ECONOMIC ANALYSIS OF ORCHID FLOWER TRADE IN KERALA

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(2013-11-183)

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by

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KERALA, INDIA
2015

DECLARATION

I hereby declare that this thesis entitled "**ECONOMIC ANALYSIS OF ORCHID FLOWER TRADE IN KERALA**" is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title of any University or Society.

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CERTIFICATE

Certified that this thesis entitled "**ECONOMIC ANALYSIS OF ORCHID FLOWER TRADE IN KERALA**" is a record of research work done independently by **Ms. Aiswarya Mohanan (2013-11-183)** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to her.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BCR	Benefit Cost Ratio
CAGR	Compounded Annual Growth Rate
EKM	Ernakulam
FIF	Federation of Indian Floriculturists
Ha	Hectares
IRR	Internal Rate of Return
ME	Marketing Efficiency
MFC	Marginal Factor Cost
MPP	Marginal Physical Product
MVP	Marginal Value Product
NHB	National Horticulture Board
NPW	Net Present Worth
PBP	Pay-Back Period
Rs	Rupees
TVM	Thiruvananthapuram
UK	United Kingdom
US	United States

LIST OF APPENDICES

Sl. no.	Appendix
1	Schedule for data collection
2	Year-wise cost of cultivation of 1000 orchid plants
3	Garrett's ranking conversion table

Introduction

1. INTRODUCTION

"Where flowers bloom so does hope"

Lady Bird Johnson

Flowers have always been an integral part of human culture. Flowers are there on almost every occasion, from birth to death, in religious ceremonies, festivals, birthdays, weddings, anniversaries and receptions to convey profound human feelings. Floriculture or flower farming has emerged as a viable economic option in the diversification of agriculture in India and worldwide. Enormous genetic diversity, favourable agro climatic conditions, versatile human resources and a fastest growing domestic market, offer India, unlimited opportunities for growth in floriculture sector.

More than 140 countries are involved in flower cultivation in the world. As of 2008, China and India have large area under flower cultivation where production is undertaken mainly for the domestic markets, with more area under open field flower cultivation rather than protected cultivation (Bhattacharyya, 2014). World leader in flower production is European Union with a production share of 42.6 per cent, followed by China and the United States.

The Netherlands has, traditionally dominated the world export market of floricultural products with its value of export growing from 5.9 billion US$ in 2003 to 10.4 billion US$ in 2012. It alone contributes more than 50 per cent of the total export of floricultural products worldwide. Columbia, Germany, Belgium, Ecuador, Denmark, the United States and Spain are the other major exporting countries. Germany is the leading importer of floricultural products, followed by the United States and the Netherlands. Rose, dendranthema, carnation, gerbera, poinsettia, orchids and tulips are the important cut flowers traded in the international market.

Orchids have received a remarkable position in the cut flower industry due to its attractiveness, long shelf life, high productivity and easiness in packing and

transportation. Orchids account for around 10 per cent of international fresh cut flower trade. The Netherlands is the top most orchid exporting country (39. 67 per cent) followed by Thailand (28.41 per cent) and Taiwan (10 per cent). Major importing countries are Japan (30 per cent), UK (12 per cent) and Italy (10 per cent). The cut flower orchid trade of the world mostly consists of Dendrobium and Phalaenopsis (De, 2014). India is home for around 1300 species, out of more than 30,000 species throughout the world. The Cymbidium, a native genus of India is grown in Sikkim, Darjeeling hills of West Bengal and Arunachal Pradesh. Tropical orchids are mainly cultivated in Kerala, Karnataka and some parts of Tamil Nadu.

The liberalization of industrial and trade policy in July 1991 paved the way for development of export oriented production of cut flowers in India. Government of India has accorded 100 per cent export oriented status to the floriculture industry. Area and production of flowers for a period from 2003 to 2012 is presented in Table 1. Area under flower cultivation in India is 2,33,000 hectares with a production of 17,29,000 metric tonnes of loose flowers and 76,732 lakh numbers of cut flowers. The total area under floriculture is growing at a Compounded Annual Growth Rate (CAGR) of about 12 per cent in India.

Marigold is the principal loose flower grown all over the country, followed by chrysanthemum, rose, jasmine etc. Rose ranks first both in production and area of cut flowers. Cut flowers such as rose, gladiolus, anthurium, gerbera, orchids and lilium are increasingly grown both for domestic consumption as well as for exports. The increase in production of cut flowers is more vigorous than the increase in production of loose flowers over the years. There is a shift in production preference of growers from traditional flowers which are mainly used in domestic market to modern cut flowers which are more profitable and has a lot of export potential. Leading loose flower producing states are Tamil Nadu (19 per cent), Karnataka (12 per cent) and Madhya Pradesh (11 per cent). Leading states with respect to cut flower production are West Bengal (27 per cent), Karnataka (13 per cent) and Odisha (11 per cent).

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

Year	Area('000ha)	Loose flower production('000 metric tonnes)	Cut flower production (lakh no.)
2003	101	580	17930
2004	118	659	20710
2005	129	654	27620
2006	144	880	37175
2007	166	868	43654
2008	167	987	47942
2009	183	1021	66671
2010	191	1031	69027
2011	254	1652	75066
2012	233	1729	76732

(Source: NHB: Indian Horticulture Database, 2014)

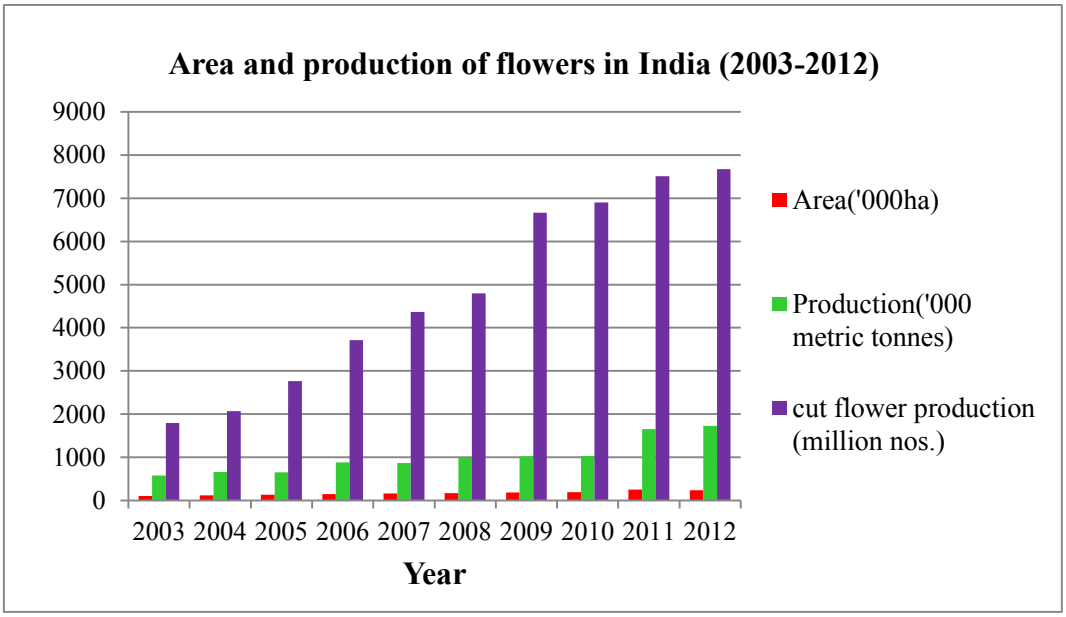

Figure 1. Area and production of flowers in India (2003-2012)

India's contribution to the global export of floricultural products has increased notably during the period 2000-07 (Table 2). After 2007 India faced a setback in its export of floricultural products. But it is gaining back its momentum during the last three years. India exported floricultural products worth US$ 78.4 million in 2012. During the period 2008-12, the USA has been the major importer of Indian floricultural products followed by the Netherlands, Germany and United Kingdom. In the year 2012, around 45 per cent of the total value of floricultural products exported from India has been foliage and about 40 per cent was in the category of cut flowers. In the recent years, dried flowers and foliage have been forming a large part of floricultural products export from India. During 2008-09, dried flowers constituted over 60 per cent of cut flowers export, and dried foliage constituted around 99 per cent of total foliage export from India (Muthukumaran, 2009).

Table 2. Export of floricultural products from India

Year	Export (in million US$)	Percentage share of cut flowers in export
2003	43.52	42.72
2004	54.83	47.38
2005	66.84	47.77
2006	88.57	48.60
2007	140.54	57.28
2008	80.30	30.36
2009	67.61	32.33
2010	62.71	39.01
2011	73.50	42.61
2012	78.44	39.75

(Source: UNCTSD, 2003-2012)

At present Kerala does not find a place in the horticulture map of India. Nearly 95 per cent of the demand in Kerala for the traditional flowers is met by neighbouring states of Karnataka and Tamil Nadu. Kerala is producing loose flowers like jasmine, marigold etc. and cut flowers like orchid, anthurium, lily etc. in small quantities. According to the report of Department of Economics and Statistics, Kerala (2009), out of the 61,389 quintals of loose flowers traded in the state, 22.84 per cent was jasmine, 15.18 per cent was marigold and 5.07 per cent was chrysanthemum. The trade of flowers like anthurium, orchid and lotus were done in numbers. Out of the 15,73,430 flowers traded, 26.25 per cent was orchid, 14.12 per cent was anthurium and 59.61 per cent was lotus. Major portion of the trade was reported from Ernakulam (17.52 per cent) and Thiruvananthapuram districts (12.61 per cent). Kerala has been identified as a perfect place for cultivation of orchids because of its high humidity, low temperature and plethora of sunlight. Cultivation of orchids have acquired wide acceptance all over the state and today, a number of big and small entrepreneurs are engaged in production and marketing of orchids as cut flowers and potted plants in Kerala.

Even though there was a boom in orchid cultivation in nineties, in recent days, new entrepreneurs are reluctant to enter into cut flower orchid production mainly because of the problems in marketing. Because of the scarcity of reliable statistics pertaining to the status of production and marketing of orchids in Kerala, this study has been conducted with the objective to bring out a realistic picture of the commercial aspects of orchid cultivation in Kerala.

Specific objectives of the study were

1) To study the economics of orchid cultivation in Kerala, and
2) To find out the opportunities and challenges in orchid flower trade in Kerala

The present study compares the variation in production and marketing of cut flower orchids in Ernakulam and Thiruvananthapuram districts of Kerala.

1.1 Scope of the study

There has not been a field level empirical study comparing the differences in economics and marketing of open field and protected cultivation of orchids. By taking Thiruvananthapuram and Ernakulam as two locations for sample collection, this study could reveal the strengths of growers of Thiruvananthapuram in marketing of orchids and the weaknesses of orchid flower marketing in Ernakulam which would be of use to the orchid entrepreneurs and policy makers who wish to have a realistic picture of economic feasibility and marketing situation of orchids in Kerala.

1.2 Limitation of the study

As the primary data was collected based on sample surveys, possibility of errors due to natural bias in the reporting of data by respondents could not be completely ruled out. However, possible efforts were made to minimize the errors by cross-questioning, cross-checking and by visual observations. There was a tendency to shift from orchid flower trade to orchid plant trade due to the problems related to marketing. Hence, sample size was limited to 20.

1.3 Organization of study

This thesis is presented in five chapters. Scenario of Indian floriculture industry, importance of orchids, limitations and scope of the work are presented in the first chapter, 'Introduction'. The second chapter 'Review of literature' describes the past works in similar field of study. The third chapter 'Methodology' encompasses the details on different methods adopted for the measurement of variables and statistical techniques employed. Results of research and their interpretations form the fourth chapter, 'Results and discussion'. The fifth chapter summarizes the salient findings and implications of the study.

Review of literature

2. REVIEW OF LITERATURE

A critical review of the past work is essential to have a thorough understanding of our topic of research. It is the knowledge of our field which allows us to identify the gap which our research could fill. As the reviews on economics of orchid cultivation are meagre, reviews related to flower crops and other perennial horticultural crops were collected for the present study. The reviews thus obtained are presented under the following headings.

2.1 Production and marketing of flower crops

2.2 Production and marketing of other horticultural crops

2.1 PRODUCTION AND MARKETING OF FLOWER CROPS

2.1.1 Production

Dahiya *et al.* (1997) compared the economics of floricultural crops and their competing crops in Sonepat district of Haryana. Marigold was found to be more profitable (net return of Rs. 20,295 per hectare) over its competing crops that are paddy (Rs. 9,827 per hectare) and arhar (Rs. 3,380 per hectare). Similarly gladiolus was found to be highly profitable (net return of Rs. 78,808 per hectare) over its competing crops that are mustard (Rs. 3,958 per hectare) and wheat (Rs. 1,372 per hectare)

Saini and Sharma (1997) evaluated the economic sustainability of hi-tech floriculture in Himachal Pradesh. They estimated that a medium term capital of Rs. 13.24 lakhs was required to establish tissue culture lab and a short term capital of Rs. 2.77 lakhs was needed to purchase chemicals, inputs etc., for producing about 2 lakh plants of begonia and orchids annually.

Karn (1999) estimated the economics of orchid and anthurium cultivation in Kerala. In the study, unit cost of cultivation of orchid was found decreasing with the increase in unit size, ranging from Rs. 19,902 in G-I(< 500 plants), Rs. 19,114 in G-II (500-1000 plants) and Rs. 16,508 in G-III (>1000 plants). Total

cost of establishment was worked out to Rs. 10,007 in which cost of plants and cost of shade house together constituted 85 per cent. Average recurring cost for five years was computed as Rs. 7,464. The distribution of average annual return from 100 orchid plants was estimated as Rs. 2,816 in first year, Rs. 8,008 in second year, Rs. 8,452 in third year, Rs. 8,217 in fourth year and Rs. 8,595 in the fifth year. In the capital productivity analysis, net present worth was computed to Rs. 9,345 and benefit cost ratio was observed as 1.61. Aggregate internal rate of return came to be 39 per cent, which was greater than the opportunity cost of capital.

Sharma (2001) in his study on economics of production and marketing of marigold in Jaipur district of Rajasthan found that it was highly profitable to grow marigold in the study area. The total cost per hectare of marigold cultivation was estimated to be Rs. 35,822. The variable cost exceeded the fixed cost on all size groups of farms. The higher paid out cost was incurred by small farmers on account of higher use of human labour, mechanical power and farm yard manure. The average net income worked out to be Rs. 59,797 per hectare. On an average, one rupee invested in cultivation of marigold paid Rs. 2.66 on the sample farmers.

Singh (2001) estimated the economics of wild marigold production and distillation in Himachal Pradesh. The variable costs were found to be increasing at a constant rate (Rs. 2,528 per batch) with the increase in the number of batches distilled. The incremental net returns to capital investment was Rs. 2,472 for every additional batch distilled. Minimum number of batches to be distilled per annum for economic operation of the distillation plant was found to be 34 and the requirement of fresh herbage for the distillation of 34 batches was 272 quintals per annum.

Sudha (2001) estimated the economics of protected cultivation of cut-rose for international markets. The average annual cost of production for export, for one hectare of cut-rose was worked out to Rs. 67.21 lakhs per hectare. The cost of production per rose spike was computed as Rs. 4.31 in the study area. With an

average price of Rs. 6 per spike, the cut rose production for export purpose in the study area was found to be profitable and economically viable.

Nair (2002) in his work on cut flower industry in Kerala stated that 45 per cent of the orchid cultivators utilised family labour at various levels of cultivation. Those who utilised hired labour for these purposes was worked out to 41 per cent and those who deployed family and hired labour for the same constituted 14 per cent of the total. Fifty seven per cent of orchid cultivators carried on their cultivation with their own funds while 29 per cent of them depended on borrowed funds for the cultivation of plants and for meeting other expenses. Only 14 per cent of the growers resorted to both the borrowed funds and own funds for cultivation.

Kiyuna *et al.* (2004) analysed the investment in protected cultivation of anthurium in Brazil. The results of profitability analysis showed that the investment was feasible at an internal rate of return of 25 per cent. The study further revealed that the cultivation of anthurium could be an attractive option for small and average producers, near metropolis, as an alternative to the use of land and capital.

Singh *et al.* (2006) examined the problems and prospects of contract farming of floriculture in Punjab. They reported that farmers growing flowers for seed production under the umbrella of contract farming showed their satisfaction about the facilities provided by the contracting agencies. Income from different flowers ranged from about Rs. 31,364.09 for ice plant to about Rs. 84,621.63 for verbena flower per hectare while income from wheat was only Rs. 20,885.41 per hectare. Employment generation was much higher for different flower crops compared to wheat.

In a study conducted on floriculture potential of Haryana by Kundu *et al.* (2007), costs and returns from different flower crops were compared. From the study it was found that total cost of cultivation was highest for gladiolus, accounting for Rs. 88,005.20 followed by tuberose (Rs. 59,840.56), rose (Rs.

42,611), marigold (Rs. 19,880.88) and chrysanthemum (Rs. 19,728.24). Income per person was maximum for gladiolus (Rs. 7,099.48) followed by rose (Rs. 3,738.90), tuberose (Rs. 3,500), chrysanthemum (Rs. 1,877.76) and marigold (Rs. 1,211.91).

Vanishree (2007) studied the production and marketing of jasmine in Chitradurga district of Karnataka. The study indicated that jasmine was a labour intensive crop requiring on an average 799.58 mandays per acre, out of which harvesting accounted for a lion's share. The average total cost of cultivation was computed as Rs.43,046.28 per acre. The returns over variable, fixed and marketing costs was worked out to Rs.78,181.77, Rs.73,454.35 and 57,381 respectively indicating the profitability of jasmine cultivation. The investment appraisal analysis revealed that the net present value of investment was Rs. 5,36,212.40 per acre at 12 per cent discount rate for jasmine enterprise. The payback period was found to be three years and the discounted benefit cost ratio was 2.28. The internal rate of return was found to be more than 50 per cent.

A study conducted on anthurium cultivation in Coorg district of Karnataka revealed that anthurium cultivation was capital intensive for both organized and unorganized sectors, and that the income in the organized sector was comparatively higher due to the better price received for their produce. (Guledgudda *et al.,* 2008)

Perke *et al.* (2009) estimated the economics of production of kagda (*Jasminum arborescens*) flower in Maharashtra. Gross return from kagda production was worked out to Rs. 1,42,198.61 per hectare. Farm business income was estimated as Rs. 77,405.99 followed by family labour income as Rs. 43,092.46. Net income of Rs. 37,364.35 implied that kagda garden was most profitable in flower production.

Singh *et al.* (2010) evaluated the adoption of commercial cut flower production technology in Meerut. Education level of farmers was found to have positive and significant contribution towards adoption of cut flower gladiolus

cultivation technology. They pointed out the need for improving social participation of the flower cultivators by mobilizing them towards forming self help groups or co-operative associations as the social participation variable came significant with adoption.

Steephan (2011) analysed the changing scenario of cut flower industry in central Kerala. For a unit size of above 1500 plants, cost of cultivation was computed as Rs. 11,199 per 100 plants. Planting material cost constituted to the highest share in total paid out cost. Total establishment cost was found as Rs. 13,092, in which cost of plants accounted 47 per cent. Recurring cost for the total life span of crop was calculated as Rs. 2,450 and labour accounted 64 per cent of the total recurring cost. Total return was estimated as Rs. 35,474 in which a maximum of 32 per cent was obtained in the last year. The estimated payback period was 2.7 years and benefit cost ratio was 1.72. Internal rate of return was 46 per cent. All the estimated parameters indicated the profitability of orchid enterprise.

