketing margin is the difference between price paid by the consumer and price received by the producer for an equivalent quantity of farm produce. The total

marketing margin includes all the costs and profits involved in moving the produce from the initial point of production till it reaches the ultimate consumer (Acharya and Agarwal, 1987). The net margin of each intermediary is the margin received by intermediaries over their cost in the disposal of a unit equivalent quantity of produce.

3.5.6 Marketing Efficiency

Marketing efficiency is related to the cost involved to move goods from the producer to the consumer and the quantity of services provided or desired by the consumer. If the cost compared with the services involved is low, then it will be an efficient marketing system and vice versa. An improvement that reduces the cost of a particular function without reducing consumers' satisfaction indicates improvement in the marketing efficiency (Chahal and Gill, 1991). In the present study marketing efficiency in various channels were computed by Shepherd's formula and price spread.

3.5.6.1 Shepherd's formula

Shepherd (1965) has suggested that the ratio of the total value of goods marketed to the marketing costs may be used as a measure of efficiencies. Marketing efficiency is measured as follows,

$$ME = (V/I) - 1$$

Where, V= Total value of goods marketed and

I= Marketing cost

3.5.6.2 Price Spread

It refers to the difference between the price paid by the consumer and the price received by the producer for an equivalent quantity of farm produce (Acharya

and Agarwal, 1987). It is the proportion of marketing cost and marketing margin in terms of consumer rupee.

3.6 Constraints in production and marketing of cut flowers

The farmers were asked to rank the constraints from 1 to 10 according to the order of importance perceived by each of them. A weight of 10 was given to the first ranking constraint and 1 to the tenth ranking constraint respectively in the decreasing order of preference. These ranks were multiplied by the corresponding weights and total score of each constraint was worked out.

Results and Discussion

4. RESULTS AND DISCUSSION

The data collected through the survey were subjected to statistical analysis and the results are presented under four sub headings pertaining to anthurium and orchid and the last session dealing with the constraints faced in the cut flower industry. The first session deals with the socio economic profile of growers. In the second session general information on cultivation and in the third session the economics of cultivation and capital productivity analysis are dealt with. The fourth session deals with the marketing and marketing efficiency of the selected enterprises. The sessions one to four are categorized separately under anthurium and orchid for three different scales of operation [C-1(<500 plants), C-11(500-1000 plants) and C-111(>1000 plants)].

4.1 Anthurium

4.1.1 Socio-economic profile of growers

4.1.2 General information on anthurium cultivation

4.1.3 Economic analysis of the enterprise

4.1.4 Marketing and marketing efficiency

4.2 Orchid

4.2.1 Socio-economic profile of growers

4.2.2 General information on orchid cultivation

4.2.3 Economics analysis of the enterprise

4.2.3 Marketing and marketing efficiency

4.3 Constraints in cut flower industry

4.1 Anthurium

4.1.1 Socio-economic profile of growers

Any study on economics or marketing will be imperfect without a narrative of the general socio-economic conditions of the sample. An idea on the size of units, age, gender, educational status, occupation and family income will help in understanding the results and interpreting it in a better way.

The distribution of sample growers by size of units is presented in Table 4.1

Table 4.1: Distribution of sample growers across different categories

Scale of operation	No. of farmers	Average no. of plants cultivated
C-1	38	286
C-11	33	670
C-111	9	1714
Total	80	2670

More number of growers are available in the lower sized groups compared to C-111. The average number of plants cultivated in each category was 286, 670 and 1714 respectively.

Table 4.2: Distribution of respondents based on age

Age group (years)	C-1	C-11	C-111	Total
25-60	34 (89.47)	26 (78.79)	9 (100.00)	69 (86.25)
>60	4 (10.53)	7 (21.21)	0 (0.00)	11 (13.75)
Total	38 (100)	33 (100)	9 (100)	80 (100)

(Figures in parentheses indicate per cent to total)

The farmer respondents included in the study were categorized into two groups as detailed in Table 4.2 according to their age. Majority of the farmers (86.25%) belonged to the age group of 25-60 years. Only 13.75 per cent farmers were over 60 years of age. Category wise analysis also revealed that in all the categories majority of the farmers belonged to the age group of 25-60 years.

Table 4.3: Classification of respondents based on gender

Gender	C-1	C-11	C-111	Total
Male	0 (0.00)	2 (6.06)	2 (22.22)	4 (5.00)
Female	38 (100.00)	31 (93.94)	7 (77.78)	76 (95.00)
Total	38 (100)	33 (100)	9 (100)	80 (100)

(Figures in parentheses indicate per cent to total)

The classification of growers on the basis of gender revealed that out of a total of 80 respondents, 76 were female and only four were male. The same pattern was observed in all the categories (Table 4.3).

The classification of the respondents according to their educational status is given in Table 4.4 below.

Table 4.4: Classification of respondents based on educational status

Education status	C-1	C-11	C-111	Total
upto SSLC	7 (18.42)	3 (9.09)	0 (0.00)	10 (12.50)
Higher secondary	20 (52.63)	13 (39.39)	3 (33.33)	36 (45.00)
Technical	0 (0.00)	3 (9.09)	0 (0.00)	3 (3.75)
Graduation	7 (18.42)	10 (30.30)	3 (33.33)	20 (25.00)
Post graduation	3 (7.89)	3 (9.09)	1 (11.11)	7 (8.75)
Professional	1 (2.63)	1 (3.03)	2 (22.22)	4 (5.00)
Total	38	33	9	80

(Figures in parentheses indicate per cent to total)

Nearly 45 per cent of the respondents have acquired higher secondary level qualification followed by graduation (25%), SSLC (12.5%) and post graduates (8.75%). This was the pattern in all the categories. It should be noticed that in C-111

33.33 per cent of the respondents were graduates and 22.22 per cent were professionals. Only in C-11 respondents having technical education could be found.

Table 4.5: Distribution of respondents based on main occupation

Occupation	C-1	C-11	C-111	Total
Agriculture	24 (63.16)	29 (87.88)	6 (66.67)	59 (73.75)
Govt. service	0 (0.00)	0 (0.00)	1 (11.11)	1 (1.25)
Private service	13 (34.21)	4 (12.12)	0 (0.00)	17 (21.25)
Own Business	1 (2.63)	0 (0.00)	2 (22.22)	3 (3.75)
Total	38 (100)	33 (100)	9 (100)	80 (100)

(Figures in parentheses indicate per cent to total)

From the Table 4.5 it could be observed that, majority of the respondents were engaged in agriculture (73.75 %) followed by private service (21.25%) and business (3.75%). In all the three categories more than 60 per cent of respondents were engaged in agriculture. Around 34 per cent of the respondents were working in private services in C-1. None of the respondents were engaged in business in C-11. But in C-111, 22 per cent of the respondents were engaged in business.

The distribution of growers based on family income given in Table 4.6 indicated that majority of respondents were having an annual family income in the range of Rs.0.50 -1 lakh (48.75%).

Table 4.6: Distribution of respondents based on family income

Annual family income (Rs.)	C-1	C-11	C-111	Total
50,000-1 lakh	25 (65.79)	13 (39.39)	1 (11.11)	39 (48.75)
1-2 lakh	10 (26.32)	16 (48.48)	1 (11.11)	27 (33.75)
>2 lakh	3 (7.89)	4 (12.12)	7 (77.78)	14 (17.5)
Total	38 (100)	33 (100)	9 (100)	80 (100)

(Figures in parentheses indicate per cent to total)

33.75 per cent received an annual income of Rs.1-2 lakh and 18 per cent more than Rs.2 lakh income. Category-wise analysis also revealed that majority of the respondents in C-1 had an annual family income in the range of Rs.0.50 -1 lakh (65.79%). In C-11 majority had Rs.1-2 lakh annual family income (48.48%). But in C-111, 78 per cent had an annual family income of more than Rs.2 lakh.

The analysis of socio-economic profile of anthurium gowers in the study area indicated that anthurium cultivation was taken up mostly by women (Table 4.3). Majority of the respondents belonged to the productive age group (Table 4.2) with more than three years experience in flower cultivation. Cultivation of anthurium was taken up mostly by educated women having higher secondary level qualification and above (Table 4.4). Size of the production unit was found to be positively correlated with family income. Majority of the growers fall in the income range of Rs.0.50-1lakh. But in C-111 the average size of the unit was nearly six times that of C-1 and the annual family income was more than Rs.2 lakhs (Tables 4.1 and 4.6). The socio-

economic profile analysis of anthurium growers studied by Karn (1999) also obtained similar results in age, gender and family income.

4.1.2 General information on anthurium cultivation

Generally sample growers cultivated red varieties. Tropical red, Mauritius orange, Gold flake, Liver red, Ema white and Lima white are the most common varieties seen. Anthurium prefers higher level of shade, about 75 per cent in Kerala's climatic condition. Almost all the respondents were growing anthurium in earthern pots under shade houses. Commonly used media for anthurium planting were tiles, sand, soil, charcoal, gravel etc. Anthurium requires a little large sized pots than that of orchids. 46.25 per cent of the growers used tissue culture plants for cultivation followed by suckers (45 %). 8.75 per cent of the respondents used both tissue culture plants and suckers for cultivation (Table 4.7).

Table 4.7: Distribution of growers according to the type of planting materials used for cultivation

Type of planting material	Frequency
Tissue culture plants	37 (46.25)
Suckers	36 (45.00)
Both TC plants & suckers	7 (8.75)
Total	80 (100)

(Figures in parentheses indicate per cent to total)

Table 4.8: Sources of planting materials of anthurium

Source	Frequency
Private nurseries	49 (63.75)
Societies	19 (23.75)
Neighbours/friends	10 (12.5)
Total	80 (100)

(Figures in parentheses indicate per cent to total)

Private nurseries were the major source of planting materials for majority of the growers (63.75 %) (Table 4.8). Besides, different flower societies (23.75 %), neighbours and friends (12.5 %), also served as the source of planting materials to the growers. Government and Krishi bhavan is not at all figuring as planting material source of anthurium.

It was observed that nearly 91 per cent of the growers used organic manures for cultivation. Dried cow dung, ground nut cake, neem cake, coconut water, fish extract, diluted cow's urine etc. are the commonly used organic manures. About 9 per cent of growers used both organic and inorganic fertilizers. Disease and pest occurrence was not seen severe in the plants. Generally farmers used I*ndofil, Bavistin, Roger* etc. to control the attack of diseases and pests. Most of the growers used sprinkler for irrigation (57%) followed by manual irrigation (43%). Majority of the growers used well as a source of irrigation (77.5%) followed by pond (20 %) and bore well (2.5%) (Table 4.9).

Table 4.9: Details of irrigation

Source of irrigation	Frequency	Type of irrigation	Frequency
Well	62 (77.50)	Sprinkler	46 (57.00)
Pond	16 (20.00)		
Bore well	2 (2.50)	Manual	24 (43.00)
Total	80 (100)		80 (100)

(Figures in parentheses indicate per cent to total)

Table 4.10: Source of technical assistance

Sources	Frequency
Krishibhavan	41 (51.25)
Kerala Agrl. University	20 (25.00)
Pvt.nurseries	12 (15.00)
Neighbours/friends	7 (8.75)
Total	80 (100)

(Figures in parentheses indicate per cent to total)

The cultural practices and management of anthurium are different from that of other crops. Hence the growers are in need of technical advice on various aspects like crop management and marketing. The institutional support is necessary for achieving success in anthurium enterprises. Krishi bhavans, Kerala Agricultural University, Private nurseries and neighbours and friends had a good role in supplying technical information to growers, especially on various aspects like production techniques, plant protection etc. as given in (Table 4.10). But these institutions seldom were found to support the growers on marketing their flowers.

Experience of the growers in floribusiness is an indirect indication of the interest in flower cultivation. It could be seen that that majority of the farmers had experience in flower cultivation in the range of 5-10 years (57.5 percent). 40 per cent of the farmers had less than 5 years experience in flower cultivation. Only 2.5 per cent had more than 10 years experience (Table 4.11).

Table 4.11: Details regarding experience in floribusiness

Year	Frequency
<5 years	32 (40.00)
5-10 years	46 (57.50)
>10 years	2 (2.50)
Total	80 (100)

(Figures in parentheses indicate per cent to total)

Anthurium cultivation was mostly seen taken up by house wives. Hence it was thought right to enquire the motivational forces for venturing into floriculture.

Interest towards farming, the financial and technical support from the Government, the scope for doing it as a household activity, its scope for providing better opportunity as a self employment venture and business were reported as the reasons for undertaking anthurium cultivation. The responses were mixed as represented in Fig.3.

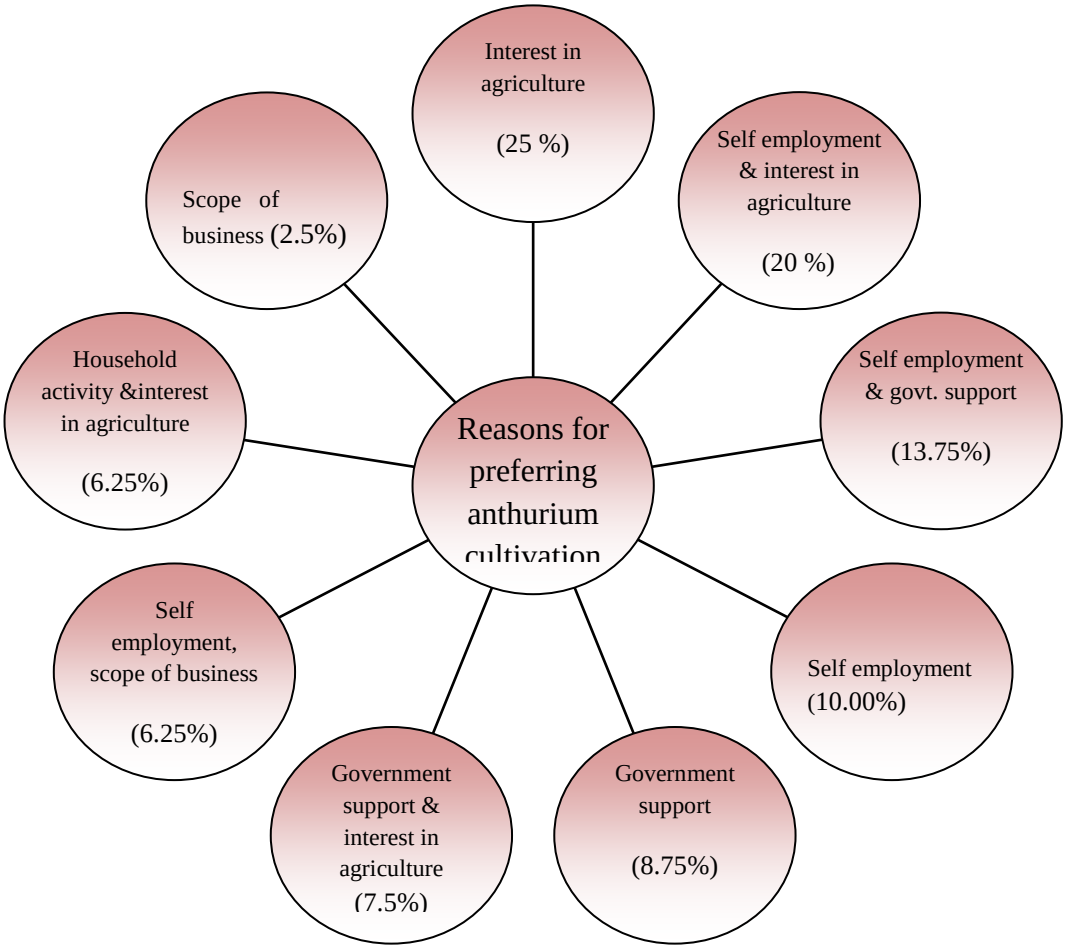

Fig. 3. Reasons for preferring anthurium cultivation

Majority of the growers started anthurium cultivation due to interest in farming alone (25%) followed by 20 per cent due to interest in farming and scope for self employment. It was the good support from Government and the scope as self employment venture that attracted 13.75 per cent of growers. The scope for self employment opportunity alone was reported as the driving force by only 10 per cent of the respondents. The scope for considering anthurium cultivation as an enterprise was reported as the motivational factor only by 2.5 per cent of the respondents and they belonged to the C-111 category.

