

**PRODUCTION AND MARKETING MANAGEMENT OF
ORCHIDS IN UTTAR KANNADA DISTRICT**

**Thesis submitted to the
University of Agricultural Sciences, Dharwad
in partial fulfilment of the requirements for the
Degree of**

MASTER OF BUSINESS ADMINISTRATION

IN

AGRIBUSINESS

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JUNE, 2012

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1. INTRODUCTION

India is blessed with a diverse agro-climatic conditions prevailing in the different regions of the country. A wide range of climatic and edaphic conditions in the Indian sub continent ensure that it is ideally suited to produce all most all the ornamental crops throughout the year. Cut flowers and ornamental plants play an important role in the floriculture industry. In many advanced countries, ornamentals are the major exportable crops. In our country, ornamental commodities will increase tremendously in the near future. Continuous efforts are being made in ornamental crop research during the last five decades which has generated awareness in the recent advances made by the Universities and Research Institutes in this direction.

Currently, floriculture is recognised as a lucrative profession. The demand for flowers in the world market is growing around 15 per cent each year. The floriculture industry in India comprises the florist trade, nursery plants, potted plants (including house plants), bulb and seed production, micro propagation (tissue culture raised plant) material and extraction of essential oils from flowers. The industry is worth about \$200 millions. Flowers like China aster, chrysanthemum, crossandra, gladiolus marigold, rose, jasmine and tuberose are used in religious and social events. These traditional flowers grown on large acreage of land, on a commercial scale for loose flower production. Modern cut flowers like rose, gladiolus, chrysanthemum, carnation, gerbera, anthurium, tuberose and orchids are basically used in floral arrangements. Area under cultivation of ornamental plants in India during 2011 is: Jasmine -6630 ha, rose -5498 ha, chrysanthemum -3752 ha, marigold -1404 ha, tuberose -912 ha, gladiolus -0289 ha, orchid -46 ha, gerbera -36 ha and carnation -16 ha. Credit for cultivation goes to the efforts of multi disciplinary group of scientists from several State Agricultural Universities (SAU's) and many other National Institutes.

The offering and exchange of flowers on all social occasions, in places of worship and their use for adornment of hair by women and for home decoration have become an integral part of human living. With changing life styles and increased urban affluences, floriculture has assumed a definite commercial status in recent times during the past 2-3 decades particularly. Appreciation of potential of commercial floriculture has resulted in the blossoming of this field into a viable agri-business option. Availability of natural resources like diverse agro- climatic conditions helped in production of wide a range of temperate and tropical flowers, almost all through the year in one part of the country or other. Improved communication facilities have increased their availability in every part of the country. The commercial activity of production and marketing of floriculture products is also a source of gainful employment to crores of people.

Global scenario

The world cut flower industry is a highly dynamic industry. Product varieties, the origin of the production, production techniques, markets and retailing arrangements are all undergoing continuous changes, challenging the adaptive capacity of the factors involved. In a slowly, but steadily growing world market, new developing country exporters are gaining market share at the expenses of existing producers. These producers try to stay ahead by raising productivity and through diversification and innovation. The world cut flower trade is characterised by a high degree of concentration by product and sources. Roses are the main traded product; Germany is the main market for imports, and the Netherlands the world's leading exporter of flowers. The world orchid trade is estimated to be nearly US \$ 44 billion with an annual growth rate of 10 – 20 per cent.

The evolution of orchid culture from hobbyist to commercial grower is very slow as most of the orchids collected from different regions do not adapt to local conditions, hence died. The methods of propagation are not known and most of the orchids which flower under utmost care are found to be self sterile. Further, it is difficult to germinate the seeds, which lacks any functional endosperm. The seeds sown in the nursery beds require long period of germination and any disturbance to the soil or physical environment destroyed the whole population.

It was only in 1921 when Conard Loddiges and Sons started growing orchid's plants commercially at their nursery Hackney, followed by John Daminy of M/s Veitch and Sons who produced the first orchid hybrid between two *Calanthe* species in 1852, which flowered in 1856 in Veitch Nursery Exeter, England. This was followed by a large number of man made hybrids produced by hobbyists and small growers. In 1913, Sun Kee Nursery, Singapore, started the first cut-flower production of *Arachnis* type hybrids.

Orchids belong to the family Orchidaceae. The family Orchidaceae contains the largest number of species than any other family of flowering plants, with possibly as many as 25,000 species. Orchids have been occupying a pride place in horticulture and floriculture not only for their aesthetic value but also for their therapeutic value right from the Vedic Age. Proportionately orchids take eight percent of the total flower market in the world with Thailand contributing almost 85 percent of total orchid trade. Sri Lanka and Malaysia are the other major contributors. *Cymbidium* has the highest demand, followed by *Dendrobium*, *Phalaenopsis*, *Oncidium*, *Vanda* and *Mokara*. Though, India is blessed with all varied climatic conditions of the world, it has not made any head way in cut flower production for both the international and national markets.

The major developments in cultivation of orchids in the world have been due to modern scientific technology which has been suitably used in case of orchid seed germination and meristem culture. Today orchids are grown on assembly- line method in extensive glasshouses with controlled environment and the sale of orchid flowers runs in millions of dollars. The modern methods of propagation have brought orchid cultivation on par with other commercial crop.

Indian scenario

Flower industry is emerging as a blooming business not only in India but in other countries as well. Flower industry/floriculture denotes cultivation of flowers, developing new varieties of commercial value, sale as raw commodities, processing, distribution etc, for the local and international markets.

After liberalization, the Government of India identified floriculture as a sunrise industry and accorded it 100 per cent export oriented status. In the flower industry, cut flowers have assumed prominent place in respect of consumer use. From amongst wide range of flowers, only certain type of flowers are grown as cut flowers because of their special features. Cut flowers are mainly used for decoration and preparing bouquets.

India is a minor player in the global floriculture trade. India's foreign exchange earnings from cut flowers is ₹ 30 crores, accounting for less than one percent of the world trade. With the industry beginning to blossom, it is estimated that the country has the potential to capture 10 to 15 per cent of the world trade.

In India, flowers are grown in an area of 1.91 lakh hectares (National Horticulture Board Annual report 2010-11), out of which 45,000 hectares is under modern cut flowers such as rose, chrysanthemum, gladiolus, carnation, tuberose and orchids. Cultivation of traditional flowers such as jasmine, marigold, champaka and crossandra still dominate the floricultural scenario in our country. India's market for floricultural products is focused mainly at the USA, European Union and West Asian countries. Among different floricultural products, cut flowers dominated with a share of about 65 per cent of the total exports.

The domestic floriculture industry has been witnessing an unprecedented growth during the past few years and also has been getting increased acceptability in world markets. Currently, the floriculture business in India is valued at an alarming US\$ 50 billion. The floriculture industry has been growing at an annual rate of 17 per cent, which has also seen a number of corporate houses entering the fray during the past three to five years. Higher standards of living and the growing desire to live in an environment- friendly atmosphere have led to a boom in the domestic market as well.

Growing of orchids commercially in India was not organised and in the hands of hobbyist and few dealers who mainly depended on wild collections from forest to meet a large part of their foreign and local demands. Due to this some of the orchid growing areas are now without any orchid. This necessitates the commercial cultivation of both native and exotic species to meet the demand and also to conserve the country's orchid wealth.

Prospects of an increasing consumer demand and buoyant world market have promoted the status of orchid growing to an industry in our country in the past two decades. India has a great potential of becoming a major exporter of orchids at global level. Its main strength lies in its rich genetic resources, varied climatic zones, availability of trained manpower in the field of floriculture, lesser cost of production in comparison with the other major orchid growing countries. However, till date, India has failed to make any impact in this sector. Orchid trade is still in infancy due to the lack of knowledge on the varieties suitable for commercial production and export. Moreover, research work on the evaluation of commercial hybrids and varieties for suitability to our condition is very limited in our country.

In India the area under commercial cultivation of orchid's particularly tropical orchids like *Dendrobium* etc. is limited to the Southern states and Maharashtra, whereas temperate orchids like *Cymbidium* are grown in North-Eastern states. Most of the produce is sold internally with meagre export.

Karnataka is the leader in floriculture, accounting for 75% of India's total flower production. The state has the highest area under modern cut flowers, and 40 flower growing and exporting units. The expert committee set up by Govt. of India for promotion of export oriented floriculture units has identified Bangalore, Pune, New Delhi and Hyderabad as the major areas suitable for such activity especially for cut flowers. APEDA (Agricultural and Processed Food Products Export Development Authority) is the registering authority for such units.

Karnataka is the leader in floriculture, accounting for 75% of India's total flower production. The state has the highest area under modern cut flowers, and 40 flower growing and exporting units. The country's first and only flower auction centre is located in Karnataka.

In Karnataka, there are 18,000 hectares under floriculture cultivation. Karnataka is into floriculture for over 300 years. The Tigala community near Devanahalli, Chickaballapur and VSL Agro Tech are extremely good at growing flowers. The area under orchids (*Dendrobium*) in Karnataka is 3000 square meters with the production potential of 2.6 lakh spikes per annum.

Orchids are most fascinating and beautiful of all flowers. They exhibit a wide range of diversity in form, size, colour and texture of flowers beyond the imagination of human mind. This manifold and perplexing range of floral structures arouse our highest admiration. Orchids constitute an order of royalty in the world of ornamental plants and they are of immense horticulture importance and play a very useful role to balance the forest ecosystem.

Orchids have emerged as an important constituent in the global cut flower trade. *Cymbidium*, *Dendrobiums*, *Phaphilopedilums*, *Phalaenopsis*, *Vandas*, *Cattleyas*, and *Orchidiums* are the types especially used for cut flower production. Over all, orchids have gained immense popularity in both domestic and international market as they possess long vase life and have inherent therapeutic value. India accounts for nearly 7 per cent of world's genetic diversity contributing 1300 species of orchids. The distribution pattern of orchids in India shows that they are mostly inhabited in Western Ghats and Andaman and Nicobar group of Islands.

They are most pampered of the plants occupy top position among all the flowering plants valued for cut flower production and potted plants. They are known for their long lasting and bewitchingly beautiful flowers which fetch a very high price in the international market.

Need for the study

Cultivation of orchids has become a very profitable occupation as it is one of the most important ornamental plants. Development of new hybrids and commercial production of cut flowers in orchids has expanded tremendously. Presently, orchids are grown as subsidiary crop in major producing areas. So there is vast market potential in the domestic and export market which is yet to be tapped. There is tremendous scope for orchid improvement and development of industry based on these wonderful plants. The findings of the study would be helpful to policy makers and researchers for applying to similar conditions that prevails. This would throw further light on the avenue for future research in the area of floriculture in general and orchids in particular.

Due to the diversity of environmental condition in India, it is possible to grow all types of orchids in suitable places in open conditions without creation of any artificial environment. The present study has been designed to undertake the problems on orchid cultivation, production and marketing system with special emphasis to generate information concerned to the orchid production and its marketing management and to estimate the cost, returns and net profit in cultivation of orchids in the district. The analysis of marketing efficiency would be useful indicator to select the most profitable marketing channel which is one of the prime ingredients in making marketing decision.

Uttar Kannada district is purposively selected as it is one of the major orchid growing region.

Realizing the importance of orchid production and marketing management the present study is focused on the following specific objectives.

- 1) To document the different orchids produced in Uttar Kannada district.
- 2) To analyze the investment pattern in orchid production in Uttar Kannada district.
- 3) To estimate the cost and returns in production of different orchids.
- 4) To analyze marketing management in orchid production.
- 5) To study the problems faced in the production and marketing of orchid.

Hypotheses

- 1) Investment in orchid production is financially feasible.
- 2) The returns from orchid's production increases over a time period.
- 3) Orchid growers face the problem of marketing.

Presentation of the study

The study has been presented in six chapters as indicated below:

Chapter-I deals with the nature and importance of the present study and also the specific objectives of the study have been clearly indicated.

Chapter II describes comprehensively a review of the relevant research work done in the past related to the present study.

Chapter III outlines the features of the study area, population taken for the study, collection of relevant data and analytical tools used in the study.

Chapter IV is devoted to present the main findings of the study through Table's graphs etc.

Chapter V In this chapter, discussion of the results of the study are presented.

Chapter VI provides summary of the whole study and also suggest the policy implications based on findings of the study. At the end important references have been listed related to the present study.

2. REVIEW OF LITERATURE

This chapter deals with a brief review of the research work done in the past and are presented under the following headings based on the objectives of the study.

- 2.1 Documentation
- 2.2 Investment pattern in perennial crops
- 2.3 Costs and returns structure
- 2.4 Marketing management of flowers
- 2.5 Problems in production and marketing

2.1 Documentation

Perez *et al.* (1995) studied the short-term impacts of irrigation management transfer in the Hakra 4R Distributary canal in Pakistan's Southern Punjab. This technical report looked into the printing, issuing and use of the official documentation for the transport of forest products and the importance of the adequate handling of these documents for the operational process of forestry in Michoacan, Mexico. To this end, sites authorized for the exploitation of resin and wood were inspected, and visits were made to industrial plant and to the offices of the SARH and the Unidad de Conservacion and Desarrollo Forestal which issue documentation for the transport of forest products. Moreover, a survey was carried out with the owners of exploitation sites, industrial plants and contractors. The problems related with each of the stages of the process of documentation were defined, and how these problems coincide to the detriment of forest resources were indicated. Some alternative solutions were suggested for each particular case, all with the objective of reducing the possibility of 'legalizing' shipments of wood and resin from clandestine operations.