Gowda *et al.* (2012) studied the economics of hi-tech rose cultivation. The average establishment cost of rose under controlled condition was found to Rs. 125.38 lakhs in Bangalore. The most important component was buildings and other structures which constituted about 54 per cent of the establishment cost. The material cost was worked out to Rs. 41.23 lakhs per hectare of which planting material was found to be the major item which constituted about 30 per cent of cost of establishment. Of the total flowers harvested, nearly two-third of the quantity was exported and the remaining one-third was sold in the domestic market. Export price of rose was Rs. 8.45 whereas the domestic price was Rs. 1.40.

Majumdar and Lahiri (2012) compared the profitability of cut flower roses with hibiscus and jasmine in West Bengal. The total cost of production for one hectare was highest for rose (Rs. 27,13,290.63) followed by jasmine (Rs. 20,29,678.21) and hibiscus (Rs. 11,56,498.78). Net income received was highest

for hibiscus (Rs. 72,18,588.94) followed by jasmine (Rs. 32,08,73.74) and rose (Rs. 27,14,544.42). Gross and net income was found to be highest for hibiscus than all other flowers because of low cost involved in procuring planting material, cost of fertilizers and plant protection chemicals.

Kolambkar *et al*. (2013) studied the economics of production of marigold cultivation in Maharashtra. The per hectare cost of cultivation was worked out to Rs. 2,02,046.40 and per hectare net returns was obtained as Rs. 2,27,206.60. Major items of cost were rental value of own land (35.41 per cent), seedlings (29.98 per cent), human labour (12.69 per cent) and interest on fixed capitals (6.03 per cent).

Koripalli *et al.* (2013) analysed the costs, returns and investment pattern of commercial floricultural nurseries in East Godavari district of Andhra Pradesh. The study revealed that the total expenditure incurred by floricultural nursery entrepreneurs was Rs. 25,51,338.29 per hectare. The cost of maintenance of per hectare floricultural nurseries was Rs. 18,32,100.75 and the net returns per hectare was Rs. 5,45,206.79. The results of capital investment analysis showed that payback period was 2.72 years, the net present worth discounted at 12 per cent was Rs. 29,82,790.38, the benefit-cost ratio was 1.64 and the internal rate return obtained by investment was 123.52 per cent.

From the feasibility analysis of investment in floricultural nurseries in East Godavari district of Andhra Pradesh, it was found that the total cost was Rs. 18,32,100 per hectare. The net present worth was found to be Rs. 29,82,790.38. In the functional analysis for overall sample nurseries, the production factor of human labour was found positively significant at one per cent probability level and planting material and polythene bags were found to be positively significant at five per cent probability levels, indicating a significant impact on gross returns (Mayuri *et al.*, 2013)

Waghmare and Shendage (2013) studied the profitability of cut roses grown under hi-tech cultivation. The average cost for establishment of polyhouse

was estimated to be 23.13 lakhs. The framework cost shared about 50 to 53 per cent of the total cost. The average cost of cultivation of cut roses was Rs. 5.97 lakhs and it decreased across the size group of polyhouse.

2.1.2 Marketing

Vedini (1997) studied the costs and margins in marketing of jasmine flower in Mysore city. The main marketing channels identified in her study were, Channel I: Producer – Trader cum commission agent – Retailer – Consumer; Channel II: Producer – Consumer. The analysis showed that 94 per cent of the total marketing cost was accounted for labour charges. Among all the intermediaries the net return per kilogram of flower trade was highest in case of retailers due to the creation of form utility.

Tilekar (1998) analyzed the price differentials between domestic and export markets for rose cut flowers. He observed that the difference in per dozen net prices realized in Pune and Mumbai markets was (Rs. 6.50 in Mumbai minus Rs. 6.12 in Pune) only Rs. 0.38 which was very negligible. The entire rose cut flowers produced in polyhouses were sold to European countries and also to Japan. The average net prices realized in these markets were Rs. 87.36 per dozen which were 14 to 15 times greater than in Pune and Mumbai markets.

Karn (1999) identified the important marketing channels for orchids in Kerala which were, Channel I: Producers – Local florists – Consumers; Channel II: Producers – Exporters –Florists(outside) –Consumers; Channel III: Producers -Florists(outside) –consumers; Channel IV: Producers – Consumers. First channel was identified as most important channel through which 57 per cent of the produce was marketed. It was also observed that 81 per cent of growers sold their produce, partly or wholly through the first channel.

Five different kinds of marketing channels were identified by Banerjee and Ali (2001) for chrysanthemum marketing in Midnapore district of West Bengal. Channel I: Producer – Primary Wholesale Market (Mallickghat) – Secondary

Wholesale Market (New Market) – Nearby Retail market (New Market) – Consumer; Channel II: Producer – Primary Whole sale Market – Retail market (college Street) – Consumer. Eighty five per cent of the total flowers produced in the district was transacted through first two channels. Channel II was found more efficient for grade A type chrysanthemum flowers. It could provide farmers with 53.92 per cent of final price. The share of producer in the consumer rupee was found to be 46.85 in Channel I.

A study was undertaken to work out the cost of cultivation, marketing costs and price spread of marigold in Jaipur district of Rajasthan. Study revealed that the total marketing cost in the sale of marigold was Rs. 6.22 per kilogram. The major items of cost were value of quantity loss (30.87 per cent) followed by labour (28.14 per cent), commission (14.31 per cent) and transport (10.77 per cent). Producers incurred 36.5 per cent and florists, 63.5 per cent in the total marketing cost. Producers received only 31.27 per cent of the price paid by the consumers. Florists received 39.39 per cent of consumer's price as his profit in the business which was more than the producer's share (Sharma, 2001)

Sudha (2001) studied the production of cut roses for international markets. It was observed that the marketing costs formed 17.35 per cent of the gross realization in lean as well as peak seasons in auction sale while the marketing costs formed 31 per cent of the gross realization in direct sale during the lean period and only 20 per cent in case of peak season. She suggested that a combination of direct and auction sale is better for getting more returns.

Sangeetha (2005) observed three marketing channels for anthurium in Thrissur and Palakkad districts of Kerala. They were Channel I: Producers – Pushpakrishi vikasanan samiti / Cut flower society – Consumers; Channel II: Producers – Local florists – Consumers; Channel III: Producers – Florists (outside state) – Consumers. Marketing efficiency index was worked out as respectively, 14, 12.33 and 11.63 for Channel I, Channel II and Channel III.

Two different kinds of marketing channels were identified by Satpute *et al.* (2006) for rose marketing in Ahmednagar district of Maharashtra state. They were Channel I: Producer – Commission agent cum wholesaler – Retailer – Consumer; Channel II: Producer – Retailer – Consumer. The market intermediaries appropriated nearly 49 and 36 per cent of the consumer's rupee in the Channel I and II. Hence, in order to offer the rose grower a fair deal, there is a need to regulate the activities of middleman.

Saraswat (2008) studied the economics, marketing and constraints of cut flower production in Himachal Pradesh. The channels identified were Channel I: producer – Final Consumer; Channel II: Producer – Commission agent/Wholesalers – Consumer; Channel III: Producer – Commission agent/Wholesalers – Retailers – Consumer; Channel IV: Producer – Cooperatives – Commission agent – Consumer; Channel V: Producer – Cooperatives – Consumer; Channel VI: Producer – Cooperatives – Commission agent – Retailers – Consumer. Carnation was found to be more profitable than gladiolus, lily and tulip because producer's share in consumer rupee was 57.20, 54.62, 47.50, 40.00 per cent respectively for these flowers. The major expense borne by growers was commission paid to commission agent, which ranged from 7.80 per cent to 11.31 per cent of the consumer rupee for different flowers.

Singh *et al.* (2008) in their study on marketing behavior of marigold cultivation in Jaipur identified Producer – Commission agent – Retailer – Consumer as the important channel for marketing marigold. The major items of marketing cost were the value of quantity loss and labour charges. Retailers earned a margin of 43.77 per cent in consumer's rupee which was higher in comparison to producer's share, due to creation of form utility by the retailers.

Haridas (2010) estimated the economics of anthurium cultivation in Wayanad district of Kerala. The total cost of cultivation was worked out to 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). In the study area, use of organic fertilizers and biofertilizers was found higher compared to the use of chemical fertilizers.

Palma *et al.* (2010) conducted a survey on consumer preferences for potted orchids in the Hawaiian market. He observed that, price is the primary factor that influenced consumer preference for purchasing orchids, followed very closely by size and species. A significant portion of respondents (55 per cent) had a yearly income of less than $25,000, which indicated the high significance of price, as lower income households were more price conscious. The results suggested that orchid growers in the state of Hawaii would benefit by growing larger orchid pots (5 and 6 inch diameter pots), with less expensive species that can be sold at a lower price.

Chakrabarti and Sarker (2011) in their study opined that institutional credit is the urgent need of the hour for both male and female marketing agents to make domestic trade market of flower crops more profitable in West Bengal. They also observed that provision of institutional credit to female marketing agents, in particular, must play an important role in lowering the intra- occupational gender earnings gap between female and male marketing agents in the domestic trade market of flower crops, which employ a large section of women workforce.

Raina (2011) studied the marketing behaviour and information sources utilization pattern of flower growers in Jammu. The results showed that majority of the producers sell their produce as raw without grading to the small processors in the nearby market. Most of the producers took market counseling from friends or relatives. Other information sources including personal localite as well as cosmopolite sources were the major information providers to flower growers followed by electronic media, print media and traditional media respectively. They also suggested that if a producer is able to predict quantities supplied in subsequent weeks, he or she may be able to skim profits by adjusting crop production practices to hit short term price peaks through utilization of suitable information sources.

Steephan (2011) observed three marketing channels for orchid cultivation in Kerala which were, Channel I: Producers – Local Florists –Consumers Channel II: Producers – Consumers; Channel III: Producers – Vanitha pookrishi vikasanan samiti/Cut flower society – Consumers, in which Channel I was identified as the most important channel through which 89 per cent of the growers sold their produce. Channel I itself was the most efficient channel with highest marketing efficiency index of 24 and minimum price spread of Rs. 2.5.

Singh and Punitha (2012) studied the marketing and price spread of anthurium in Mizoram and identified two main channels I: Producer – ZOPAR (Wholesaler) – Wholesaler/Retailer in other states; Channel II: Producer – Retailer – Consumer. Ninety nine per cent of the sample anthurium growers in Mizoram were marketing their produce through Bangalore based exporter, ZOPAR Export Ltd. to wholesalers in other states like Kolkata, Delhi, Mumbai and Bangalore. The marketing cost incurred by the anthurium growers was 0.79 per stem in channel I. The producer's share was found to be 45.42 per cent, 37.31 per cent, 37.38 per cent and 38.33 per cent in Kolkata, Bangalore, Mumbai and Delhi respectively. Price spread was found to be highest in Bangalore (Rs. 15.81) because of higher transportation cost. The producer on an average received Rs. 10.20 per stem.

In a study on profitability of cut roses grown under hi-tech cultivation, the average cost of marketing was estimated to Rs. 18.60 per bundle. More than 50 per cent growers sold their produce in Mumbai market, 70 per cent produce was sold though commission agents, 25 per cent through retailers and remaining 5 per cent through local sale. About 60 per cent produce was sold at pre-determined price and 40 per cent through auction sale (Waghmare and Shendage, 2013).

2.1.3 Constraints

Karn (1999) identified high level of intra-farm varietal diversity, small unit size, high cost of shade structures, unorganized marketing and lack of standardized practices of cultivation as the major constraints of cut flower production in Kerala.

Nair (2002) identified the major problems faced by cut flower growers in Kerala. High cost of planting material (17 per cent), non-availability of high yielding plants (15 per cent), non availability of disease resistant planting materials (13 per cent) and high cost of plant protection chemicals (12 per cent) were identified as the major production constraints. Major marketing constraints were lack of procuring agencies (13.99 per cent), inadequate market information (12.55 per cent) and lack of technology to keep the freshness of flowers (11.51 per cent).

Tale *et al.* (2003) observed that unorganized marketing, high cost of transportation, absence of regular buyers and exploitation by the florists were the major bottlenecks of floriculture sector in Maharashtra. He pointed out that formation of growers association would help in collection of flowers and efforts should be made for development of low cost technology for production.

Kumar *et al.* (2004) found out price fluctuation as the major problem of flower growers in Uttar Pradesh. Illegal deduction from the receipt of growers, inadequate transport facilities, improper weighment and lack of institutional credit were observed as other important constraints.

Chakraborty and Tah (2007) identified the problems and prospects of trade of Indian cut flower roses in international market. Study revealed that, Indian growers incurred loss when price realization per stem was below Rs. 10 at the Dutch auction houses. They suggested product differentiation through pruning and de-budding to improve the quality and quantity of rose flower production in India.

The major constraints identified by Saraswat (2008) in cut flower cultivation in Himachal Pradesh were non-availability of quality seed and planting material, lack of proper physical infrastructure, non-availability of rural financial support, lack of scientific or technical knowhow among farmers, lack of proper packing material, lack of assured marketing, lack of protection against the risk involved, inadequate and expensive transport facility, lack of organized cooperative societies/NGO's for small holder farmers, lack of research and development support by institutions, non-availability of market information and poor encouragement from the part of Government.

Kumar *et al.* (2011) studied the infrastructural profile and constraints of cut flower growers in Muzaffer Nagar district of western Uttar Pradesh. The major constraints identified were problem of wild animals, land shifting, erratic supply of electricity, interference of middle man in credit facilities and marketing system, less provision of flower fairs or exhibitions and problem of unnecessary changes by policeman at barrier or police chauki.

Pal *et al.* (2011) identified the bottlenecks in commercializing cymbidium orchids in Darjeeling. The major problems confronted by the growers were lack of knowledge about management of disease and pests, post harvest handling of cut flowers, lack of infrastructural facilities, high cost of planting material and marketing outlets. Majority of farmers suggested that quality planting material of orchids should be made available at subsidized rate, trainings for identification and management of diseases and pests should be organized and credit through banks and infrastructure should be developed for proper development of orchid industry in the region.

Steephan (2011) identified low market price, irregular market, delay in getting sale proceeds, high initial investment, non-availability of quality planting material etc. as the important constraints faced by orchid growers in central Kerala. Short supply of flowers to fulfill bulk orders, lack of government support,

lack of storage facilities etc. were found out as the major constraints faced by cut flower traders.

2.2 Production and marketing of other horticultural crops

2.2.1 Production

Singhal and Agarwal (1997) examined the cost and returns of mango cultivation in Rampur district of Uttar Pradesh. The average annual total cost (for the 15 year period) per hectare was worked out to Rs. 2,713, Rs. 3,102 and Rs. 3,322 for small, medium and large orchards respectively. Annual average total returns were worked out to be Rs. 12,525, Rs. 14,226 and Rs. 16,071 for the corresponding categories of orchards.

Korikanthimath (2000) analysed the economics of replanting of cardamom in Karnataka. The investment for replanting of cardamom was worked out to Rs. 56,698 per hectare. The total annual maintenance cost was estimated as Rs. 82,411 per hectare. Labour alone constituted about 70 per cent of total maintenance cost.

Santhosh (2001) worked out the payback period for coconut as 13 years. Net present worth obtained at 14 per cent opportunity cost of capital was Rs. 1,946.38 for one hectare. Benefit cost ratio came to 1.02 while internal rate of return was 14.29 per cent. Project worth measures indicated an unworthy project even for a small fall in price of coconut.

Parayil and Narender (2002) estimated the profitability of sweet orange cultivation in Hyderabad. The pay-back period for the investment made up to the fourth year in sweet orange was calculated as 2.15 years indicating that the producer gets back his returns quite early. The benefit cost ratio was 2.16, which indicated the high rate of returns in sweet orange cultivation.

Economics of grape cultivation was estimated by Beeraladini (2003) in Bijapur district of Karnataka. The vineyards were grouped into three age groups, which were, four years, four to ten years and eleven to fifteen years. The cost of cultivation was found higher for the age groups of five to ten years when compared to other age groups and return per investment was also high for this age group.

From the economic analysis of coffee in Visakhapatanam district of Andhra Pradesh it was found that the total establishment cost was Rs. 23, 656 per hectare. The total cost incurred for the first year amounted to Rs. 13,090 which accounted for 55.34 per cent of the total establishment cost. The total labour cost accounted for 56.44 per cent of the establishment cost and material cost formed 37.63 per cent. Total maintenance cost of coffee plantations was worked to Rs. 7,609, Rs. 8,129, Rs. 9,243, Rs. 9,405 and Rs. 10,326 respectively for the fourth, fifth, sixth, seventh and eighth subsequent years. Of this, manuring and fertilizer application formed 40 per cent during all the years (Devi and Pandurangarao, 2003).

In a profitability study on mango and kinnow plantations in Himachal Pradesh, establishment cost of mango plantations was estimated to be Rs. 28,202 per hectare and for kinnow plantations it was Rs. 29,658 per hectare. The net present value and the internal rate of return were found to be higher for the kinnow plantation than mango plantation. It was concluded that the kinnow plantation was financially more remunerative than mango plantation (Kumar and Singh, 2003).

Lokesh *et al*. (2004) estimated the profitability of passion fruit in Karnataka. The economic life of passion fruit garden was assumed to be 6 years. The net present value was worked out to Rs. 1, 55,395 per hectare yielding a benefit cost ratio of 2.17 at 15 per cent discount rate and internal rate of return of 67 per cent.

In an economic evaluation of kinnow mandarin cultivation in Punjab the net present value, benefit cost ratio and internal rate of return at 12 per cent discount rate was worked out to Rs. 1,10,803, 1.4 and 24.48 respectively for the orchard. The economic life of kinnow orchards was assumed to be 25 years. The results also revealed that the kinnow orchards were worth retaining as long as they give income of Rs. 13,877 over the maintenance cost (Gangwar *et al.,* 2005).

Thamban *et al.* (2006) compared the economics of coconut cultivation under micro irrigation and conventional system of irrigation. The benefit cost ratio for the farms with drip irrigation ranged between 1.32 in marginal holdings to 1.71 in large holdings. In the case of coconut cultivation with basin irrigation, it was ranged between 1.29 to 1.63. Cash flow analysis indicated that the relative profitability of installing drip irrigation system increases with the land holding size.

Gangwar *et al.* (2008) evaluated the economics of peach cultivation in North Indian plains. The economic productive life of peach orchards was assumed to be 24 years. He found that the orchards needed to be replanted when the annual returns over maintenance cost falls below Rs. 4,810, Rs. 5,582, Rs. 6,746 and Rs. 5,713 for the orchards of the size of below 1 hectare, 1-2 hectare, above 2 hectare and at overall respectively. The optimum size of peach orchards was found to be above 2 hectares.

Rai and Rai (2008) studied the economics of guava production in Kanpur district of Uttar Pradesh. study observed that the guava orchard was economical up to 3 to 12 years age and thereafter the size and quality both declined. On an average input cost of Rs. 31,673.50 per hectare was incurred during establishment period of guava orchard at first three years. Intercropping with wheat played an important role to provide income in gestation period for curtailing the establishment cost.