4.1.3 Economic analysis of anthurium enterprises

An inquiry into the various costs and returns in anthurium cultivation revealed the extent of profitability of the enterprise. The details are presented on a 100 plant unit basis for a life span of 5 years, separately for three scales of operation. The input wise breakup of the cost of cultivation of plants was worked out on ABC cost concept.

The analysis as given in Table 4.12 showed that for C-1, C-11 and C-111 Cost C_1 and Cost C_2 was Rs.15,164, Rs.11, 486 and Rs.9,963 respectively. Cost A_1 and Cost A_2 were similar because we were not taking into account the rental value of leased in land. Cost of cultivation is seen to be decreasing towards larger scale of operation, reflecting the scale of size. Planting material cost constitute the major share in total paid out cost, which amounted to nearly half of the total cost. This was followed by manures and fertilizers, potting media, plant protection chemicals and growth hormones. The units were mainly managed by family labour. The proportion of expenditure on manures and fertilizers, plant protection chemicals, growth hormones remained more or less same for all the three categories. The share of expenditure on planting materials to total cost was highest for C-111 (51.54%). But the share of imputed value of family labour was highest for C-1 as indicated by cost C (Table 4.12).

Table 4.12: Input wise cost of cultivation of 100 anthurium plants

Items of cost	C-1 (Rs.)	C-11 (Rs.)	C-111 (Rs.)
Planting material	5738 (33.84)	5435 (47.32)	5135 (51.54)
Potting media	277 (1.83)	171 (1.49)	90 (0.90)
Manures & Fertilizers	690 (4.55)	505 (4.40)	450 (4.52)
Plant protection chemicals	60 (0.40)	50 (0.44)	40 (0.40)
Growth hormones	50 (0.33)	40 (0.35)	25 (0.25)
Interest on working capital	872 (5.75)	644 (5.61)	549 (5.51)
Depreciation on fixed capital	925 (6.10)	829 (7.22)	798 (8.01)
Cost A_1	8612 (56.79)	7674 (66.81)	7087 (71.13)
Cost A_2	8612 (56.79)	7674 (66.81)	7087 (71.13)
Interest on fixed capital	906 (5.97)	817 (7.11)	779 (7.82)
Cost B_1	9518 (62.77)	8491 (73.92)	7866 (78.95)
Cost B_2	9518 (62.77)	8491 (73.92)	7866 (78.95)
Imputed value of family labour	5646 (37.23)	2995 (26.08)	2097 (21.04)
Cost C_1	15164 (100)	11486 (100)	9963 (100)
Cost C_2	15164 (100)	11486 (100)	9963 (100)
Cost C_3	16680	13002	10959

(Figures in parentheses indicate aggregate per cent to total)

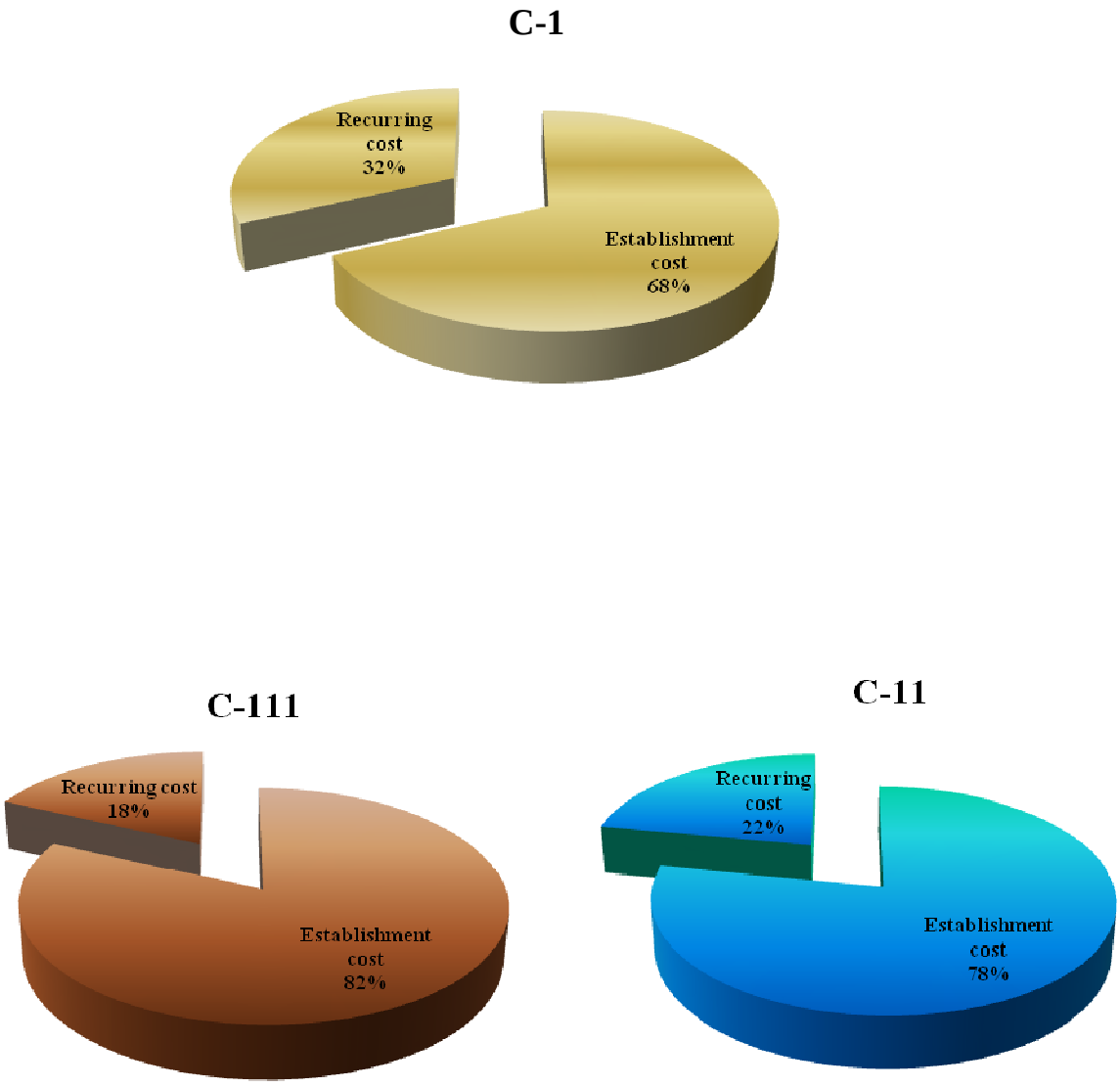

Fig. 4. Percentage share of establishment cost and recurring cost to cost of cultivation of 100 anthurium plants for three scales of operation

Table 4.13: Component wise cost of establishment of anthurium (Rs. per 100 plants)

Input items	C-1		C-11		C-111	
	Rs.	(%)	Rs.	(%)	Rs.	(%)
Plants	5738	43.75	5435	45.26	5135	45.32
Shade house	4545	34.65	4005	33.35	3958	34.93
Pots	1981	15.10	1895	15.78	1833	16.18
Tools & irrigation system	444	3.39	382	3.18	203	1.79
Potting media	277	2.11	171	1.42	90	0.79
Labour	131	1.00	120	1.00	112	1.00
Total	13116	100.00	12008	100.00	11330	100.00

Establishment cost covers costs of all components which are required at the beginning to start the enterprise. The establishment cost was found to be Rs.13,116 in C-1, Rs.12,008 in C-11 and Rs. 11,330 in C-111. Planting material alone accounted for about 43.75 per cent of the total establishment cost in C-1, 45.26 per cent in C-11 and 45.32 per cent in C-111, followed by shade house (34.65% in C-1, 33.35% in C-11 and 34.93% in C-111) and pots (Table 4.13). The establishment costs were showing a declining trend towards larger groups. Labour employed for potting and planting was included in the establishment cost. The percentage share of labour to

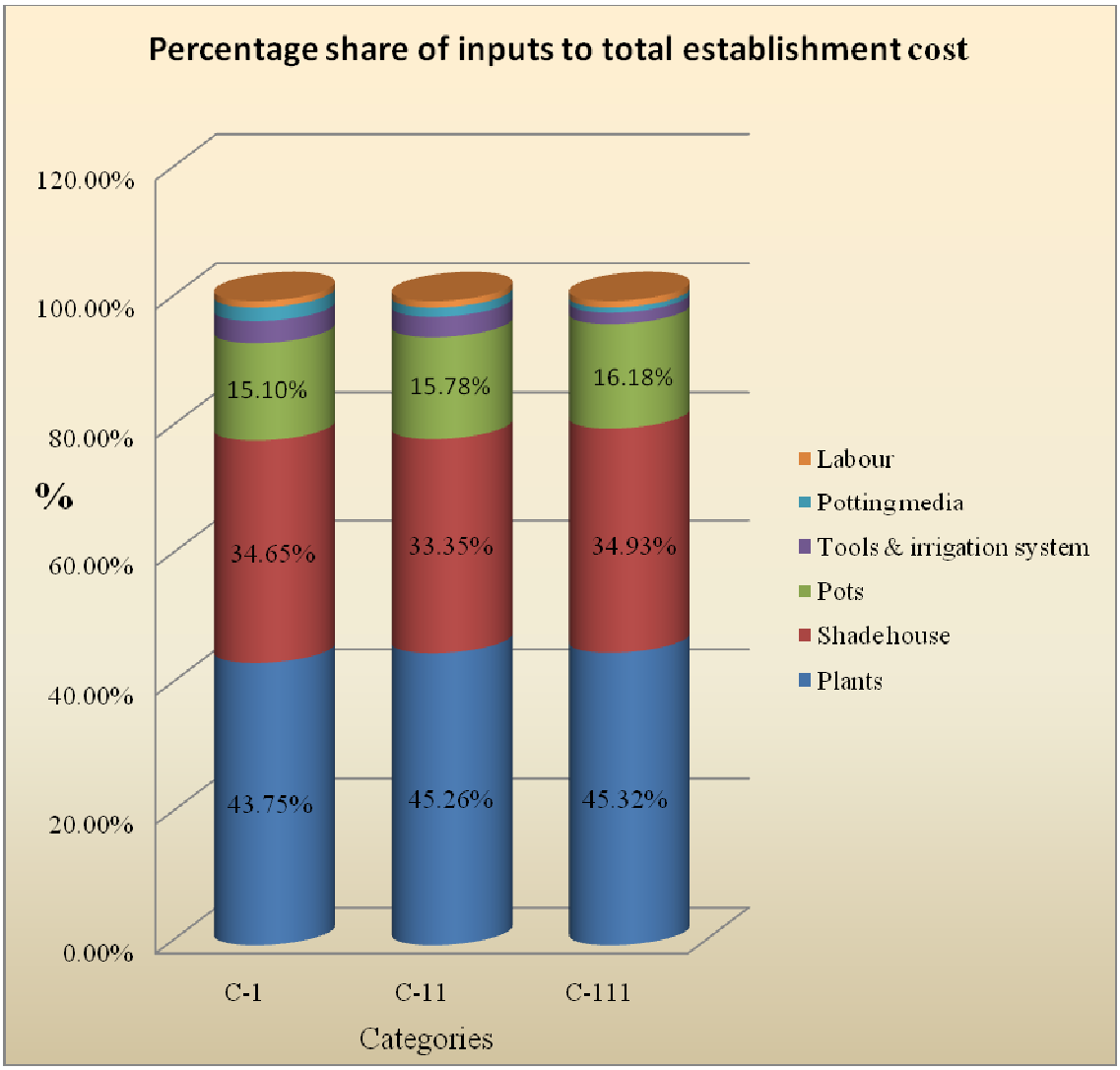

Fig. 5. Percentage share of inputs to total establishment cost of 100 anthurium plants

total establishment cost was almost similar in all the three categories. Cost of plants and shade house were the other two major items of establishment cost. The percentage share of plants and pots to total establishment cost were seen increasing towards larger groups. But the percentage share of shade house to total establishment cost was lowest for C-11 when compared to other categories.

Table 4.14: Input wise breakdown of recurring costs for anthurium (Rs. per 100 plants)

Input items	C-1		C-11		C-111	
	Rs.	(%)	Rs.	(%)	Rs.	(%)
Labour costs	5515	87.33	2875	82.85	1985	79.4
Agro-inputs	800	12.67	595	17.15	515	20.6
Total	6315	100.00	3470	100.00	2500	100.00

Input-wise breakup of total recurring cost (for five years) recognized labour as the single most important component which accounted for about 87 per cent in C-1, 83 per cent in C-11 and 79 per cent in C-111 of the total recurring cost (Table 4.14). This cost component constituted almost similar proportion of total recurring cost in all the categories. The cost of labour was higher in smaller groups and lower in larger groups for the maintenance of same number of plants. Labour cost included labour charge for application of agro-inputs and labour charge for irrigation and harvesting. It was found that larger groups were using sprinkler for irrigation as a result labour charge for irrigation was lesser for these groups. But smaller groups were using pipe for irrigation (manual irrigation) and labour charge was higher. This is the main reason for higher recurring cost for C-1 when compared to C-11 and C-111. Other cost components were agro-inputs, which accounted for about 13 per cent in C-1, 17

per cent in C-11 and 21 per cent in C-111 of total recurring costs. Share of cost of agro-inputs showed increasing trend towards larger groups.

Table 4.15: Cost of agro-inputs used in anthurium (Rs. per 100 plants)

Inputs	C-1		C-11		C-111	
	Rs.	(%)	Rs.	(%)	Rs.	(%)
Manures & Fertilizers	690	86.25	505	84.87	450	87.38
Plant protection chemicals	60	7.5	50	8.40	40	7.77
Growth hormones	50	6.25	40	6.72	25	4.85
Total	800	100.00	595	100.00	515	100.00

The term ‘agro-inputs’ included manures and fertilizers, plant protection chemicals and growth hormones. Manures and fertilizers contributed most to the cost of agro-inputs which accounted to 86.25 per cent in C-1, 84.87 per cent in C-11 and 87.38 per cent in C-111 followed by plant protection chemicals and growth hormones (Table 4.15).