Mitra (2000) studied the lack of control in documentation for transport of forest products: Mexico. Joint Forest Management (JFM) in a real sense began in Maharashtra (India) in 1996-97. Financial assistance was provided by the state government in a phased manner for its various components. The micro-plans were prepared in consultation with the villagers. The progress was monitored at circle and state levels. Process documentation was being carried out as it was likely to motivate the people. Finally he noticed benefits in the quality of forest management, moisture regime and better quality of grasses, and some employment to the villagers.

Rukmini (2001) studied improving organ donation in Central Saudi Arabia. This chapter examined the experiences of Seva Mandir, a voluntary organization working in rural development in Rajasthan, India, in the context of social learning theory. She identified six avenues for organizational learning and adaptation: feedback from field-level workers; process documentation; research studies; training programmes; internal conflict and debate; and interactions with the government. Then examined cases of each learning mode to illustrate the processes that led to crucial modifications in organizational perceptions, structure and strategy. Seva Mandir's experience suggested that some redundancies and apparent inefficiencies in organizational structure and function could actually enhance learning opportunities and, ultimately, the effectiveness of development interventions.

Bodmer (2004) wrote paper on Ethnopharm acological studies of antimicrobial remedies in the South of Brazil. This paper dealt with the usage of imitated and falsified drugs for animal treatment, which might cause risks for consumers as well as monetary and confidential losses for the producers of branded drugs. First, the current process of medical treatment and documentation of these treatments were described. Problems that might arise within this process were shown. A proposal was then developed on how the current process of documentation of the medical treatment of animals that were meant for human consumption could be improved. This proposal was used to develop an adequate ER-model designed to cover the needs of plausibility checks.

Souza *et al.* (2004) studied facilitating process for community-based tourism management: Mong Community Houy Namrin Village and Chiang Daow Village, Chiang Mai Province.

The study reported the antimicrobial evaluation of the species most commonly used in Rio Grande do Sul (RS), the Southernmost state of Brazil, for treating conditions likely to be associated with microorganisms. A four-stage process of documentation and evaluation was conducted: (a) review of RS ethnobotanical studies; (b) analysis of traditional uses; (c) literature survey on phytochemical and pharmacological data; (d) microbiological screening of selected plants. From the 149 species initially identified, 49 were cited as being used for microbial associated conditions in at least two other regions in RS, and 18 were further selected for screening. The crude methanol extract of these 18 plants were evaluated against seven microorganisms using the diffusion agar test. Extracts from *Chaptalia nutans*, *Cordia monosperma*, *Echinodorus grandiflorus*, *Eugenia uniflora*, *Leonurus sibiricus*, *Luehea divaricata*, *Malva sylvestris*, *Ocotea odorifera*, *Parapiptadenia rigida*, *Pluchea sagittalis*, *Psidium cattleianum* and *Senna neglecta* were active against at least one microorganism. Although preliminary, these results were useful for rationalizing the use of medicinal plants in established systems of traditional medicine in primary health care.

2.2 Investment pattern

Patil and Pramod Kumar (1983) studied the economic viability of investments in alphonso mango plantations in Ratnagiri district of Maharashtra considering 72 orchards from six villages. The study revealed that the capital investment in alphonso mango plantations was an economically viable proposition. The Benefit Cost Ratio (BCR) was 1.38, NPV was (₹ 21.78 /ha) the Internal Rate of Return (IRR) was higher than interest rate of bank (18%) and Pay Back Period (PBP) was 10 years.

Rameshkumar (1989) evaluated the "Investment in jasmine gardens in Madurai district" using discounted cash flow measures. The economic life of the jasmine was assumed to be 12 years. The Net Present Worth (NPW) was found to be ₹ 13,195 per ha at a discount rate of 15 per cent. The Benefit Cost Ratio (BCR) was 1.6 and the Internal Rate of Return (IRR) was found to be more than 50 per cent.

Neeraja Devi (1990) evaluated the "investment pattern in jasmine gardens in Bangalore district" using discounted cash flow measures. The average expected productive economic life of the jasmine orchard was assumed to be 15 years. The Net Present Worth (NPW) was found to be ₹ 1, 05,198 per acre at a discount rate of 15 per cent. The Benefit Cost Ratio (BCR) was 2.3 and the Internal Rate of Return (IRR) was found to be more than 50 per cent.

Raikar (1990) in his findings of the study indicated that per ha. NPV was found to be ₹ 28,440.58 in the case of small orchard, ₹ 16,780.84 in the large orchard and ₹ 21,034.59 in average orchard. The Benefit Cost Ratio (BCR) at 12 per cent discount rate was 2.87 in small orchard, 12.25 in large orchard and 2.49 in an average orchard. The Pay Back Period (PBP) was 8.90 years, 9.38 years and 9.18 years in small, large and over all orchards, respectively. The Internal Rate of Return (IRR) was found to be 20.22, 17.88 and 18.88 per cent in small, large and average orchard respectively.

Azad and Sikka (1991) in their study on production and marketing of temperate fruits applied project evaluation measures to study the economic viability of fruits such as apples, peaches, plums and apricots. The Net Present Value (NPV) was ₹ 26,257 for apples, ₹ 89,222 for peaches, ₹ 1, 17,837 for plums and ₹ 1, 60,541 for apricots per acre. The Internal Rate of Return (IRR) was 22.33 and 47 per cent respectively. The Benefit Cost Ratios (BCR) was 1.36, 3.87, 4.62 and 5.10 respectively.

Hugar *et al.* (1991) examined the economic potentiality and viability of guava cultivation under scientific management. The study revealed that the Net Present Worth (NPW) was ₹ 7, 38,042 per hectare. The Benefit Cost Ratio (BCR), Internal Rate of Return (IRR) and Pay Back Period (PBP) were found to be 3.88, 57.82 per cent and six years respectively.

Koujalagi and Kunnal (1992) evaluated financial feasibility of investment in pomegranate orchard in Bijapur district of Karnataka. The study showed that the per acre Net Present Value (NPV) for the entire life period of the project was found to be ₹ 8,283.81. The discounted Benefit Cost Ratio (BCR) (at 12 per cent discount rate) was 1.53. The Pay Back Period (PBP) was 6.56 years and Internal Rate of Return (IRR) was 15.55 per cent.

Ravindrakumar (1996) studied the cost of production of gladiolus in Karnataka. He estimated the total cost of cultivation of gladiolus per ha to be ₹ 2, 84,356.78. The total marketing cost incurred by the farmers was ₹ 31.83 per 1000 spikes of gladiolus. The major component of marketing cost was appropriated by transportation cost. The net return realized per ha of gladiolus was ₹ 1, 40,544.70.

Bhattacharya (1997) made a detailed study on floriculture industry in India and found that the profit margin varied between 25 to 30 per cent of the cost of production. Roses were sold at the local markets at ₹ 70-100 per kg. A basket of roses were priced at ₹ 150. He opined that floriculture industry was both labour and capital intensive with an investment of ₹ 2.50 crores per ha. It was found that more the land used better was the economy of scale. The investment on plant materials alone accounted about 25 per cent of the total establishment cost and low cost greenhouse would cost ₹ 70,000, 50 per cent of which would be reimbursed on subsidy. He also worked out the typical breakup of the cost of production under greenhouse environment. Labour cost and depreciation were found to be major components accounting 24.5 per cent and 22.7 per cent respectively of total cost of production.

Chengappa *et al.* (1998) compared the net returns across flowers such as rose, chrysanthemum, aster, gladiolus, tuberose in and around Bangalore. The study indicated that the net returns was maximum in rose (₹ 79,671.56) followed by tuberose (₹ 57,666.25) and gladiolus (₹ 61,097.09). In terms of returns per rupee of investment it was observed that tuberose yielded the maximum input output ratio at 1:3.28 followed by gladiolus (1:2.98), chrysanthemum (1:2.92) and aster (1:2.04).

Pawan and Goyal (1998) studied the cost of establishing the rose gardens in Sonpet district of Haryana state. The total cost of establishing the garden worked out to be ₹ 27,356 per ha. The breakup of the total establishment cost revealed that among the various components of establishment cost, the cost of seedlings of rose formed the single largest cost item accounting for 63.97 per cent of the total establishment cost i.e., ₹ 17,500 per ha. Manures and fertilizers, transplanting and preparatory tillage were the other major components of establishment cost accounting for 10 percent, 43 percent, 5.63 percent and 4.26 per cent of the total establishment cost respectively. The average annual net returns were ₹ 44,457.

Gajanana and Subramanyam (1999) found out the cost of establishment of 1000 anthuriums consisting of shade house, pots, seedlings, material and labour inputs to be ₹ 1.27 lakhs in Karnataka and ₹ 1.39 lakhs in Kerala. The cost of seedlings was the major component of establishment cost in both the states. Cost of cultivation including the amortised establishment cost accounted to be ₹ 49,000 in Karnataka and ₹ 55,000 in Kerala. The cost of producing one anthurium stem would be ₹ 8 to ₹ 10 in Karnataka and ₹ 9 to ₹ 12 in Kerala. The average price received by the producer ranged from ₹ 7.5 to ₹ 11 per stem in Karnataka and ₹ 8 to ₹ 13 per stem in Kerala depending upon whether the flower was sold in the local or distant market. Though the cost of cultivation was less in Karnataka, the net returns were also lower at ₹ 1.15 and ₹ 1.36 per stem in Karnataka as against ₹ 1.35 and ₹ 1.46 per stem in Kerala which was attributed mainly to higher price realized by Kerala farmers who sold their flowers in distant markets like Mumbai and Kolkatta.

Shivprasad (2002) conducted an experiment on anthurium cultivation in Madikeri taluk of Coorg district. He analysed a total recurring expenses of ₹ 3,88,060 during the first year. The total planting area was 5148 sq.m. The flowers produced per plant was eight, in all flowers produced was ₹ 2, 59,200. Ninety per cent of the total flowers produced were sold at a sale price of ₹ 10 per flower. The total income realized per year was ₹ 23, 32,800.

Sundaravardarajan and Ramanathan (2003) reported that B: C Ratio and IRR for new cashew plantations were 1.42 and 34.36 per cent, while for old cashew plantations it was 1.06 and 17.17 per cent respectively. Further, they suggested that need to create an awareness to adopt improved varieties (HYV), which not only reduce the cost of cultivation but also to increase the net income among the different size group of farmers.

Anand and Shivakumar (2005) conducted study on economic analysis of production and marketing of papaya in North Karnataka. The capital productivity measures indicated that the investment on papaya garden in the region was profitable proposition. The Benefit Cost Ratio (BCR) was 3.51.

The positive Net Present Value (NPV) indicated the soundness of investment made in the papaya cultivation. The Internal Rate of Return (IRR) also indicated favourable nature of return.

2.3 Costs and Returns structure

Pappiah and Balkrishna (1989), recorded a net income of ₹42,885 from the cultivation of red rose in Bangalore with a gross output value at ₹ 60,000 over the total input cost of ₹1, 71,115. The input-output ratio was calculated as 1:2.5.

Nagarajan (1992) conducted study on cost of cultivation of soundarya kanakamberam at Olakkur village in Trivendram taluk (Madras). The results revealed that, it provided a net income of ₹1, 59,485 per acre with a gross output value of ₹ 2, 40,000.00 on total input costs of ₹ 80,575.

Hiremath (1993) in his study on economics of production and marketing of lime in Bijapur district, Karnataka revealed that the per ha cost of establishment for the four year gestation period was ₹ 56,424.58 in small, ₹ 49,179.62 in medium and ₹ 47,143.09 in large orchards. The intercrops reduced the establishment cost by 58.82, 53.90 and 46.68 per cent in three size group of orchards, respectively. The per hectare cost of cultivation (8th to 30th year) was high in medium (₹ 12,454.34) followed by large (₹ 1,203.76) and (₹11,399.60) small orchards. The average yield of lime was 340.59, 366.98 and 378.96 bags in small, medium and large orchards, respectively.

Chengappa *et al.* (1998) compared the net returns across flowers such as rose, chrysanthemum, aster, gladiolus and tuberose in and around Bangalore. The study indicated that the net returns was maximum in rose (₹ 79, 67,156) followed by tuberose (₹ 57,666.25) and gladiolus (₹ 61,097.09). In terms of returns per rupee of investment, it was observed that tuberose yielded the maximum input output ratio at 1:3.28 followed by gladiolus (1:2.98), chrysanthemum (1:2.92) and aster (1:2.04).

Gajanana and Subramanyam (1999) found component of establishment out of the total cost of establishment of 1000 anthuriums consisting of shade house, pots, seedlings, material and labour inputs to be ₹1.27 lakhs in Karnataka and ₹ 1.39 lakhs in Kerala. The cost of seedling was the major component of establishment cost in both the states. Cost of cultivation including the amortised establishment cost would be ₹49,000 in Karnataka and ₹ 55, 000 in Kerala. The cost of producing one anthurium stem would be ₹ 8- ₹ 10 in Karnataka and ₹ 9- ₹ 12 in Kerala. The average price received by the producer ranged from ₹ 7.5 to ₹11 per stem in Karnataka and ₹ 8 to ₹ 13 per stem in Kerala depending upon whether the flower was sold in the local or distant market. Though the cost of cultivation was less in Karnataka, the net returns were also lower at ₹.1.15 and ₹ 1.36 per stem in Karnataka as against ₹ 1.35 and ₹1.467 per stem.