Singh and Sayeed (2008) estimated the production of aonla in Pratapgarh district of Uttar Pradesh. Study revealed that per hectare cost on an average came to Rs. 28,958.64. The major cost involved in the cultivation of aonla was reported on human labour followed by manure and fertilizer, plant protection and irrigation charges. It was noticed that family labour cost was higher on marginal farmers and it increased with the increase in the size of farms.

In an economic appraisal of kinnow production in Jammu total establishment cost has been found as Rs. 12,707. The overall economic viability of the kinnow cultivation, mainly net present value, internal rate of return, benefit cost ratio and payback period have been computed as Rs. 7929, 15.42 per cent, 1.52 and 7.6 years, respectively. The returns from kinnow orchards start from the fifth year and continue beyond 28 years. The results also revealed that family human labour was an important factor in the costs incurred for the whole period (Bhat *et al.*, 2011)

Lama and Sarker (2013) evaluated the costs and returns of mandarin orange in Darjeeling district. The study revealed that the higher net income (Rs. 1,67,748) obtained by the growers in the age group between 20 to 30 years was due to the higher productivity of fruits. The lowest net income (Rs. 70,837) received by the growers in the age group of 40 and above years was due to the higher operational cost involved in maintaining their gardens.

2.2.2 Marketing

The total marketing cost incurred by guava produces in Karnataka was Rs. 168.21 per tonne. The commission charges paid to the commission agents constituted the biggest item of total marketing cost amounting to Rs. 75.07 per tonne. It formed 45 per cent of the total marketing cost and labour charges shared 12.15 per cent of total marketing cost (Chinnappa, 1997).

Dangat *et al*. (1997) studied the marketing of grapes through co-operatives in Pune district. They found out that half of the produce sold through co-operatives indicating the important role played by them in the marketing of grapes. The average per kilogram gross price realized for grapes worked out to about Rs. 10.50, Rs.17, Rs. 20, Rs. 43 and Rs. 55 in Mumbai, Delhi, Ludhiana, Dubai and England markets respectively.

Singhal and Agarwal (1997) observed two important channels for marketing of mango in Rampur district of Uttar Pradesh. Channel I: Producer – Contractor – Commission agent/Wholesaler – Retailer – Consumer; Channel II: Producer – Wholesaler / Commission agent – Retailer – consumer. The share of producer in the consumer rupee was 37.44 per cent and 39.61 per cent in Channel I and Channel II respectively.

Gangwar and Singh (1998) estimated the price spread and marketing margins for Nagpur mandarins. The results indicated that the producer's share in the consumer's rupee varied from about 30 to 53 per cent in different markets. The truck freight and cost of packaging material took a lion's share in the market expenditure incurred by the traders. It was also observed that the benefits of price rise were not obtained by the mandarin growers. These price gains were reaped by the mandarin traders reflecting the inefficiency in the existing marketing system.

In an analysis of Litchi marketing and export in Muzaffarpur market of Bihar, it was revealed that litchi is generally marketed through pre-harvest contractor and village trader for distant markets and through retailer for sale in the local market. The price spread analysis indicated that the litchi growers get 30 to 55 per cent of the consumer's price. Amongst the various cost items, the charges for loss of weight and spoilage, packaging charges including cost of the box and the transportation cost constituted the major share (Singh *et al.*, 1998).

Sebastian (2001) conducted a study on economic analysis of production and marketing of cashew nut in Kerala. In this study, Producer – Secondary Wholesaler – Processor channel was identified as the most efficient channel with highest producer's share in consumer's rupee of 49 per cent. Cost of transportation contributed to over 80 per cent of the total marketing cost in all the channels.

Ladaniya *et al.* (2003) worked out the price spread of pomegranate in Maharashtra. When the produce was sold through co-operative society in Pune market, marketing cost incurred by the producer was Rs. 3.34 per kilogram of which 31.43 per cent, 11.97 per cent and 47.9 per cent were towards packaging, transportation and commission respectively. The producer paid Rs. 1 per box as a service charge to society which arranged transportation and commission agent's services for him.

In a study conducted on production and marketing of vanilla by Deepa (2005), Producers – Vanilla growers association – Exporter channel was identified as widely adopted channel, as there was lack of proper marketing facilities.

Chinnappa and Hippargi (2006) examined the cost and constraints in marketing of arecanut in Karnataka. Study revealed that 39 per cent of the farmers sold their produce through commission agents. The second major buyer of arecanut was co- operative marketing society (34 per cent) followed by pre-harvest contractors (27 per cent). Graded produce fetched 25 per cent higher returns over ungraded produce. The total cost of marketing of one quintal of arecanut was worked out to Rs. 53.64. The transportation cost was the biggest item of total marketing cost constituting 45.5 per cent and Rs. 24.42 per quintal.

Sairam *et al*. (2006) studied the marketing of coconut products in Tamil Nadu and Pondicherry regions. They observed that marketing channel of coconut widely varied from totally unorganized to well organized features. The share of producers in the end price of the consumers varied between 60 and 70 per cent.

Farmer's shandies facilitated by State Department of Agriculture were a welcoming feature of coconut farming in Tamil Nadu. In farmers shandies, farmers were in direct contact with the consumers.

Sharma and Singh (2006) identified Producer – Pre-harvest contractor – Commission agent – Retailer – Consumer as the predominant method for sale of mango in Haryana. On an average 44.80 and 45.33 per cent of total mango marketed in Yamunanagar and Chhachhrouli markets where sold through this channel while the direct sale of mango from the producer to consumer contributed the lowest in marketing of mango.

Saraswat (2009) studied apple marketing system in Shimla district of Himachal Pradesh. He found that marketing costs accounted for 25.96 per cent of the consumer's rupee in Delhi market. Since apple fruits were fragile and needed proper packing, packing costs accounted 9.08 per cent of consumer's rupee. Though Delhi market was officially regulated, commission and fees were charged at higher rates by intermediaries.

Deshmukh *et al.* (2010) evaluated the marketing scenario of pomegranate in Maharashtra. He identified Producer – Co-operative marketing societies – Commission agent – Wholesaler – Retailer – Consumer as the major channel for marketing pomegranate in the state. It was marketed in various metropolitan cities like Mumbai, Delhi and Bangalore. Marketing costs constituted major expenses on the items like grading and packaging (20 to 30 per cent), transportation (22 to 35 per cent) and commission (20 to 30 per cent).

Four marketing channels identified for kinnow production in Jammu were Channel I: Producer – Commission agent – Retailer – Consumer; Channel II: Producer – Wholesaler – Retailer – Consumer; Channel III: Producer – Retailer – Consumer; Channel IV: Producer – Consumer. The average per quintal marketing cost at producer's level has been found to vary to the extent of Rs. 450, Rs. 375, Rs. 303 and Rs. 223 for channels I, II, III and IV respectively. A

comparison of price spread through different marketing channels has revealed that producer's share in consumer's rupee was the highest in (81 per cent) channel IV due to self sale in the local market. The marketing efficiency was also found to be highest in channel IV (Bhat *et al.,* 2011)

Banerjee and Banerjee (2013) in their book pointed out that the commission agents were the most important link in the marketing of mango, controlling about two-thirds of the total markets in the country. Their study also revealed that purchasers pay Rs. 60 for loading or unloading or grading of mangoes to commission agents. They required to pay 1 per cent of the turn over as market fee to the Agricultural Market Committee and 4 per cent of the turn over as commission to the commission agents.

In a study on impact of post harvest loss in marketing of grapes in Karnataka the price spread in fresh grapes was found out to be Rs. 6 per kilogram in field sale channel and Rs. 18.28 in distant market sale. Marketing cost accounted for 61 per cent in field sale and 62 per cent in distant market sale. Aggregate share of marketing loss in total price spread in all channels were in the range of 32 to 33 per cent. Marketing costs followed by marketing loss were the two major contributing factors accounting for nearly 68 per cent of price spread in fresh grapes (Murthy, 2013)

2.2.3 Constraints

Chinnappa (1997) in his study on marketing of guava in Karnataka observed that guava producer sold their produce immediately after each picking due to the absence of adequate and proper storage facilities. The other problems reported by guava farmers were high spoilage and fear of price fall.

Ladaniya (2003) found out that lack of marketing finance and market information were the two major constraints in pomegranate marketing in Maharashtra. He suggested that financing from banks at lower interest rates could provide some help to the growers for packing and transportation.

A study on cost and constraints in marketing of arecanut revealed that the problems of higher transportation cost and shortage of transportation facilities were the two major constraints confronting the arecanut growers. (Chinnappa and Hippargi, 2006)

Sharma and Singh (2006) described some of the major problems in marketing of mango in Haryana. Lack of support price, lack of processing facilities, higher marketing cost, lack of cheap packing material, problems due to short duration varieties of mango (Dushheri) and lack of cold storage facilities were identified as the major problems.

Deshmukh *et al.* (2010) opined that less awareness about cultivation practices to be followed for export, high transportation cost, reduction of quality of fruits damaged in transport due to the overloading of trucks were the major constraints in marketing of pomegranate in Maharashtra. The private exporters had established good relations in export markets, therefore the best quality produce exported by the co-operative fruit marketing societies fetched low price.

Methodology

3. METHODOLOGY

Selection of an appropriate methodology is of the utmost importance in bringing out meaningful conclusion from research. On the basis of review of literature presented in the previous chapter, appropriate methodology was selected for each aspect of the present study. The procedures adopted in the selection of sample, collection of data, analytical techniques employed and the concepts used in the study are briefly described below.

3.1 LOCATION

3.1.1 Kerala state

Located on the southernmost tip of India, the state of Kerala embraces the coast of Arabian sea on the west, and is bounded by the Western Ghats in the east. This blissful land of incredible beauty comprises 1.18 per cent area of the country and lies between east longitudes 74^{o} 52' and 72^{o} 22' and north latitudes 8^{o} 18' and 12^{o} 48'. Coconut constitutes the base crop in almost every homestead of Kerala, intermixed with other seasonal, annual and perennial crops. In South India, Kerala with high humidity, low temperature accompanied by good rainfall, has the congenial climate for commercial orchid cultivation.

3.1.2 Thiruvananthapuram (TVM)

Thiruvananthapuram, the southernmost district, is the capital city of Kerala. The district lies between north latitudes 8°17' and 8°54' and east longitudes 76°41' and 77°17'. It stretches 78 kilometres along the shores of the Arabian sea on the west, Kollam district on the north with Tirunelveli and Kanyakumari districts of Tamil Nadu on the east and south respectively. Thiruvananthapuram is the densest district in Kerala with 1,509 inhabitants per square kilometre. With regard to orchid cultivation, Thiruvananthapuram can be considered as a traditional orchid growing area.

3.1.3 Ernakulam (EKM)

Ernakulam district situated at the central part of Kerala is the commercial capital of the state. It is the third most populous district in Kerala, after Malappuram and Thiruvananthapuram. On the western side, district remains bounded by the beautiful coast line of Arabian sea, stretching a length of 26.2 kilometres. It has Alappuzha and Kottayam districts on the south, Thrissur district on the north, and Idukki district on the eastern side. The exact location of Ernakulam district as per the meridians is east longitude 76°12 to 76°46' and latitude 90°42' to 10°18' north. The first step towards commercialization of orchids in Kerala was made by AV Thomas and Co. in 1972 by organizing households to take commercial production under contract in Ernakulam.

3.2 SAMPLING FRAMEWORK

3.2.1 Selection of study area

A survey was conducted by the Department of Economics and Statistics, Kerala in 2009 on flowers, vegetables, medicinal crops and fruits. Accordingly, out of the 15,73,430 cut flowers traded in Kerala, orchids, anthurium and lotus constituted about 26, 14 and 60 per cent respectively. Major portion of the trade was going on in Ernakulam (18 per cent) and Thiruvananthapuram was in the second position with 13 per cent share. Therefore these two districts were considered prominent with regard to orchid flower trade and were selected for the study.

3.2.2 Sampling design

Simple random sampling was adopted for selection of samples. List of orchid growers was collected from cut flower societies, krishi bhavans and florists. From the two districts 20 elite growers having more than five years of experience, actively involved in commercial orchid production and 10 florists were selected randomly for an in depth study of production and marketing of orchids. Distribution of respondents in two districts is presented in Table 3

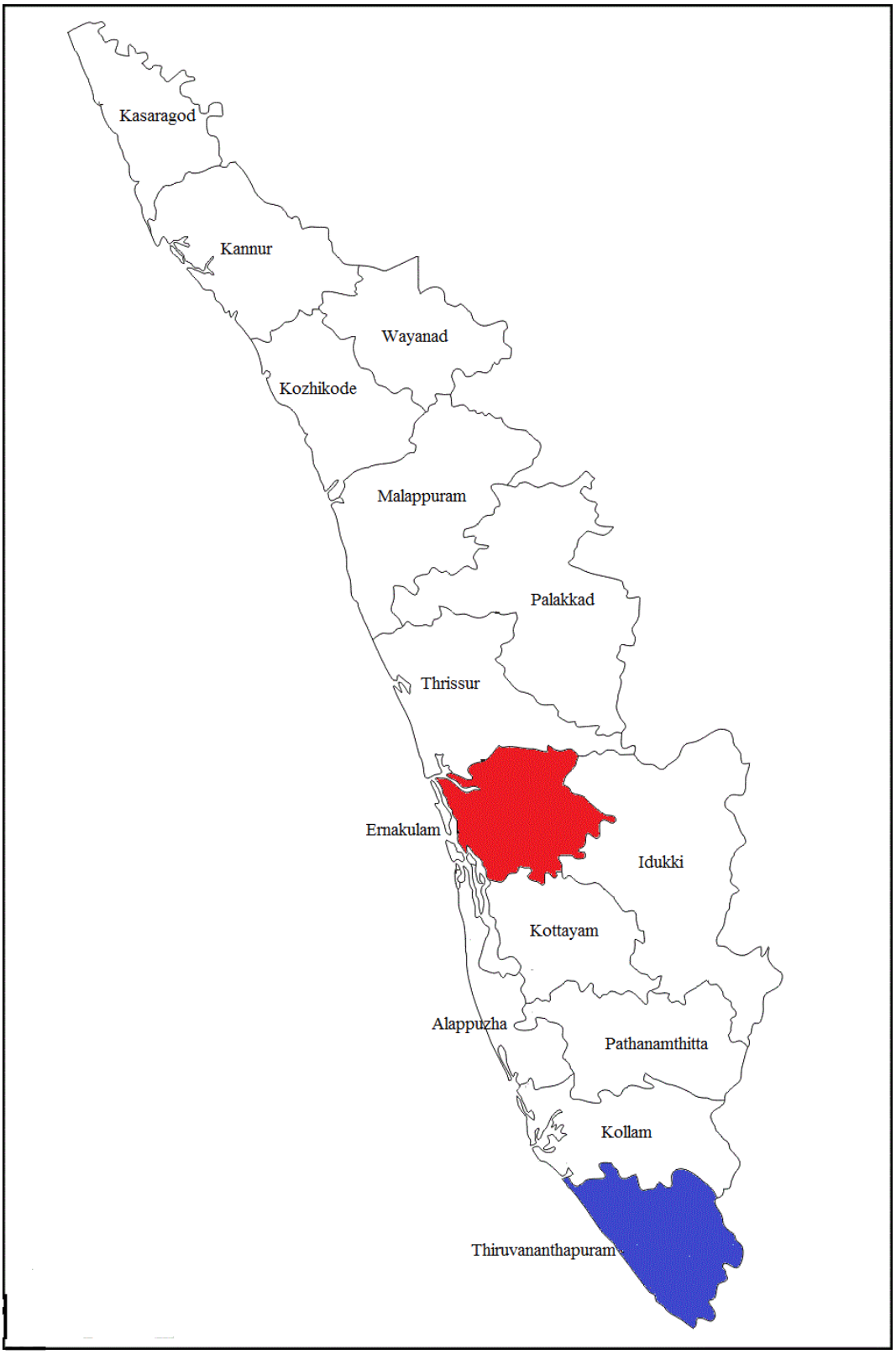

Figure 2. Map of Kerala demarcating the study area –Thiruvananthapuram and Ernakulam districts

Table 3. Distribution of respondents in study area

District	Growers	Florists
Thiruvananthapuram	10	5
Ernakulam	10	5
Total	20	10

3.2.3 Collection of data

The primary data were collected from selected sample growers through personal interview method using a pre tested interview schedule. The survey was conducted during October 2014 to March 2015. A separate interview schedule was used to obtain details on marketing channels, marketing costs etc.

3.3 VARIABLES AND THEIR MEASUREMENT

3.3.1 Cost of planting material

Near flowering stage planting materials which produce flowers within one year was used by growers to start cut flower orchid production. Therefore cost of planting material was calculated by taking the actual market prices of near flowering stage plants of different varieties. The cost taken for different varieties are given in the following Table 4.

Table 4. Cost of different varieties

Variety	Cost (in Rs)
Aranthera	70
Aranda	250
Mokara	250
Vandachnis	250
Terete vanda	20
Arachnis	20
Dendrobium	70
Phaleanopsis	300

3.3.2 Cost of hired human labour

Growers in TVM district employed permanent labourers in their farms. Value of hired labour was calculated on the basis of actual monthly wages paid to the labourers. The wage rate prevailing in the study area was Rs. 550 per day for men and Rs. 400 per day for women.

3.3.3 Cost of family labour

Family labour was computed on the basis of man day equivalents. Eight hours of labour was considered as one man day and the wage rates prevalent in the study area was used to account family labour.

3.3.4 Cost of material inputs

Cost of manures, fertilizers, plant protection chemicals and media were valued at the prevailing market rate for each in the locality.

3.3.5 Cost of maintenance

Annual maintenance charges included total cost incurred for the maintenance of shade house, irrigation system, tools and equipments.

3.3.6 Miscellaneous cost

Cost of electricity, fuel charges and tying materials were included under miscellaneous cost.

3.3.7 Land Revenue

In EKM district orchid was mainly grown on terraces or backyards of house premises. Therefore land revenue and rental value of own land were not considered as relevant cost components and it was excluded from the study. But in TVM, land revenue was computed on the basis of actual amount paid to the government.

3.3.8 Depreciation

Straightline method was used to compute the depreciation on fixed assets. It is given as the difference between original value and residual value divided by the useful life of asset.

3.3.9 Interest on working capital

An interest rate of 7 per cent was taken for computing interest on working capital, which was the lending rate of commercial banks on short term agricultural loans.

3.3.10 Interest on fixed capital

Fixed capital is the present value of fixed assets owned by the farm. Interest on fixed capital was computed at an interest rate of 13 per cent, which was the lending rate of commercial banks for long term loans.

3.3.11 Rental value of leased in land

Rental value of leased in land was taken as zero since the farmers did not practice the method of leasing in.

3.3.12 Rental value of own land

Rental value of own land was computed by taking the rental value prevalent in the study area.

3.4 TOOLS FOR ANALYSIS

Analytical tools employed for the primary data are given below.

3.4.1 Percentages and averages

Percentages and averages were used for the interpretation of data on socio-economic characteristics of sample growers, cost of cultivation and marketing.

3.4.2 Cost of cultivation

Cost of cultivation includes the total factor costs upto the harvesting of the crop. In this study, cost ABC concept of farm management was used to work out the cost of cultivation.

Cost A_1: It consists of all the expenses actually paid by the growers. Various components under cost A1 includes

a) Cost of hired human labour
b) Cost of material inputs
c) Annual maintenance charges
d) Miscellaneous cost
e) Land revenue
f) Interest on working capital, and
g) Depreciation

Cost A_2

Cost A_2 equals cost A_1 plus rent paid for leased in land.