The projected establishment cost for a unit of 500 anthurium plants by the Federation of Indian Floriculturists (1997) was Rs. 76,500 and the recurring costs were Rs.3,500 in the first year, Rs. 4,500 in the second year and Rs. 4,000 each in all the remaining two years. Comparing these values with corresponding production unit size (C-11) in the present study it was seen that the actual establishment cost and recurring costs at field level was lesser than this.

The results of the study are in agreement with Gajanana and Subrahmanyam (1999) and Karn (1999). The breakup of establishment cost, where the cost of planting materials as the major cost component was also reported by Gajanana and Subrahmanyam (1999). Karn (1999) also obtained comparable results with regard to establishment cost but recurring costs were higher. Nearly 90 per cent of the farmers were using organic manures like dried cowdung, diluted cow's urine, coconut water, fish extract, groundnut cake and neem cake slurry etc. for cultivation. Cost of these manures was lesser when compared to inorganic fertilizers. More over disease and pest incidence was very less in anthurium. So growers did not have to use plant protection chemicals often. These reasons resulted in low cost of agro-inputs. Majority (58%) of the respondents were using sprinkler for irrigation. Hence labour charge for irrigation was lesser for growers. Labour cost and cost of agro-inputs being the two major components of recurring costs, reduction in these costs resulted in lower recurring costs. Karn (1999) reported that the cost of cultivation of anthurium was expressing a declining trend towards larger groups and the cost of planting materials contributed most to the total establishment cost. Comparable results were obtained in this study also.

4.1.3.1 Labour utilization pattern

Labour is one of the major items of the input costs having a share of 37.23 per cent (C-1), 26.08 per cent (C-11) and 21.04 per cent (C-111) in the total cost of cultivation. Total labour employed has been studied under two categories namely: a) labour for potting and planting and b) labour for care and maintenance.

Labour cost for potting and planting accounted 0.86 per cent in C-1, 1.05 per cent in C-11, 1.12 per cent in C-111 of the total labour cost. In the establishment cost, share of labour cost was only one per cent (Table 4.13). On an average about 4.8 hours of labour was required for potting and planting of 100 anthurium plants (Table 4.16).

Labour for care and maintenance contributed 36.37 per cent in C-1, 25.03 per cent in C-11 and 19.92 per cent in C-111 of the total cost of cultivation. It included all the labour related activities after planting till harvesting. The time required for such activities was seen declining with the increasing number of plants per unit. Time spent per year in C-1 was much higher (49.74 hrs.) than in C-11 (18.24 hrs.) and C-111 (8.02 hrs.) (Table 4.16). Family labour contributed upto 100 per cent of the total labour use. In monetary terms, the annual care and maintenance cost was about Rs.5,515 in C-1, Rs.2,875 in C-11 and Rs.1985 in C-111 (Table 4.14).

Table 4.16: Labour utilization pattern in anthurium in different categories (Hours per 100 plants)

Category	Potting and planting (Hrs.)	Care and maintenance (Hrs./year)
	Family Labour	Family labour
C-1	5.18	49.74
C-11	4.64	18.24
C-111	4.57	8.02

The labour utilization pattern obtained from the study clearly indicates that anthurium cultivation is mostly taken up as a vocation by the family especially women (Tables 4.3 and 4.16). Considering the demographic pattern and the educational level of women in Kerala, these results point to the scope of floribusiness as an income generating activity to the women.

4.1.3.2 Returns

Total returns in the case of anthurium constituted of income from the sale of flowers and suckers. Total annual returns from 100 plants over five years are presented in Table 4.17. Total returns from 100 anthurium plants over a period of five years ranged from Rs.32, 790 in C-1 to Rs.41,152 in C-111. Income from the sale of flowers is 71.41 per cent of the total income in C-1, 70 per cent in C-11 and 68.54 per cent in C-111.

Distribution of total returns over years showed a common pattern among all the three categories. About 2.5 per cent of the total income was obtained in the first year, 11.8 per cent in second year, 24 per cent in third year, 29 per cent in fourth year and finally 32.8 per cent in the last year. The distribution pattern of income over years was almost similar among all the categories. A distinct peak of income was observed in the fifth year of crop, which was around 33 per per cent which includes income obtained from the sale of flowers and suckers. Production pattern of suckers shows increasing trend in production with the advancing age of plant. In the first year there was almost no sucker production, however, from second year onward plants gave increasing number of suckers. But the sale of suckers was noticed from third year onwards. Productivity of flowers as well as suckers increased across the categories. Income was seen higher towards larger groups obviously due to cost and price advantages as well as higher production (Appendix I).

Federation of Indian Floriculturists (1997) had estimated the annual returns from a unit of 500 anthurium plants as Rs. 30,000 in the second year, Rs. 47,000 in third year and fourth year and Rs. 97,000 in the fifth year. These values, when compared with the annual returns of C-11 in the present study were almost similar during the third and fourth year. FIF has not considered the returns from flower production in the first year.

Table 4.17 : Annual returns from anthurium (Rs. per 100 plants)

Year	C-1	C-11	C-111
1	868 (2.65)	925 (2.59)	985 (2.39)
2	4043 (12.33)	4326 (12.10)	4496 (10.93)
3	7722 (23.55)	8385 (23.45)	10120 (24.59)
4	9527 (29.05)	10527 (29.45)	11787 (28.64)
5	10630 (32.42)	11587 (32.41)	13764 (33.45)
Total	32790 (100)	35750 (100)	41152 (100)

Karn (1999) estimated the annual returns for a standard of 100 orchid plants from <500 plants unit, 500-1000 plants unit, >1000 plants unit in Kerala. The economic life considered was five years. On an average the annual returns was around 4.5 per cent of the total income in the first year, 18.9 per cent in second year, 22.2 per cent in third year, 21.6 per cent in fourth year and finally 32.8 per cent in the last year. The third year and fifth year values were almost comparable with C-11 in the present study but with variation in rest of the years. In the first year growers were getting only 2.5 per cent of the total income because of small sized flowers. In second year sale of suckers was not noticed among farmers in the study area. So the contribution of returns from the second year was only 12 per cent to the total income. But in fourth year increased sale of suckers and flowers were noticed and contributes 29 per cent to the total.

4.1.3.3 Capital productivity analysis

Economic performance of anthurium crop is analysed using the four measures of capital productivity analysis, a) Pay Back Period (PBP) b) Net Present Value (NPV) c) Benefit Cost Ratio (BCR) and d) Internal Rate of Return (IRR). Cash flow statement of the investment in anthurium cultivation for three units is provided in Appendix 1. The estimated values of PBP, NPV, BCR and IRR is presented in Table 4.18.

Table 4.18: Economic viability of anthurium enterprises

Project worth measures	C-1	C-11	C-111
Pay Back Period (Years)	3.52	2.05	1.71
Net Present value (@ 13.0%)	Rs. 4,849	Rs.9,696	Rs.14,320
Benefit Cost Ratio (@ 13.0%)	1.30	1.71	2.22
Internal Rate of Return (%)	28	45	61

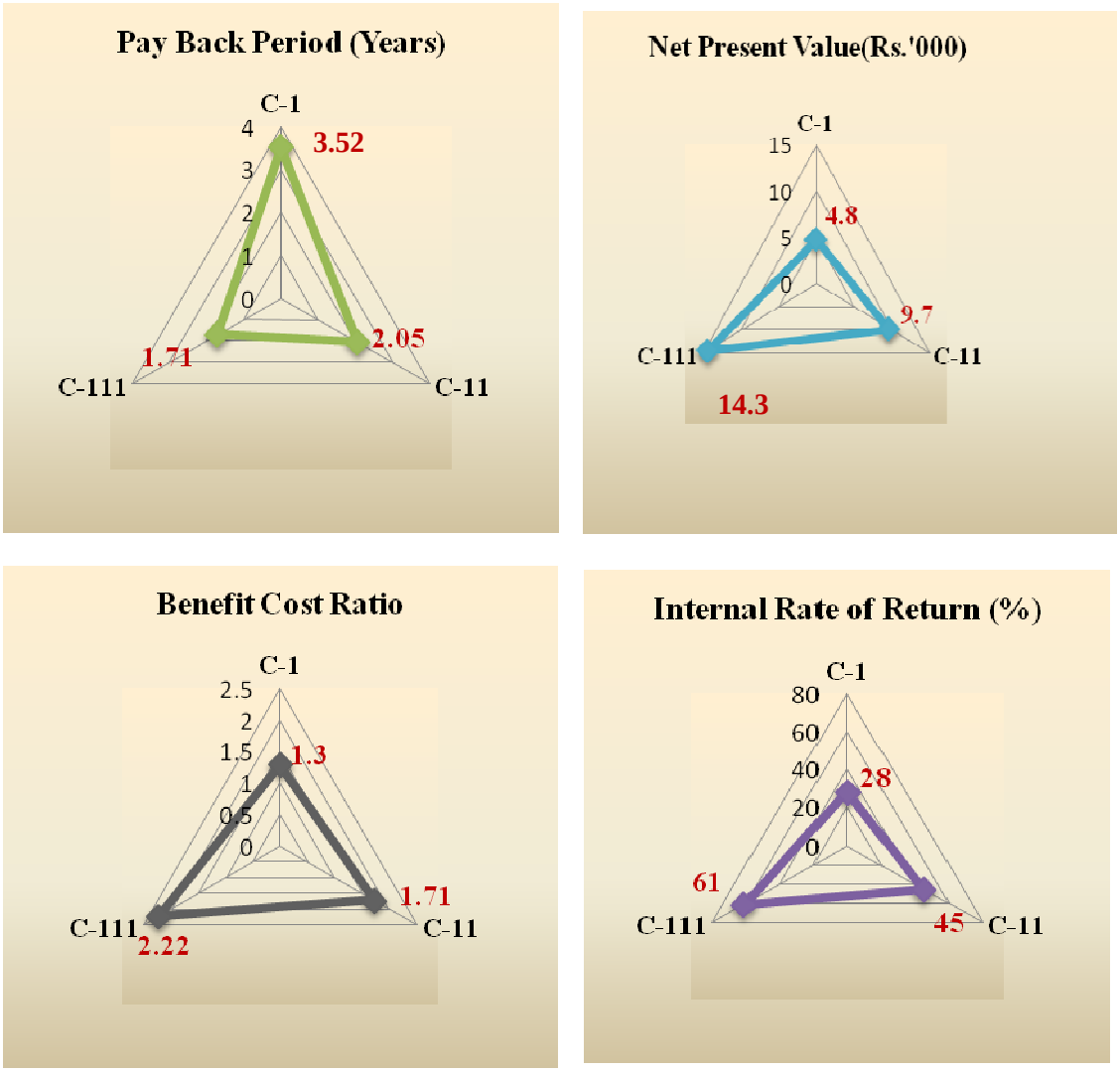

Fig. 6. Economic viability of anthurium enterprises across the different categories

Pay Back Period in C-1 was 3.52 years, which declined to 2.05 years in C-11 and 1.71 years in C-111. Smaller groups took longer time in recovering their investment as compared to larger groups. Pay Back Period is less than the project life in all the three categoties.

Net Present Values were positive in all the categories with values varying from Rs.4,849 for C-1 and Rs.9,696 for C-11 to Rs.14,320 for C-111. It is evident that larger groups earned much more than smaller ones. These values elucidate that the larger groups as more lucrative. Karn (1999) also reported that in anthurium cultivation, NPV were higher for larger groups as compared to smaller groups

Benefit Cost Ratio was seen well above unity in all the categories. It indicated that the investment is worth. Further, with the increasing scale of operation the BCR increased which rationalised the larger groups to be more profitable. Largest BCR of 2.2 was obtained in C-111 followed by C-11 (1.71) and lastly C-1 (1.3) respectively.

Karn (1999) obtained the BCR of G-111 (>1000 plants) as 2.2, 1.78 for G-11 (500-1000 plants) and 1.51 for G-1 (<500 plants). Gajanana and Subramanyam (1999) also got BCR greater than two for 1000 anthurium plants in the Coorg district of Karnataka.

The IRR was 61 per cent in C-111, 45 per cent in C-11 and 28 per cent in C-1. The Internal Rate of Return shows all the groups to be highly remunerative; at the same time it also confirms that larger group to be more remunerative than the smaller ones.

Karn (1999) also estimated the IRR as 54 per cent in G-111, 42 per cent in G-11 and 33 per cent in G-1.

Capital productivity analysis showed that anthurium enterprises are highly profitable agri-business ventures. Since all the categories are seen remunerative the decision regarding the scale of operation is to be based on the availability of capital

investment. However, all the measured parameters were in favour of larger groups, which proved to be more worthy of investment than smaller ones.

4.1.4 Marketing and marketing efficiency

Anthurium flowers are usually harvested at fortnightly intervals. Flowers were usually sold to cut flower societies, some growers sold their produce to local florists and also few growers had developed some sort of agreement with the florists who send these flowers to outside state and the florists in metropolis markets.

Six types of marketing channels were followed by growers for the sale of anthurium flowers as given below:

Channel 1 : Producers→ Vanitha PooKrishi Vikasana Samiti/ Cut flower society→ Exporters →Florists (outside state) →Consumers

Channel 11 : Producers → Vanitha PooKrishi Vikasana Samiti/ Cut flower society→ Consumers

Channel 111 : Producers → Exporters →Florists (outside state) →Consumers

Channel 1V : Producers → Local florists' → Consumers

Channel V : Producers → Consumers

Channel V1 : Producers → Florists (outside state) →Consumers

Out of the six marketing channels identified, the Channel 1 was the most important one through which 70.23 per cent of the growers sold their produce (Table 4.20). This channel was mostly preferred by growers because the society (intermediary) always made arrangements for selling the produce of farmers. Only 10 per cent commission was charged by the society. Farmers packed their produce with polythene cover and brought the produce to the society. Grading of flowers was done by a permanent skilled labour in the society. Exporters collected flowers from the

society twice in a month. They sent these flowers to outside markets like Delhi, Bangalore, Kolkata etc. Tropical Red was the most preferred variety which fetched higher price because of its deep red colour and higher demand.

Table 4.19: Different grades of anthurium

Grades	Width of spathe (inches)	Stem length (cms.)	Average price for Tropical Red (Rs.)	Average price for other varieties (Rs.)
1	5	55	12	10
2	4	45	9	7
3	3	35	7	5
4	2.5	30	4	3
5	<2.5	<30	3	2

Source: Field survey

Table 4.19 shows the grading method followed by Vanitha Pookrishi Samiti as per the requirements of exporters.

The second channel was utilised by 56.20 per cent of the growers for selling their produce (Table 4.20). These flowers were mostly used for value addition (bouquet, vases etc.). Every Monday growers brought their produce to the society and value addition was done by the permanent labour of the society. These value added products were given to churches, hotels etc.

Channel 111 was utilized by 36.66 per cent of the growers for marketing their produce (Table 4.20). Growers sold their produce to exporters who sold in north Indian markets through the florists in these markets. Packing and grading was done

by growers itself. Eventhough prices of flowers were little high through this channel, a regular marketing cannot be ensured because exporters collected flowers only during festive and ceremonial occasions and marriage seasons in North India. None of these exporters exported the collected flowers to outside India. Actual prices of flowers in other domestic markets was not revealed by these exporters, rather they provided only average prices of flowers. They were found reluctant in revealing any information with regard to their markets due to existing stiff competition.