Shivaprasad (2002) conducted an experiment on anthurium cultivation in Madikeri taluk of Coorg district. He analysed a total recurring expenses of ₹ 3, 88,060 during the first year. The total planting was 5148 sq.m. The flowers produced per plant was eight, flowers produced per square meter was 50 per cent and the total flowers produced was ₹ 2, 59,200. Ninety per cent of the total flowers produced were sold at a sale price of ₹.10 per flower. The total income analysed per year was ₹ 23, 32,800.

Sundaravardarajan and Ramanathan (2003) estimated the establishment cost of cashew plantation for the first year at ₹ 7690, ₹ 8664 and at ₹ 9491 for marginal, small and large farmers, respectively. The maintenance cost of cashew plantations in the case of marginal farms were ₹ 4059, ₹ 4410, ₹ 4, 910, ₹ 5385, ₹ 841, ₹ 6332 ₹ 6771 and ₹ 6990 for second, third, fourth, fifth, sixth, seventh, eighth, ninth year respectively and in case of large farms the maintenance cost were ₹ 5040, ₹ 5250, ₹ 5764, ₹ 6145, ₹ 6558, ₹ 7021, ₹7438, and ₹7745 for second, third, fourth, fifth, sixth, seventh, eighth and ninth year respectively. The input output ratio per ha were 1.43, 1.55 and 1.83 for respective farms.

Umesh *et al.* (2005) observed that the establishment cost of cashew was ₹ 15631 per ha in all the varieties studied during the first three years.

The maintenance cost per ha from fourth year onwards varied from ₹ 5881 to ₹ 8254 in Chintamani –1, ₹ 5640 to ₹ 8254 in Ullal–4, ₹ 5812 to ₹ 7882 in Ullal- 3 and ₹ 5821 to ₹ 7229 in ullal at the net returns of cashew orchard per ha being fairly high were in the order of ₹ 61314, ₹ 62425, ₹ 49672 and ₹ 34231 in Chintamani–1 Ullal –4, Ullal-3 and Ullal- 1.

Rane and Bagade (2006) studied economics of production and marketing of banana in Sindhudurg district of Maharashtra. The study revealed that the per hectare cost at cost C in Dodamarg and Sawantadi tahsil were ₹ 1.52 lakhs and ₹ 1.53 lakhs respectively. In Dodamarg tahsil banana was grown as a sole crop where per hectare cost of cultivation was ₹ 1.28 lakh and in Sawantadi tahsil the per hectare cost was ₹ 1.15 lakh. The Benefit Cost Ratio (BCR) in Dodamarg tahsil and Sawantadi tahsil were 2.20 and 2.33 respectively. The average Benefit Cost Ratio (BCR) of banana cultivation was 2.27.

Leumann *et al.* (2007) conducted a study on 100 wine grape growers across Switzerland in 2005 and compared with the cost of production data from 2000. There was low production cost due to improved labour use and generation change with new younger growers taking over, well-mechanised systems. Other major changes were decreased interest rates and financing costs, longer standard depreciation assuming a 23-year yield phase, increased labour costs (up 10%) and decreased hand labour (-5%). And further it was concluded that major further savings were limited, because of production costs were only 30% of the final bottled wine, and the competitiveness was also linked to other measures.

Anil Kumar (2007) studied the economics of production and marketing of ginger in Nainital district of Uttarakhand. He worked out the cost and returns from ginger cultivation. Out of 68 villages in the block, six villages were selected on the basis of highest acreage under ginger. A random sample of 36 cultivators was drawn from the selected villages. The study revealed that the cost of cultivation of ginger was ₹ 84,849.06 per hectare. The cost A1, which included all actual expenses incurred by the farmer, was worked out to be ₹ 40994.93 per hectare, other costs, viz, cost B2, cost C1, cost C2 and cost C3 worked out to be ₹ 40994.93, ₹ 69635.52, ₹ 77135.51 and ₹ 84849.06 respectively. The net returns over cost A1 were estimated to be ₹ 88637.64 per hectare and ₹ 1017.42 per quintal on sample farms.

Annesh (2007) studied on production and marketing of under-utilized millets in Karnataka –an economic analysis. He worked out the cost and returns and resource use efficiency in under-utilized millets. Multi-stage sampling technique was employed in the selection of farmers for the study based on the production of little millets and foxtail millet in the state during *kharif* season. Dharwad and Haveri districts were selected. The per hectare total cost of cultivation of savi worked out to be ₹ 7236.92, while the per quintal cost of production worked out to be ₹ 603.08. Gross return realized from one hectare of *rabi* grown by the sample farmers was ₹ 8442.96.

Hatai and Baig (2007) studied the economics of production and marketing strategies of potato in Orissa. Stratified random sampling techniques were employed to select the sample. Total ninety potato growers were selected. On the basis of different cost concept the cost of cultivation had been estimated. The net returns over different cost concepts had been estimated. The study revealed that scope for further increase in the human labour for potato cultivation.

Naphade and Tingre (2008) studied the economics of production and marketing of guava in Buldhana district of Maharashtra. The study was based on primary data of sixty farmers collected from five tahsils of Buldhana district. The selected guava growers were classified into three groups on the basis of age of guava orchards. Simple tabular analysis and standard cost concepts were used to work out the cost of establishment and cost of cultivation of guava per hectare was ₹ 34, 333 and ₹ 22,522 respectively. It was found that profit was increasing with the age of orchards.

Awdesh *et al.* (2009) studied the economics of production of soybean in block Sonkutch of district Dewas of Madhya Pradesh. Income obtained from soybean cultivation per hectare showed the increasing trend with the increasing in size of farms. The average yield of soyabean was 16.87 quintal per hectare. The average cost of production per quintal was ₹ 851.39 and the average value of output was ₹ 21751.00 per hectare.

2.4 Marketing management of flowers

Varadarajan (1982) studied the seasonal variations in prices of jasmine flowers in Coimbatore city. His study concluded that the seasonal variation in prices went with very elastic demand and relatively inelastic supply and created risk of loss through price fluctuations to the traders. This was very high for the retailers who had little protection in the market system.

Mitra *et al.* (1989) reported the seasonal price variation of tuberose cut flowers per kg and sticks per hundred in Noida district of West Bengal. The price of cut flowers and sticks remained highest during the winter quarter (October-December) of the year at ₹ 9.33 and ₹11.00 for the cut flowers and flower sticks, respectively, while it remained low during the rainy or pre-winter quarter (July-September) of the year at ₹ 3.33 and ₹ 7.00. The upward movement of prices during the winter season was due to high demand in the market owing to marriages and festivals. Another reason for higher prices in winter could be due to low production of these flowers during winter because of their photosensitive nature.

Borude and Talathi (1991) studied the seasonal variation in demand and supply of flowers in the Mumbai market. They stated that the flowers had continuous demand due to their social and religious value. The supply of these flowers increased during August to November in response to higher market prices owing to Ganeshotsava, Navaratri and Diwali. Besides, there was more demand for flowers during December due to Christmas and during March to June due to marriage ceremonies.

Gummagolmath (1994) studied the marketing margins and price spread in the marketing of mango in Dharwad district. The results revealed that producer's share in consumer's rupee was 65.70 per cent in Channel-I (Producer –Commission Agent - Retailer - Consumer) and it was 58.40 per cent in Channel – II (Producer Pre-harvest contractor cum Wholesaler-Retailer - Consumer).

Vedini and Gracy (1995) analyzed the marketing cost for jasmine flowers in the Mysore city for the year 1992-93 and has observed to be more than 15 per cent of the value of the flowers sold by the farmers under this marketing channel. Further they studied the performance of marketing channel which was identified as

Producer – Trader/Commission Agent – Retailers - Consumers

They found that producer's net share was as low as 45 per cent. The Trader-cum-Commission Agent and Retailer cost and margin were 6.02 and 45.78 per cent respectively. All the farmers opined that non-availability of adequate financial help for cultivating the crop was a major production problem. About 85 per cent of the farmers felt that commission charges were high.

Rajeevan and Satheesbabu (1997) analyzed the performance of bush jasmine cultivation which offered promising opportunities under small holdings situation and where land considered as the most limiting production factor. The study inferred that the small and marginal farmers could undertake its cultivation and marketing as a supplementary enterprise, in order to utilizing under employed/unemployed family labour, especially women labour. It stated that bush jasmine cultivation was more feasible because of the initial capital investment required at the initial stage was low.

Chand *et al.* (1999) made a case study on marketing management of ice-cream in Bangalore. The dairy had a long product-line and product mix. Vanilla flavour accounted for the highest share of the total ice cream manufactured. The dairy followed skimming (targeting relatively prosperous consumers with regard to 'luxury' ice cream products) strategies in pricing of ice cream. The marketing network was found to be satisfactory. Press advertisements remained the major advertising media for the dairy, although TV advertising had been commenced on small scale.

Arun Pandit *et al.* (2003) studied the potato marketing in India. The study revealed that the Indian marketing system suffered from high marketing cost, high middleman's margin, low producers share and inadequate marketing infrastructure, their solutions were grading should be followed rigorously, marketing cost could be reduced by establishing cold stores in producing areas. Regulation of potato market could be done by establishment of more processing units.

Khirsagar *et al.* (2003) studied the marketing of mango in Konkan coastal region. The study revealed that the marketing channel that existed for Vashi market is *viz.*, Producer – Vashi market Wholesaler – Mumbai Retailer – Consumer. Most of the farmers followed this channel. Among the marketing cost, wholesaler's commission was the highest with ₹ 51.36 followed by cost of packing, transport cost and labour charges and overall level per crate marketing cost was ₹ 142.69.

Nagarajan (2006) in his article the fragrant Madurai gundumalli endorsed on the amount of labour invested in the cultivation of this flower crop for this hard working to realize better market price the farmers in the study area had left the farm with produce early in the marketing in order to realize premium price considering the problems and dangers associated with the jasmine flower harvesting during early morning time. The then suggested evolving the suitable mechanism to minimize the hard ship experienced by the women labour in particular.

Vidhya (2006) studied “potential of cut-flower production in India, the result revealed that, India travelled a long floriculture history and flower growing was an age old enterprise however, what lacked was its commercialization to forth coming challenges and to meet out the growing demands of flowers in the domestic as well as the export market. The study suggested to make concerted effort on the part of the government as well as the private entrepreneurs to develop floriculture on scientific lines. To achieve this greater emphasis need to be laid on the development of suitable practices to ensure quality input supply and better remunerative management to create entrepreneur friendly environment.

Vidhya (2006) in her study on “potential of cut flower production in India” revealed that the production constraints requirements of scientific and commercial floriculture had been not properly understood by the growers hence, suggested to pay an attention to obtain all information relating to the flower marketing and infrastructure facilities provided by agencies, for effective management of constraints experienced during production process.

Naphade and Tingre (2008) studied the economics of production and marketing of guava in Buldhana district of Maharashtra. They studied one of the objective as price spread and marketing channels. They found total three channels in guava marketing *viz.*,

Channel I: Producer – Wholesaler – Retailer - Consumer

Channel II: Producer – Retailer - Consumer

Channel III: Producer - Consumer

The price spread in channel I was ₹ 170, channel II ₹113 and channel III ₹70. channel II was most common channel.

Sing *et al.*, (2008) studied the marketing of soybean in block Sonkutch of district Dewas of Madhya Pradesh. A large number of market functionaries *viz-* traders, retailers, tola, commission agent, village traders, palladers etc were found in the study area. Total three marketing channels were identified.

Channel I: Producer - Wholesaler/Commission Agent – Soya processing plant - Retailer-Consumer

Channel II: Producer - Village merchant - Wholesaler/Trader-Soya processing plant–Retailer-Consumer

Channel III: Producer – Soya processing plant – Retailer - Consumer

The marketing charges paid by the producer, wholesaler and oil producer were worked out to ₹ 33.75, ₹ 17.20 and ₹10.00 per quintal respectively.

Sanjeev *et al.* (2008) studied the marketing of vegetables in Vaishali district of Bihar. The marketing efficiency was measured by employing Shepherd's Index and the marketing cost function analysis facilitated to evaluate relative contribution of various factors to the marketing cost. Marketing efficiency was higher for cauliflower followed by bhendi, brinjal and tomato crop. Marketing cost emerged as one of the important components of vegetable marketing which ranged from 23.09 per cent in brinjal to 34.04 per cent in tomato.