Cost B_1

Cost B_1 includes cost A_2 plus interest on fixed capital.

Cost B_2

Cost B_1 plus rental value of own land gives cost B_2.

Cost C_1

Cost C_1 includes cost B_1 plus imputed value of family labour.

Cost C_2

Cost C_2 includes cost B_2 plus imputed value of family labour

Cost C_3

Cost C_3 equals cost C_2 plus 10 per cent of cost C_2, which is considered as the cost for management input by the grower.

3.4.3 Capital productivity analysis

Capital productivity analysis is an important tool in analyzing the financial viability of perennial crops. Capital productivity measures the efficiency of capital use in production. In this study four discounting measures were taken to analyse capital productivity.

a) Pay-back Period (PBP)
b) Benefit Cost Ratio (BCR)
c) Net Present Worth (NPW) and
d) Internal Rate of Return (IRR)

Inorder to estimate these parameters a discount rate of 13 per cent was taken, which was the lending rate of commercial banks for medium term and long term loans.

3.4.3.1 Pay-Back Period (PBP)

It is a measure of the worth of an enterprise, which measures the efficiency of cultivation by indicating the period within which the returns offset the investment (Gittinger, 1984). In order to work out discounted payback period, discounted cumulative cash inflows and discounted cumulative cash outflows are used. The year at which cumulative cash inflow exceeds the cumulative cash outflow is considered as payback period. The major drawback of payback period is that it does not consider returns after payback period. It also fails to consider the difference in the timing of earnings during the payback period. A shorter payback period represents higher profitability.

3.4.3.2 Benefit-Cost Ratio (BCR)

The benefit cost ratio represents the return on rupee of investment. It is measured by taking the ratio between present worth of returns and present worth of costs (Gittinger, 1984). A ratio above one indicates that the project is viable.

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

Where,

t = 1……..n years

n = Total number of years of the project

B_t = Benefits in t^{th} year

C_t = Costs in t^{th} year

i = Discount rate

3.4.3.3 Net Present Worth (NPW)

This is the most straightforward discounted cash flow measure of the project worth. It is simply the present worth of net cash flow stream. (Gittinger, 1984). It can also be worked out by taking the difference between present worth of cash inflows and present worth of cash outflows. A project having positive net present worth is considered as viable.

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

Symbols are same as mentioned earlier.

3.4.3.4 Internal Rate of Return (IRR)

Internal rate of return is the discount rate which makes the net present worth of cash flow equal to zero or it is the discount rate at which present worth of benefits equal present worth of costs. It shows the average earning power of money used in the project over the expected life of project (Gittinger, 1984). If

internal rate of return is above the opportunity cost of capital, a project is considered as feasible.

Symbolically, internal rate of return is that discount rate 'I' such that

$$\text{NPW} = \sum \left(\frac{B_t - C_t}{(1+i)^t} \right) = 0$$

Symbols are as mentioned earlier.

3.4.4 Resource use efficiency

Agricultural productivity depends on efficient use of factors in the production process. Improvements in resource use efficiency will increase productivity, which can reduce encroachment of population to marginal agricultural lands. Therefore measurement of efficiency is to be done as it is a measure of performance by which production units are evaluated. Farrel (1957) divided the economic efficiency into two components, namely technical efficiency and allocative efficiency. Economic efficiency occurs when a firm chooses resources and enterprises in such a way as to attain economic optimum. Further he observed that technical inefficiency arises when less than maximum output is obtained from a given bundle of factors while allocative inefficiency arises when factors are used in proportions, which do not lead to profit maximization. Efficient use and allocation of resources imply redistribution or re-allocation of resources which achieve optimal level of production. In this study Cobb-Douglas production function was used to measure the allocative efficiency of inputs in orchid cultivation.

The algebraic form of Cobb- Douglas production function is

$$Y = a \prod X_i^{bi}$$

The functional form is represented as below

$$Y = aX_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} e$$

The functional form is log linearised to obtain an estimating equation as

$\log Y = \log a + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + b_5 \log X_5 + e$

Where,

Y = Returns per year

X_1= Cost of planting material

X_2= Cost of manures

X_3= Cost of plant protection chemicals

X_4= Cost of fertilizers

X_5= Cost of labour

3.4.4.1 Estimation of marginal value product

Inorder to study allocative efficiency of resources, ratio of marginal value product (MVP) to the marginal factor cost (MFC) for each input was computed and tested for its equality to one. MVP was obtained when the marginal physical product (MPP) multiplied by the product price per unit. Marginal physical products were calculated at the geometric mean levels of variables by using the following formula

Marginal physical product = $b_i \times \frac{\bar{Y}}{\bar{X}}$

Where ,

$\bar{Y}$ = Geometric mean of returns

$\bar{X}$ = Geometric mean of i^{th} independent variable.

b_i = The regression coefficient of i^{th} independent variable

Marginal value product = MPP × P_y

Where,

P_y = Price per flower spike of orchid

The ratio (MVP/MFC = k) was compared by taking

k > 1 as under use of resources

k = 1 as optimum use of resources (allocative efficiency) and

k > 1 as excess use of resources.

In this study marginal factor cost was taken as unity since the variables in production function are expressed in monetary terms.

3.4.5 Marketing concepts

3.4.5.1 Marketing

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

3.4.5.2 Marketing channel

Routes through which agricultural products move from producers to consumers are termed as marketing channels. (Acharya and Agarwal, 1987)

3.4.5.3 Price spread

Difference between price paid by the consumer and price received by the producer for an equivalent quantity of farm produce will give marketing margin. The total marketing margin includes all the costs and profits involved in bringing the produce from the initial point of production till it reaches the ultimate consumer (Acharya and Agarwal, 1987).

Marketing margin = Marketing cost + Profit margin

Marketing costs are the actual expenses incurred in moving goods and services from the producers to the consumers. It includes commission charges, transport cost, market fee and miscellaneous cost (Acharya and Agarwal, 1987). The profit margin of each intermediary is the margin received by intermediaries over their cost in the disposal of a unit equivalent quantity of produce.

3.4.5.4 Marketing efficiency

Marketing efficiency is related to the cost required to move goods from the producer to the consumer and the quantity of services provided or desired by the consumer. Marketing system is considered as efficient if the cost compared with the services involved is low, and vice versa. An improvement which reduces the cost of a particular function without reducing consumer's satisfaction is an indicator of increased marketing efficiency (Chahal and Gill, 1991). In the present study marketing efficiency of various channels were computed using Shepherd's formula and price spread.

Shepherd's formula is given below,

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

Where, V = Total value of goods marketed and

I = Total marketing cost

3.4.5 Garrett's ranking technique

Garrett's ranking technique was used to identify the major constraints in the study. Constraints were formulated on the basis of review of literature and the respondents were asked to rank them. Ranks assigned to constraints by each respondent were converted into a per cent position by using the following formula.

$$\text{Per cent position} = 100 * (R_{ij} - 0.5) / N_j$$

R_{ij}= Rank given for i^{th} factor by j^{th} individual

N_j = Number of factors ranked by the j^{th} individual

Per cent position of each constraint was then converted to scores using Garret table. Scores obtained for a single constraint by all the respondents were cumulated and average was taken. Constraint with the highest score was considered as most important.

Results and discussion

4. RESULTS AND DISCUSSION

The analyses of the primary data pertaining to orchid growers are depicted in this chapter. The results of the study are presented under the following heads.

4.1 General characteristics of sample growers

4.2. Cultivation practices

4.3. Economics of cultivation

4.4. Resource use efficiency

4.5. Marketing

4.6. Constraints

4.7. Opportunities and challenges

4.1 GENERAL CHARACTERISTICS OF SAMPLE GROWERS

4.1.1 Age of growers

The distribution of respondents with respect to age is presented in Table 5. The sample growers were divided into three age groups, less than 35 years, 35-50 years, and above 50 years. A sizeable extent of 45 per cent of total respondents belonged to the age group of 35-50 years, followed by 40 per cent in the age group of more than 50 years at overall level. Only 15 per cent of the growers were under the age of 35 which indicated less involvement of younger generation in orchid farming. In EKM it was still less which accounted only 10 per cent. Invariably in both locations the average age of orchid growers was 47.

Table 5. Distribution of respondents according to age

Age group (years)	**TVM**	**EKM**	**Overall**
<35	2 (20)	1 (10)	3 (15)
35-50	4 (40)	5 (50)	9 (45)
>50	4 (40)	4 (40)	8 (40)
Total	10 (100)	10 (100)	20 (100)
Average age	**47**	**47**	**47**

(Figures in parentheses represent the percentage to the total)

4.1.2 Gender of growers

Classification of sample orchid growers based on gender revealed that majority of the growers were males (65 per cent) and only 35 per cent of them were females at overall level (Table 6). There was wide variation in gender involvement between two locations and maximum involvement of females was noted in EKM (60 per cent) and it was only 10 per cent in TVM. This may be due to the fact that orchid business in EKM was mainly taken up as a self employment activity by the home makers.

Table 6. Distribution of respondents according to gender

Gender	TVM	EKM	Overall
Male	9 (90)	4 (40)	13 (65)
Female	1 (10)	6 (60)	7 (35)
Total	10 (100)	10 (100)	20 (100)

(Figures in parentheses represent the percentage to the total)

4.1.3 Educational status of growers

Classification of sample growers based on educational status is presented in Table 7. The level of education of 45 per cent was graduation followed by post graduation (30 per cent) and professional level (10 per cent). The remaining 15 per cent had below higher secondary level education. It could be observed that majority (more than 80 per cent) of the orchid growers were highly educated and none of them were illiterates. It can be noted that in TVM 10 per cent had only secondary school education and in EKM the level started with higher secondary where it was 20 per cent.

Table 7. Classification of respondents according to educational status

Educational status	TVM	EKM	Overall
Secondary school	1 (10)	0 (00)	1 (5)
Higher Secondary	0 (00)	2 (20)	2 (10)
Graduation	5 (50)	4 (40)	9 (45)
Post Graduation	3 (30)	3 (30)	6 (30)
Professional	1 (10)	1 (10)	2 (10)
Total	10 (100)	10 (100)	20 (100)

(Figures in parentheses represent the percentage to the total)

4.1.4 Main occupation of growers

Orchid growers were grouped based on their main occupation and given in Table 8. It can be seen that majority (45 per cent) of orchid growers were engaged in agriculture followed by equal proportion in government and private service (20 per cent). It can also be noted that 15 per cent of the growers were doing their own business. Agriculture was the main occupation for 60 per cent of respondents of TVM followed by government service (30 per cent) whereas major portion (40 per cent) of growers in EKM was engaged in private service followed by agriculture (30 per cent).

Table 8. Distribution of respondents according to main occupation

Main occupation	TVM	EKM	Overall
Agriculture	6 (60)	3 (30)	9 (45)
Government service	3 (30)	1 (10)	4 (20)
Private service	0 (00)	4 (40)	4 (20)
Own business	1 (10)	2 (20)	3 (15)
Total	10 (100)	10 (100)	20 (100)

(Figures in parentheses represent the percentage to the total)

4.1.5 Annual income of respondents

Distribution on the basis of annual family income of respondents is summarized in Table 9. It shows that a major category of 40 per cent of the respondents had an annual family income in the range 5-10 lakhs followed by less than 5 lakhs (30 per cent). It is worth noticing that 30 per cent of respondents in TVM were earning more than 20 lakhs annually. In EKM, major portion (50 per cent) of respondents fell under category of 5-10 lakhs. Average family income of respondents in EKM was Rs. 5.55 lakhs and it was about 5 times greater in TVM. It could be inferred from the table that, orchid cultivation was taken up by urban elite farmers rather than rural traditional farmers.

Table 9. Distribution of respondents according to annual income of household

Income (in lakhs/annum)	TVM	EKM	Overall
<5	2 (20)	4 (40)	6 (30)
5-10	3 (30)	5 (50)	8 (40)
10-20	2 (20)	1 (10)	3 (15)
>20	3 (30)	0 (00)	3 (15)
Total	10 (100)	10 (100)	20 (100)
Average annual income	**28.73**	**5.55**	**17.14**

(Figures in parentheses represent the percentage to the total)

4.1.6 Growers experience in floriculture

Table 10 shows classification of farmers in 4 groups according to experience in floriculture. Maximum concentration (40 per cent) of farmers was observed in the category of 5-10 years followed by 10-15 years and 15-20 years with 25 per cent. Majority (60 per cent) of respondents in TVM had more than 15 years of experience and in EKM 90 per cent were having less than 15 years of experience in floriculture. The relatively new entrants in EKM may be the self

employment ventures of home makers which is also supported by gender bias. The average farming experience in TVM and EKM was 15 and 10 respectively.

Table 10. Distribution of respondents according to experience in floriculture

Experience (in years)	**TVM**	**EKM**	**Overall**
5-10	2 (20)	6 (60)	8 (40)
10-15	2 (20)	3 (30)	5 (25)
15-20	4 (40)	1 (10)	5 (25)
>20	2 (20)	0 (00)	2 (10)
Total	10 (100)	10 (100)	20 (100)
Average experience	**15**	**10**	**13**

(Figures in parentheses represent the percentage to the total)

4.1.7 Classification of growers according to area under orchid cultivation

Area under orchid cultivation of sample growers is given in the Table 11. Average area under orchid cultivation was 0.66 hectares in TVM and it was only 75.15 m² in EKM. This wide variation was mainly because of the fact that cultivation was undertaken in open field conditions in TVM whereas it was under shade structures in EKM. Majority (70 per cent) of the respondents in TVM had less than 1 hectare area under orchid cultivation followed by 1-2 hectare (20 per cent) and greater than 2 hectare (10 per cent). In EKM majority (60 per cent) of respondents were growing orchids in a space less than 75 m².

Table11. Classification of growers according to area under orchid cultivation

Area under orchid (in hectare)	**TVM**	**Area under orchid (in m²)**	**EKM**
<1 ha	7 (70)	<75 m²	6 (60)
1-2 ha	2 (20)	75-90 m²	2 (20)
>2 ha	1 (10)	>90 m²	2 (20)
Total	10 (100)	Total	10 (100)
Average area	**0.66**	**Average area**	**75.15**

(Figures in parentheses represent the percentage to the total)

4. 2 CULTIVATION PRACTICES

4.2.1 Varieties cultivated by growers

Popular genera of orchids cultivated as cut flowers are Aranthera, Arachnis, Aranda, Terete vanda, Mokara, Vandachnis, Dendrobium, Phalaenopsis etc.(Table 12). Among these genera, monopodials which do not require shade are cultivated in TVM in open field conditions as cut flower orchids. Shade requiring genera like Dendrobium, Phalaenopsis and Mokara are cultivated in pots, under shade structures as cut flower orchids in EKM. About 62 per cent of total cultivated varieties were Arantheras in TVM followed by Arachnis, accounting for about 13 per cent. Annie black was the most popular variety of Aranthera cultivated as cut flower orchid because of its high demand in domestic market. Eighty five per cent of cut flower orchids cultivated in EKM was Dendrobium.

Table 12. Varieties cultivated

TVM		EKM	
Varieties	**Total no. of plants cultivated**	**Varieties**	**Total no. of plants cultivated**
Aranthera	190000 (61.59)	Dendrobium	14000 (84.49)
Mokara	14900 (4.83)	Phalaenopsis	1870 (11.29)
Aranda	39000 (12.64)	Mokara	700 (4.22)
Arachnis	40200 (13.03)	-	-
Vandachnis	18400 (5.96)	-	-
Terete vandas	6000 (1.94)	-	-
Total	308500 (100.00)	Total	16570 (100.00)

(Figures in parentheses represent the percentage to the total)

4.2.2 Method of cultivation

4.2.2.1 Planting in pots (in EKM)

Mainly tissue culture seedlings were used as planting material. Planting was done in 3 to 4 inch plastic or mud pots with several holes. Charcol and tile bits were mainly used as planting media. In order to retain the moisture content, chopped coconut husk was also used. Planting was done above the medium with a support for proper anchorage. Repotting was done when the media deteriorated and affected the drainage.

4.2.2.2 Planting in open field (in TVM)

Top cuttings of atleast 1.5 feet length were used as planting materials. Beds of 15-20 cm height were prepared and cuttings were planted on coconut husks. Usually planting was done in two rows with a spacing of 40 cm between the plants. Concrete pillars which were posted at about 10 feet distance, joint by nylon ropes were used as the support structure for cuttings. Plants were tied to the nylon rope using bread tags. Media was replaced every 6 months.

4.2.2.3 Irrigation

Irrigation was mainly done in morning hours. Most of the growers followed manual irrigation. Very few growers were using mist or sprinkler irrigation. Practice of mist irrigation was stopped by many growers because of the clogging in nozzles.

4.2.2.4 Weeding

Weeds were not a problem in pot culture. But open fields in TVM were fully covered with weeds. A Few growers used weed cutters to control weeds grown on the space in between two beds. Others followed manual weeding once in a week. Some growers used wood shavings inorder to control weeds.

4.2.2.5Fertilizers and manures

Majority of the growers applied 19:19:19 (N:P:K fertilizer mixture) once in a week. Few growers were using orchid boon, green care etc. Orchids grown on open field were given cow- dung slurry once in a month. For pot plants, supernatant liquid of cowdung slurry was sprayed. Neem cake, ground nut cake, cow's urine, coconut water etc were also used as manures.

4.2.2.6 Plant protection

Pest and diseases were less in orchids compared to other crops. Yellow beetle was the major pest mentioned by majority of the growers in TVM. Other pests mentioned were aphids, mites, mealy bugs and snails. For control of snails few growers used snail pellets while others followed hand picking. Chemicals like Confidor, Rogor, Hilban etc were mainly used by growers to control insects.

Important fungal diseases mentioned by growers were black rot, leaf blight, leaf spot etc. Indofil and Bavistin were mainly used to control fungal attacks.

4.2.2.7 Harvesting and post harvesting

Flower spikes were harvested before the opening of all the buds, according to the demand. These spikes were brought to the packing houses and graded by the producer exporters. There was no standardized grading followed. Spikes were grouped into bunches of ten and wet cotton was covered around the base for increasing shelflife. These bunches were then wrapped in newspapers and packed in boxes.

4. 3 ECONOMICS OF ORCHID CULTIVATION

In this section an attempt is made for indepth analysis of cost and returns and economic viability of orchid enterprise.

4.3.1 Cost of cultivation

ABC cost concept is used to work out the cost of cultivation, for a unit of 1000 orchid plants which is detailed in Table 13.

At the overall level, cost A_1 was worked out to Rs. 1,25,585 of which cost of planting material constituted 80 per cent, followed by hired labour (7 per cent). Cost A_1 was more for TVM than EKM which were Rs. 1,28,838 and Rs. 1,22,331 respectively. Planting material was the important contributor to total paid out cost in both the locations and its share was highest in EKM (85 per cent) compared to TVM (76 per cent). The cost of planting material was arrived at by considering the variation in price for different genera of orchids. The price varied from Rs. 20 for cuttings of Arachnis to Rs. 300 for near flowering stage seedlings of Phaleanopsis. Second most contributing factor to the total paid out cost was hired labour in TVM, accounting for 12 per cent and it was interest on working capital in EKM, accounting for 6 per cent. Cost B_1, B_2, C_1, C_2 and C_3 were respectively Rs. 1,30,909, Rs. 1,31,878, Rs. 1,38,911, Rs. 1,39,880 and Rs. 1,53,868 at the overall level.