12.52 per cent of the growers used Channel 1V for selling their produce (Table 4.20). Growers sold their produce to local florists who resold again to consumer after value addition. Florists sold these flowers to consumers in combination with another flowers in certain form of arrangements, bouquets etc.

Channel V was utilised by 5.82 per cent of the growers and sold directly to consumers (Table 4.20). Beauty parlours, private organizations, individuals etc. were the main direct consumers. During festivals and marriage season price of these flowers goes exorbitantly high and during that time flowers are sold through this channel. Prices are fixed by the growers themselves in this channel.

Channel VI was utilised by only 2.83 per cent of the growers. The growers exported their flowers directly to north Indian metropolis markets. Usually few larger growers pooled their flowers together to make the volume sufficient and exported to metropolis markets. Average prices received in such markets were higher than the average price realised in local markets. Value added flowers products were marketed through this channel based on the orders from florists (outside state) and hence a regular marketing cannot be ensured through this channel.

Karn (1999) identified four marketing channels for anthurium in Kerala of which Producers → Local florists → Consumers and Producers → Exporters → Florists (outside) → Consumers were identified as the most important ones. Similar channels were identified in the present study also.

Table 4.20: Marketing efficiency of anthurium

Sl.no.	Channels	Shepherd's Index	Percentage of growers utilizing the channel
1	I	4.32	70.23
2	II	6.78	56.20
3	III	5.46	36.66
4	IV	17.75	12.52
5	V	19	5.82
6	VI	5.76	2.83

Marketing efficiency was worked out using Shepherd's formula and Price spread. It was found out the direct channel i.e. Producers → Consumers was the most efficient one followed by Channel IV. Marketing efficiency index was estimated as 19 and price spread as Rs.0.80 for the direct channel and for Channel IV marketing efficiency index was worked out as 17.75 and price spread as Rs.7. The direct channel was found to be the most efficient one with higher marketing efficiency index and minimum price spread (Table 4.20).

Sangeetha (2005) identified the most efficient channel for marketing anthurium as Producer → Cutflower society → Consumers. These results are comparable with the observation of the present study.

Table 4.21: Percentage share of producer price to consumer price in different marketing channels

Channel	Producer Price (Rs./flower)	Consumer Price (Rs./flower)	% share of producer price to consumer price
Channel I	8	30	26.67
Channel II	6	14	42.86
Channel III	10	30	33.33
Channel IV	8	15	53.33
Channel V	15.2	16	95.00
Channel VI	20	30	66.67

In each channel the producer price and consumer price was different. The consumer price in domestic markets was lesser when compared to outside markets due to lesser demand. The percentage share of the producer's price to consumer's price was highest in Channel V which also showed the efficiency of this channel. But only 5.82 per cent of growers were using this channel due to irregular market. Eventhough the efficiency was lesser in Channel I nearly 70 per cent of growers was using this due to continuous marketing.

4.2 ORCHID

Details of various cost components and returns from orchid plants are presented here. Costs and returns for three scales of operation (C-1 (<500 plants), C-11(500-1000 plants) and C-111(>1000 plants) have been tried.

4.2.1 Socio-economic profile of growers

The major socio-economic variables age, gender, education, occupation and family income of the sample respondents are discussed here.

The distribution of sample growers by size of units is presented in Table 4.22

Table 4.22: Distribution of sample growers across different categories

Scale of operation	No. of farmers	Average no. of plants cultivated
C-1	14	268
C-11	20	695
C-111	6	1717
Total	40	2680

More number of growers are available in the lower sized groups compared to C-111. The average number of plants cultivated in each category was 268, 695 and 1717 respectively.

Table 4.23: Distribution of respondents based on age

Age group (years)	C-1	C-11	C-111	Total
25-60	11 (78.57)	16 (80.00)	5 (83.33)	32 (80.00)
>60	3 (21.43)	4 (20.00)	1 (16.67)	8 (20.00)
Total	14 (100)	20 (100)	6 (100)	40 (100)

(Figures in parentheses indicate per cent to total)

The farmer respondents included in the study were categorized into two groups as detailed in Table 4.23 according to their age. Majority of the growers (80%) belonged to the age group of 25-60 years and 20 per cent belonged to the age group of above 60 years. Category wise analysis also revealed that in all the categories that majority of farmers belonged to the age group of 25-60 years.

Table 4.24: Classification of respondents based on gender

Gender	C-1	C-11	C-111	Total
Male	0 (0.00)	1 (5.00)	2 (33.33)	3 (7.5)
Female	14 (100.00)	19 (95.00)	4 (66.67)	37 (92.5)
Total	14 (100)	20 (100)	6 (100)	40 (100)

(Figures in parentheses indicate per cent to total)

The classification of growers on the basis of gender revealed that out of a total of 40 respondents, 37 were female and only three were male. A similar pattern was observed in all the categories (Table 4.24).

Table 4.25: Classification of respondents based on educational status

Education	C-1	C-11	C-111	Total
upto SSLC	3 (21.43)	4 (20.00)	0 (0.00)	7 (17.50)
Higher secondary	5 (35.71)	8 (40.00)	2 (33.33)	15 (37.50)
Technical	1 (7.14)	2 (10.00)	0 (0.00)	3 (7.50)
Graduation	3 (21.43)	4 (20.00)	3 (50.00)	10 (25.00)
Post graduation	1 (7.14)	0 (0.00)	0 (0.00)	1 (2.50)
Professional	1 (7.14)	2 (10.00)	1 (16.67)	4 (10.00)
Total	14 (100)	20 (100)	6 (100)	40 (100)

(Figures in parentheses indicate per cent to total)

The classification of respondents according to their educational status is given in Table 4.25. 37.50 per cent of the respondents have acquired higher secondary level qualification followed by graduation (25%), SSLC (17.50%), professionals (10.00%) and technical education (7.50%). Similar pattern was observed in C-1 and C-11. But in C-111 majority were graduates (50.00%).

Table 4.26: Distribution of respondents based on main occupation

Occupation	C-1	C-11	C-111	Total
Agriculture	9 (64.29)	16 (80.00)	3 (50.00)	28 (70.00)
Govt.service	1 (7.14)	0 (0.00)	0 (0.00)	1 (2.50)
Private service	4 (28.57)	0 (0.00)	2 (33.33)	6 (15.00)
Own business	0 (0.00)	4 (20.00)	1 (16.67)	5 (12.50)
Total	14 (100)	20 (100)	6 (100)	40 (100)

(Figures in parentheses indicate per cent to total)

It was observed that, majority of the respondents were engaged in agriculture (70.00%) followed by private service (15%), own business (12.50%) and government service (2.50%). Agriculture was the main occupation for 64.29 per cent of the respondents in C-1, 80 per cent in C-11 and 50 per cent in C-111. Only one grower belonging to C-1 group was a government servant, among all the respondents. 28.57 per cent of the respondents were working in private services in C-1 and 20 per cent were engaged in business in C-11. In C-111 also 33.33 per cent of the respondents were in private services.

The annual family income of the sample orchid growers ranged from Rs. 1-2 lakh (45.00%), followed by Rs. 0.50-1 lakh (42.50%). Majority of respondents of C-1 had an annual family income of Rs.0.50-1 lakh (57.14%), while in C-11 majority had Rs.1-2 lakh annual family income (55.00%) and in C-111 50 per cent had an annual family income of more than Rs.2 lakh (Table 4.27).

Table 4.27: Distribution of respondents based on family income

Annual family income (Rs.)	C-1	C-11	C-111	Total
50,000-1 lakh	8 (57.14)	8 (40.00)	1 (16.67)	17 (42.50)
1-2 lakh	5 (35.71)	11 (55.00)	2 (33.33)	18 (45.00)
>2 lakh	1 (7.14)	1 (5.00)	3 (50.00)	5 (12.50)
Total	14 (100)	20 (100)	6 (100)	40 (100)

(Figures in parentheses indicate per cent to total)

Orchid cultivation was seen taken up by women and it has become an income generation activity to the women entrepreneurs (Table 4.24). Majority of the respondents belonged to the productive age group and had more than three years experience in flower cultivation. Orchid cultivation is seen as an urban culture and not that of the rural traditional farmer. Size of the production unit was found to be positively correlated with family income; higher income group with larger sized unit. Average size of the unit was 268 plants in C-1, where majority enjoyed an annual income of Rs.0.50-1 lakh. But in C-111 the average size of the unit was nearly six times that of C-1, where majority enjoyed an annual family income of more than two lakh rupees (Tables 4.22 and 4.27). Due to this unit cost of cultivation was seen to be decreasing towards larger scale of operation and economy of scale operates. Orchid cultivation could be taken up as a leisure time activity by the house wives, which would supplement to the family income. The socio-economic profile analysis of anthurium growers studied by Karn (1999) also obtained similar results in age, gender and family income.

4.2.2 General information on orchid cultivation

Orchid cultivation was mostly done by women in the study area (Table 4.24). The most popular orchid among sample growers was dendrobium, because of its suitability to existing climatic conditions and higher market demand. Nearly 80 per cent of the total number of orchids among growers was dendrobium. Most commonly grown dendrobium varieties were Sonia-16, Sonia-17, Sonia-18, Sonia-28, Kasim Gold, Kasim white and Emma white. Vanda, Mokara, Phalenopsis, Oncidium, Cattleya etc. were also grown by respondents. Generally dendrobium is grown in earthern/plastic pots. Tile pieces, coir pith, charcoal, coconut husk etc. are used as potting media. Orchids require only partial shade, about 50 per cent in Kerala's agro-climatic condition. Majority of the respondents were growing orchids under shade house. But intergeneric monopodials like Mokara, Aranthera etc. were grown in open conditions. Some growers utilized the available space on the terrace for orchid cultivation. Almost all the farmers used tissue culture plants for cultivation. For sympodials, use of back bulbs as propagules was practiced by farmers. In case of monopodials top cutting was performed by the sample growers.

Table 4.28: Sources of planting materials of orchids

Sources	Frequency
Private nurseries	28 (70.00)
Neighbours/friends	6 (15.00)
Other state/country	6 (15.00)
Total	40 (100)

(Figures in parentheses indicate per cent to total)

Private nurseries were the major source of planting materials as reported by majority of the growers (70%). It is interesting to note that 15 per cent of the farmers were getting planting materials from outside the country/state. They opined that productivity of such plants were higher when compared to plants from other sources.

It was observed that 70 per cent of the growers used organic manures for cultivation. Dried cow dung, coconut water, fish extract, diluted cow's urine etc. are the commonly used organic manures. About 30 per cent of growers used both organic and inorganic fertilizers. The occurrence of pests and diseases was very less in orchid cultivation. 45 per cent of the respondents were applying nutrients and plant protection chemicals once in a week followed by 30 per cent applying plant protection chemicals twice in a month and 25 per cent applied plant protection chemicals once in a month, as prophylactic measure. Snails were the most common pests and these were controlled by hand picking during the night-time.

Table 4.29: Details of irrigation

Source of irrigation	Frequency	Type of irrigation	Frequency
Well	33 (82.50)	Manual	32
Pond	7 (17.50)	Mist	8 (20.00)
Total	40 (100)		40 (100)

(Figures in parantheses indicate per cent to total)

Most of the growers followed manual irrigation (80.00%) followed by mist irrigation (20.00%). Majority of the growers used well as a source of irrigation (82.50%) followed by pond (17.50 %) (Table 4.29).

Table 4.30: Sources of technical advice to growers

Sources	Frequency
Kerala Agrl. University	15 (37.50)
Private nurseries	15 (37.50)
Krishibhavan	5 (12.50)
Neighbours/friends	5 (12.50)
Total	40 (100)

(Figures in parentheses indicate per cent to total)

Kerala Agricultural University, Krishibhavans, Private nurseries and neighbours/friends also had a good role in providing technical information to growers, on various aspects like cultivation practices, disease and pest management etc. (Table 4.30).

Table 4.31: Experience in floribusiness

Year	Frequency
<5 years	15 (37.50)
5-10 years	21 (52.5)
>10 years	4 (10.00)
Total	40 (100)

(Figures in parentheses indicate per cent to total)

Majority of the farmers had experience in orchid cultivation in the range of 5-10 years (52.5%). 37.5 per cent of the farmers had less than 5 years experience and only 10 per cent had more than 10 years experience (Table 4.31).

The reasons for preferring orchid cultivation was enquired among the sample growers. Majority of the respondents started cultivation due to interest in agriculture (37.5%) alone. It was the good support from Government and the scope as self employment venture that attracted 27.5 per cent of growers. Government support and interest in farming forced 12.5 per cent of the growers for starting orchid cultivation. The scope for considering anthurium cultivation as an enterprise was reported as the motivational factor by 10 per cent of the respondents. 10 per cent of the growers opined that government support alone motivated them for preferring orchid cultivation (Fig.7).

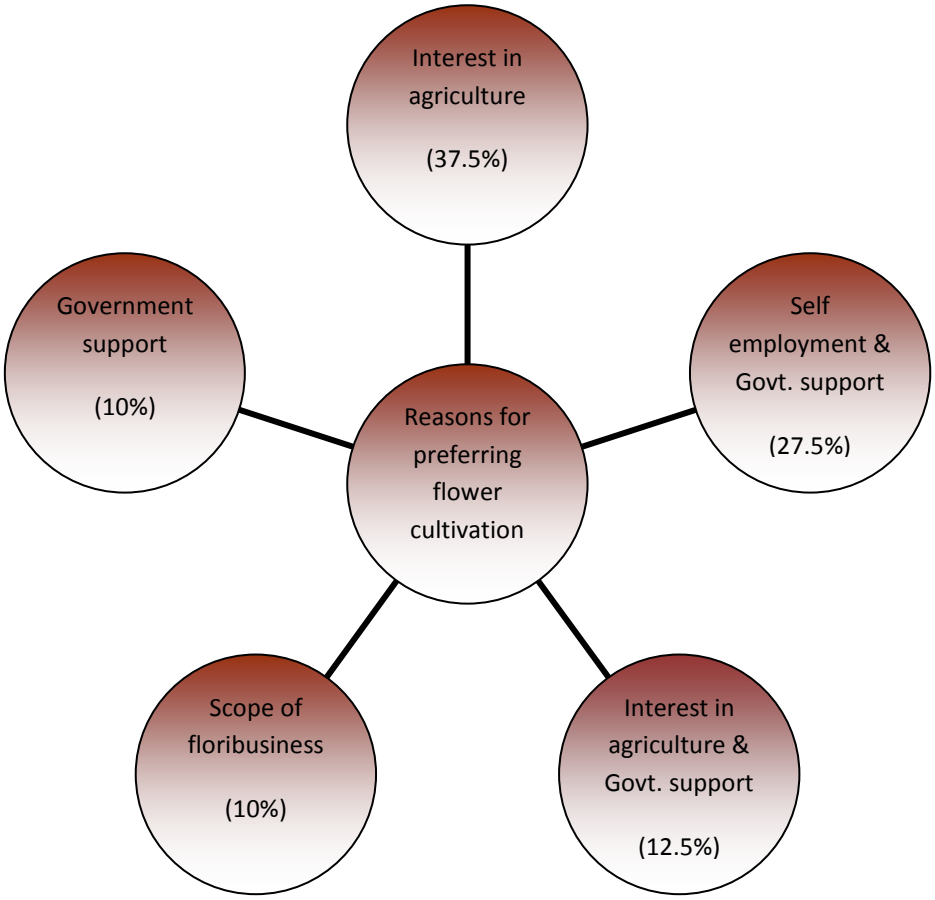

Fig. 7. Reasons for preferring orchid cultivation

4.2.3 Economic analysis of orchid enterprises

An inquiry into the various costs and returns in orchid cultivation revealed the extent of profitability of the enterprise. The details are presented on a 100 plant unit basis for a life span of 5 years, separately for three scales of operation. The input wise breakup of the cost of cultivation of plants was worked out on ABC cost concept.