Kerutagi *et al.*, (2009) studied on marketing of sapota in Northern Karnataka. They selected two districts, Belgaum and Dharwad purposively. A multistage purposive sampling procedure was adopted for the selection of representative districts, taluks and villages. Two taluks from each district and from each taluks two villages were selected. In all 90 sapota cultivators, ten commission agent cum wholesalers and ten retailers were selected randomly, to make total sample size as 110. Their one of the objective was to identify the channels in sapota marketing. They identified two marketing channels, viz,

Channel I: Producer - Commission Agent – Retailers - Consumer

Channel II: Producer - Pre-harvest contractor cum Wholesaler – Retailer - Consumer

Producer's share in consumer's rupee in channel I was higher (59.58%) than in channel II (48.14%). Price spread in channel I was less (26.32%) compared to channel II (42.11%).

Singh and Singh (2009) studied on costs, margins and price spread of rapeseed and mustard in Sriganganagar district of Rajasthan. There were four channels identified viz,

Channel I: Producer - Commission Agent - Processors - Oil wholesaler – Retailer - Consumers

Channel II: Producer - Wholesaler cum Commission Agent – Processors - Oil Wholesaler I - Wholesaler II- Retailer-Consumer

Channel III: Producer - Commission Agent- Wholesaler – Processors - Oil Wholesaler I- Wholesaler II - Retailer - Consumer

These were most dominating channels contributing to nearly 97 per cent in total quantities sold in the market. The study concluded that producers were receiving remunerative price for their produce.

2.5 Problems in production and marketing

Neerajadev (1990) highlighted the problems in production and marketing of kakada flowers in Bangalore district. The prevalence of high commission charges emerged as a major problem in marketing of the flowers. The other problems related to marketing were inadequate transport facilities and high cost of transportation.

Vedini (1994) studied the major problems in the production of jasmine, in Mysore district as inadequacy of financial resources, lack of technical know-how, non-availability of labour and incidence of pests and diseases. High commission charges, inadequate transport facilities, high cost of transportation were the major problems faced by them in marketing.

Chengappa *et al.* (1998) highlighted the major production constraints in cut flower production. These comprised of high cost of inputs, irregular supply of electricity, high incidence of pests and diseases, lack of knowledge of recommended practices, infrastructural constraints, and scarcity of trained labour and non-availability of quality planting material. The problems identified in marketing of cut flowers related to absence of organized markets, high commission charges, price fluctuations, high costs of transportation and high handling charges etc.

Gajanana and Subramanyam (1999) studied the main constraints in the production and marketing of anthurium in Karnataka and Kerala. The non-availability of the required quantity and quality of planting materials, high cost of seedlings, incidence of pest and diseases were the major constraints in the production of the flowers. As regards to marketing absence of organised market was the major problems followed by non- availability and high cost of transportation. Besides, exploitation by the form of delayed payment and purchase of only quality flowers were the other constraints faced by the growers in marketing of anthuriums.

Kadam *et al.* (2000) conducted a study on constraints in marketing management of oranges faced by farmers in 1998/99 in Amravati district, Vidarbha region, Maharashtra, India.

Results indicated that a majority of farmers had a medium level of marketing management men constraints education, land holding, socioeconomic status, management orientation, achievement motivation, mass media exposure and knowledge emerged as the important factors which affected marketing management. Major constraints reported by farmers were absence of pre-cooling centres, absence of cold storage centres, high transportation cost and lack of processing units.

Rudholph *et.al* (2000) in their study suggested that the food retailers risk a loss image or even a loss of the customer if they did not learn to react effectively to failures and improve their service strategy.

Shivaprasad (2002) studied the problems and prospects in the production and marketing of anthuriums in Madikeri taluk. The study revealed there was damage to the flowers to an extent of 5 per cent during transportation in government buses. Further low light intensity during winter brought down the flower production.

Alagumani (2005) in his study on economic analysis of tissue cultured banana and sucker propagated banana in Theni district of Tamil Nadu revealed that, the risk in cultivation of banana using tissue culture plantlets was lower than that of sucker propagated banana production. The constraints in tissue culture banana production were high cost of tissue culture plantlets and few farmers were also expressed problem of marketing of big size bunches obtained from tissue culture banana.

Brij Bala (2006) conducted a study on marketing system for apple in hills problems and prospects (A case study of Kullu district, Himachal Pradesh). They surveyed 120 apple growers. They identified many constraints faced by the growers such as lack of road facility, unawareness inadequate storage facility delayed payment and lack of market intelligence.

Rane and Bagade (2006) studied economics of production and marketing of banana in Sindhudurg district of Maharashtra. The study revealed that farmers were facing the problem of bunchy top disease of banana and also aphids of banana in production.

Rama Shankar and Amlendu (2008) studied production and marketing of betel leaf: A study of constraints in Bihar. Study based on primary data collected from the two districts namely: Bhagalpur and Vaishali. The collected data were analyzed and average rank of all the identified constraints was determined. The most serious constraints in marketing of betel leaf were the price fluctuation, while in case of production biological constraints. The study concluded that marketing was the most important constraints for the growers.

3. METHODOLOGY

In the process of achieving the objectives of the study, it is very important to follow a systematic and scientific approach so as to present and interpret the results of the study or investigation conducted. This chapter on methodology presents the details of the description of the study area, population taken, nature and source of data collected, analytical tools and techniques employed to evaluate the objectives of the present study. The details are presented under the following headings.

- 3.1 Description of the study area
- 3.2 Sampling design
- 3.3 Nature and sources of data
- 3.4 Analytical tools and techniques employed
- 3.5 Definition of terms and concepts used in the study

3.1 Description of the study area

Karnataka is the eighth largest state in India with geographical area of 190 lakh ha. It is situated between 11.5° and 19.0° North latitude and between 74° and 78° East longitude in the Southern plateau. The state receives the average annual rainfall of about 1139 mm both from South-West and North-East monsoons. The important crops grown in the state are jowar, ragi, maize, bajra and wheat among cereals; red gram, green gram, tur and bengal gram among pulses; groundnut, sunflower and safflower among oilseed crops, cotton, sugarcane, chilli and tobacco among commercial crops. Karnataka comprises 30 districts of which 13 districts are located in Northern part of the state and rest in Southern part of state, Uttar Kannada district was chosen for the study purposively due to higher concentration of area and production of orchids. The map of the study area is presented in Fig.3.1

3.1.1 Location and area

The study was undertaken in Uttar Kannada district which is situated roughly in the mid North-Western part of the state. As per agro-climatic regional classification, Uttar Kannada district falls under hilly region. The district lies between 13° 55' and 15° 31' North latitude and between 74° 9' and 75° 10' East longitude. It is surrounded on the East by Dharwad and Haveri districts, on the South by Shimoga and Udupi districts, on the North by Belgaum district and Goa state and on the West by the great Arabian sea. The district is endowed with 144 km coastal line running in five coastal taluks, viz, Karwar, Ankola, Kumta, Honnavar and Bhatkal.

Uttar Kannada district comprises of 11 taluks and total area of the district is 10291 sq. km., consisting of 1348 villages.

3.1.2 Geographic and Demographic features

The population of the district is 13, 53,644 of which 6, 86,876 (50.75%) are male and 666768 (49.25%) are female. Rural population comprises 965731 (71.3%) while, 387,913 (28.64%) is urban population. Literacy in the district is 76.5 percent and literacy with respect to male is more (84.50%) compared to female (68.50%) (2001 Census). Uttar Kannada district is characterized by highly undulating topography of river basins, mountains, deep valleys and plains. The average elevation ranges from 25 to 619 meters from Mean Sea Level (MSL).

Major part of the district consists of dense forest area. Its major part is essentially highland, the low land being restricted to pockets along the course of rivers. A somewhat broken and irregular Sahyadri range of central hills with an average height of 700 meters divides the district into two parts, the uplands or the regions above the ghat with an area of nearly 7,770 sq. km, which is 600 to 700 meters above Mean Sea Level (MSL) and the low lands covering about 3370 sq. km. Except the shallow Karwar and Belekeri bays in the North, the 144 km of the Uttar Kannada coast stretch in a long nearly straight line to the South-East. Though unbroken by deep bays or wide-mouthed estuaries, the coast is varied and picturesque with green islands and rocky capes.

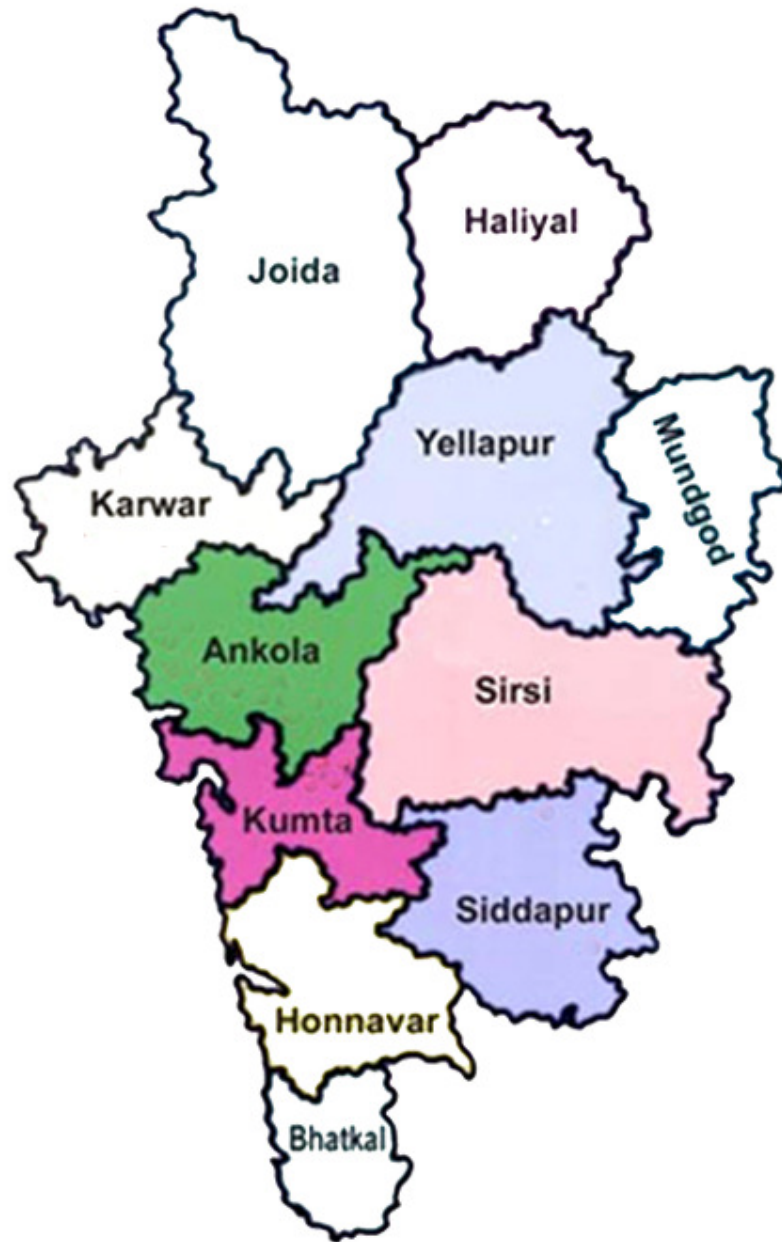


Fig. 3.1 Map of Uttar Kannada District

Fig 3.1 Map of Uttar Kannada District

There stretch rich winding valleys, waving woody hills and a wild background of high peaks behind the changing coast line. The district has three main and distinctive regions; the Coast lands, the Sahyadrian interior and the Eastern margin.

The coastal lands are the best economically developed areas with a high density of population. It is in this region Karwar, Ankola, Kumta, Honnavar and Bhatkal taluks are situated. The Sahyadrian region is the forest and only the roads crossing the ghats sustain human activity, though the valleys have special significance as scenic antiquity. The Eastern margin is an undulating land, partly under forest and partly cleared up for agriculture. It is a transitional zone between the forests proper and cultivated uplands of the Dharwad and Haveri districts. Parts of Haliyal, Yellapur and Mundgod taluks are plain, comparable with the Western half of Dharwad and Haveri district. Daily temperature touches around 15° to 20° in up ghats and plains during winter months (December to February). During summer (March to May) it will be varying between 30° C to 38°C across the regions. The atmosphere is highly humid throughout the year and particularly during the South-West monsoon months (May to September).

Uttar Kannada district receives an average rainfall of 2741.7 mm of which around 80 per cent is received between June and August by South-West monsoon. The rainfall received from North-East monsoon is very less and it is not uniform and certain. Therefore, in most of the areas of the district the agricultural activities are concentrated only during *Kharif*.

The soils are mostly of lateritic origin which is reddish through the district except in coastal areas where only along the coastal belt up to an average distance of 3 Km from sea, coastal alluvial beds are observed. Sandy loams are also seen along the river beds to certain distance. Two clear cut soil zones can be differentiated based on elevation, namely the coastal taluks and the up-ghats. Soils in Kumta, Honnavar, Bhatkal and Siddapur are derived from laterites, while some soils derived from granites occur in Ankola and Karwar taluks. Red loamy soils derived from mixed laterites and traps are found in parts of Joida, Haliyal and Mundgod taluks. In other parts of Mundgoad, Haliyal and Joida taluks, the soils are patches of black soil derived from trap rocks. There are also gazani lands which are saline sandy along the coast. The forest taluks like Sirsi, Siddapur, Yellapur, parts of Haliyal, Mundgod and Joida are covered with red loamy soils.