It could be further observed from the table that cost A_1 for TVM was 5.31 per cent higher than the cost A_1 for EKM. Hired labour is the main contributing factor for this difference. Share of hired labour to total paid out cost was 12 per cent in TVM, while it was only 2 per cent in EKM. Majority of the growers employed permanent labourers in their farms in TVM whereas in EKM, hired labour was only used at the time of potting and planting. Since orchid cultivation was not carried out in leased in land the rental value on leased in land was not taken into account and as such cost A_1 and A_2 were same. Cost B_1 and B_2 were same in EKM because the rental value of own land was not considered.

Steephan (2011) worked out the cost of cultivation for a unit of 100 orchid plants in Thrissur and Palakkad districts. Cost A_1 worked out to Rs. 8,678 which means Rs. 86,780 for 1000 plants. The estimated cost A_1 was higher in the present study mainly because of hike in prices of planting material, labour and agro-inputs.

Even though the total paid out costs was higher in TVM, cost C_3 was 6 per cent lower than the cost C_3 estimated for EKM. Difference in cost C_3 was mainly because of the higher involvement of family labour in EKM. Majority of the growers in EKM had small unit size and except for planting and potting, family labour was utilized for all the other operations. Growers utilizing family labour was very less in TVM. The imputed value of family labour obtained in the study by Steephan (2011) was comparable with that of EKM in the present study because her work was confined to the pot culture of cut flower orchids under shade structures as it was carried out in the central region of Kerala, where practice of open field cultivation of orchids was not followed. Figure 3 and Figure 4 represents the share of different components of cost A_1 and the ABC cost of orchid cultivation respectively.

Table 13. Input wise cost of cultivation of 1000 orchid plants (Rupees)

Items of cost	TVM	EKM	Overall
Hired labour	15753.65 (12.23)	2212.79 (1.81)	8983.22 (7.15)
Planting material	98473.26 (76.43)	103560.65 (84.66)	101016.95 (80.44)
Media	2799.25 (2.17)	2326.31 (1.90)	2562.78 (2.04)
Manures	756.85 (0.59)	164.15 (0.13)	460.50 (0.37)
Fertilizers	221.06 (0.17)	445.58 (0.36)	333.32 (0.27)
Plant protection chemicals	874.66 (0.68)	425.72 (0.35)	650.19 (0.52)
Maintenance	100.32 (0.08)	298.73 (0.24)	199.53 (0.16)
Miscellaneous	861.88 (0.67)	213.12 (0.17)	537.50 (0.43)
Interest on working capital	8388.87 (6.51)	7675.29 (6.27)	8032.08 (6.40)
Depreciation	608.18 (0.47)	5009.06 (4.09)	2808.62 (2.24)
Cost A_1	128837.99 (100.00)	122331.42 (100.00)	125584.71 (100.00)
Interest on fixed capital	4026.11	6622.30	5324.20
Cost B_1	132864.09	128953.73	130908.91
Rental value of own land	1938.41	0.00	969.21
Cost B_2	134802.51	128953.73	131878.12
Imputed value of family labour	758.51	15244.97	8001.74
Cost C_1	133622.60	144198.70	138910.65
Cost C_2	135561.01	144198.70	139879.86
CostC_3	149117.12	158618.57	153867.84

(Figures in parentheses represent the percentage to the total)

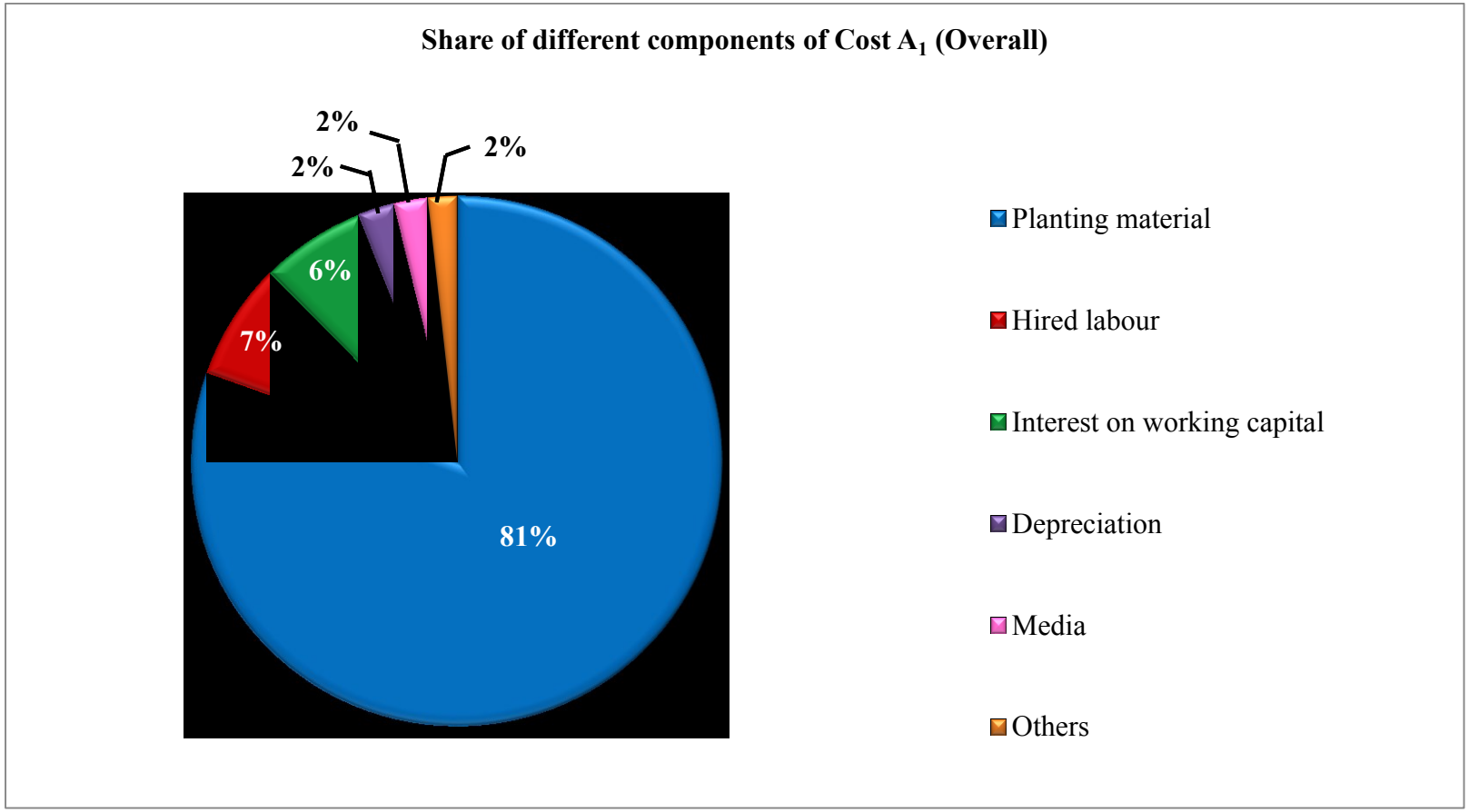

Figure 3. Share of different components of Cost A_1 (Overall)

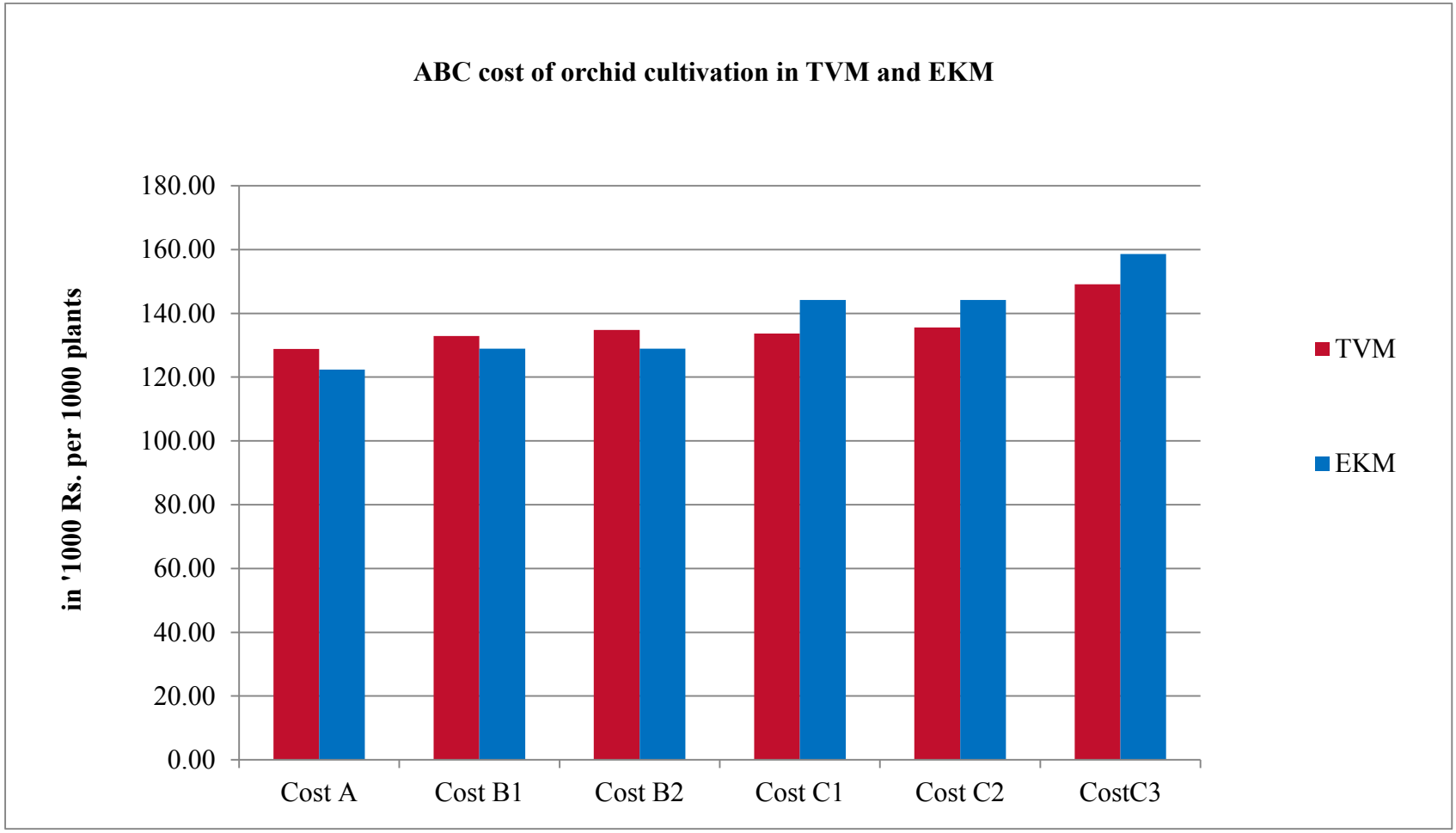

Figure 4. ABC cost of orchid cultivation in TVM and EKM

4.3.2 Cost of establishment

Input wise breakdown of total establishment cost is given in Table 14. Overall cost of establishment was worked out to Rs. 1,49,504. Cost of planting material and shade structure or artificial support were the two prominent items of establishment cost which constituted about 86 per cent of total. Planting material alone accounted for 68 per cent in total initial investment. These two items were followed by labour with a share of 3 per cent. Cost of establishment in EKM which accounted to Rs. 1,60,516 was higher when compared to TVM (Rs. 1,38,493). Cost of shade structure, stand and trays and pots together constituted to 30 per cent share of cost of establishment in EKM whereas in TVM cost of artificial support contributed only 17 per cent to the total cost of establishment. The share of inputs towards establishment cost is depicted in Figure 5.

Table 14. Input wise breakdown of establishment cost of 1000 orchid plants (Rs)

Input items	TVM	EKM	Overall
Planting material	98473.26 (71.10)	103560.65 (64.52)	101016.95 (67.57)
Shade structure /artificial support	23725.77 (17.13)	32085.09 (19.99)	27905.43 (18.67)
Stand and trays	0.00 (0.00)	6770.12 (4.22)	3385.06 (2.26)
Resting shed	4991.90 (3.60)	0.00(0.00)	2495.95 (1.67)
Pots	0.00 (0.00)	8606.52 (5.36)	4303.26 (2.88)
Media	2799.25 (2.02)	2326.31 (1.45)	2562.78 (1.71)
Tools and irrigation system	2140.07 (1.55)	3479.06 (2.17)	2809.56 (1.88)
Labour	6215.56 (4.49)	3687.99 (2.30)	4951.77 (3.31)
Miscellaneous	146.73 (0.11)	0.00 (0.00)	73.36 (0.05)
Total	138492.54(100.00)	160515.74(100.00)	149504.14(100.00)

(Figures in parentheses represent the percentage to the total)

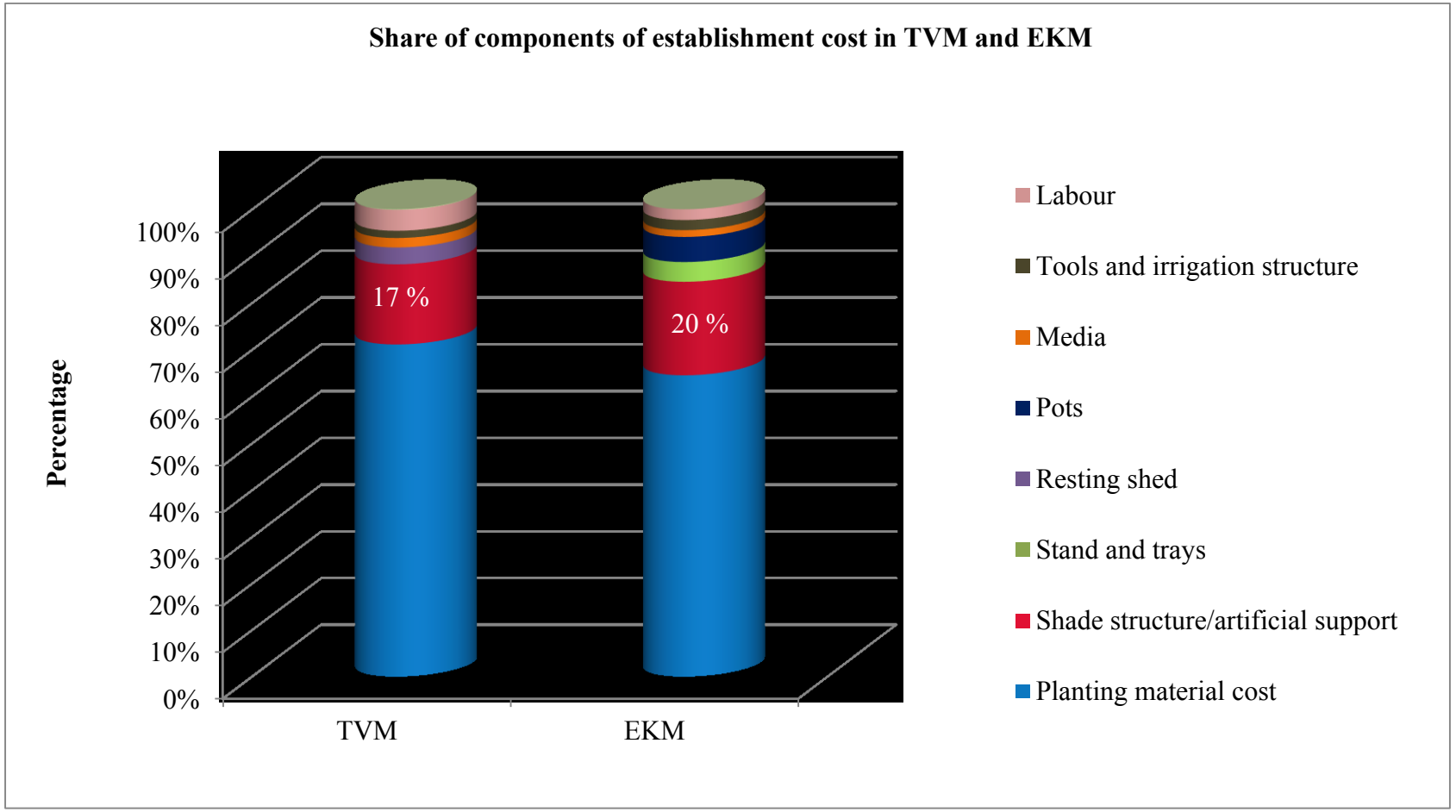

Figure 5. Share of components of establishment cost in TVM and EKM

4.3.3 Recurring costs

Major items of recurring costs were media, agro-inputs and labour (Table 15). Average annual recurring cost for 1000 orchid plants worked out to Rs. 20,669. Annual recurring cost for TVM was more when compared to EKM and it was recorded as Rs. 22,126 and Rs. 19,685 respectively. Labour was identified as the most prominent component accounting for 82 per cent followed by media which constituted 7 per cent. Similar result was also observed in TVM. In EKM, agro-inputs were the second most contributing factor to the recurring costs, accounting for 5 per cent. Recurring cost on media was less in EKM (3 per cent) compared to TVM, which accounted about 13 per cent. In TVM, media was replaced in every 6 months while in EKM repotting was done once in two years only. While repotting, old media like tile bits or brick pieces could be used again after washing.

Table 15. Input wise breakdown of recurring cost for 1000 orchid plants, Rs

Input items	TVM	EKM	Overall
Media	2799.25 (12.65)	679.42 (3.45)	1502.87 (7.27)
Agro-inputs	1852.58 (8.37)	1035.45 (5.26)	1444.02 (6.99)
Labour	16512.16 (74.63)	17457.77 (88.69)	16984.96 (82.18)
Miscellaneous cost	962.20 (4.35)	511.85 (2.60)	737.03 (3.57)
Total	22126.19 (100.00)	19684.50 (100.00)	20668.87 (100.00)

(Figures in parentheses represent the percentage to the total)

4.3.4 Cost of agro-inputs

Details on cost of agro-inputs is presented in Table 16. Agro-inputs included manures, fertilizers and plant protection chemicals. Annual cost for agro-inputs was estimated as Rs. 1,444. At the overall level, expenditure on plant protection chemicals was higher (45 per cent) compared to other two inputs. Similar pattern was observed in TVM district. Growers in EKM spend approximately equal amounts for fertilizers and plant protection chemicals. Expenditure on manures was 4.6 times higher in TVM compared to EKM. This difference was mainly because of the use of cowdung slurry in TVM. In EKM plants were sprayed with the supernatant liquid of cowdung slurry and only less amount was required. Growers in EKM district used more amounts of fertilizers than manures.