Table 4.32: Input wise cost of cultivation of 100 orchid plants

Items of cost	C-1 (Rs.)	C-11 (Rs.)	C-111 (Rs.)
Hired labour	-	-	20(0.002)
Planting material	6836(42.91)	6541(50.25)	6126(54.70)
Potting media	364(2.28)	236(1.81)	194(1.73)
Manures & Fertilizers	845(5.30)	720(5.53)	705(6.30)
Plant protection chemicals	105(0.66)	85(0.65)	90(0.80)
Growth hormones	160(1.00)	90(0.69)	80(0.71)
Interest on working capital	936(5.87)	752(5.78)	619(5.53)
Depreciation on fixed capital	840(5.27)	781(6.00)	864(7.71)
Cost A_1	10086(63.31)	9205(70.72)	8678(77.67)
Cost A_2	10086(63.31)	9205(70.72)	8678(77.67)
Interest on fixed capital	787(4.94)	740(5.68)	870(7.77)
Cost B_1	10873(68.25)	9945(76.40)	9548(85.44)
Cost B_2	10873(68.25)	9945(76.40)	9548(85.44)
Imputed value of family labour	5059(31.75)	3072(23.60)	1651(14.74)
Cost C_1	15932(100.00)	13017(100.00)	11199(100.00)
Cost C_2	15932(100.00)	13017(100.00)	11199(100.00)
Cost C_3	17525	14319	12319

(Figures in parentheses indicate aggregate per cent to total)

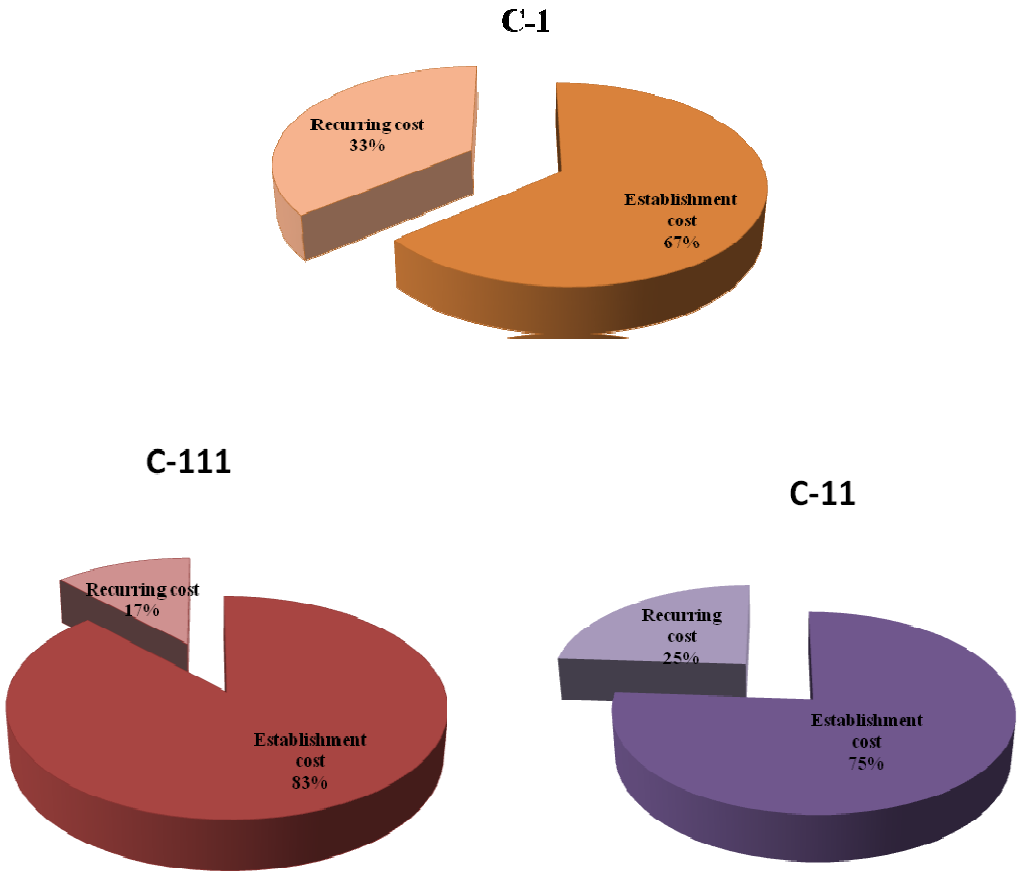

Fig. 8. Percentage share of establishment cost and recurring cost to cost of cultivation of 100 orchid plants for three scales of operation

The analysis showed that for C-1, C-11 and C-111 Cost C_1 and Cost C_2 was Rs.15,932, Rs.13,017 and Rs.11,199 respectively. Cost A_1 and Cost A_2 were similar because we were not taking into account the rental value of leased in land. Since we were not taking the rental value of own land Cost B_1 and Cost B_2 were similar. Cost of cultivation is seen to be decreasing towards larger scale of operation reflecting the scale of size. Planting material constituted to the major share of total paid out cost. This was followed by manures and fertilizers, potting media, growth hormones and plant protection chemicals. Hired labour was employed only for potting and planting in C-111. Family labour was fully utilized in C-1 and C-11. The share of expenditure on planting materials to total cost was highest for C-111 (54.70%). But the share of imputed value of family labour was highest for C-1. So cost C was highest for C-1.

Table 4.33: Component wise cost of establishment of orchid (Rs. per 100 plants)

Input items	C-1		C-11		C-111	
	Rs.	(%)	Rs.	(%)	Rs.	(%)
Plants	6836	51.03	6541	51.9	6126	46.79
Shade	4678	34.92	4225	33.53	3895	29.75
Pots	994	7.42	906	7.19	893	6.82
Tools & irrigation system	381	2.84	562	4.46	1908	14.57
Potting media	364	2.72	236	1.87	194	1.48
Labour	144	1.07	132	1.05	76	0.58
Total	13397	100	12602	100	13092	100

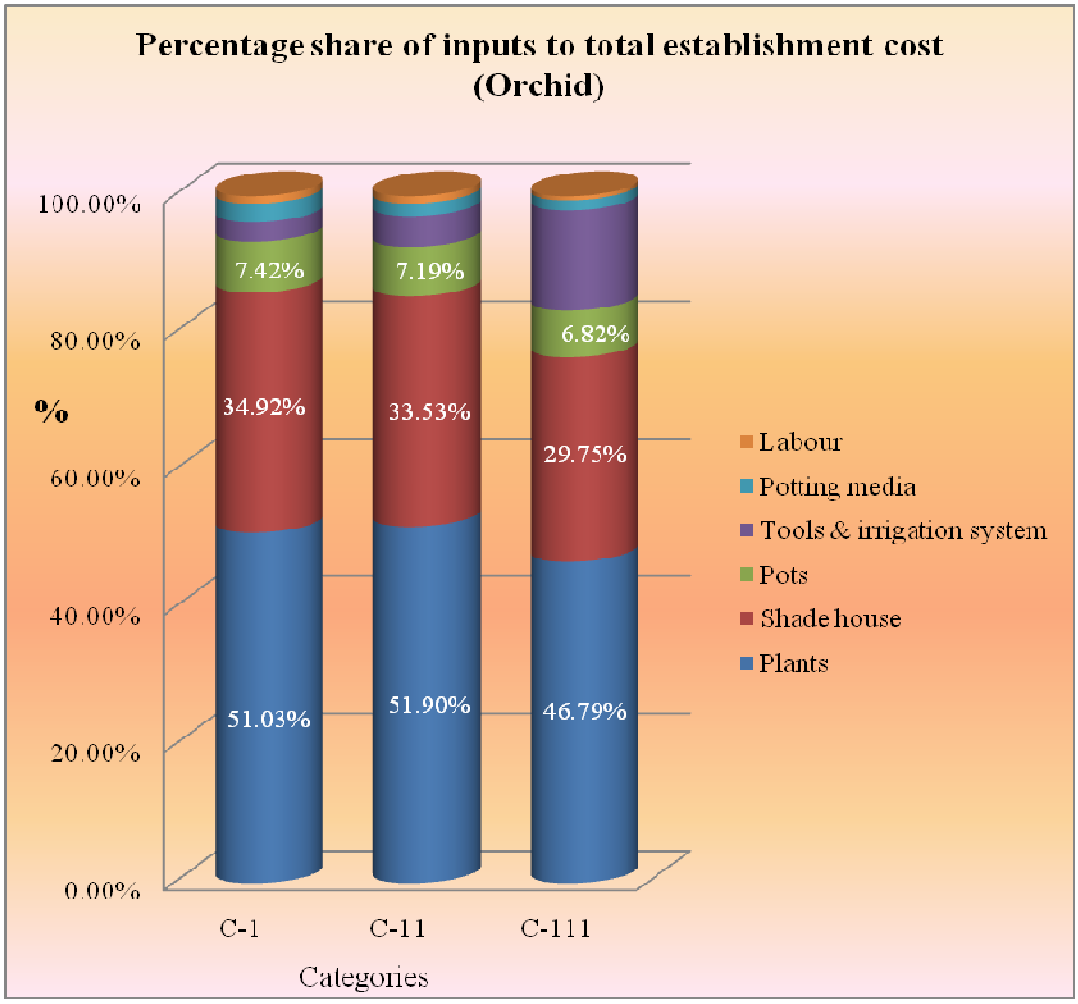

Fig. 9. Percentage share of inputs to total establishment cost of 100 orchid plants

Establishment cost covers costs of all components which are required at the beginning to start the enterprise. It included cost of shade house, plants, pots, potting mixture, labour, tools and irrigation system. The establishment cost was found to be Rs.13,397 in C-1, Rs.12,602 in C-11 and Rs. 13,092 in C-111 (Table 4.33). Share of establishment cost to total cost is showing an increasing pattern towards larger scale of operation. Cost of plants was the major cost component in establishment cost which accounted to 51.03 per cent in C-1, 51.90 per cent in C-11 and 46.79 per cent in C-111. Cost of plants was found to be low in C-111 compared to other categories because some of the growers were using tissue culture plants obtained in flasks for cultivation. Cost of flasks were very less i.e. Rs.100 for one flask containing nearly 14 plants. Other important components were cost of shade house (around 49.91%) and that of pots and media (around 9.16%). Tools and irrigation system constituted 2.84 per cent in C-1, 4.46 per cent in C-11 and 14.57 per cent in C-111. It was observed that larger groups were using mist irrigation system. As a result cost of irrigation system was higher in such groups. Labour constituted only a minor share of about one per cent in C-1 and C-11 but 0.58 per cent for C-111.

Table 4.34: Input wise breakdown of recurring costs for orchid (Rs. per 100 plants)

Input items	C-1		C-11		C-111	
	Rs.	(%)	Rs.	(%)	Rs.	(%)
Labour costs	4915	81.58	2940	76.67	1575	64.29
Agro-inputs	1110	18.42	895	23.34	875	35.71
Total	6025	100	3835	100	2450	100

Input-wise breakup of total recurring cost (for five years) recognised labour as the single most important component which accounted for about 82 per cent in C-1, 77 per cent in C-11 and 64 per cent in C-111 of the total recurring cost (Table 4.34).

The cost of labour was higher in smaller groups and lower in larger groups for the maintenance of same number of plants. Labour cost included labour charge for application of agro-inputs and labour charge for irrigation and harvesting. It was found that larger groups were using mist irrigation system as a result labour charge for irrigation was lesser for these groups. But smaller groups were using pipe for irrigation (manual irrigation) and labour charge was higher. This is the main reason for higher recurring cost for C-1 when compared to C-11 and C-111. Other cost components were agro-inputs, which accounted for about 18 per cent in C-1, 23 per cent in C-11 and 36 per cent in C-111 of total recurring costs. Share of cost of agro-inputs showed increasing trend towards larger groups.

Table 4.35: Cost of agro-inputs used in orchid (Rs. per 100 plants)

Inputs	C-1		C-11		C-111	
	Rs.	(%)	Rs.	(%)	Rs.	(%)
Manures & Fertilizers	845	76.13	720	80.45	705	80.57
Plant protection chemicals	105	9.46	85	9.50	90	10.29
Growth hormones	160	14.41	90	10.06	80	9.14
Total	1110	100	895	100	875	100

The term ‘agro-inputs’ included manures and fertilizers, plant protection chemicals and growth hormones. Manures and fertilizers contributed most to the cost of agro-inputs which accounted to 76.13 per cent in C-1, 80.45 per cent in C-11 and 80.57 per cent in C-111 followed by growth hormones and plant protection chemicals (Table 4.35).

The economics of orchid cultivation was estimated earlier by Rajeevan (1998), Federation of Indian Floriculturists (1997) and Karn (1999) for an economic life span of 5 years. After a period nearly >10 years, the cost escalation as observed in this was justifiable. The recurring costs in the present study were found to be lower than that reported by Karn (1999) because 70 per cent of the farmers were using organic manures for cultivation. Dried cowdung, diluted cow's urine, coconut water, fish extract, groundnut cake and neem cake slurry etc. were the most commonly used organic manures. Cost of these manures was lesser when compared to inorganic fertilizers. Disease and pest occurrence was not seen severe in orchids. So growers were not using plant protection chemicals frequently. All these reasons resulted in low cost of agro-inputs. 20 per cent of the respondents were using mist irrigation system. As a result labour charge for irrigation was lesser for growers. Labour cost and cost of agro-inputs were the two major components of recurring costs. Reduction in these costs resulted in lesser recurring costs. Karn (1999) also reported that the cost of cultivation of orchid was showing a declining trend towards larger groups and the cost of planting materials contributed most to the total establishment cost. Comparable results were obtained in this study also.

4.2.3.1 Labour utilization pattern

Table 4.36: Labour utilization pattern in orchid in different categories (Hours per 100 plants)

Category	Potting and planting (Hrs.)		Care and maintenance (Hrs./year)	
	Family Labour	Hired Labour	Family labour	Hired labour
C-1	5.94	0.00	46.74	0.00
C-11	5.64	0.00	21.90	0.00
C-111	2.17	0.82	7.02	0.00

Labour is one of the major items of the input costs having a share of 31.75 per cent (C-1), 23.60 per cent (C-11) and 14.74 per cent (C-111) in the total cost of cultivation (Table 4.32). Total labour employed has been studied under two categories namely: a) labour for potting and planting and b) labour for care and maintenance.