Of the total area, forest occupies 80.96 per cent (82, 99,613 ha) followed by agricultural area 10.94 per cent (1, 12,121 ha). Remaining land is used for other purposes. Around 18300 ha are sown more than once and thus making gross cropped area to around 1, 30,400 ha (41%). Around 21.07 per cent of the net sown area is net irrigated area. Tanks and other sources like small streams and brooks are major irrigation sources accounting for 40.98 per cent and 37.54 per cent respectively of total area irrigated.

3.2 Sampling design

Since the numbers of cultivators of orchids in the district were very small, the entire population was considered for the study (This information obtained by Kan Flora Flower Growers Association, Sirsi). In all about 50 orchids growing farmers were identified for eliciting detailed information with regard to production and marketing aspects of the crop.

3.3 Nature and sources of data

In order to accomplish the various objectives outlined for the study, the research was exclusively based on primary data. The data were collected from the orchid growers on various aspects at production and marketing at the crop with the help of pre-tested, comprehensive questionnaire exclusively designed for the study. The respondents were interviewed personally to elicit the information required for the study.

3.4 Analytical tools and techniques employed

In order to analyse the objectives of the study, the data collected were subjected to analysis through appropriate techniques as follows.

3.4.1 Tabular analysis

The technique of tabular analysis used to interpret the results obtained from the investigation. The data collected were presented in tabular form to facilitate easy comparisons. The cost of production, marketing cost and profit accrued to the orchid growers were worked out and presented in the tabular form. The data was summarised with the help of statistical tools like averages and percentages to obtain meaningful results.

3.4.2 Financial analysis

The techniques used for the financial analysis were:

1. Pay Back Period (PBP)
2. Net Present Value / Worth (NPV/W)
3. Benefit-Cost Ratio (B: C Ratio)
4. Internal Rate of Return (IRR)

3.4.2.1 Pay Back Period (PBP)

Payback period represents the length of time required for the stream of cash proceeds produced by the investment to be equal to the original cash outlay *i.e.* the time required for the project to pay for itself.

$$P=I/E$$

Where,

P=Payback period of the project in years,

I=Investment of the project in ₹

E= Average annual net cash revenue in ₹

3.4.2.2 Net Present Value / Worth (NPV/W)

The present value represents the discounted value of the net cash inflows to the project. In the present study, a discount factor of 9 per cent was used to discount the net cash inflows representing the opportunity cost of capital.

The NPV was worked out as follows:

$$NPV = \sum \frac{Y_t}{(1+r)^t} - I$$

Y= Net returns in period t

t = 1.....8

r = Discount rate

I= Initial investment

3.4.2.3 Benefit Cost Ratio (BCR)

The Benefit Cost Ratio (BCR) was worked out by using following formula

$$B: C \text{ Ratio} = \frac{\text{Discounted cash inflows}}{\text{Discounted cash outflows}}$$

3.4.3.4 Internal Rate of Return (IRR)

The rate at which the Net Present Value (NPV) of project is equal to zero is Internal Rate of Return (IRR) to the project. The net cash inflows were discounted to determine the present worth following the interpolation technique.

IRR is also known as 'marginal efficiency' of capital or yield on the investment. It is the discount rate at which the present values of the net cash flows are just equal to zero, i.e., NPW=zero. The IRR must be found out by trial and error with some approximation.

The positive NPW value of the project indicates that IRR is still higher and next assumed arbitrary IRR value must be comparatively higher than the initial level. This process is continued until NPW becomes negative. Then by interpolation method the exact IRR is found out by using the following equation

The method of interpolation followed is as under:

$$\text{IRR} = \text{Lower discount rate} + \frac{\text{Difference between two Discount rates}}{\text{Absolute difference between present worth of cash flows stream at the two discount rate}} \times \frac{\text{Present worth of cash flows at lower discount rate}}{\text{Absolute difference between present worth of cash flows stream at the two discount rate}}$$

3.4.3 Garrett's Ranking Technique

Garrett's ranking technique was adopted for studying problems faced by farmers at production and marketing.

Production factors faced by the orchid growers

- 1) High incidence of pest and diseases
- 2) High rate of plant protection measures
- 3) Non-availability of pesticides and insecticides
- 4) Non-availability of skilled labour
- 5) High wage rate
- 6) High cost of planting material
- 7) Lack of credit facility
- 8) Lack of technical guidance
- 9) High cost of maintenance

Marketing factors faced by the orchid growers

- 1) High packaging cost
- 2) Lack of regulated market facility
- 3) Lack of storage facility
- 4) No incentives from government
- 5) Problems in transportation
- 6) Lack of market information
- 7) Lack of grading and standardization information
- 8) Low demand in local market
- 9) High commission charges

In the first stage: ranking given by 50 respondents for each factor was analyzed.
Eg: Rank given by the respondents.

Respondent No.	Factors								
	1	2	3	4	5	6	7	8	9
1	5	6	4	7	1	3	2	9	8
2	4	7	3	6	2	1	5	9	8
49									
50	6	7	1	5	2	3	4	9	8

In the second stage: Thus assigned ranks by the individual respondents were counted into percent position value by using the formula.

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

Where, R_{ij} stands for rank given for the i^{th} factor by the j^{th} individual.

N_j stands for number of factors ranked by j^{th} individual.

The per cent position value for the same assigned ranks by the respondents as follows.

Respondent No.	Factors								
	1	2	3	4	5	6	7	8	9
1	50	61.11	38.89	72.22	5.56	27.78	16.67	94.44	83.33
2	38.89	72.22	27.78	61.11	16.67	5.56	50	83.33	94.44
49									
50	61.11	72.22	5.56	50	16.67	27.78	38.89	83.33	94.44

In the stage third – For each per cent position scores were obtained with reference to Garrett's Ranking Conversion Table (Appendix II) and each per cent position value was converted into scores by reference to Garret's Table (Fisher 1995). Eg: Garrett's Table scores for the per cent position values as follows.

Respondent No.	Factors								
	1	2	3	4	5	6	7	8	9
1	50	44	56	38	81	62	69	19	31
2	56	38	62	44	69	81	50	31	19
49									
50	44	38	81	50	69	62	56	31	19

In the fourth stage – Summation of these scores for each factor was worked out for the number of respondents who ranked for each factor.

Respondent No.	Factors								
	1	2	3	4	5	6	7	8	9
1	50	44	56	38	81	62	69	19	31
2	56	38	62	44	69	81	50	31	19
49									
50	44	38	81	50	69	62	56	31	19
Σ	150	120	199	132	219	205	175	81	69

In the fifth stage – Mean scores were calculated by dividing the total score by the number of respondents

Respondent No.	Factors								
	1	2	3	4	5	6	7	8	9
1	50	44	56	38	81	62	69	19	31
2	56	38	62	44	69	81	50	31	19
49									
50	44	38	81	50	69	62	56	31	19
Σ^{50}	150	120	199	132	219	205	175	81	69
$n=1$									
Mean	50	40	63.33	44	73	68.33	58.33	27	23

In the last stage – Overall ranking was obtained by assigning ranks I, II, III IX etc. in the descending order of the mean score.

Respondent No.	Factors								
	1	2	3	4	5	6	7	8	9
1	50	44	56	38	81	62	69	19	31
2	56	38	62	44	69	81	50	31	19
49									
50	44	38	81	50	69	62	56	31	19
Mean	50	40	63.33	44	73	68.33	58.33	27	23
Ranks	V	VII	III	VI	I	II	IV	VIII	IX

3.5 Definitions of terms and concepts used

1. Planting material

The planting material used (cuttings) was valued at the current market rate of ₹ 60 per cutting.

2. Manures, fertilizers and plant protection chemicals

These were valued at the purchase price of the farmers. The values of on-farm inputs were valued at the prevailing market price in that area.

3. Total cost of cultivation

Cost of cultivation included variable costs and fixed costs. Variable costs included the expenditure on labour and material input cost. The interest on working capital was also included under variable cost. Orchid farmers told that total variable cost (labour cost+ material cost) was remained same in four to nine year age group of plants.

. Fixed costs comprised apportioned cost of establishment, depreciation, land revenue, rental value of land and interest on fixed capital which were used in the orchid production, comes under the fixed cost.

3. Depreciation: Depreciation is the decrease in value of an asset due to its wear and tear. In the present study, this was calculated by using the formula,

$$\text{Depreciation} = \frac{\text{Purchase value} - \text{Junk value}}{\text{Economic life of the asset}}$$

4. Human labour

Human labour was estimated in terms of man hours because labours are used on the basis of hours in orchid house. Both men and women wages are same i.e. ₹.30 per hour.

5. Land revenue

These were charged according to the actual payments incurred by the cultivators.

6. Gestation period

It is period for which time taken up to bearing after establishment of orchid garden.

7. Bearing period

It is time of flowering which includes economic life period i.e., up to 8 years in orchids.

8. Rental value of land

Rental value of land was calculated as per the rate prevailing for irrigated land in the study area on per gunta basis.

9. Interest on fixed capital

Interest on fixed capital was calculated at the rate of 12 per cent on fixed capital at which the banks charge for the terms loans.

10. Interest on working capital

Interest on working capital was charged at the rate of 9 per cent per annum, which was the rate at which the farmers used to get short-term loans.

11. Apportioning of costs

Orchid being a perennial crop, total establishment cost during the first year was apportioned over the economic bearing life period of orchid house, which was fixed at 8 years based on the opinion of the experienced orchid growers.

12. Price spread

The difference between the price paid by the consumer and price received by the producer was the marketing margin or price spread.

13. Gross income

It is the value of total quantity of orchid produced at the prices where the product is sold.

14. Net returns

This was defined as the difference between gross returns and total cost incurred by farmers.

13. Wholesalers

Wholesalers are professional buyers/ sellers. He purchases from the producer at large quantities and sells it to the retailer.

15. Retailers

Retailers sell the orchid flowers / spike directly to the consumer in the market. They purchase the produce either from wholesaler or commission agent and sell it to consumers.

16. Producer's share in consumer's rupee

It can be calculated by using the formula,

$$\text{Producer's share in consumer's rupee} = \frac{\text{Price received by the producer}}{\text{Price paid by the consumer}} \times 100$$

17) Unit cost : Since the land holdings of the orchid growers are small, and initial investment per gunta is high, the costs are calculated on the basis of per gunta as unit cost.

(1 gunta=0.025 acre) or (100 Sq.m) or 0.0125 ha. or 33 X 33'

4. RESULTS

The data collected were analysed and the results obtained have been presented under following important heads.

- 4.1 General characteristics of the orchid growers
- 4.2 Documentation of different orchids produced in Uttar Kannada district
- 4.3 Investment pattern and maintenance cost in orchid production
- 4.4 Cost and return structure of different orchid's cultivation
- 4.5 Financial feasibility of investment in orchid gardens
- 4.6 Marketing management of orchid cultivation
- 4.7 Constrains in production and marketing of orchids

4.1 General characteristics of orchid growers

Table 4.1 indicated the general characters of orchid growers in the study area. From the Table, it could be observed that the average age of the farmers was found to be 50 years and with regard to educational status; all the respondent orchid farmers were literates (100%), having their education ranging from primary to degree level. The average size of holding of farmers was 1.65 ha of which 94.50 per cent was under irrigation. Only 5.50 per cent of the land was under rainfed cultivation. Average area under orchid cultivation by the respondent was 2.1 guntas. Totally 105 guntas of land was under orchid cultivation in the study area. On an average, 1000 plants were found in each gunta of land under cultivation and had on an average 6 years experience in orchid cultivation.

4.2 Documentation of different varieties of orchids produced in Uttar Kannada district

An effort was made to document the different varieties of orchids grown in Uttar Kannada district during the study period and are presented in Table 4.2. It was seen from the Table that five different varieties of orchids, viz, *Sonia-16*, *Sonia-28*, *Singapore white*, *Singapore red* and *Burana jade* were grown in the study area to an extent of 45, 40, 10, 8 and 2 guntas respectively. Their respective concentration was to the extent of 42.85, 38.09, 9.54, 7.62 and 1.90 per cents in that order. Among these varieties, *Sonia-16* and *Sonia-28* differ only in colour, but both have high market demand and shelf life is up to 30 days, where as *Singapore white* and *Singapore red* having shelf life of 10-15 days and having attractive colour. *Burana jade* is the other variety of which plant height can reach height up to 3 feet before flowering. Even though *Burana jade* yields more number of spikes/plant, it was cultivated in less area because, the flowers of this variety had less demand in market. These plants are also used for ornamental purpose.

4.3.1 Investment pattern and maintenance cost in orchid production

Investment in orchid cultivation mainly consists of the costs incurred in establishing the green house for orchids. The costs incurred in the green house up to bearing stage which takes one year, formed the establishment cost of the green house for orchid cultivation. The establishment costs in orchid cultivation were classified into material costs and maintenance cost. The material costs were the costs incurred during the first year and they included the green house construction, costs on well, pump set, pump house, sprayer, plant material and planting *etc.*. The maintenance costs were the costs incurred in maintenance of the orchid house till the time of bearing, that is up to one year after planting and they included expenditure on labour, fertilizers, manures, plant protection chemicals and irrigation *etc.*

The results related to cost of establishment of green house for orchid cultivation on per gunta is presented in Table 4.3. The total cost of establishment per gunta was ₹ 2, 32,920. The investment cost constituted the major share (94.67%) of the total establishment cost. Out of the total per gunta investment cost, the establishment cost was ₹ 2, 20,500 and maintenance cost was ₹12,420 (5.33%).