Table 16. Cost of agro-inputs used in orchid cultivation, Rs

Agro-inputs	TVM	EKM	Overall
Manures	756.85 (40.85)	164.15 (15.85)	460.50 (31.89)
Fertilizers	221.06 (11.93)	445.58 (43.03)	333.32 (23.08)
Plant protection chemicals	874.66 (47.21)	425.72 (41.11)	650.19 (45.03)
Total	1852.58 (100.00)	1035.45 (100.00)	1444.02 (100.00)

(Figures in parentheses represent the percentage to the total)

Rajeevan (1998) has found out the cost of establishment for a unit of 1000 orchid plants as Rs. 1,00,000. Recurring cost calculated as Rs. 5,000. Karn (1999) has estimated the cost of establishment as Rs. 1,00,007, of which planting material alone constituted 66 per cent. Recurring cost worked out to Rs. 15,000 and labour was identified as the most prominent component in pooled recurring cost, accounting for 87 per cent followed by agro-chemicals (11 per cent). After

more than 10 years, the results of the present study are justifiable, when we compare the results of above mentioned works. Establishment and recurring costs were higher in the present study mainly because of the rise in wage rates and material inputs over these years.

Steephan (2011) has also estimated the cost of establishment and recurring costs for orchid cultivation which was accounted to Rs. 13,092 and Rs. 4,500 respectively. Total cost for agro-inputs was worked out to Rs. 1,750. Cost of establishment and cost for agro-inputs of present study was comparable with her results. But the recurring expenses are not in line with the present study, which amounted to Rs. 20,669 which was very high. Imputed value of family labour was the major contributor to this difference. This may be due to the cost of family labour accounted in the present study which was higher than the labour cost accounted by Steephan (2011). In her study labour was calculated only for irrigation and application of fertilizers and plant protection chemicals. But in the present study labour was calculated by taking into account, the total time spend by the family members in a day for various operations in the garden.

4.3.5 Returns

Pattern of production of flower spikes over the economic life period of plant is given in Table 17. Economic life span of orchid was taken as 5 years. All the growers resorted to replanting after 5 years because of the reduction in quality and quantity of the flower spikes. Production of flower spikes was lowest in the first year, accounting for 1,927 spikes and it was highest in the 5^{th} year, accounting for 8,412 spikes. Annual average production of flower spikes per 1000 orchid plants worked out to 5958 spikes. It could be further observed that there was 170 per cent increase in production of flower spikes between the initial two years which reduced to about 6 per cent between last two years. A lean period in flower production was noticed during rainy season which was not very pronounced. Flower production pattern was more or less similar in both the districts.

Table 17. Annual production of flowers per 1000 orchid plants

Year	TVM	EKM	Overall
1	1497.57	2357.27	1927.42
2	5380.88	5006.04	5193.46
3	6343.60	6284.85	6314.23
4	8032.41	7853.95	7943.18
5	8444.08	8380.21	8412.14
Total	29698.54	29882.32	29790.43
Annual average	**5939.71**	**5976.46**	**5958.09**

The details of price received per flower spike according to different grades is provided in Table 18. Grading was practiced by wholesalers and producer exporters in TVM which was not standardized. Three important grades of orchids observed were

1) Premium – 60 cm spike lengh + 10 to 12 flowers

2) Large – less than 60 cm spike length + 8 to 10 flowers

3) Medium – less than 60 cm spike length + less than 8 flowers

The varieties of Aranthera and Aranda were graded as mentioned above while Arachnis was sorted to only first two grades. Grading was not followed for all the other varieties. The price prevalent in the study area for different grades was taken for TVM, even though there was slight variation in price realized by different growers. But in EKM there was wide variation in price received by each grower. Therefore average price received per flower spike was taken for the study. Grading was not practiced in EKM. Certain growers in EKM even retained the orchid flowers as they add to the scenic beauty of the garden in the context of low prices offered by the consumers.

Table 18. Price received per flower spike, Rs

TVM							EKM	
Variety	Price received						Variety	farmer's price
	Farmer's price			Wholesalers price				
	P	L	M	P	L	M		
Aranthera	14	10	8	20	18	10	Dendrobium	14.5
Arachnis	5	4	-	10	8	-	Phalaenopsis	28.8
Aranda	14	10	8	20	18	10	Mokara	17
Vandachnis	25	-	-	50	-	-	-	-
Terete vanda	3	-	-	8	-	-	-	-
Mokara	15	-	-	20	-	-	-	-

P – Premium, L – Large and M - Medium

Returns from a unit of 1000 orchid plants is shown in Table 19. Returns obtained by sales of flower spikes were only accounted in the present study eventhough sale of keikis and cuttings takes place on a small scale. In EKM, growers divided the plant only if it had outgrown the pots and the production of keikis was very less. In TVM, growers could take the cuttings every year, but it was not practiced because of the lack of demand for vandaceous orchids in the local households. Therefore after a certain height, growers practiced pruning to control the height of the plant.

From the table it can be seen that returns obtained over the economic life of plant is showing an increasing trend. Annual average returns obtained from a unit of 1000 orchid plants was Rs. 1,06,789. The average returns obtained in TVM was Rs. 1,14,525, which was 16 per cent higher than the returns obtained in EKM (Rs. 99,053). The higher returns in TVM was mainly attributed to the higher price realized by producer exporters. Exporting of flowers was not seen in EKM.

Table 19. Annual returns from 1000 orchid plants, Rs

Year	TVM	EKM	Overall
1	31481.64 (5.50)	40250.45 (8.13)	35866.05 (6.72)
2	104632.74 (18.27)	83943.87 (16.95)	94288.31 (17.66)
3	123899.03 (21.64)	105591.43 (21.32)	114745.23 (21.49)
4	153653.23 (26.83)	128892.58 (26.03)	141272.90 (26.46)
5	158956.29 (27.76)	136584.19 (27.58)	147770.24 (27.68)
Total	572622.93 (100.00)	495262.52 (100.00)	533942.72 (100.00)
Average	**114524.59**	**99052.50**	**106788.54**

(Figures in parentheses represent the percentage to the total)

Projected returns of Federation of Indian Floriculturists (FIF, 1997) was Rs. 47,000 in the second year, Rs.82,000 in the third year, 85,000 in the third year and 1,57,000 in the fifth year. Returns estimated by Karn (1999) was Rs. 28,160, Rs. 80,080, Rs. 84,520, Rs. 82,170 and Rs. 85,950 for five years respectively. Steephan (2011) also worked out the returns obtained from an orchid enterprise, which was projected as Rs.18,930, Rs. 43,690, Rs. 88,350, Rs. 92,720 and Rs. 1,11,050 from first to the fifth year respectively. All the above estimated returns are represented for a unit of 1000 plants.

Returns projected in the fifth year by FIF is higher than the present study as they had accounted the returns from keikis and mother plant. Planting material of near flowering stage was only considered in the present study, which resulted in higher returns in the earlier years. Overall returns obtained in the present study

was higher than the estimated returns by Karn (1999) and Steephan (2011). This was mainly because of the higher price received by exporters in TVM.

4.4 CAPITAL PRODUCTIVITY ANALYSIS

Capital productivity measures the efficiency in use of capital and assess the economic viability of the enterprise by considering the time value of money. Discounted project worth measures like Net Present Worth (NPW), Pay Back Period (PBP), Benefit Cost Ratio (BCR) and Internal Rate of Return (IRR) were used to analyse the capital productivity. Cash flow stream was discounted at 13 per cent discount rate.

Cash flow stream of investment in orchid cultivation is given in Table 20. From the table it can be seen that net cash flow is showing an increasing trend over the economic life span of the crop and cumulated net cash flow was Rs. 2,67,654 at overall level. Cumulated cash inflow at the end of fifth year for TVM (Rs. 5,72,623) was 16 per cent higher than the cumulated cash inflow for EKM (Rs. 4,95,263) while cumulated cash outflow came more or less the same in both the locations.

4.4.1. Pay-Back Period

Measures of investment worth for an orchid enterprise is presented in Table 21. Pay-back period is the period required to repay the initial investment incurred in establishing the orchid enterprise. PBP was found to be 2.60 for TVM and 3.39 years for EKM with 3.03 years at overall level. This indicated that the orchid entrepreneurs were in a position to recover the establishment cost in about 3 years.

4.4.2. Net Present Worth

The NPW, indicating cumulative net return at the end of 5 years, was found to be Rs. 1,76,170 and Rs. 99,675 for TVM and EKM respectively and at the overall was Rs.1,37,898**.** The higher and positive NPW indicated that the future net returns were worth to compare the present investment and returns.

Table 20. Cash flow stream of investment in orchid enterprise (Rs)

Year	TVM			EKM			Overall		
	Cash outflow	Cash inflow	Net Cash flow	Cash outflow	Cash inflow	Net Cash flow	Cash outflow	Cash inflow	Net Cash flow
1	158393.24	31481.64	-126911.60	185856.77	40250.45	-145606.32	172125.01	35866.05	-136258.96
2	22768.57	104632.74	81864.17	22049.59	83943.87	61894.28	22409.08	94288.31	71879.23
3	22786.73	123899.03	101112.31	26494.80	105591.43	79096.63	24640.76	114745.23	90104.47
4	22802.61	153653.23	130850.62	22080.89	128892.58	106811.68	22441.75	141272.90	118831.15
5	22810.37	158956.29	136145.92	26534.85	136584.19	110049.34	24672.61	147770.24	123097.63
Total	**249561.51**	**572622.93**	**323061.41**	**283016.91**	**495262.52**	**212245.62**	**266289.21**	**533942.72**	**267653.51**

4.4.3 Benefit-Cost Ratio

The BCR indicates the net returns per rupee of investment during economic life period of orchid enterprise. The BCR, which is the ratio of sum of discounted gross returns to the sum of discounted total costs was estimated to be 1.88 for TVM, 1.44 for EKM and 1.64 at the overall level. Results indicated that the investment in orchid enterprise is economically feasible and financially sound.

4.4.4 Internal Rate of Return

This technique has been indicated as important and scores over the other techniques of evaluation, since it considers the reinvestment opportunities which are absent in other criteria. The respective IRRs obtained for TVM, EKM and at overall level were 70, 43 and 55 per cent which shows the marginal efficiency of capital.

It could be further observed from the table that BCRs were greater than one, NPWs were positive and IRRs were greater than the opportunity cost of capital in both the locations. Thus, orchid enterprise in both the locations was found to be financially viable. The BCR, IRR and NPW were found to be higher for TVM compared to EKM. Thus it may be concluded that the orchid agri-business in TVM was financially more remunerative than EKM. Results of capital productivity analysis done by Karn (1999) and Steephan (2011) were comparable with the present study. Pictorial representation of the economic viability of orchid enterprise is shown in Figure 6.

Table 21. Measures of investment worth for orchid enterprise

Project worth measures@ 13% Discount rate	**TVM**	**EKM**	**Overall**
Pay Back Period(Years)	2.60	3.39	3.03
Net present Worth(Rs.)	176170.25	99675.06	137897.82
Benefit Cost Ratio	1.88	1.44	1.64
Internal Rate of Return (%)	70	43	55

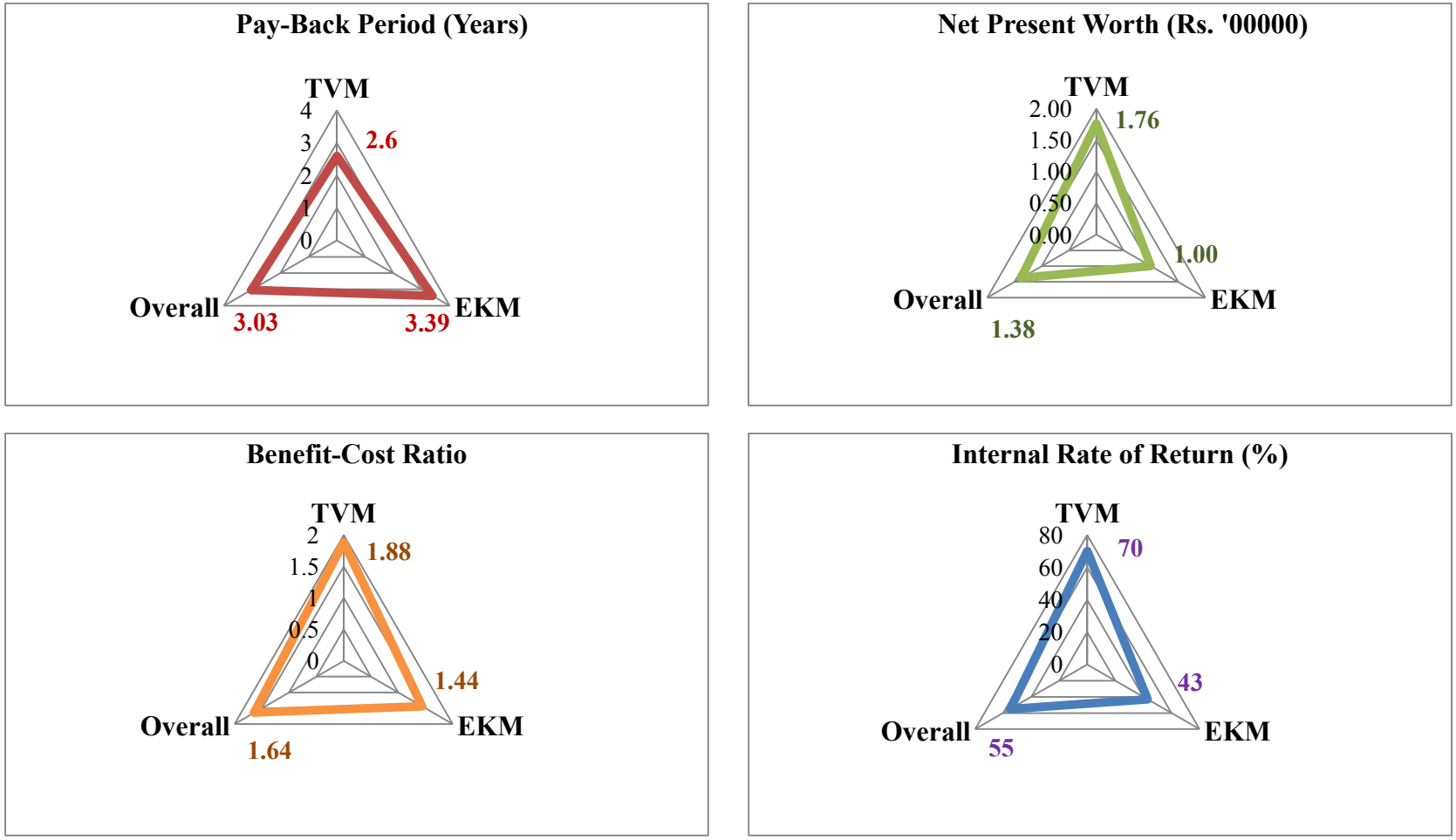

Figure 6. Economic viability of orchid enterprise

4.5 RESOURCE USE EFFICIENCY

Resource use efficiency of orchid cultivation was studied by fitting a Cobb-Douglas production function for the sample as a whole. Returns per year was taken as the dependent variable. Five independent variables, namely planting material, manures, plant protection chemicals, fertilizers and labour were taken and were expressed in monetary terms. The results thus obtained are given in Table 22.

The independent variables included in the fitted regression function could explain 96 per cent variation in the returns. Planting material was the single variable which came positively significant in production function analysis. The negative and insignificant coefficients of other variables may be explained by the fact that in the production function for orchids, planting material acted as a dominant variable which absorbed almost all the variation of output keeping negligible for the others. The sum of all regression coefficients which directly gives the return to scale was found to be 1.09 indicating constant returns to scale. Constant returns to scale occurs when a proportional increase in all the inputs result in an equivalent increase in the output.

Table 22. Production function of orchid cultivation

Sl. No	Explanatory variable	Elasticity of production
1	Planting material	**1.44***
2	Manures	0.05
3	Plant protection chemicals	-0.26
4	Fertilizers	-0.05
5	Labour	-0.09
6	Adjusted R^2	**0.96**
7	F value	89.63**
8	Returns to scale	**1.09**

** Significant at 1 per cent level, * Significant at 5 per cent level

Marginal value product indicates the returns which can be expected by adding one more unit of the input factor to the present average level of use, the other factors remaining at their geometric mean level. The MVP for planting material was found to be 1.18 (Table 23) indicating that a rupee additional investment in these input will add Rs. 1.18 to the per 1000 plants gross returns from orchid. The ratio 'k' (MVP/MFC) for planting material was more than one indicating underutilization of this resource and should be increased to enhance the allocative efficiency. A 15 per cent increase in use of planting material would result in the efficient allocation of that resource for optimum production.

Table 23. Allocative efficiency of inputs

Sl. No	Inputs	Geometric mean	Coefficient	MVP	MVP/ MFC	% adjustment for optimum
1	Returns per year	94104.55	-	-		
2	Planting material	114626.7	1.44	1.18	1.18	15.25

4.6 MARKETING

Marketing was the major challenge faced by every entrepreneur entering into the cut flower business. As there were cases of failure of orchid business due to problems in marketing, identification of marketing strategies followed by the performing units would be useful for the new entrants to achieve success in this field. In this study, an attempt has been made to investigate marketing aspects of orchid cultivation with the objective to study marketing costs, margins and efficiency of different marketing channels.

The required data on marketing cost, purchase price, sale price etc., were collected from the intermediaries involved in the different marketing channels. With regard to the distant wholesalers data obtained based on the information gathered from the local wholesalers and producer exporters.

4.6.1 Marketing channels

Marketing channels consist of various agencies which perform different marketing functions in a sequence as the produce moves from the producers to the ultimate consumers. The main marketing channels identified were:

Channel I: Producer – Local Wholesaler – Distant wholesaler – Consumer

Channel II: Producer (exporter) – Distant Wholesaler – Consumer

Channel III: Producer – Florist – Consumer

Channel IV: Producer – Consumer

The first three channels were used exclusively by growers in TVM. All the growers in EKM sold their flowers directly to the consumers. On the whole 55 per cent of growers used channel IV to sell off their flowers. Channel I and II were followed by 30 and 20 per cent of the growers respectively. Only 10 per cent of the growers marketed their produce through channel III.

A wide inequality can be noticed in the quantity of flowers marketing through different channels. Channel I was identified as the most prominent channel according to the quantity of flowers marketed followed by channel II (Table 24). About 51 per cent and 42 per cent of total flowers produced were sold through the respective channels while the direct sale of flowers as shown in channel IV from the producer to consumer contributed very less that is about 5 per cent of the total flowers. The channel III contributed lowest in the marketing of orchid cut flowers, which was only 2 per cent. Hotels, beauty parlors, event management groups, offices, retail shops etc., constituted the local orchid flower consumers in the state. Growers in EKM could not find a place in domestic market mainly because of the lack of ability to supply adequate volume of preferred varieties.

Table 24. Quantity of flowers marketed through different channels

Channel	Number of flowers marketed	Percentage to total
Channel I	1156400	51.13
Channel II	94520	41.79
Channel III	37200	1.64
Channel IV	123030	5.44
Total	2261830	100.00

Karn (1999) identified, Producers – Local florists – Consumers as the most prominent channel for orchid marketing in Kerala through which bulk of the produce (57 per cent) was marketed. He found out that 33 per cent of produce was exported to outside markets. Steephan (2011) also observed that the channel involving florists was the important channel for orchid marketing in central Kerala.

Present study revealed that the involvement of florists has become minimal in orchid flower marketing in Kerala. This was mainly because of the import of orchid cut flowers from other parts of the country, especially from Bangalore. Florists had opted purchase of flowers from other markets, because of the irregular and inadequate supply of flowers from the local producers. Because of the same reason orchid cut flower societies and other producers associations have become nonfunctional in the state.