Labour cost for potting and planting accounted 0.90 per cent in C-1, 1.01 per cent in C-11, 0.68 per cent in C-111 of the total labour cost. In the establishment cost, share of labour cost was only one per cent in C-1 and C-11 and 0.58 per cent in C-111 (Table 4.33). On an average about 5.79 hours of labour was required for potting and planting of 100 orchid plants in C-1 and C-11 but only 3.06 hours in C-111(Table 4.36).

Labour for care and maintenance contributed 30.85 per cent in C-1, 22.6 per cent in C-11 and 14.06 per cent in C-111 of the total cost of cultivation. It included all the labour related activities after planting till harvesting. The time required for such activities was seen declining with the increasing number of plants per unit. Time spent per year in C-1 was much higher (46.74 hrs.) than in C-11 (22 hrs.) and C-111 (7.02 hrs.) (Table 4.36). Family labour contributed upto 100 per cent of the total labour use in C-1 and C-11 but hired labour was employed for potting and planting in C-111. In monetary terms, the annual care and maintenance cost was about Rs.6,025 in C-1, Rs.3,835 in C-11 and Rs.2,450 in C-111 (Table 4.34).

The labour utilization pattern obtained from the study clearly indicates that orchid cultivation is mostly taken up as a vocation by the family especially women (Tables 4.24 and 4.36). Considering the demographic pattern and the educational level of women in Kerala, these results point to the scope of floribusiness as an income generating activity to the women.

4.2.3.2 Returns

Total returns in the case of orchid are constituted of income from the sale of flowers. Sale of back-bulbs and keikis was rarely seen among growers. So income from flowers is only accounted. Total annual returns from 100 plants over five years are presented in Table 4.37.

Distribution of total returns over years showed a common pattern among all the three categories. About 3.7 per cent of the total income was obtained in the first year, 11.8 per cent in second year, 23 per cent in third year, 29 per cent in fourth year and finally 32.3 per cent in the last year. The distribution pattern of income over years was almost similar among all the categories. A distinct peak of income was observed in the fifth year of crop, which was around 32 per cent. In the case of orchids, returns constitute income exclusively from the sale of flower spikes produced and no additional income is obtained by selling the keikis and mother plants (after economic life of plants). Hence it was not considered in this study for the purpose of estimation of total returns. Production of flower spikes starts by first year and is spread over to fifth year. Though plants continue to bear flower after the age of five years also, its quality and quantity are not satisfactory in terms of marketability. In practice, all of the sample growers replaced the old plants after five years in commercial production units with new plants though they retained the discarded plants for aesthetic value. Income was seen higher towards larger groups obviously due to cost and price advantages as well as higher production. Pooled income from 100 plants in C-1 was Rs.27,640 in C-1; in C-11 Rs.30,461 and in C-111 Rs.35,474 (Table 4.37).

Federation of Indian Floriculturists (1997) had projected the annual returns from a unit of 500 orchid plants as Rs. 23,500 in the second year, Rs. 41,000 in third year, Rs. 42,500 in the fourth year and Rs. 78,500 in the fifth year. Though total

Table 4.37: Annual returns from orchid enterprises (Rs. per 100 plants)

Year	C-1 (Rs.)		C-11 (Rs.)		C-111(Rs.)	
	No. of spikes	Rs.	No. of spikes	Rs.	No. of spikes	Rs.
1	110	736 (2.66)	115	905 (2.97)	165	1893 (5.34)
2	394	3261 (11.79)	410	3446 (11.31)	420	4369 (12.32)
3	576	6248 (22.6)	598	6695 (21.98)	610	8835 (24.91)
4	745	8340 (30.17)	795	9405 (30.88)	775	9272 (26.14)
5	768	9045 (32.72)	810	10010 (32.86)	815	11105 (31.30)
Total	2593	27640 (100)	2728	30461 (100)	2737	35474 (100)

(Figures in parentheses indicate aggregate per cent to total)

returns over years is almost equal to the present study some deviation is seen in beginning and ending years of the unit. Projected returns of FIF is higher than estimated ones towards the later part of plant life; it is obviously because of inclusion

of imputed values of keikis and mother plants which has been ignored in the present study.

Karn (1999) estimated the annual returns for a standard of 100 orchid plants from <500 plants unit, 500-1000 plants unit, >1000 plants unit in Kerala. The economic life considered was five years. On an average the annual returns was around 7.8 per cent of the total income in the first year, 22.2 per cent in second year, 23.4 per cent in third year, 22.8 per cent in fourth year and finally 23.8 per cent in the last year. There was slight variation with the returns obtained in the present study because he had considered only near flowering plants. As a result first year income contributed more than the present study and in the fifth year he had included salvage values. Flower production is showing an increasing pattern over the years. As a result income from the sale of flowers is having an increasing trend over the years in the present study.

4.2.3.3 Capital productivity analysis

Economic performance of orchid is analysed using the four measures of capital productivity analysis, a) Pay Back Period (PBP) b) Net Present Value (NPV) c) Benefit Cost Ratio (BCR) and d) Internal Rate of Return (IRR). Cash flow statement of the investment in anthurium cultivation for three units is provided in Appendix III. The estimated values of PBP, NPV, BCR and IRR are presented in Table 4.38.

Table 4.38 : Economic viability of orchid enterprises

Project worth measures	C-1	C-11	C-111
Pay Back Period (Years)	3.94	3.45	2.7
Net Present value (@ 13.0%)	Rs.1476	Rs.5491	Rs.9625
Benefit Cost Ratio (@ 13.0%)	1.09	1.40	1.72
Internal Rate of Return (%)	18	31	46

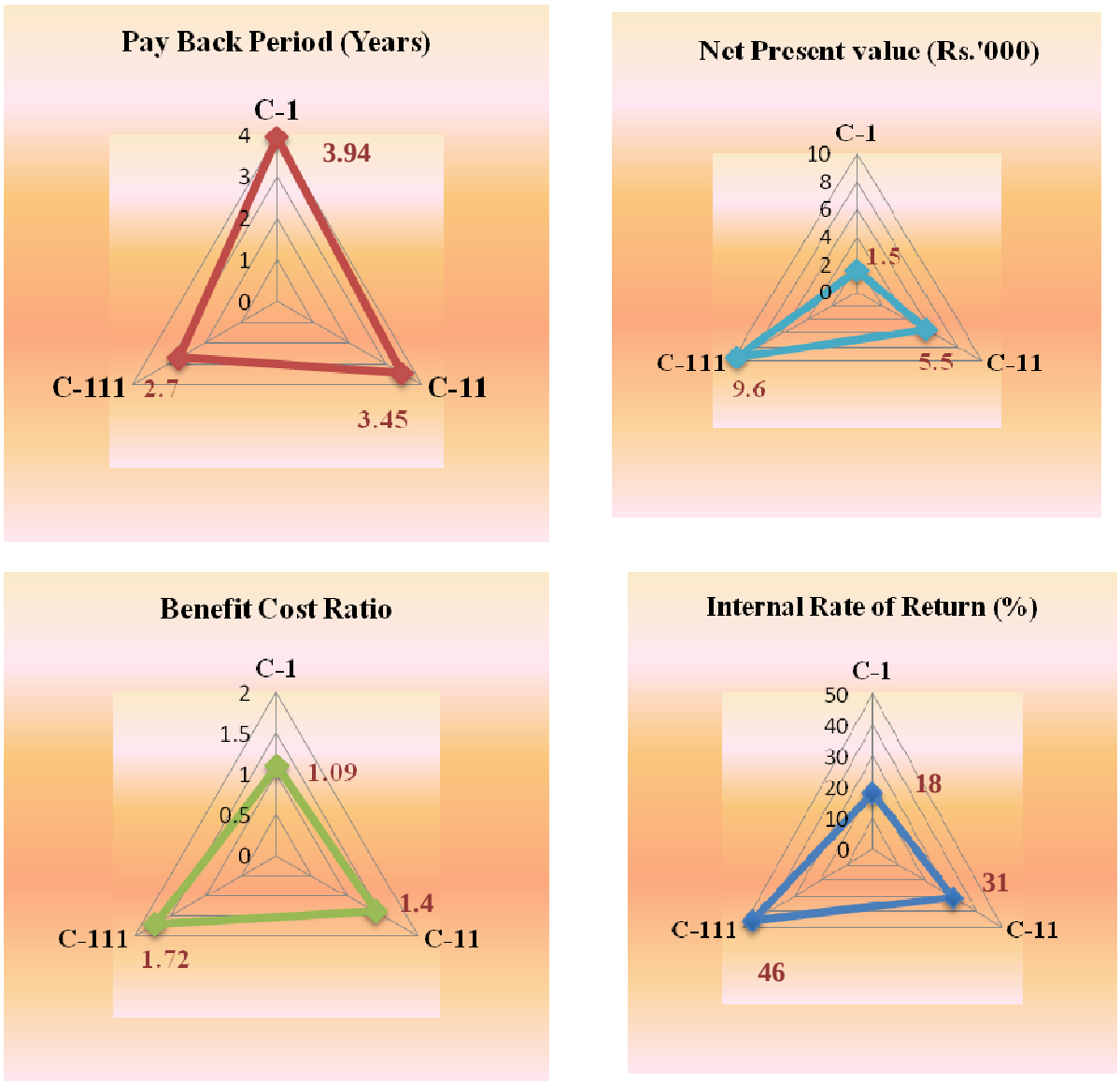

Fig. 10. Economic viability of orchid enterprises across different categories

Pay Back Period in C-1 was 3.94 years, which declined to 3.45 years in C-11 and 2.7 years in C-111. Smaller groups took longer time in recovering their investment as compared to larger groups. Pay Back Period is less than the project life in all the three categoties.

Net Present Values were positive in all the categories with values varying from Rs.1,476 for C-1 and Rs.5,491 for C-11 to Rs.9,625 for C-111. It is evident that larger groups earned much more than smaller ones. Karn (1999) reported that in orchid cultivation, Net Present Values were higher for larger groups as compared to smaller groups. This is in accordance with the present study.

Benefit Cost Ratio was well above unity in all the categories. It indicated that the investment is of worth in all the categories. Further, with the increasing scale of operation this ratio was increasing which rationalises the larger groups to be more profitable. Largest BCR of 1.72 was seen in C-111 followed by C-11 (1.4) and lastly C-1 (1.1). Karn (1999) obtained the Benefit Cost Ratio for G-111 (>1000 orchid plants) as 1.8, 1.4 for G-11 (500-1000 orchid plants) and 1.32 for G-1 (<500 orchid plants).

The Internal Rate of Return was 46 per cent in C-111, 31 per cent in C-11 and 18 per cent in C-1. The IRR shows all the groups to be highly remunerative; at the same time it also confirms the larger group to be more remunerative than the smaller ones. Karn (1999) also estimated the internal rate of return as 49 per cent in G-111, 35 per cent in G-11 and 29 per cent in G-1.

Capital productivity analysis showed that orchid enterprises are highly profitable agri-business ventures. Since all the categories are seen remunerative the decision regarding the scale of operation is to be based on the availability of capital investment. However, all the measured parameters were in favour of larger groups, which proved to be more worthy of investment than smaller ones.

4.2.4 Marketing and marketing efficiency

Due to the perishable nature of orchid flowers, harvesting is done only based on a predetermined schedule, based on time and quantity of sale. Majority of the sample growers in this study resorted to local sale.

For the sale of orchid flowers, growers depended on three types of marketing channels.

Channel 1 : Producers → Local florists' → Consumers

Channel 11 : Producers → Consumers

Channel 111 : Producers → Vanitha PooKrishi Vikasana Samiti/ Cut flower society→ Consumers

Among the three channels identified, the Channel I was the most important channel through which majority of the growers were selling their produce (Table 4.39). Florists sold these flowers to consumers after value addition as floral arrangements, bouquet, garland etc. in which they used a combination of different flowers/leaves. 7.5 per cent of the growers used Channel II for selling flowers. It is the direct channel where there are no intermediaries. Consumers mainly consisted of beauty parlours, hotels, offices etc. Channel III was utilised by only 6.5 per cent of growers. Here flowers were value added by the society and given to consumers.

Karn (1999) identified four marketing channels for orchids in Kerala of which Producers ⟶ Local florists ⟶ Consumers and Producers ⟶ Exporters ⟶ Florists (outside) ⟶ Consumers were identified as the most important ones. Similar channels were identified in the present study also.

Table 4.39 : Marketing efficiency of orchid

Sl.no.	Channels	Shepherd's Index	Percentage of growers utilizing the channel
1	I	24	88.5
2	II	9	7.5
3	III	6.78	6.5

Marketing efficiency was worked out using Shepherd's formula and Price spread. It was found out the channel I i.e. Producers → Local florists' → Consumers was the most efficient one followed by Channel II i.e. Producers →Consumers. Marketing efficiency index was estimated as 24 and price spread as Rs.2.5 for the Channel I and for Channel II marketing efficiency index was worked out as 9 and price spread as Rs.3. Channel 1 was found to be the most efficient one with higher marketing efficiency index and minimum price spread (Table 4.39 and Table 4.40).

Sangeetha (2005) identified three marketing channels for orchids of which Producer→Cut flower society→ Consumer was found to be the most efficient channels. The results are almost comparable with the observations of the present study.

Table 4.40: Percentage share of producer price to consumer price in different marketing channels

Channel	Producer Price (Rs./flower)	Consumer Price (Rs./flower)	% share of producer price to consumer price
Channel I	17.5	20	87.50
Channel II	17	20	85.00
Channel III	10	14	71.43

In each channel the producer price and consumer price was different The percentage share of the producer's price to consumer's price was highest in Channel I which also showed the efficiency of this channel and majority of the growers were using this channel for selling their produce.

4.3 Constraints in cut flower industry

4.3.1 Constraints faced by cut flower growers

The following constraints for the production and marketing of cut flower growers were identified from the pilot study and were used for the sample survey.

Table 4.41: Constraints faced by cut flower growers in production and marketing

Constraints	Aggregate weighted score	Rank
High initial investment	766	4
High maintenance cost	263	10
Non availability of quality planting	727	5
Incidence of pests and diseases	431	8
Low market price	1003	1
Delay in getting sale proceeds	779	3
Irregular market	947	2
Lack of training	658	7
Low domestic demand	723	6
Transportation problem	305	9

Prevalence of low market price was found to be the major problem faced by majority of the growers. It was observed that majority of the growers were giving

their produce to cut flower traders and they were sending these flowers to florists' outside state. But there were only limited number of cut flower traders in the study area. This resulted in lack of bargaining power or low bargaining power for farmer because his option to select an alternate buyer of his produce became limited. So the existing traders will try to keep their profits as high as that they received previously by reducing the price given to the producer farmer. Proper marketing network as in the case of plantation crops had not been developed so far in Central Kerala for the marketing of orchids and anthuriums. Hence there was no uniformity in the prices offered by each trader to the cultivator.

Irregular market was the next problem faced by majority of the farmers. Orchid and anthurium flowers have high demand in North India during festive and ceremonial occasions like Holy, Deepavaly, Navarathri, etc. and during marriage seasons and the demand become sluggish during rainy seasons. This often results in wide gap between demand and supply of flowers produced in the state. It was observed that sometimes traders were collecting flowers from farmers once in three or four months. As a result huge wastage of farm produce occurs.