Table 4.1 General characteristics of the orchid growers

Sl.No	Particulars	Unit	
1.	Age	Years	50
2.	Education		
	Illiterate		--
	Primary		2 (4.00)
	High school		23 (46.00)
	P.U.C		10 (20.00)
	College		15 (30.00)
	Total		50
3.	Total area under orchid	Gunta	105
4.	Average area under orchid	Gunta	2.1
5.	Plant population	Plants/ gunta	1000
6.	Experience in cultivation of orchids	Years	6
6.	Average Land holdings		
	Irrigated	Ha	1.56 (94.50)
	Dry land	Ha	0.098 (05.50)
	Total	Ha	1.65 (100.00)

Note: Figures in parentheses indicate percentage to the total.

Table 4.2 Description of different varieties of orchids produced in Uttar Kannada district

Sl. No	Varieties	No of farmers grown	Area cultivated (gunta)	(%)	Description of varieties
1	Dendrobium. Sonia-16	20	45	42.85	Dark purple in colour Yield(8-9 spikes/plant) High market demand High stem life (up to 30 days) More number of flowers/spike
2	Dendrobium. Sonia-28	18	40	38.09	Light purple in colour Yield (8-9 spikes/plant) More market demand High stem life (up to 30 days) More number of flowers/spike
3	Dendrobium. Singapore white	5	10	9.54	White in colour Shelf life is about 15 days Yield(6-7 spikes/plant) Comparatively less demand
4	Dendrobium. Singapore red	5	8	7.62	Red in colour Shelf life is about 10-15 days More attractive Domestically cultivated Yield 5-6 spikes/ plant
5	Dendrobium. Burana jade	2	2	1.90	Green in colour Flowers with distinctive purple centres that are surrounded by green petals. Domestically cultivated Yield 10-11 spikes/plant Less demand
	Total	50	105	100	

Table 4.3 Investment pattern in orchid cultivation

(Per gunta)

Sl. No	Particulars	Value(₹)	%
A.	Investment costs		
1	Green house (including shade net, uv sheet, fabrication ,labour cost for construction, bed preparation, pots and planting)	1,10,000	47.22
2	Land preparation	2000	0.86
3	Open well	18,000	7.73
4	Pipe line	2000	0.86
5	Pump set	8000	3.43
6	Pump house	5000	2.15
7	Sprayers	2000	0.86
8	Plant material	60,000	25.76
9	Sprinklers	7000	3.01
10	Foggers	3500	1.50
11	Baskets and trolley	1000	0.43
12	Potting media	2000	0.86
	Total	2,20,500	94.67
B.	Maintenance cost (up to one year)		
1.	I Year	12,420	5.33
	Total	12,420	
	Total establishment cost (A+B)	2,32,920	100



Sonia - 16



Sonia -28



Singapore white



Singapore red



Burana jade

Plate 1

Table 4.3 Investment pattern in orchid cultivation

(Per gunta)

Sl. No	Particulars	Value(₹)	%
A.	Investment costs		
1	Green house (including shade net, uv sheet, fabrication ,labour cost for construction, bed preparation, pots and planting)	1,10,000	47.22
2	Land preparation	2000	0.86
3	Open well	18,000	7.73
4	Pipe line	2000	0.86
5	Pump set	8000	3.43
6	Pump house	5000	2.15
7	Sprayers	2000	0.86
8	Plant material	60,000	25.76
9	Sprinklers	7000	3.01
10	Foggers	3500	1.50
11	Baskets and trolley	1000	0.43
12	Potting media	2000	0.86
	Total	2,20,500	94.67
B.	Maintenance cost (up to one year)		
1.	I Year	12,420	5.33
	Total	12,420	
	Total establishment cost (A+B)	2,32,920	100

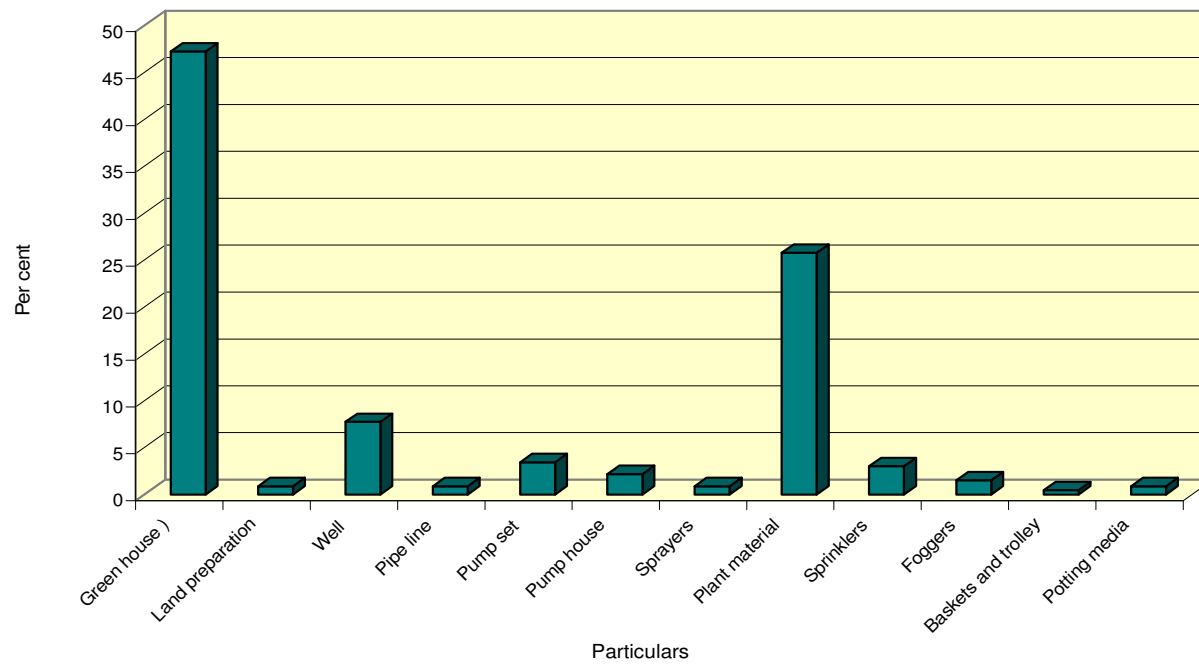


Fig 2. Investment pattern in orchid production

Fig 2. Investment pattern in orchid production

Among the investment costs the cost of green house establishment accounted for the largest share (47.22 per cent of the total establishment cost) followed by planting material cost (25.76 per cent) and cost of open water well (7.73 per cent). The costs incurred on land preparation, rental value of land, pipe line, pump set, pump house, sprayers, sprinklers, foggers, baskets and trolley, potting media accounted for nominal amount which put together was less than four percent of the total establishment cost.

The maintenance costs which were incurred during gestation period were ₹ 12,420 per gunta (5.33 per cent of the total establishment cost).

4.3.2 Maintenance cost of orchid garden during gestation period

Labour cost and material cost were the major items of cost of maintenance of orchid garden during gestation period, which constitute 59.74 and 40.26 per cent to the total maintenance cost respectively. (Table 4.4).

Among the labour costs, the cost of application of manures and fertilizers (₹ 2200) and cost of irrigation (₹ 1800) were the prominent one on per gunta basis which constituted 17.71 and 14.49 per cent of the total maintenance cost of gestation period respectively. Other major item of labour cost during the period was on spraying of plant protection chemicals (₹ 1400 each). Pot preparation and weeding were ₹ 1000 and ₹ 720 respectively.

Total material cost amounted to ₹ 5000 per gunta, of which plant protection chemicals (₹ 2500) and chemical fertilizers (₹ 2000) were the major chunk of material cost which constitute 20.13 per cent and 16.10 per cent of the total maintenance cost of orchid garden during gestation period respectively. Manure and micronutrients were the other material cost items during the period.

4.3.3 Maintenance cost of orchids in different age group gardens during bearing period

It could be observed from the Table 4.5 that the total maintenance cost accounted to ₹ 11,860 in second year to ₹ 14,360 during four to nine years of age. The material cost per year per gunta was accounted to ₹ 3700 to ₹ 5000 up to nine years. Out of this, the major cost was on plant protection chemical which was of ₹ 2000 in second year increased up to 2500 in during five to nine years age group of garden.

The average quantity of fertilizers used per gunta was 3 kg, 1 kg and 2 kg of nitrogen, phosphorus and potash, respectively. It was interesting to note that quantity of these fertilizers used per gunta was same in all the age group of plants. It was further observed that the second important material cost was towards the fertilizer which was accounted ₹ 2000 to ₹ 2500.

The total cost of labour used for application of manures and fertilizers was ₹ 2700 per gunta. The use of labour per year per gunta for application of manures and fertilizers was 90 man hours amounting to ₹ 2700 per gunta and retained same in all age group of plants.

It was also observed that the use of labour for harvesting and management per gunta increased from 40 man hours during second year to 80 man hours in four to nine year age group of plants. The cost of labour increased from ₹ 1200 in second year to ₹ 2400 in four to nine year age group.

The next important labour involving item was irrigation which required 60 man hours amounting to ₹ 1800 per gunta and it was also observed that the use of labour per gunta was same in all the age group of plants.

The total quantity of labours used per gunta was 292 man hours which amounted to ₹ 8760 per year in four to nine year age group of gardens. In this the labour used per gunta per year on harvesting of flowers and management was maximum 80 man hours which amounted to ₹ 2400. The pattern of labour used per gunta in a year indicated that, it increased from 272 man hours in second year age group to 312 man hours in four to nine years age group. Human labour was estimated in terms of man hours, for both man and woman and wage rates were same for both ₹ 30 per man hour. There was not much difference between the wage paid to the permanent and hired labour in the study area.

Table 4.4 Maintenance cost of orchid garden during gestation period (Up to one year)

(Per gunta)

Sl. No	Particulars	Value(₹)	Per cent
A.	Labour cost		
1.	Pots preparation	1000	8.05
2.	Weeding	720	5.80
3.	Application of manures and fertilizers	2200	17.71
4.	Spraying of P.P. chemicals	1400	11.27
5.	Irrigation	1800	14.49
6.	Miscellaneous	300	2.42
	Total labour cost (A)	7420	59.74
B.	Material cost :		
1.	Manures	300	2.42
2.	Fertilizers : N P K	2000	16.10
3.	Plant protection chemicals	2500	20.13
4.	Micronutrient	200	1.61
	Total material cost(B)	5000	40.26
	Grand Total (A+B)	12420	100

Table 4.5 Year wise maintenance cost of orchids in different age group gardens during bearing period

(₹/year/gunta)

Sl No.	Items	Years					
		2		3		4-9	
		Man hours	Cost (₹)	Man hours	Cost (₹)	Man hours	Cost (₹)
A.	Labour cost						
1.	Weeding	24	720	24	720	24	720
2.	Application of manures and fertilizers	90	2700	90	2700	90	2700
3.	Spraying of P.P. chemicals	48	1440	48	1440	48	1440
4.	Irrigation	60	1800	60	1800	60	1800
5.	Harvesting and Management	40	1200	60	1800	80	2400
6.	Miscellaneous	10	300	10	300	10	300
	Total	272	8160	292	8760	312	9360
B.	Material cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
1.	Manures	600	300	600	300	600	300
2.	Fertilizers (kgs) : N P K	3 1 2	1200	3 1 2	1500	3 1 2	2000
3.	Plant protection chemicals		2000		2200		2500
4.	Micronutrients (kgs)	2	200	2	200	2	200
	Total		3700		4200		5000
	Total cost (A + B)		11860		12960		14360

Note: Figures in the parentheses indicate percentage to the total cost.
Wage rate: ₹ 30/hour

4.3.4 Cost of production of orchids in different age group of gardens during bearing period

The cost of production includes all the costs, which were included in the annual maintenance costs and the interest on working capital, fixed costs and marketing cost as indicated in Table 4.6. The total cost of production of orchid flowers per gunta was ₹ 71945.64 during second year, the same was increased up to ₹ 90864.04 in four to nine age group of plants. Cultivation can be further divided into variable cost and fixed cost. Among cultivation cost variable cost worked out to be ₹ 12926.40 in second year, same was went on increasing that it was ₹ 15585.82 during four to nine year age group of plants.

Among the labour cost, cost on application of manures and fertilizers appeared to be highest (₹ 2700 per gunta) followed by irrigation (₹ 1800 per gunta). It was interesting note that these costs were same in all the age group of plants. Labour cost for harvesting and management was ₹ 1200 during second year and same was increased up to ₹ 2400 in five to nine year age group of gardens.

The total material costs worked out to be per gunta ₹ 3700 in second year to ₹ 5000 during five to nine years age group of garden and farmers opined that material cost was remained same in four to nine years age group of plants.

Apportioned cost of establishment was the major item of fixed cost (₹ 29,115 per gunta). Land rent (₹ 10000 per gunta) was the other prominent fixed cost item, and these costs were same in all the group of plants.