Growers in TVM could establish contacts with wholesalers outside the state because of the larger scale of operation compared to growers in EKM. None of these exporters are exporting flowers outside India. Further there is a tendency of shift from orchid flower to orchid plant trade which is considered as more remunerative.

4.6.2 Price spread

Details on price spread of various channels of orchid marketing is given in Table 25.

4.6.2.1 Channel I: Producer – Local Wholesaler – Distant wholesaler – Consumer

In this channel, the price received by producer, local wholesaler and distant wholesaler are Rs. 14.25, Rs. 20 and Rs. 25 respectively. Price spread, which is the difference between net price received by the farmer and the price paid by the consumer, worked out to Rs. 10.84 for channel I (Table 25). Marketing margin constituted 82 per cent of price spread where as share of costs came only 18 per cent which means the profit share of intermediaries was very high compared to the cost incurred by them. Net margin earned by the local and distant wholesalers worked out to 17 and 18 per cent in consumer's rupee respectively. The lower net margins of wholesalers may be due to lower sale price owing to larger arrivals of flowers in these markets. Shepherd's index of marketing efficiency was accounted 6.36 in this channel. It was observed that the producer received a fairly high share of 57 per cent in consumer's rupee in channel I

4.6.2.2 Channel II: Producer (exporter) – Distant Wholesaler – Consumer

In this channel an intermediary as local wholesaler was eliminated and this channel was observed as the best as growers realized highest net price of Rs. 18.7 for flower spikes compared to all the other channels. Because, the average price realized in distant markets were higher than the average price received in local markets.

This channel was identified as the second most efficient channel where producers received as high as 75 per cent of consumer's rupee. Shepherd's index was 8 and price spread worked out to Rs. 6.3. The extent of margin was 65 per cent which was realized by the distant wholesalers. The potential of channel II

where producer acts as exporters should be tapped for a breakthrough in orchid trade in India and abroad. The major advantage obtained by the growers using first two channels was the assurance of market. Sometimes large growers collected flowers from small growers to make sufficient quantities for marketing because they had to send an agreed volume of flowers on a regular basis to distant markets. About 93 per cent of total quantity of flowers produced was marketed through the first two channels.

4.6.2.3 Channel III: Producer – Florist – Consumer

Flowers were sold by florists after value addition. Florists used different kinds of flowers, leaves and other decorating materials to make value added products like flower arrangements, bouquets, wreaths etc. But in case of vandaceous orchids, because of their long spikes, arrangements were solely made from orchids. Such arrangements were considered while computing the marketing costs for value added products. It was revealed that among the intermediaries florists received the highest net margin, which was accounted as Rs. 9.11 (28.7 per cent in consumer's rupee) and the marketing cost incurred by them was Rs. 8.62. This indicated that they took a profit share almost equal to the expenses made by them. This channel was identified as the least efficient channel with highest price spread of Rs. 18.27, lowest Shepherd's index of 0.53 and lowest producers share on consumer's rupee, which came as 42.41 per cent.

4.6.2.4 Producer – Consumer

In this channel producers sold their produce directly to the consumers. Almost half of the respondents entirely followed this channel to sell of their flowers because of the inadequate volume of production which prevented them from entering into distant markets and growers found it's extremely hard to get regular local market. Most of the growers, following this channel did not make any efforts for value addition of flowers which could provide them with higher returns. Producers share in consumer's rupee and Shepherd's index was highest in this channel which accounted to 99 per cent and 156 respectively. Price spread was worked out as Rs. 0.09 which was lowest compared to all the other channels.

Therefore this channel was observed as the most efficient channel but the net price realized by the farmer was only best next to channel II. The growers of EKM are forced to depend this channel even though it is not a reliable channel.

Table 25. Price spread of different marketing channels (Rs)

Sl. No.	Price spread	Channel I	Channel II	Channel III	Channel IV
1	Producer's sale price	14.25	20.5	14	14.5
	Marketing cost	0.09	1.8	0.54	0.09
	Net price received by producer	14.16	18.7	13.46	14.41
2	Local Wholesaler				
	Purchase price	14.25	-	-	-
	Marketing cost	1.43	-	-	-
	Marketing margin	4.32	-	-	-
3	Distant Wholesaler				
	Purchase price	20	20.5	-	-
	Marketing cost	0.42	0.42	-	-
	Marketing margin	4.58	4.08	-	-
4	Florist				
	Purchase price	-	-	14	-
	Marketing cost	-	-	8.62	-
	Marketing margin	-	-	9.11	-
5	Consumer				
	Purchase price	25	25	31.73	14.5
6	Total cost	1.94	2.22	9.16	0.09
7	Total margin	8.9	4.08	9.11	-
8	Price spread	10.84	6.3	18.27	0.09
9	Producers share on consumers rupee(%)	56.66	74.8	42.41	99.36
10	Shepherd's index	6.36	8.23	0.53	155.76

The split up of the marketing cost for the different channels is depicted in Table 26. Transportation, packing, labour and freight charges were the major items of marketing cost incurred by local wholesalers in which freight charges constituted 38 per cent followed by packaging charges (24 per cent). Higher cost of local wholesalers is attributed to the freight charges compared to distant wholesalers.

Packaging was given importance by local wholesalers to maintain the quality of flowers. Flowers were graded by local wholesalers and were arranged into bunches of ten. Basal portion of each bunch was then covered with wet newspaper and a polythene cover over that, inorder to increase the shelflife. However no chemicals were used to increase the vase life of flowers. Each bunch was then wrapped with newspaper and packed in boxes of size 100×40×40 cm^3, which could contain 700 spikes. Flowers were transported to the distant markets via bus, train or by air transport. Major domestic markets were Bangalore, Chennai, Hyderabad, Mumbai and Delhi.

Total marketing cost incurred by producer exporters was Rs. 1.8 per flower spike. Grading and packing were done as mentioned earlier for the local wholesalers. Instead of wet newspaper, producers used wet cotton to increase vase life of flowers which resulted in a slight increase in the packaging cost of producer exporters.

Marketing costs incurred by local and distant wholesalers were respectively, Rs. 1.43 and 0.42 per flower spike in channel I. Among the intermediaries highest marketing cost per spike was incurred by florists since they are doing value addition. Cost of pots, oasis, leaves and decorating materials constituted the cost of arrangements for florists which accounted 78 per cent of total marketing cost incurred by channel III. Apart from the cost of arrangement, transportation and labour florists incurred expenses for electricity, water and maintenance of furnitures in their shops which was accounted under other expenses in Table 26.

Major cost item incurred by producers in channel IV was transportation. Sometimes growers didn't incur any cost as the consumers collected the produce from the farm itself.

Table 26. Marketing costs of different marketing channels (Rs)

Particulars	Channel I			Channel II		Channel III		Channel IV
	P	LW	DW	PE	DW	P	F	P
Transportation	0.09	0.04	0.01	0.05	0.01	0.54	0.13	0.09
Packaging/ arrangement	0.00	0.35	0.00	0.50	0.00	0.00	6.73	0.00
Labour	0.00	0.33	0.27	0.54	0.27	0.00	1.28	0.00
Freight	0.00	0.54	0.00	0.54	0.00	0.00	0.00	0.00
Other expenses	0.00	0.17	0.14	0.17	0.14	0.00	0.49	0.00
Total	0.09	1.43	0.42	1.8	0.42	0.54	8.62	0.09
Total marketing cost	**1.94**			**2.22**		**9.17**		**0.09**

P – Producer; PE – Producer Exporter; LW – Local Wholesaler; DW – Distant Wholesaler; F – Florist

The details on quantity of flowers sold in both local and domestic markets are presented in Table 27. Majority of 92 per cent of total quantity of flowers produced were sold in domestic market while 8 per cent sold in local market. Ninety seven per cent of flowers produced in TVM were sold in domestic market while in EKM exclusively in local markets.

Table 27. Number of flowers sold in local and domestic markets

District	Local	Percentage	Domestic	Percentage	Total
TVM	61200	3.34	1771200.00	96.66	1832400
EKM	99030	100	0.00	0.00	99030
Total	160230	8.30	1771200.00	91.70	1931430

4.7 CONSRAINTS FACED BY GROWERS

A clear understanding of constraints helps to formulate research and to suggest suitable policy options. The constraints were grouped into three categories, production constraints, marketing constraints and technological constraints. The plausible constraints were ranked by orchid growers and scores were obtained using the Garrett ranking technique. Marketing constraints had been identified as the most crucial problem in trade of flowers. The important constraints faced by growers on the order of importance are presented in Tables 28, 29 and 30 respectively.

Important constraint faced by small growers in marketing of flowers was low price of flowers (Table 28). This was mainly due to lack of demand in local market and availability of market only in distant metro cities. Local demand is confined to wedding seasons, Christmas, New Year etc. This irregular market had forced the farmers to distress sale. Another reason for low price of flowers was the production of inadequate volumes of a single variety. Usually consumers insisted for larger quantities of a single variety which could not be fulfilled by small growers. Infact they had less numbers of diverse varieties in their farm. Therefore consumers like florists resorted to import of flowers from other states because of lack of assured supply.

Absence of organized market and inability of small growers to find market were emerged as other important bottlenecks in cut flower trade. Cut flower orchid cultivation flourished in Kerala during nineties and lot of cut flower societies, agri-horti societies, orchid societies, orchid vanitha clubs, flori clubs etc were engaged in conducting training programmes and marketing of cut flower orchids at that time. After the initial enthusiastic efforts, later on growers failed to assemble required volume of preferred varieties at the collection centres as per the increasing consumer's demand, which led the grower associations ineffective in marketing. Many growers are not convinced of the potentials of

this crop due to the absence of assured marketing facilities which prevented the new entrants in this field.

Other marketing problems cited by growers were delay in getting sale proceeds and frequent changes in taste and preference of consumers. These problems had mainly affected the exporters. Without the help of any grower associations these producer exporters had succeeded in establishing contacts with reliable market functionaries outside the state because of their continuous efforts and better access to market. Many of them didn't receive timely payment during the initial years of business. Most of the small growers could not achieve this due to lack of resources and inadequate volume of flower production. In North Indian markets there is high requirement of flowers in theme based parties in which they demand large number of flowers of a single colour.

Absence of refrigerated infrastructure for storage of flowers and lack of demand for flowers from individual households were some of the other constraints felt by the growers. Loss of produce during transportation was ranked last because most of the producers didn't feel that as an important problem.

Table 28. Marketing constraints

Constraints	**Garret Score**	**Rank**
Low market price of flowers	70.25	1
Unorganized marketing of flowers	69.05	2
Inability of small growers to find market	60.95	3
Delay in getting sale proceeds	52.85	4
Frequent changes in taste and preference of consumers	52.7	5
Insufficient cold storage facility from production centre's to consumers	52.1	6
Lack of demand from local households	41.7	7
Unhealthy competition among growers	27.4	8
High rate of damages in transit	25	9

High price of planting material and lack of large scale multiplication centres were the major production constraints reported by growers (Table 29). About 60 per cent of the growers in TVM had used their own planting material to start commercial cut flower production as they had started floriculture business long back. The remaining 40 per cent depended on progressive growers and importers of orchids to purchase planting material. Seventy per cent of the growers in EKM purchased planting material from importers and 30 per cent from private nurseries. Most of the growers were not satisfied by the high price and low quality of planting material purchased from importers and private nurseries and direct import of plants was not within the reach of small growers as its procedures were very tedious. Therefore they pointed out the need for starting government owned tissue culture labs for large scale production of quality planting material.

Only 25 per cent of the growers depended on institutional credit for starting orchid enterprise as majority of them were high income groups. Another reason was difficulties in fulfilling the procedural formalities in availing loans. Constraints like high price of plant protection chemicals and difficulties in identification of pest and diseases were assigned lower ranks by the growers as the incidence of pest and diseases were reported very less in orchids.

Table 29. Production constraints

Constraints	Garrett Score	Rank
High price of planting materials	75.35	1
Lack of large scale multiplication centre's	65.1	2
Procedural formalities in availing institutional credit	53.05	3
High cost of plant protection chemicals and fertilizers	50.55	4
Difficulty in identification of pest and diseases	44.4	5

High initial investment in infrastructure and lack of technical expertise were identified by growers as the major technological constraints, which resulted in sluggish growth of cut flower industry in Kerala (Table 30). High cost of planting material and shade structures contribute to the high initial investment in orchid enterprise. Even though government is providing assistance for starting hi-tech floriculture ventures, most of the growers found reluctant to avail such subsidies due to the requirement of submission of detailed project reports, which felt cumbersome by the growers.

Table 30. Technological constraints

Constraints	Garrett Score	Rank
High initial investment in infrastructure	70.75	1
Lack of technical expertise	57.85	2
Absence of practical training	53.65	3
Lack of research for developing new varieties	43.5	4

Karn (1999) observed that the marketing problems discouraged the expansion of cut flower industry in Kerala. He suggested channeling of marketing procedures under the control of a government organization or a strong producers association. Other constraints cited by him were high level of intra farm varietal diversity which resulted in supply management problems in commercial scale, small scale of operation and higher investment for good quality shade house. He also emphasized the need for developing low cost protected cultivation models suitable for small holdings.

High cost of planting material, non-availability of disease resistant planting material and high cost of plant protection chemicals were identified as the major production constraints by Nair (2002). In his opinion larger growers were not faced with any marketing problems, but small growers found it very difficult to find procuring agencies. He reported the problems faced by growers

as inadequate market information, lack of technology to keep the freshness of flowers, delay in payment of sale proceeds, erratic fluctuations in price etc. He also pointed out that people of Kerala had indifferent attitude towards flowers like anthurium and orchid as they are having high price and without any fragrance.

Steephan (2011) also identified problems in marketing of flowers as major constraint in cut flower industry in Kerala. Low price of flowers, irregular market and delay in payment of sale proceeds were observed as major marketing constraints by her. She further explained that limited number of cut flower traders in the study area has reduced the bargaining power of farmers which resulted in the low price of flowers and seasonal demand of flowers has resulted in huge wastage of farm produce in the off season. She also stated that nonpayment of dues to the traders has led to collapse of their business. The results of the present study were comparable with the past works.

4.8 OPPORTUNITIES AND CHALLENGES

4.8.1 Opportunities

Flowers are an inevitable part of every festive occasion. Ever increasing demand for floricultural products has attracted a large number of entrepreneurs into this industry worldwide. In India the state of Kerala has most congenial climate for growing tropical orchids.

Orchid enterprise provides great opportunities for uneducated youth and home makers in Kerala to undertake it as a hobby or a self employment activity. Flower cultivation not only helps them for earning but also for effective utilization of their time. Working with plants and flowers in the garden imparts a feeling of peace and tranquility, reduces stress and offers a sense of self esteem and mastery of environment (Bhattacharjee, 2001)

Value addition refers to increase in the value of a raw product anytime between harvesting and sale of the final product through changes by processing. Value addition can significantly increase the net returns of a small-scale orchid enterprise by reducing wastage and affording an outlet for creativity. It ensures high premium to the growers, while providing more acceptable quality products to the customers. Value addition includes preparation of products from fresh flowers like cut flower arrangements, bouquets, garlands, corasage, wreaths, buttonholes and dried flower arrangements like wreaths, pot pourris, products made up of press dried flowers like greeting cards, wall hangings etc.

High status people in India have developed a party culture for celebrating each and every special occasions of their life and there is a high demand for cut flowers in which orchids have received a remarkable position because of its late but royal entry with stunningly attractive long spikes to the cut flower industry in India. This had made it dearer for the high society people than other cut flowers like rose, gerbera etc.

Recently, people in Kerala have become increasingly interested in decorating their house compound with potted flowering plants because of their improved standard of living and growing consciousness to live in an environment friendly and aesthetically rich atmosphere. Potted orchid plants are one among the highly demanded potted plants in Kerala. This gives ample opportunities for entrepreneurs to establish orchid nursery business.

As the demand for cut flower orchids is increasing there is scope for establishment of high-tech tissue culture labs capable of evolving and mass multiplying hybrid varieties of orchids suited to the state so that growers could obtain high quality planting materials at reasonable prices. There is also scope for developing suitable packaging and cold storage facilities to reduce wastage and to increase the export market for orchids.

4.8.2 Challenges

Assured market outlet is the most challenging factor in orchid agribusiness. This risk is aggravated by the import of flowers from other states instead of depending on local market. This is often due to lack of assured supply of flowers. This challenge can be faced to a greater extent by developing local and domestic market simultaneously and even entering international market through market oriented production

Even though growers in TVM have been found successful in marketing their monopodial orchids, scope for increasing open field cultivation of monopodial orchids is limited in a state like Kerala where availability of land is a major constraint in cultivation of any crop. Both the protected and open field cultivation of orchids has been found to be highly capital intensive and risky. It may not be possible for an ordinary grower to bear the risk of crop failure that may lead him to complete economic disaster. The cost of planting material which constituted the lion's share of establishment cost was mainly due to the absence of large scale multiplication centres for planting material of orchids.

Summary

5. SUMMARY

Orchids occupy a prime position in the trade of cut flowers in both domestic and international market. Kerala has been identified as the best suited place for cultivation of orchids because of its high humidity, low temperature and plenty of sunlight. Cultivation of orchids have acquired wide acceptance all over the state and today, a number of big and small entrepreneurs are engaged in production and marketing of orchids as cut flowers and potted plants in Kerala. Most important varieties of cut flower orchids grown in the state are Aranthera, Arachnis and Dendrobium. This study was carried out with the objective to study economics of commercial orchid production, marketing, constraints and to identify the opportunities and challenges faced by orchid cultivators in Kerala.

Primary data on orchid cultivation was collected from Thiruvananthapuram and Ernakulam districts of Kerala. From the two districts 20 elite growers having more than five years of experience, actively involved in commercial orchid production and 10 florists were selected randomly for an in depth study of production and marketing of orchids. In this study socio-economic characteristics of the orchid growers were ascertained. Cost of cultivation was worked out using A B C cost concept for a unit of 1000 orchid plants. Capital productivity analysis was done by taking the values of estimated cost of cultivation and returns. Allocative efficiency of resource was estimated using Cobb – Douglas production function. Different marketing channels were identified and price spread was calculated. Marketing efficiency was found out using producer's share in consumer's rupee and Shepherd's index.

The analysis of socio-economic characteristics of respondents revealed that orchid cultivation was taken up by educated resource rich urban entrepreneurs rather than poor rural traditional farmers. There was wide variation in gender involvement between two locations and maximum involvement of females was noted in EKM (60 per cent) and it was only 10 per cent in TVM. Orchid business in EKM was mainly taken up as a self employment activity by the home makers.

Average area under orchid cultivation was 0.66 hectares in TVM and it was only 75.15 m² in EKM. This wide variation was mainly because of the fact that cultivation was undertaken in open field conditions in TVM whereas it was under shade structures in EKM.

According to ABC cost concept, Cost A_1 was worked out to Rs. 1,28,838 for TVM, Rs. 1,22,331 for EKM and Rs. 1,23,585 at overall level. Estimated cost A for TVM was 5.31 per cent higher than the cost A for EKM. Planting material was the major contributing component (80 per cent) of total paid out cost at overall level. Cost B_1, B_2, C_1, C_2 and C_3 was estimated as Rs. 1,30,909, Rs. 1,31,878, Rs. 1,38,911, Rs. 1,39,879 and Rs. 1,53,867 respectively at overall level. Even though the total paid out costs was higher in TVM, Cost C_3 was more for EKM because of the higher involvement of family labour in EKM. Overall cost of establishment was worked out to Rs. 1,49,504. Planting material alone accounted for 68 per cent in total initial investment followed by shade structure of artificial support (19 per cent). Higher establishment cost was observed in EKM because of the high cost of shade houses. Average annual recurring costs for 1000 orchid plants was computed to Rs. 20,669. Labour was identified as the most prominent component accounting for 82 per cent followed by media (7 per cent).