The most important reason for the third problem i.e. delay in getting sale proceeds to the growers was that cut flower traders of Kerala were often forced to sell the flowers on credit to the terminal markets situated in other states. Many of the traders were not getting prompt and timely payment of their sale proceeds from the traders in the terminal market. There were several instances of non-payment of dues to the traders in Kerala leading to the collapse of their businesses. So the traders were not able to give money timely to the growers. Several cut flower traders were observed as thrown out of the industry. The high risk attached to this trade makes new entrants hesitant to enter into this field.

High initial investment was the major production problem faced by the growers. The high rate of investment by way of construction of shade house and cost of plants were found to be the main obstacles for cultivation of cut flowers. The

investment is rather high when compared to the returns in the initial years. Mercy (1999) reported the high cost of good planting material of anthurium and lack of its adequate availability as a most serious constraint affecting the prospective of anthurium growers of Kerala. Soorianathasundaram and Rengasamy (1999) also reported the higher initial investment (Rs. 1.0 – 1.5 lakh per 1000 plants) on the cost of planting material as foremost among the constraints faced by the anthurium growers. The next problem cited was the non availability of quality planting materials. Many of the high yielding varieties were imported from other countries and its availability was also limited to a great extent. Cultivators often have to purchase such plants in bulk quantities, which ultimately lead to high cost of investment. Moreover there is no guarantee in the quality of plants purchased from the local nurseries, as it can be determined only after the flowering of plants. Majority of the farmers opined that productivity of imported plants were high compared plants from other sources like private nurseries. But it was found that the import procedure of plants were beyond the reach of an ordinary grower of these plants.

Low domestic demand due to the frequent changes in the tastes and preferences of consumers was the next major marketing constraint faced by the growers. Somasundaran (2002) identified the reasons for low internal demand of cut flowers like orchids and anthuriums in Kerala. He opined that due to the traditionalistic outlook of the people, majority of the people in Kerala had an indifferent attitude towards orchids and anthuriums as alier flowers having high price and no fragrance. He pointed out that inadequate interventions from the part of Government, voluntary organizations, cut flower societies, and innovative entrepreneurs were the basic reasons for the conservative outlook of people and the low level of internal demand.

Lack of training regarding the value addition of flowers was cited as the next important marketing problem faced by the growers. Most of the small scale growers were not aware of the value addition of flowers such as making bouquets,

flower vases, interior decoration etc. So they were not able to find alternate markets like large scale growers. That's why they were forced to give their produce at low price.

The other constraints in the order of importance were incidence of pests and diseases, transportation problem and high cost of maintenance. However, these were assigned only lower scores by the growers.

The results are comparable with studies conducted by Sindhu (1997), Karn (1999) and Somasundaran (2002).

4.3.2 Constraints faced by cut flower traders

The problems faced by the cut flower traders in Central Kerala have been identified by means of discussions with them, which are as follows.

1. Short supply of flowers to fulfill bulk orders

Traders and agents often get bulk orders for selected varieties of cut flowers from outside the state. But when they approach the cultivators to fulfill their needs, it is often very difficult to find sufficient number of selected varieties of flowers required by them. It is mainly due to the fact that majority of the cultivators used to grow several varieties in small number instead of cultivating large number of plants of a few varieties.

2. Lack of Government support

The Government has not yet provided any support to the traders by providing infrastructure facilities such as quick transportation facilities, centralized air-conditioned storage facilities for keeping the flowers in prime locations, auction centres with all modern facilities, fixation of support prices etc.

3. Lack of storage facilities

In Central Kerala there is no air conditioned storage facilities to keep the flowers fresh. Lack of such a facility either in private or public sector in the study

area often compel the flower traders to sell their produce at low prices compared to their competitors.

4. Improper grading and packing procedures adopted by the growers

Due to lack of proper training, many of the cultivators were ignorant with regard to the standardized grading and packing procedures. Unhygienic methods of harvesting, careless handling and improper transportation of flowers cause severe damages and degradation to the quality of flowers. This often makes the flowers unsuitable for marketing by traders at distant places. Sometimes it also requires further grading and repacking by the traders resulting in additional expenses.

5. Lack of market intelligence services

The Government has not taken any initiative for the development of market intelligence services as in the case of other commercial crops. This often creates many problems among the traders at the time of fixation of prices for the flowers procured by them.

Somasundaran (2002) identified the problems of cut flower traders in Kerala as lack of assistance from the Government and short supply of flowers. Similar results were obtained in the present study also.

Marketing of flowers had been identified as the major constraint in cut flower industry which discouraged the expansion of existing units and also prevented the new entrants in this field. Effective marketing system is bound to boost the production and productivity of these crops as well as adoption of this business at larger scale. Study on the scope and possibility of expansion of the domestic market is the urgent requirement. Marketing procedure of flowers should be channeled under the control of State government. The lessons from milk marketing can be suitably emulated here, as both the products are highly perishable.

4.4 Changing scenario of the cut flower industry in central Kerala

For analyzing the changes in the status of cut flower industry, the present study was compared with the study conducted by Karn (1999) entitled “Orchid and anthurium industry in Kerala – a study of home scale units in Kerala”. The objectives of his study were to study the economics of commercial production and marketing of orchid and anthurium in Kerala and to identify the constraints of orchid and anthurium cultivation in Kerala. Karn has identified Agnihotri, Limawhite and Tropical as the most commonly grown varieties of anthurium and Dendrobium as the most popular orchid. In the present study it was found out that Tropical red and Mauritius orange were the commonly grown varieties of anthurium; but in the case of orchid Dendrobium was still observed to be the most preferred one.

The cost of cultivation of cut flowers registered a declining trend towards larger groups in the study by Karn and similar trend was obtained in the present study also. The recurring costs were found to be higher in the previous study. Most of the farmers were using organic manures like dried cow dung, diluted cow’s urine, coconut water, fish extract, groundnut cake and neem cake slurry etc. for cultivation. Cost of these manures was lesser when compared to inorganic fertilizers. More over disease and pest incidence was very less in orchid and anthurium in the study area. So growers did not have to use plant protection chemicals often. These reasons might have resulted in low cost of agro-inputs. As against earlier study majority of the respondents were found to use sprinkler and mist systems for irrigation. Labour cost and cost of agro-inputs being the two major components of recurring costs, reduction in these costs resulted in lower recurring costs in the study area. Estabishment costs of cut flower units in the present study were almost comparable with the past studies.

Karn identified four marketing channels for anthurium and orchid and the most important one was Producer → Local Florist →Consumer through which major proportion of the produce was marketed. Six marketing channels for anthurium and

three marketing channels for orchid were found out in the present study. It was observed that 70 per cent of the growers were using Producers→ Vanitha PooKrishi Vikasana Samiti/ Cut flower society→ Exporters →Florists (outside state) →Consumers channel.

In the present and past study it was found out that the most significant problem faced by orchid and anthurium growers were the marketing of their products. The major constraints identified in the past studies still remain as constraints. Karn has suggested the “Milma model” of marketing for orchid and anthurium. But the model was not seen adopted by the respondents studied. Alternately, this study proposes a SHG (Self Help Group) model for production and marketing of cut flowers in Kerala.

Summary and Conclusion

5. SUMMARY AND CONCLUSION

Floriculture, till recently considered to be a simple garden activity, has become an important agri-business enterprise. 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. Orchid 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. This study was conducted with the specific objective to study the economics of cut flower enterprises, marketing channels and marketing efficiency of cut flower trade and to identify the major constraints in cut flower industry in Central Kerala.

The study is based on primary data collected from 120 growers in Thrissur and Ernakulam districts of Kerala. ABC cost concepts, Capital productivity analysis, Shepherd's formula and Price spread were used for analysing the data. Orchid and anthurium units have been studied across three scales of operation, *viz.*, small (<500 plants: C-1), medium (500-1000 plants: C-11) and large (>1000 plants: C-111). All the costs, returns and other parameters are estimated and discussed here are for 100 plants.

5.1 ANTHURIUM

According to ABC cost concept cost of cultivation for five years for C-1, C-11 and C-111 was estimated to be Rs.15,164, Rs.11,486 and Rs.9,963 respectively per 100 plants. Per unit cost of cultivation was found to be decreasing as the scale of operation increases. The highest share in total paid out cost was contributed by the value of planting materials. Of the total cost establishment cost accounted to 68 per cent in C-1, 78 per cent in C-11 and 82 per cent in C-111. The establishment cost was found out to be Rs.13,116 (C-1), Rs.12,008 (C-11) and Rs.11,330 (C-111). Cost of

plants was the major cost component in establishment cost which accounted to 43.75 per cent in C-1, 45.26 per cent in C-11 and 45.32 per cent in C-111. Other important components were cost of shade house (around 34%) and that of pots and media (around 17%). Recurring cost ranged from Rs.2,500 in C-111 to Rs.6,315 in C-111. Input-wise breakup of total recurring cost (for five years) recognised labour as the single most important component which accounted for about 87 per cent in C-1, 83 per cent in C-11 and 79 per cent in C-111 of the total recurring cost.

Labour is one of the major items of the input costs having a share of 37.23 per cent (C-1), 26.08 per cent (C-11) and 21.04 per cent (C-111) in the total cost of cultivation. Labour cost for potting and planting accounted 0.86 per cent in C-1, 1.05 per cent in C-11, 1.12 per cent in C-111 of the total labour cost. On an average about 4.8 hours of labour was required for potting and planting of 100 anthurium plants. Labour for care and maintenance contributed 36.37 per cent in C-1, 25.03 per cent in C-11 and 19.92 per cent in C-111 of the total cost of cultivation.

In anthurium, the return is comprised of income from the sale of flowers and suckers. About 2.5 per cent of the total income was obtained in the first year, 11.8 per cent in second year, 24 per cent in third year, 29 per cent in fourth year and finally 32.8 per cent in the last year. Total returns varied for three scales of operation – higher returns from larger scale of operation. It was Rs.32,790 in C-1; in C-11 Rs.35,750 and in C-111 Rs.41,152.

The estimated Pay Back Period in C-1 was 3.52 years, which declined to 2.05 years in C-11 and 1.71 years in C-111. Net Present Values were positive in all the categories with values varying from Rs.4,849 for C-1 and Rs.9,696 for C-11 to Rs.14,320 for C-111. Benefit Cost Ratio is seen well above unity in all the categories. Largest Benefit Cost Ratio of 2.2 is seen in C-111 followed by C-11 (1.71) and lastly C-1 (1.3). The Internal Rate of Return was above 50 per cent in C-111, 45 per cent in

C-11 and 28 per cent in C-1. All the estimated parameters rationalise the larger scale of operation to be more efficient and profitable.

Six marketing channels were found to be existing in anthurium cultivation. The most important one was "Producers→ Vanitha PooKrishi Vikasana Samiti/ Cut flower society→ Exporters →Florists (outside state) →Consumers", through which 70 per cent of the growers sell their produce. Marketing efficiency was estimated for all the six channels and the direct channel "Producers→Consumers" was found to be more efficient with a higher marketing efficiency index of 19 and minimum price spread of Rs.0.80.

5.2 ORCHID

Per unit cost of cultivation of orchid showed increasing pattern towards smaller groups. According to ABC cost concept cost of cultivation for five years for C-1, C-11 and C-111 was estimated to be Rs. 15,932, Rs.13,017 and Rs.11,199 respectively per 100 plants. The highest share in total paid out cost was contributed by the value of planting materials. Of the total cost establishment cost accounted to 67 per cent in C-1, 75 per cent in C-11 and 83 per cent in C-111. The establishment cost was found out to be Rs.13,397 (C-1), Rs.12,607 (C-11) and Rs.13,092 (C-111). Cost of plants was the major cost component in establishment cost which accounted to 51.03 per cent in C-1, 51.90 per cent in C-11 and 46.79 per cent in C-111. Other important components were cost of shade house (around 50%) and that of pots and media (around 9%).

Recurring cost was estimated as Rs.2,450 in C-111, Rs.3,835 in C-11 and Rs.6,025 in C-1. Labour was identified as the single most important component which accounted for about 82 per cent in C-1, 77 per cent in C-11 and 64 per cent in C-111 of the total recurring cost.

Labour is one of the major items of the input costs having a share of 31.75 per cent (C-1), 23.60 per cent (C-11) and 14.92 per cent (C-111) in the total cost of cultivation. Labour cost for potting and planting accounted 0.90 per cent in C-1, 1.01 per cent in C-11, 0.68 per cent in C-111 of the total labour cost. On an average about 5.79 hours of labour was required for potting and planting of 100 orchid plants in C-1 and C-11 but only 3.06 hours in C-111. Labour for care and maintenance contributed 30.85 per cent in C-1, 22.6 per cent in C-11 and 14.24 per cent in C-111 of the total cost of cultivation.

In orchid, the return was taken to be the exclusive income from the sale of flowers. About 3.7 per cent of the total income was obtained in the first year, 11.8 per cent in second year, 23 per cent in third year, 29 per cent in fourth year and finally 32.3 per cent in the last year. Total returns varied for three scales of operation – higher returns from larger scale of operation. It was Rs.27,640 in C-1; in C-11 Rs.30,461 and in C-111 Rs.35,474.

The estimated Pay Back Period in C-1 was 3.94 years, which declined to 3.45 years in C-11 and 2.7 years in C-111. Net Present Values are positive in all the categories with values varying from Rs.1,476 for C-1 and Rs.5,491 for C-11 to Rs.9,625 for C-111. Largest Benefit Cost Ratio of 1.72 is seen in C-111 followed by C-11 (1.4) and lastly C-1 (1.1). The Internal Rate of Return was 46 per cent in C-111, 31 per cent in C-11 and 18 per cent in C-1. All the estimated parameters indicated that the profitability and efficiency of enterprise increased with the increasing scale of operation.

Three marketing channels were found to be existing in orchid cultivation. The most important was “Producers→Local florists→Consumers” through which 89 per cent of the growers sell their produce and this channel was identified as the most efficient one with higher marketing efficiency index of 24 and minimum price spread of Rs.2.5.

5.3 CONSTRAINTS IN CUT FLOWER INDUSTRY

Low market price, irregular market, delay in getting sale proceeds, high initial investment, non availability of quality planting materials etc. were identified as the major constraints faced by cut flower growers. Short supply of flowers to fulfil bulk orders, lack of government support, lack of storage facilities etc. were the major constraints faced by cut flower traders. As marketing of flowers is the major constraint in the cut flower industry, it is better to have an effective marketing system. Effective marketing system is bound to boost the production and productivity of cut flowers as well as adoption of this business at large scale.

5.4 SUGGESTIONS AND POLICY IMPLICATIONS

1. SHG (Self Help Group) model would be the viable models for production of cut flowers, with collection centres at the ward level. A consortium of producer SHGs at the Grama panchayat level should be established for procurement and for ensuring fair prices to the growers of orchid and anthurium. This will avoid the exploitation of the intermediaries to a greater extent. Government should take necessary steps for the procurement and marketing of orchid and anthurium from the SHGs.

2. Necessary arrangements to be made by the Government to supply good quality planting materials to the cut flower growers at a reasonable rate. Tissue culture labs should be established at the block level or in selected academic institution, utilising the technical expertise, to act as the main centres of mass multiplication and distribution of exotic varieties of orchid and anthurium at reasonable rates to the needy farmers.

3. The initial investment cost for establishing the cut flower units being large, necessary institutional support from the Government and financial institutions may be given.