Among the marketing costs, major chunk was eaten away in the form of commission charges, which worked out about ₹ 10,800 during second year and went on increasing up to ₹ 24,300 in four to nine years age group of garden. Packing cost and transportation costs were the other marketing costs.

4.4. Cost and returns from different varieties of orchids in different age group gardens during bearing period

The cost of production and selling price were same in all the varieties. But the yields were varied in different varieties. Cost and returns are assumed to remain same in five to nine years age group of plants and as per the opined of the farmers the prices of orchid flowers have remained same over the years.

4.4.1 Cost and returns from Sonia series orchids in different age group gardens during bearing period

The total cost of production went on increasing with the age of the garden, i.e. ₹ 73,296.04 during second year to ₹ 83,730.04 during third year to ₹ 90,864.04 during 4th to 9th year. However, cost of production was stagnant from 4th year to 9th year.

Orchid plants starts yielding flowers from second year onwards at 8000 spikes per gunta to 9600 spikes to 10,500 to 11,000 spikes as the age of the plant advances.

The selling price at the producer level is based on per spike depending on the number of flowers in each spike. On an average ₹ 15 was obtained by the producers for each spike grown.

The gross returns worked out to be ₹ 1,46,625 per gunta which incresed with the age of the gardens from ₹ 1, 20,000 in the second year to ₹ 1, 65,000 during five to nine years. Net return generated from one gunta of Sonia series orchid production was ₹ 46704 during second year same was increased upto ₹ 74,136 during five to nine years age group of gardens.

4.4.2. Cost and returns from Singapore series orchids in different age group of gardens during bearing period

The cost and return structure of Singapore series orchid variety in different age group are presented in Table 4.8.

Table 4.6 Cost of production of orchids in different age group of gardens during bearing period

(₹ per gunta)

Sl. No	Particulars/ Age group of gardens	Years		
		2	3	4-9
I.	Cultivation cost			
A.	Variable cost			
i.	Labour cost			
1.	Weeding	720	720	720
2.	Application of manures and fertilizers	2700	2700	2700
3.	Spraying of P.P. chemicals	1440	1440	1440
4.	Irrigation	1800	1800	1800
5.	Harvesting and Management	1200	1800	2400
6.	Miscellaneous	300	300	300
	Total labour cost (i)	8160	8760	9360
ii.	Material cost :			
1.	Manures	300	300	300
2.	Fertilizers	1200	1500	2000
3.	Plant protection chemicals	2000	2200	2500
4.	Micronutrient	200	200	200
	Total material cost(ii)	3700	4200	5000
iii.	Interest on working capital @ 9%	1067.4	1164.4	1225.8
	Total variable cost (i+ii+iii)	12927.4	14124.4	15585.8
B.	Fixed cost			
1.	Land rent	10000	10000	10000
2.	Apportioned cost of establishment	29115	29115	29115
3.	Land revenue	2.00	2.00	2.00
4.	Depreciation on machinery and equipments	2060	2060	2060
5.	Interest on fixed capital@ 12%	4941.24	4941.24	4941.24
	Total fixed cost	46118.24	46118.24	46118.24
	Total cultivation cost (A+B)	59045.64	60242.64	61704.04
II.	Marketing Cost			
1.	Commission charges	10800	18900	24300
2.	Transportation cost	900	1680	2160
3.	Packing cost	1200	2100	2700
	Total	12900	22680	29160
	Total production cost (I+II)	71945.64	82922.64	90864.04

Table 4.7 Cost and returns from Sonia series in different age group of gardens during bearing period

Sl. No.	Particulars/ age group of gardens	Years (n=35)			
		2	3	4	5-9
1	Cost of production (₹/gunta)	73296.04	83730.04	90864.04	90864.04
2	Yield (spikes/gunta)	8000	9600	10500	11000
3	Selling price (₹/spike)	15	15	15	15
4	Gross returns (₹/gunta)	1,20,000	1,44,000	1,57,500	1,65,000
5	Net returns (₹/gunta)	46,704	60,270	66,636	74,136

The Singapore series orchid plants yield was 7600 spikes per gunta during second year and it increased up to 10500 spikes per gunta in five to nine year age group of plants.

The average net returns accounted to ₹ 41,704 during second year to ₹ 66,636 in five to nine year age group of orchid plant. The selling price at the producer level is based on per spike depending on the number of flowers in each spike. On an average ₹ 15 obtained by the producers for each spike grown.

The gross returns per gunta were increased with the age of the gardens from ₹ 1, 14,000 in the second year to ₹ 1, 57,500 during five to nine years.

4.4.3 Cost and return structure of Burana jade variety during bearing period

It could be seen from Table 4.9 that the total yield of Burana jade orchid variety obtained by the orchid growers worked out to be 8500 spikes during second year and increased upto 11500 spikes during five to nine year age group of gardens and the selling price was ₹ 15. The gross returns worked out to be ₹ 1, 27,500 per gunta during second year which was increased with the age of the gardens to ₹ 1, 72,500 during five to nine years. Net return generated from one gunta of Burana jade orchid production was around ₹ 54,204 to ₹ 81,636 in five to nine years age group of garden.

4.5 Financial feasibility of investment in orchid cultivation

To evaluate the feasibility of investment in orchid enterprise, the criteria such as Net Present Value (NPV), Benefit Cost Ratio (BCR), Pay Back Period (PBP) and Internal Rate of Return (IRR) were employed and the results were presented in Table 4.10. This analysis is considered for the orchid farmers of Sonia variety as this variety was largely grown in the study area.

4.5.1 Net Present Value (NPV)

Net Present Worth (NPW) of an investment is the difference between the present value of series of inflow (returns) and outflows (costs) over the economic life period of the orchid plants. The Net Present Worth (NPW) was ₹ 3,05,931 per gunta at 9 per cent discount rate.

4.5.2 Benefit Cost Ratio (BCR)

This criterion indicates the rate of return per rupee invested in orchid enterprise. The Benefit Cost Ratio (BCR) at 9 per cent discount rate was 2.31 which was more than unity and indicated that investment in orchid enterprise was financially feasible.

4.5.3 Pay Back Period (PBP)

It is the period required to recover the initial investment incurred in establishing the orchid garden and in the present study the Pay Back Period (PBP) was found to be 3.45 years. This clearly indicated that it would take around four years and four months per gunta to recover the entire investment made in orchid garden. However, the net returns realized by the farmers in the subsequent years were much more and much higher in case of long term enterprise like orchid cultivation.

4.5.4 Internal Rate of Return (IRR)

It indicates average earning power of the money invested in the project. The value of IRR generally depends on the magnitude of returns realized in each year over the economic life period and more particularly in the initial years of orchid cultivation.

The IRR calculated for orchid cultivation in the study area was found to be 32.02 per cent, indicating that the investment in orchid house was profitable, economically feasible and financially sound considering the present bank rate of interest (9%).

4.6 Marketing of orchid flowers.

An attempt was made to trace the marketing channel for marketing of orchids by the orchid growers in the study area. Orchid flowers are sold in spikes at the producer's level. The price per spike depends on number of flowers contained in it. In Uttar Kannada district only one marketing channel for the marketing of orchids was identified.

Table 4.8 Cost and returns from Singapore series orchids in different age group of gardens during bearing period

Sl. No.	Particulars/ age group of gardens	Years (n=12)			
		2	3	4	5-9
1	Cost of production (₹/gunta)	73296.04	83730.04	90864.04	90864.04
2	Yield (spikes/gunta)	7600	8500	10000	10500
3	Selling price (₹/spike)	15	15	15	15
4	Gross returns (₹/gunta)	1,14,000	1,27,500	1,50,000	1,57,500
5	Net returns (₹/gunta)	40,704	43,770	59,136	66,636

Table 4.9. Cost and return from Burana jade variety during bearing period

Sl. No.	Particulars/ age group of gardens	Years (n=3)			
		2	3	4	5-9
1	Cost of production (₹/gunta)	73296.04	83730.04	90864.04	90864.04
2	Yield (spikes/gunta)	8500	9700	10800	11500
3	Selling price (₹/spike)	15	15	15	15
4	Gross returns (₹/gunta)	1,27,500	1,45,500	1,62,000	1,72,500
5	Net returns (₹/gunta)	54,204	61,770	71,136	81,636

Table 4.10 Financial feasibility of investment in orchid production

Sl. No.	Particulars	
1.	Net Present Value (NPV) (₹/gunta) @9%	3,05,931
2	Benefit Cost Ratio (BCR) @9%	2.31
3	Internal Rate of Return (IRR) (Per cent)	32.02
4	Pay Back Period(PBP) (Years)	3.45

Channel: Grower _ Kan Flora Flower Growers Association_ Retailer _ Consumer

In the channel producer himself brought the produce to distant market and sold through commission agents. Growers association acts as a mediator between producer-seller and retailer. Commission agents are the growers association themselves (Kan Flora Flower Growers Association), which collects ₹ 225 for each box of 100 spikes as commission. They meet transportation, loading, packing and labour cost from this commission which worked out to be around ₹ 160 per box and remaining amount is deposited in the association account to meet the common expenditure of growers association.

4.6.1 Marketing cost incurred by the producers

Marketing cost incurred by the producers of orchid was depicted in the Table 4.11. These costs were expressed in terms of costs per box of 100 spikes.

Major items of costs incurred by the producers were commission charges (₹ 225 / box), transportation cost (₹ 30/ box) and packing material cost (₹ 15 /per box) which constitute 83.33, 11.11 and 5.56 per cent of the total marketing cost incurred by the producers respectively. In all, producers incur on an average ₹ 270 for each box to sell it to the Kan Flora Flower Growers Association.

4.6.2 Marketing costs incurred by market intermediaries

Kan Flora Flower Growers Association act as Wholesaler-cum-Commission Agent at the primary level which collects the produce from the growers, sort them based on colour, variety, number of flowers/spike and size of the flowers and sell them to the retailers in distant market. Retailers in the distant market receive the boxes and sell it to the consumers by breaking the bulk into individual flowers or spikes.

Per box marketing cost incurred by the growers association and retailers in the marketing channel identified are presented in Table 4.12. The growers association on an average incur a cost of ₹ 160 per box which it meets out of the commission (₹ 225/box).

It receives from the producer seller of the marketing cost incurred by them, major chunk goes to transportation (37.50%) followed by labour charges (31.25%), packing material cost (18.75%) and loading cost (12.50%). These costs on per box basis were worked out to be ₹ 60, ₹ 50, ₹ 30 and ₹ 20 respectively.

At retailers level total marketing cost per box worked out was ₹ 200 which comprised of labour charges ₹ 100 (50%), transportation and loading ₹ 50 each (25%). However there was no cost on packing material at retailer level. Since, they sell the individual flowers/spikes to the consumer.

4.6.3 Price spread in marketing of orchids

Marketing cost and margins of the agencies involved in the marketing of orchids through identified channel were given in Table 4.13. The total marketing cost incurred by producers accounted for 9 per cent of consumer's price (₹ 270).

The growers association save ₹ 65 on each box of orchids sold after meeting a marketing cost of ₹ 160 per box out of the commission of the ₹ 225 which was collected from the growers. Retailers in the distant market would realise around ₹ 3000 per box the flowers individually or in spikes to the consumer.

The retailer profit margin is ₹ 1300 per box which constitute 43.33 per cent of the price paid by the consumer. The price spread in the marketing channel was identified was ₹ 1770 per box from producers to the ultimate consumer. Producers share in consumer rupee worked out to be 41 per cent.

4.7 Problems faced by the growers in orchid cultivation and marketing

Opinion survey was conducted to know the constraints in production and marketing of orchid crop and was analysed using Garrett's Ranking Techniques.

The nine factors considered in the analysis of the production problems faced by the growers and they were high incidence of pest and disease, high rate of plant protection measures, non-availability of skilled labour, high wage rate, non-availability of pesticides and insecticides, non availability of technical guidance, lack of credit facility, high cost of maintenance and high rate of planting material. In marketing also nine factors were considered as marketing problems faced by the farmers namely, lack of regulated market, lack of storage facility, no incentive from government, lack of standard grades, lack of storage facilities, problems in transportation, lack of market information, low demand in local market and high commission charges. Results of Garrett Ranking Technique are presented in Tables 4.14 and 4.15 respectively.

4.7.1 Problems in Orchid production

Table 4.14 depicted the results of Garrett Ranking Analysis of problems associated with production of orchid. Among nine factors considered, the lack of credit facility was the major problem expressed by most of the farmers with a mean score of 74.16. So this problem got assigned first rank, followed by lack of technical guidance (II rank with a mean score of 72.5), high cost of planting material (III rank with a mean score of 64.14), high incidence of pest and diseases (IV rank with a mean score of 54.32), high rate of plant protection measures (V rank with a mean score of 53.12), non-availability of pesticides and insecticides (VI rank with a mean score of 40.48), non-availability of skilled labour (VII rank with a mean score of 36.48), high cost of maintenance (VIII rank with a mean score of 35.42), high wage rate (IX rank with a mean score of 19.76).