Returns on orchid cultivation was taken exclusively from the sale of flower spikes. Annual average production of flower spikes per 1000 orchid plants was worked out to 5958 spikes. Pattern of flower production was more or less similar in both the locations. Annual average returns obtained from a unit of 1000 orchid plants was Rs. 1,06,789. The average returns obtained in TVM was Rs. 1,14,525 was higher than the returns obtained in EKM (Rs. 99,053) due to the higher price realized by producer exporters in TVM.

The estimated pay-back period was 3.03 years at overall level, 2.60 years for TVM and 3.39 years for EKM. The net present worth was worked out to Rs. Rs.1,37,898 at overall level, Rs. 1,76,170 for TVM and Rs. 99,675 for EKM.

Highest benefit cost ratio of 1.88 was observed for TVM while for EKM it was 1.44. The respective IRRs obtained for TVM, EKM and at overall level were 70, 43 and 55 per cent. All the estimated parameters indicated that orchid enterprise in both the locations was financially viable and it was more remunerative in TVM compared to EKM.

In the Cobb-Douglas production function analysis planting material was identified as the single variable having positive significant influence on returns. The independent variables included in the fitted regression function could explain 96 per cent variation in the output. From the measure of allocative efficiency, planting material was found to be underutilized and could be increased further to reach the optimum level.

Ninety two per cent of total quantity of flowers produced were sold in domestic market of Chennai, Bangalore, Mumbai, Delhi etc. and the remaining were sold in local market. Producer – Local Wholesaler – Distant wholesaler – Consumer channel was identified as the most prominent channel according to quantity of flowers marketed. About 51 per cent of total flowers produced were sold through this channel. Channel II was observed as the best as growers realized highest net price of Rs. 18.7 for flower spikes compared to all the other channels. This channel was identified as the second most efficient channel where producer's received as high as 75 per cent of consumer's rupee.

Producer – Consumer channel was observed as the most efficient channel as the producer's share in consumers' rupee and Shepherds' index was highest and price spread was lowest in this channel, accounted to 99 per cent and 156 and Rs. 0.09 respectively. The net price realized by the farmer was only best next to channel II. The growers of EKM are forced to depend this channel even though it is not a reliable channel. Hotels, beauty parlors, event management groups, offices, retail shops etc., constituted the local orchid flower consumers in the state. Wholesalers followed the practice of grading and packaging to improve the

quality of flowers. The study revealed that the producers and local wholesalers were not aware of the use of chemicals to prolong the shelflife of flowers.

Marketing costs incurred by local and distant wholesalers were respectively, Rs. 1.43 and 0.42 per flower spike in channel I. Among the intermediaries highest marketing cost per spike was incurred by florists since they are doing value addition.

Marketing problems were identified as the major constraint in orchid cut flower industry. Low market price of flowers, unorganized marketing, inability of small growers to find market, delay in getting sale proceeds, frequent changes in taste and preference of consumers and lack of demand from local households were observed as the major marketing constraints. At production and technological side, constraints faced by growers were high price of planting material, lack of large scale multiplication centres, high cost of plant protection chemicals and fertilizers, procedural formalities in availing institutional credit, high initial investment in infrastructure and lack of technical expertise.

5.1 Opportunities and challenges

Orchid cultivation in Kerala can be a highly profitable agribusiness enterprise, if proper marketing strategies are followed. High demand for orchid flowers in both international and domestic markets provides ample opportunities for growers engaged in orchid cultivation. In a state like Kerala, cultivation of cut flowers like orchids not only provide ample scope for self employment generation among educated youth and home makers, but also for the utilization of small land holdings in a more scientific way. Often higher returns is associated with value added products of orchid flowers like bouquets, arrangements, dry flower making etc. High demand for potted orchid plants in the households of Kerala could help in the growth of orchid nursery business in the state.

Cut flower marketing in Kerala is highly unorganized and under developed. Therefore marketing of flowers is more critical than production itself.

Scanty and scattered production, less number of flower traders and absence of primary market in the producing area has resulted in the deplorable state of marketing system in the state.

5.2 Policy options

In this back drop, it is suggested that orchid flower marketing system should be under the ambit of regulation and control. Efforts should be made to strengthen marketing. This requires establishment of primary market producing area, wholesale market in the cities, terminal markets for export and revitalization of nonfunctional producers association and growers in the state. These producer associations must be financially supported by the government, which could operate in the remote and far flung areas to expand flower cultivation and to safe guard the interests of growers.

Training programmes should be organized to keep the orchid growers well versed of the improved production and marketing techniques. Growers in the same locality must be convinced of the production of large number of few important varieties for the assurance of supply and market of flowers. A standardized grading system should be developed and growers must be given proper training on quality and grading norms so that they can maintain the plants accordingly to get better grade and can grade their flowers themselves.

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Appendix I

APPENDIX – I (a)

KERALA AGRICULTURAL UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS

COLLEGE OF AGRICULTURE, VELLAYANI

SCHEDULE

ECONOMIC ANALYSIS OF ORCHID FLOWER TRADE IN KERALA.

I.GENERAL INFORMATION

Name: Phone:

Address: Date:
Place: TVM / EKM

Family detail:

S. N	Age group (Years)	Number		Education	Occupation		Av. Annual Income		Hrs/day, spent in garden/ farm	Farming experience
		M	F		Main	Subsidiary	Main	Sub.		
1	<15									
2	15-25									
3	25-60									
4	>60									

II. INVENTORY OF RESOURCES: LAND

Sl.No.	Particulars	
1	Total area: Area owned; leased in; leased out Area under building	
2	Net cropped area	
3	Area under floriculture	
4	Area under orchids(Rooftop; field ;pots)	
5	Value of owned land	
6	Land revenue	
7	Rent on land	

III. ORCHID

Sl. No.	Major varieties	At present		Peak production month	Lean production month	Harvesting stage
		Flowering	Total			

- Cultivation type: Open field/ Open pot/ Shade field/ Shade pot
- Shade type: One-side/ Two-sides/ Four sides/ Fully covered shade structure
- Year of starting floriculture business:
- Attached labour Payment:
- Approximate time spend for orchid related works:
- Which varieties in your opinion are better for commercial cultivation?

IV. ESTABLISHMENT COSTS

- Land development:

Human labour:

Others:

Particulars	No.	Year of construction/ purchase	Value	Expected life	Annual operation & maintenance cost	Depreciation	Remarks
Building Shade net Irrigation structure Electricity Sprayer / tools / equipments Others							

- Planting material used

	Type* of Planting material	Stage	No.	variety	Cost	Sources **
1st year						
Recent years						

* Tissue culture plants /suckers/cuttings etc
**Sources: Private nursery/ Improved growers/ Govt. institutions/ Imported material/ Volunteer organizations/ Cut flower societies/ Others

- Pots and potting media

Component	Quantity	Rate	Cost	Source
Pots (……inch)				
Potting mixture 1. 2. 3.				
No. of pots that can be filled:				
Proportion of above ingredients used:				

V. COST OF CULTIVATION

a) Material cost

		1st year			2nd year			3rd year			4th year			5th year		
S. No.	Item	Rate	Quantity	Value	Rate	Quantity	Value	Rate	Quantity	Value	Rate	Quantity	Value	Rate	Quantity	Value
Pots																
Potting media	1. 2. 3.															
Organic manure	1. 2. 3.															
Fertilizers	1. 2. 3.															
Plant protection chemicals	1. 2. 3.															
Miscellaneous																

b) Labour cost

Wage rate: Men- Women- (FL - family labour; HL- hired labour										
	1st year		2nd year		3rd year		4th year		5th year	
Item	FL	HL	FL	HL	FL	HL	FL	HL	FL	HL
Application of manures and fertilizers										
Application of plant protection chemicals										
Weeding										
Potting mixture preparation & planting										
Harvesting and post harvesting										
Grading and packing										

VII. GRADING AND PRICES OF FLOWERS

Grade	characteristics	Prices at different customers				
		Exporters	Societies	Retailers	Brokers	Others

VIII. PRODUCTION STARTS AT THE AGE

From	Flowering	suckering	Life of the plant
TC plants			
Suckers (stage)			
Others			

IX. FLOWER PRODUCTION PATTERN OVER THE LIFE SPAN OF THE CROP

	1st year		2nd year		3rd year		4th year		5th year	
No . of flowers	No.	Price	No.	Price	No.	Price	No.	Price	No.	Price
No. of suckers										

X. SEASONAL VARIATION IN DEMAND FOR ANY SPECIFIC TYPE OF FLOWERS

Season	Maximum demand for type/size/colour		
	International market	Local market	Other domestic market

XI.SOURCES OF TECHNOLOGY AND INFORMATION

Information on	*Sources of information
Motivation to grow the crop	
Cultivation and other techniques	
Disease pest management	
Market & marketing	

* Possible sources : Krishi Bhavans, Exporters, Brokers, Local vendors, Funding agency, University, others

XII. SOURCES OF FINANCE

- Which are your sources of finance

Item	Own fund(Rs.)	Borrowed fund(Rs.)	Total amount

- Details regarding borrowed fund

Name of the agency	Purpose	Amount of loan	Rate of interest	Mode of repayment
Primary cooperative bank				
Commercial bank				
Other agencies				

- Have you got any financial assistance from the Govt. or other agencies
  Yes or No
- If the answer is Yes give the details of assistance or subsidy

Name of the agency	Purpose*	Amount

*Green house /poly house/ mist chamber and accessories/sprayer tools and accessories/plants/permanent structures

XIII.CONSTRAINTS

S. No.	Constraints	Priority
1	Production constraints 1. Less availability of quality planting materials 2. High price of planting materials 3. High incidence of pest and diseases 4. High cost of plant protection chemicals 5. Difficulty in identification of pest and diseases 6. Difficulty in availing institutional credit 7. Lack of large scale multiplication centres	
2	Marketing constraints 1. Lack of coordination among florists 2. Unhealthy competition among growers 3. High price of flowers 4. Frequent changes in taste and preference of consumers 5. Unorganized marketing channels 6. Inability of small growers to find market 7. Lack of demand from local households 8. Insufficient cold storage facility from production centres to consumers 9. Delay in payment of sale proceeds 10. High rate of damages in transit	
3	Technological constraints 1. Absence of practical training 2. High initial investment on infrastructure 3. No standardized practices to follow 4. Lack of research for developing new varieties 5. Lack of technical expertise	
4	others	

APPENDIX I – (b)

KERALA AGRICULTURAL UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS

COLLEGE OF AGRICULTURE, VELLAYANI

SCHEDULE FOR MARKETING INTERMEDIARIES

I .BASIC DETAILS

a) Type of intermediaries:

b) Name and Address :

c) Volume of transactions:

1) Orchid

peak average :
Lean average :

2) Others

II. OVERHEAD AND OPERATING EXPENSES

Sl. No.	Particulars	Rent	Original value	Remarks
1	Building			
2	Storage structures a) b)			
3	Furniture			
4	Equipments & machinery a) b)			

Expenditure Remarks

5. Lisence fee

6. Electricity

7. Communication charges

8. Travel

9. Cost of material
   a)
   b)
   c)

10. Other costs
   a)
   b)
   c)

11. Labour charges Owned Hired

	No.	Wages:	No.	Wages:
a) Permanent staff				
b) Casual labour				

12. Taxes paid

   a) Local cess

   b) Professional tax

   c) Sales tax

   d) Income tax

III. MARKET FINANCE

Source	period	Amount	Interest rate

IV. SALE PROCEEDS

a) From whom purchased

b) Quantity purchased/year

c) Average price paid/ variety Wholesale price: Retail price:

d) Loading and unloading charges

e) Mode of transport

f) Transporting charges

g) Packaging costs

h) Average loss in handling

i) Weighment charges

j) Deductions if any

k) Varietal preference of consumers

l) Value addition

m) Others if any

V. SALES

a) Average retention time

b) To whom sold

c) Mode of sales

d) Market fees

e) Price received/flower

VI. MARKETING PROBLEMS & SUGGESTIONS

APPENDIX II: Year- wise cost of cultivation of 1000 orchid plants (Rs)

	TVM	EKM	Average
Establishment cost			
Planting material cost	98473.26	103560.65	101016.95
Shade or artificial support	23725.77	32085.09	27905.43
Stand and trays	0.00	6770.12	3385.06
Resting shed	4991.90	0.00	2495.95
Pots	0.00	8606.52	4303.26
Media	2799.25	2326.31	2562.78
Tools and irrigation structure	2140.07	3479.06	2809.56
Labour	6215.56	3687.99	4951.77
Total	**138492.54**	**160515.74**	**149504.14**
Recurring costs (annual)			
1st yr. Labour cost	16512.16	18784.66	17648.41
Media	2799.25	2326.31	2562.784
Agro inputs	1852.58	1035.45	1444.017
Miscellaneous cost*	962.20	511.85	737.0275
Total	**22126.19**	**22658.28**	22392.23
2nd yr. Labour cost	16512.16	15244.97	15878.57
Media	2799.25	234.50	1516.88
Agro inputs	1852.58	1035.45	1444.02
Miscellaneous cost	996.40	525.60	761.00
Total	**22160.39**	**17040.53**	19600.46
3rd yr. Labour cost	16512.16	18784.66	17648.41
Media	2799.25	1124.34	1961.80
Agro inputs	1852.58	1035.45	1444.02
Miscellaneous cost	1014.56	541.28	777.92
Total	**22178.55**	**21485.73**	21832.14
4th year Labour cost	16512.16	15244.97	15878.57
Media	2799.25	234.50	1516.88
Agro inputs	1852.58	1035.45	1444.02
Miscellaneous cost	1030.43	556.90	793.67
Total	**22194.43**	**17071.83**	19633.13
5th yr. Labour cost	16512.16	18784.66	17648.41
Media	2799.25	1124.34	1961.80
Agro inputs	1852.58	1035.45	1444.02
Miscellaneous cost	1038.20	581.33	809.7641
Total	**22202.19**	**21525.78**	**21863.99**
Grand total	**249354.24**	**260297.89**	**254826.04**

(*Miscellaneous cost includes cost of bread tag, electricity charges, fuel charges and cost of maintenance)

APPENDIX III

GARRETT RANKING CONVERSION TABLE

The conversion of orders of merits into units of amount of "scores"

Percent	Score	Percent	Score	Percent	Score
0.09	99	22.32	65	83.31	31
0.20	98	23.88	64	84.56	30
0.32	97	25.48	63	85.75	29
0.45	96	27.15	62	86.89	28
0.61	95	28.86	61	87.96	27
0.78	94	30.61	60	88.97	26
0.97	93	32.42	59	89.94	25
1.18	92	34.25	58	90.83	24
1.42	91	36.15	57	91.67	23
1.68	90	38.06	56	92.45	22
1.96	89	40.01	55	93.19	21
2.28	88	41.97	54	93.86	20
2.69	87	43.97	53	94.49	19
3.01	86	45.97	52	95.08	18
3.43	85	47.98	51	95.62	17
3.89	84	50.00	50	96.11	16
4.38	83	52.02	49	96.57	15
4.92	82	54.03	48	96.99	14
5.51	81	56.03	47	97.37	13
6.14	80	58.03	46	97.72	12
6.81	79	59.99	45	98.04	11
7.55	78	61.94	44	98.32	10
8.33	77	63.85	43	98.58	9
9.17	76	65.75	42	98.82	8
10.06	75	67.48	41	99.03	7
11.03	74	69.39	40	99.22	6
12.04	73	71.14	39	99.39	5
13.11	72	72.85	38	99.55	4
14.25	71	74.52	37	99.68	3
15.44	70	76.12	36	99.80	2
16.69	69	77.68	35	99.91	1
18.01	68	79.17	34	100.00	0
19.39	67	80.61	33		
20.93	66	81.99	32		

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Abstract of the
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ABSTRACT

The research entitled "Economic analysis of orchid flower trade in Kerala" was conducted in Thiruvananthapuram (TVM) and Ernakulam (EKM) districts during the period from October, 2014 to March 2015. A sample of 10 elite growers having 5 years of experience, actively involved in commercial orchid production and 5 florists were selected randomly from each district. The study was carried out with the objective to understand the opportunities and challenges in orchid flower trade in Kerala and to assess the economic viability of orchid cultivation as an agri-business enterprise.

In this study, the socio-economic characteristics of the orchid growers were ascertained. Aranthera was observed as the most popular orchid among the growers in TVM district whereas Dendrobium was mostly cultivated in EKM district. Even though growers had developed their own practices for cultivation of orchids, innovations could not be observed. The costs and returns were analysed for a unit of 1000 orchid plants. Cost of cultivation using A B C cost concepts showed that cost A_1 (paid out costs) was Rs. 1,25,585 of which planting material accounted for 80.44 per cent, followed by hired labour (7.15 per cent). Considering all variable and fixed costs, cost C_3 came to Rs. 1,53,868. The total cost of establishment was worked out to Rs. 1,49,504. Cost of planting material alone contributed 67.57 per cent of the total cost of establishment followed by shade structure or artificial support (18.67 per cent). The average annual returns obtained from a unit of 1000 orchid plants was Rs. 1,06,789. Even though the cost of cultivation and establishment costs were higher, the returns was lower in Ernakulam district.

Capital productivity analysis revealed that orchid cultivation is a viable enterprise with B – C ratio of 1.64 and Net Present Worth of Rs. 1,37,898. Pay Back Period and Internal Rate of Return was obtained as 3.03 years and 55 per cent respectively. Orchid cultivation was found more remunerative in TVM compared to EKM. The resource use efficiency estimated using Cobb-Douglas production function revealed that the input planting material was underutilized and could be increased further to reach the optimum level.

Four marketing channels were identified, of which Producer (exporter) – Distant Wholesaler – Consumer channel was observed as the most prominent channel contributing to 51.13 per cent. Price spread was Rs. 6.3 per flower and producer's share was 74.8 per cent in this channel. Most efficient channel was Producer – Consumer with lowest price spread (Rs. 0.09), highest Shepherd's index (155.76) and highest producer's share (99.36 per cent). But only 5.44 per cent of total flowers produced were marketed through this channel. Ninety two per cent of total quantity of flowers produced were sold in domestic markets of Chennai, Bangalore, Mumbai, Delhi etc and the remaining were sold in local market. Flowers were sold by florists after value addition. Value added products like flower arrangements, bouquets and wreaths helped them in realizing highest net margin among intermediaries. However value addition was not observed among growers.

Orchid cultivation in Kerala can be a highly profitable agribusiness enterprise, if proper marketing strategies are followed. Opportunities are optimal for new entrepreneurs to start orchid cultivation since there is high demand for orchid flowers in the domestic market and high demand for potted flowering plants in the local market. Marketing is the major challenge faced by growers in cut flower orchid production, because of the small unit size and unorganized marketing. Therefore it is suggested that orchid flower marketing system should be under the ambit of regulation and control. This requires establishment of primary market producing area, wholesale market in the cities, terminal markets for export and revitalization of nonfunctional producers association in the state which must be financially supported by the government.