4. The Government should fix the grade standards for cut flowers and fix a reasonable price for each grade. Thus a uniform price can be maintained, which will prevent price fluctuation.

5. Setting up of cold chains and auction centres and publishing the market price of cut flowers through mass media will help to flourish the cut flower industry in central Kerala.

6. Flori-trade being an emerging agri business enterprise and considering the domestic and external market demand, the stake holders should be trained in capturing the market.

References

REFERENCES

Acharya, S.S. and Agarwal, N.L. 1987. *Agricultural marketing in India*. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 491p.

Ahmed, N. 2005. Flowers blossoming, business booming; nevertheless lot to be done. *Agric. Today*. 8(11):39-41.

Alsagoff, S.Y. 2000. The Southeast Asian orchid industry in the next millennium: issues and challenges. *Garden Wise.* 14: 10-11.

Anefalos, L.C., Tombolato, A.F., and Ricordi, A. 2010. Current panorama and future perspectives of the productive chain of tropical flowers: the case of the anthurium. *Revista Brasileira de Hort. Ornamental*. 16(1):107-111.

APEDA (2010)

Biswas, B.C., Lalit Kumar and Shukla, D.K. 2009. Economics of Flower Cultivation, *Indian J.Fert*. 5(5): 33-47.

Chahal, S.S. and Gill, K.S. 1991. Measurement of marketing efficiency in farm sector : A review. *Indian J. Agric. Mkt*. 5(2): 138-143.

Dadlani, K.N. 2002. Promoting floriculture business in India. *Indian Hort*. 46(4):39-43.

FIF (Federation of Indian Floriculturists). 1997. Model scheme for orchids and and anthuriums. *Report of Task Force on Innovative Agriculture*, Ninth five years plan, Thiruvananthapuram, Kerala, pp.39-41.

Fitch, C.M. 1998. Orchids triumph over opium. *Orchids*. 67(3):252-257.

Gajanana, T.M. and Subrahmanyam, K.V. 1999. Economics of production and marketing of anthuriums in Karnataka. *Agric. Econ. Res. Rev*. 12(1):48-55.

George, M.V. and Joseph, P.T. 1973. Cost benefit analysis of investment in tree crops. *J. Plntn. Crops*. 10;145-147.

Ghosh, S.P. 1998. Research and development in horticulture: commercial floriculture. *Indian Hort*. 43(1):7-11.

Gittinger, J.P. 1984. *Economic analysis of agricultural projects*. Agricultural Refinance and Development Corporation, Bombay, 221p.

Gowda, B.T., Angadi, J.G., and Hirevenkangoudar, L.V. 2006. Adoption and marketing pattern of cut flowers in Belgaum district. *Karnataka J. Agric.Sci*. 19 (3):603-608.

Guledgudda, S.S., Handigol, J.A., and Smitha, P.R. 2008. Costs, returns and resource use efficiency in anthurium cultivation in Croog district. *Agric. Situ. in India*. 65(9): 593-596.

Haridas, S.K. 2010. Evaluating the performance of Wayanad District Floriculture Society. MBA project report, Kerala Agricultural University, Thrissur.116p.

Horarueong, B., Pankaew, Y., Teeravanich, R., Sawa trum, P., and Sujarinphong, P. 2010. Orchid production and marketing in the central region and neighboring areas. *Proceedings of the forty eighth Kasetsart University Annual Conference*; 3-5 March, 2010; Kasetsart. Kasetsart University, Kasetsart, pp.12-20.

Jadhav, M.S., Inamdar, P.P., and Pagire, B.V. 2000. Export potential and marketing of flowers in India. *Indian J. Agric. Mkt*. 10(2): 128-134.

Jiunshong, W., Boshin, X., and Shianngwo, J. 2009.A study on the willingness and behaviors in knowledge sharing of orchid production and marketing teams. *J. Agric. Ass. Taiwan*. 10(6): 452-469.

Joglekar, S. 1998. Floriculture – an overview. *Agric. Industry Surv*. 8(9): 13-14.

John, K. 2003. Extension prospects in India. *Vanilla : The prince of spices*. Spices Board, Cochin, 92p.

Karn, P.K.1999. Orchid and anthurium industry in Kerala - A study of home scale units. M.Sc. (Hort.) thesis, Kerala Agricultural University, Thrissur.121p.

Kaur, J. 1999. Valentine day: providing impetus to domestic floral trade. Floriculture Today. 3(10):6-12.

Kazi, S.S. 2002. Floriculture-still a dormant sector. *Agric.Today*. 5 (12):24-26.

Khan, J.M. 2004. Towards the golden revolution. *Agric. Today*. 7(11):42-45.

Khushk, A.M. and Lashari, M.I. 2002. Improving marketing system of cut flowers in Sindh: a preliminary analysis.*Sarhad J. Agric*. 18(1):121-128.

Kiyuna, I., Takane, R.J., Okawa, H., and Morales, M.C. 2004. Cost, profitability and investment evaluation in the production of anthurium: a case study. *Informacoes Economicas-Instituto de Economia Agricola*. 34(8): 13-24.

Kohno, K. 2009. Changes in demand for floriculture products in Japan since the 1990s. *Acta Hort.* 831:229-236.

Kotler, P. 1989. *Marketing management*. Prentice Hall of India Pvt. Ltd., New Delhi, 722p.

Kumar, A. 2000. Floriculture industry - an over view. *Plant Hort. Tech.* 1(4):29-30.

Kumar, R., Reddy, A.R., and Sen, C. Marketing of marigold, rose and jasmine in Uttar Pradesh. *Indian J. Agric. Mkt*. 18(1):128-134.

Mahalakshmi, S. 2004, May 31. Floriculture units eye; government’s revival package. *Financial Express*. p13.

Mercy, S.T. 1999. Breeding new anthurium hybrids for commercial cultivation. *Proceedings of the Seminar on Kerala Floriculture 2020*, 11-13 February, 1999 (eds. Rajeevan, P.K. and Valsalakumari, P.K.). Kerala Agricultural University, Thrissur, pp.45-48.

Misra, J.P. 1997. High-tech agriculture in India-trends, prospects and conditions for growth. *Agric. Econ. Res. Rev*. 10(2):230-243.

Muthoka, N.M. and Muriithi, A.N. 2008. Small holder summer flower production in Kenya: a myth or a prospect? *Acta Hort.* 766: 219-224.

NHB (2010)

Nimbalkar, C.A. and Tilekar, S.N. 1999. Economics of production and marketing of rose cut flowers produced under high-tech agriculture. *J. Maharashtra Agric. Univ*. 24(2):189-192.

Rajeevan, P.K. 1998. Orchids – basic cultivation techniques. *Agric. Ind. Surv*. 8(10): 38-39.

Rajeevan, P.K. 1999. Taking tropical flowers to export market. *Proceedings of the Seminar on Kerala Floriculture 2020*, 11-13 February, 1999 (eds. Rajeevan, P.K. and Valsalakumari, P.K.). Kerala Agricultural University, Thrissur, pp.15-20.

Rajeevan, P.K., Valsalakumari, P.K., Geetha, C.K., and Sudhadevi, P.K. 2006. *Reflections on Indian floribusiness*. State Horticulture Mission, Kerala, 211p.

Salvi, B.R.1997. Optimisation of shade,nutrients and growth regulators for cut – flower production in anthurium. Ph.D. thesis, Kerala Agricultural University, Thrissur,150p.

Samuel, M. 1999, Jan. 1. State on threshold orchid bloom. *The Hindu*. p10.

Sangeetha, K. 2005. Marketing of commercial flowers- a study in Palakkad and Thrissur districts of Kerala. M.Sc. thesis, Kerala Agricultural University, Thrissur.102p.

Sen, S. and Raju, S. 2006, Jun. 30. Globalisation and expanding markets for cut flowers: who benefits? *Economic and Political Weekly* 41(26): 2725-2731.

Shepherd, G.S. 1965. *Marketing farm products-economic analysis*. Iowa State University Press, USA, 254p.

Shukla, S. and Jain, N. 1996, Mar. 11. A long wait to bloom. *The Economic Times*. p4.

Sindhu, R. 1997a. Problems and prospects of flowers in India. *Indian Hort*. 42(2):52-55.

Sindhu, S. 1997b. Prospects and constraints of commercial cut flower production in Thiruvananthapuram district. M.Sc. (Ag.) thesis, Kerala Agricultural University, Thrissur.91p.

Somasundaran, K.V.2002. A study on the cut flower industry in Kerala.Ph.D. (Social Sciences) thesis, Mahatma Gandhi University, Kottayam. 547p.

Soorianathasundaram, K. and Rengasamy, P. 1999. Perspective plan for floriculture research and development in Kerala. *Proceedings of the Seminar on Kerala Floriculture 2020*, 11-13 February, 1999 (eds. Rajeevan, P.K. and Valsalakumari, P.K.). Kerala Agricultural University, Thrissur, pp.36-38.

Tale, B.N., Kalamkar, S.S., and Shende, N.V. 2003. Economics of flower marketing. *Indian J. Agric. Mkt*. 17(2):117-119.

Thakur, D.R., Saini, A.S. and Sharma, K.D. 2004. Floriculture scenario in Himachal Pradesh – infrastructural needs. *Indian J. Agric. Mkt*. 18(3): 40-51.

Tilekar, S.N. and Salunkhe, G.N. 2001. *Price analysis of cut flowers produced around urban areas of western Maharashtra*. Zonal Agricultural Station, Pune, 105p.

Vinod, G. 1984. Cost of cultivation and marketing of pepper in Idukki district. M.Sc. (Ag.) thesis. Kerala Agricultural University, Vellanikkara, Thrissur, 150p.

Appendices

Appendix I: Year wise returns from flowers and suckers from anthurium units (Rs. per 100 plants)

Year	C-1				C-11				C-111			
	Flowers		Suckers		Flowers		Suckers		Flowers		Suckers	
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
1	225	868	-	-	250	925	-	-	310	985	-	-
2	565	4043	85	-	625	4326	88	-	665	4496	93	-
3	745	5290	110	2432	798	5460	114	2925	805	6545	118	3575
4	810	6262	135	3265	848	6952	137	3575	860	7542	141	4245
5	845	6952	145	3678	875	7362	148	4225	898	8638	149	5126
Subtotal	3190	23,415	475	9375	3396	25,025	487	10,725	3538	28,206	501	12,946
Total	Rs.32,790				Rs.35,750				Rs.41,152			

Appendix II: Cash flow statement of investment in anthurium enterprises (Rs. per 100 plants)

Years	C-1			C-11			C-111		
	Cash outflow	Cash inflow	Cash flow	Cash outflow	Cash inflow	Cash flow	Cash outflow	Cash inflow	Cash flow
1	14380	868	-13512	12702	925	-11777	11830	985	-10845
2	1263	4043	2780	694	4326	3632	500	4496	3996
3	1263	7722	6459	694	8385	7691	500	10120	9620
4	1263	9527	8264	694	10527	9833	500	11787	11287
5	1263	10630	9367	694	11587	10893	500	13764	13264

APPENDIX III: Cash flow statement of investment in orchid enterprises (Rs. per 100 plants)

Years	C-1			C-11			C-111		
	Cash outflow	Cash inflow	Cash flow	Cash outflow	Cash inflow	Cash flow	Cash outflow	Cash inflow	Cash flow
1	14602	736	-13866	13369	905	-12464	13582	1893	-11689
2	1205	3261	2056	767	3446	2679	490	4369	3879
3	1205	6248	5043	767	6695	5928	490	8835	8345
4	1205	8340	7135	767	9405	8638	490	9272	8782
5	1205	9065	7860	767	10010	9243	490	11105	10615

CHANGING SCENARIO OF THE CUT FLOWER INDUSTRY IN CENTRAL KERALA – AN ECONOMIC ANALYSIS

By

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ABSTRACT OF THE THESIS

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ABSTRACT

Floriculture is fast emerging as a lucrative profession in the world scenario and is a potential money spinner for many countries. In terms of production, floriculture in the world is growing at an average rate of 10 per cent per year. Floriculture is a multi-crore industry in India which contributes 0.6 per cent to global floriculture trade. In 2009-10 the total area under floriculture was estimated to be 1,83,000 hectare with an estimated production of 1021 metric tonnes of loose flowers and about 6667 million numbers of cut flowers.

Cut flowers like orchid and anthurium are identified as the most important flowers with commercial potential suitable for Kerala. The present study was done to investigate the economics of cut flower enterprises, marketing channel and marketing efficiency of cut flower trade and to identify the constraints of cut flower industry in Central Kerala. Orchid and anthurium were the major cut flowers included in the study. The study was conducted with a sample of 120 cut flower growers. Percentage analysis, ABC cost concept, Capital productivity analysis and Shepherd's formula were used to analyze the data. Orchid and anthurium growing units have been studied across three scales of operation, *viz*., small (less than 500 plants: C-I), medium (500 to 1000 plants: C-II) and large (above 1000 plants: C-III) for a standard of 100 plants in each categories.

Anthurium

Per unit cost of cultivation of anthurium showed increasing pattern towards smaller groups. According to ABC cost concept cost of cultivation for five years for C-1, C-11 and C-111was estimated to be Rs. 15,164, Rs.11,486 and Rs.9,963 respectively. The establishment cost was found out to be Rs.13,116 (C-1), Rs.12,008 (C-11) and Rs.11,330 (C-111). Recurring cost ranged from Rs.2,500 in C-111 to Rs.6,315 in C-111. The total return realized over crop life varied from Rs.32,790 to

Rs.41,152 in different scales of operation. The estimated project worth parameters were well above acceptance level in C-11 and C-111.

Orchid

According to ABC cost concept cost of cultivation for five years for C-1, C-11 and C-111 was estimated to be Rs. 15,932, Rs.13,017 and Rs.11,199 respectively. The establishment cost was found out to be Rs.13,397 (C-1), Rs.12,607 (C-11) and Rs.13,092 (C-111). Recurring cost was Rs.2,450 in C-111, Rs.3,835 in C-11 and Rs.6,025 in C-1. Per unit cost of cultivation was found to be decreasing as the scale of operation increases. The total return realized over the economic life of the crop was found to Rs.27,640 in C-1, Rs.30,461 in C-11 and Rs.35,474 in C-111.Higher returns were realized from larger units. The estimated project worth parameters were well above acceptance level in all the categories.

Capital productivity analysis of orchid and anthurium showed that larger units were seen comparatively more efficient and profitable than smaller ones. In anthurium cultivation only family labour was utilized for all operations in three scales of operation. But in case of orchid, hired labour was employed for potting and planting in C-111.

Marketing channels and efficiency

Six marketing channels were identified for anthurium. The direct channel i.e. Producer ⟶ Consumer was found to be more efficient. Out of the three marketing channels identified for orchid, Producer ⟶ Local florists' ⟶ Consumer was identified as the most efficient channel.

Constraints in cut flower trade

The most serious problem faced by orchid and anthurium growers, especially smaller sized units, was low market price for their products. Irregular markets

followed by delay in getting sale proceeds were identified as the other major constraints faced by the growers. Short supply of flowers, lack of government support, lack of storage facilities etc. were the major problems faced by cut flower traders. Effective production planning and marketing management were identified as the key factors for the development of the sector.