4.7.2. Marketing problem faced by farmers

Table 4.15 explained the marketing problem faced by the orchid farmers as expressed by the Garrett analysis. The problem of lack of market information was the major problem expressed by the farmer respondents relating to marketing of orchid. According to Garrett's Ranking the mean score for this problem was 75.96 and hence the problem got assigned with first rank followed by lack of grading and standardization (II rank with a mean score of 66.28), no incentives from government (III rank with a mean score of 63.18), low demand in local market (IV rank with a mean score of 60.06), lack of regulated market (V rank with a mean score of 50.58), problems in transportation (VI rank with a mean score of 44.54), lack of storage facilities (VII rank with a mean score of 35.58) , high commission charges (VIII 30.4) and high packaging cost (IX rank with a mean score of 22.54).



Orchid house



Harvesting of orchids



Initial packing



Sorting



Labeling and packing



Placing graded and labelled spikes in the box



Explanation regarding the contents of the box



Final packing for transport to distant market

Plate 3

Table 4.11 Marketing cost incurred by producers

(Per box of 100 spikes)

Sl. No	Particulars	Amount (₹)	Per cent
1	Packaging material cost	15	5.56
2	Transportation cost	30	11.11
3	Commission charges	225	83.33
	Total	270	100

Table 4.12 Marketing cost incurred by market intermediaries

(₹/box) 1box=100 spikes)

Sl. No	Particulars	Growers Association		Retailer	
		Amount	%	Amount	%
1	Transportation cost	60	37.50	50	25
2	Loading cost	20	12.50	50	25
3	Packing cost	30	18.75	-	-
5	Labour charges	50	31.25	100	50
	Total cost	160	100	200	100

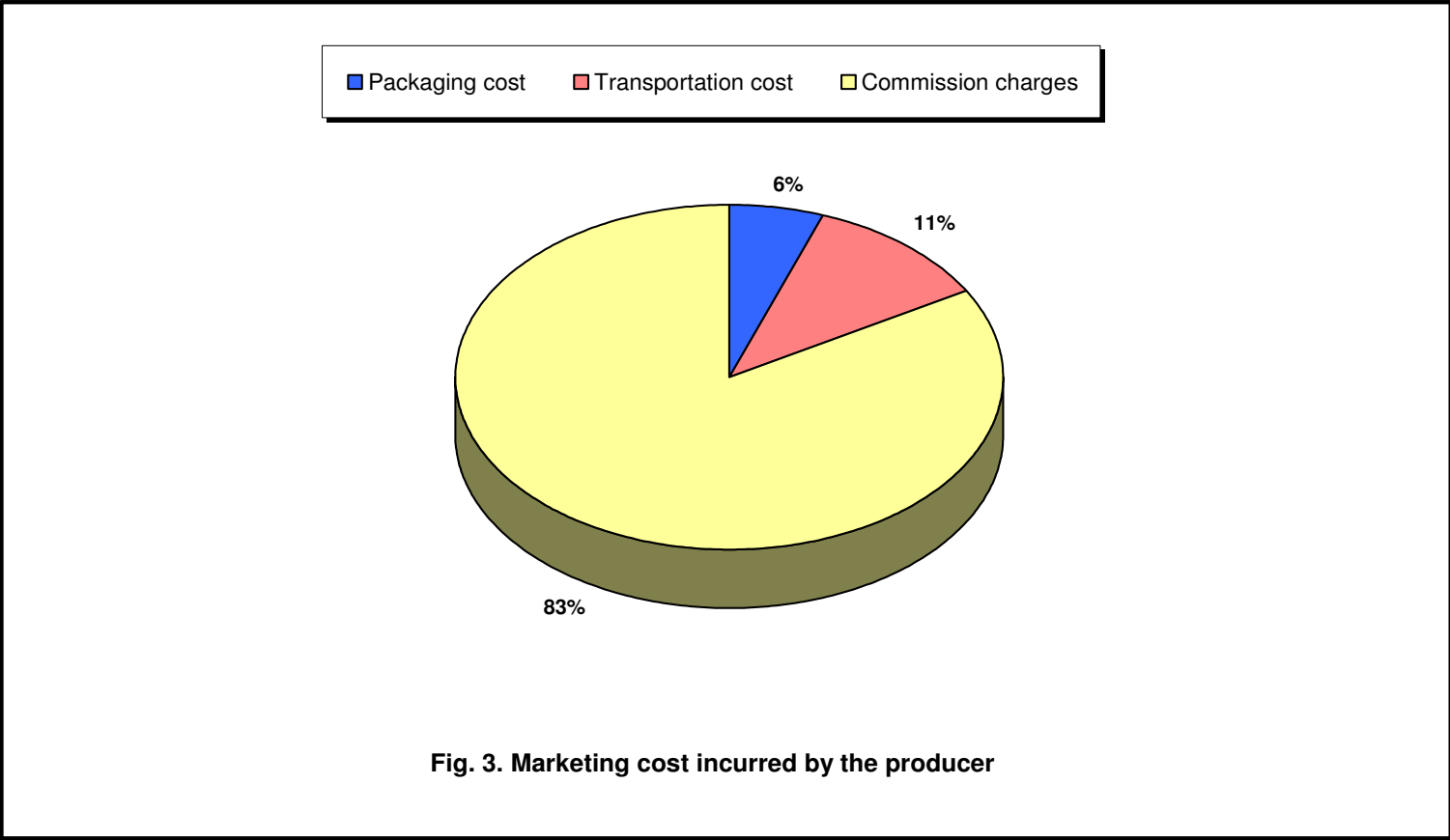


Fig. 3. Marketing cost incurred by the producer

Fig. 3. Marketing cost incurred by the producer

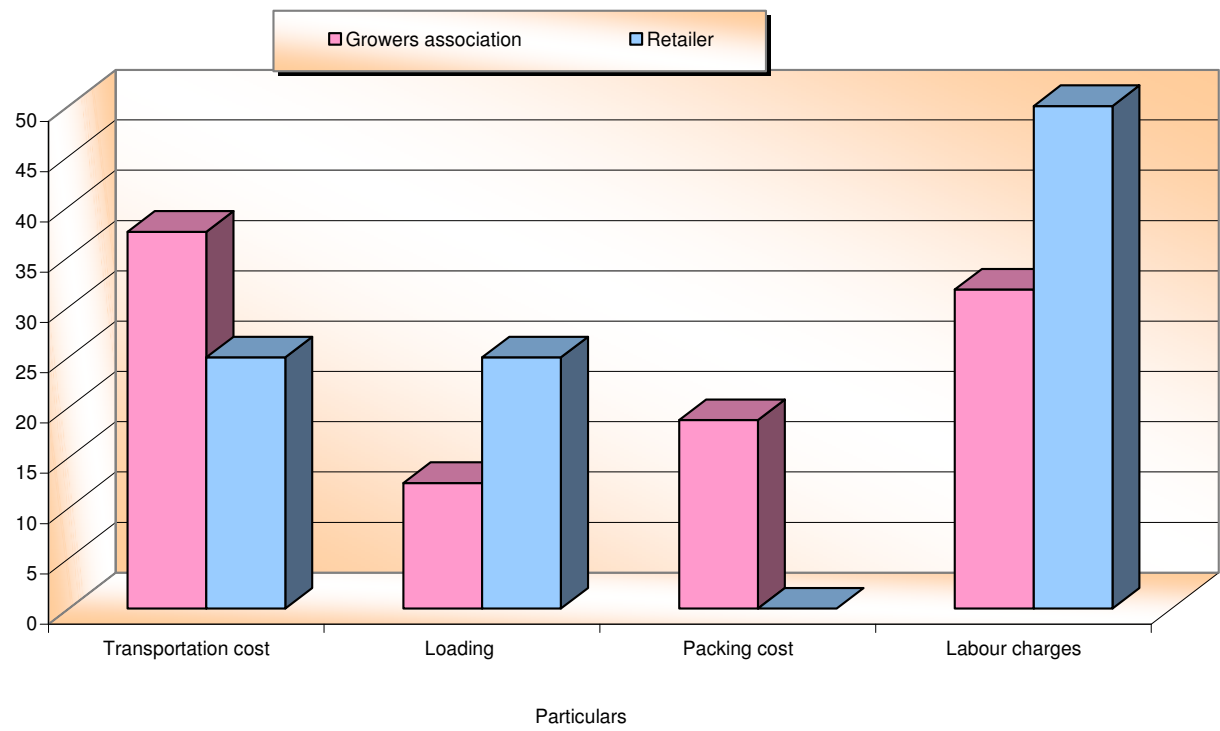


Fig. 4. Marketing cost incurred by growers association and retailer

Fig. 4. Marketing cost incurred by growers association and retailer

Table 4.13 Price spread in marketing of orchids

(Per box of 100 spikes)

Sl. No	Particulars	₹/-	% Share in consumer's price
1	Producer selling price to grower association	1500	50
2	Deduction made by vide Table (4.12)	270	9
3	Producers price	1230	41
4	Growers association purchase price	1500	50
5	Growers association selling price	1500	50
a	Commission obtained by growers association	225	7.5
b	Marketing cost incurred by growers association	160	5.33
6	Profit of growers association	65	2.17
7	Retailer purchasing price	1500	50
8	Marketing cost incurred by retailer	200	6.67
9	Retailer selling price	3000	100
10	Retailers profit	1300	43.33
11	Price spread	1770	59
12	Producer's share in consumer rupee		41

Table 4.14 Problems faced by farmers in production of orchid flowers

Sl. No	Particulars	Sum of the scores	Mean	Ranks
1.	Lack of credit facility	3708	74.16	I
2.	Lack of technical guidance	3625	72.5	II
3.	High cost of planting material	3207	64.14	III
4.	High incidence of pest and diseases	2716	54.32	IV
5.	High rate of plant protection measures	2656	53.12	V
6.	Non-availability of pesticides and insecticides	2029	40.58	VI
7.	Non availability of skilled labour	1824	36.48	VII
8	High cost of maintenance	1771	35.42	VIII
9	High wage-rate	988	19.76	IX

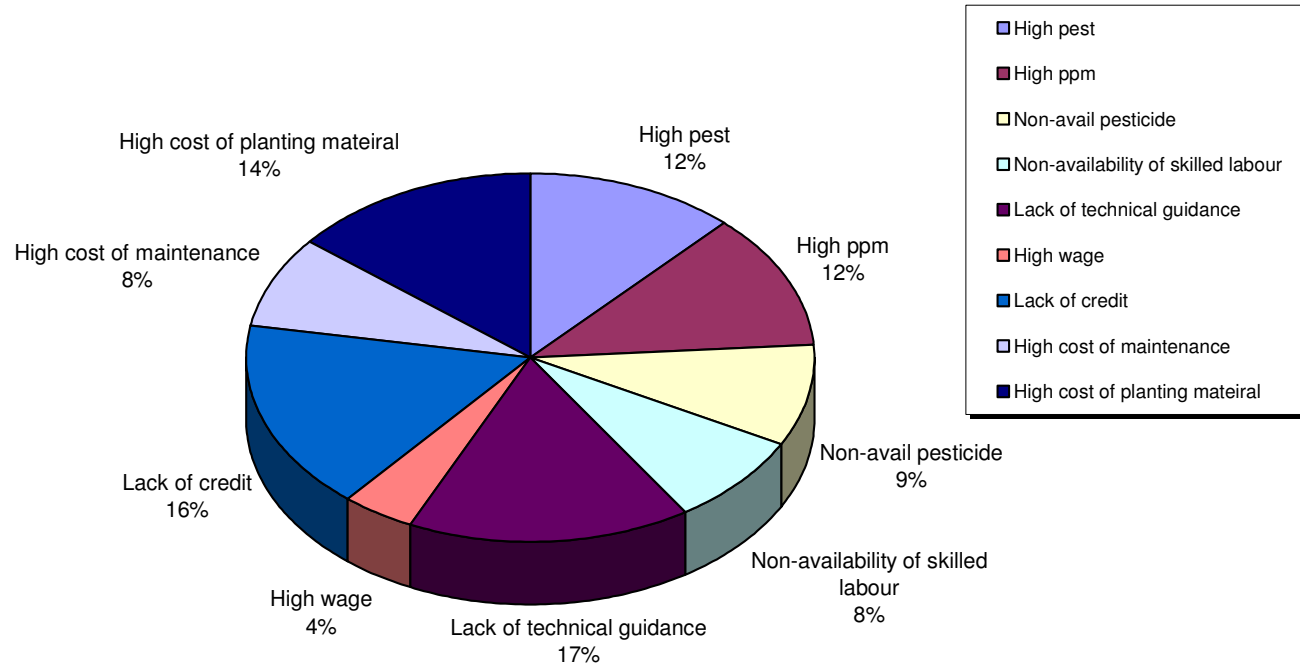


Fig. 5. Production problems encountered by orchid growers

Fig. 5. Production problems encountered by orchid growers

Table 4.15 Problems faced by farmers in marketing of orchid flowers

Sl. No	Particulars	Sum of the scores	Mean	Ranks
1.	Lack of market information	3798	75.96	I
2.	Lack of grading and standardization	3314	66.28	II
3.	Lack of incentives from government	3159	63.18	III
4.	Low demand in local market	3003	60.06	IV
5.	Lack of regulated market	2524	50.58	V
6.	Problems in transportation	2227	44.54	VI
7.	Lack of adequate storage facility	1779	35.58	VII
8.	High commission charges	1520	30.4	VIII
9.	High packaging cost	1127	22.54	IX

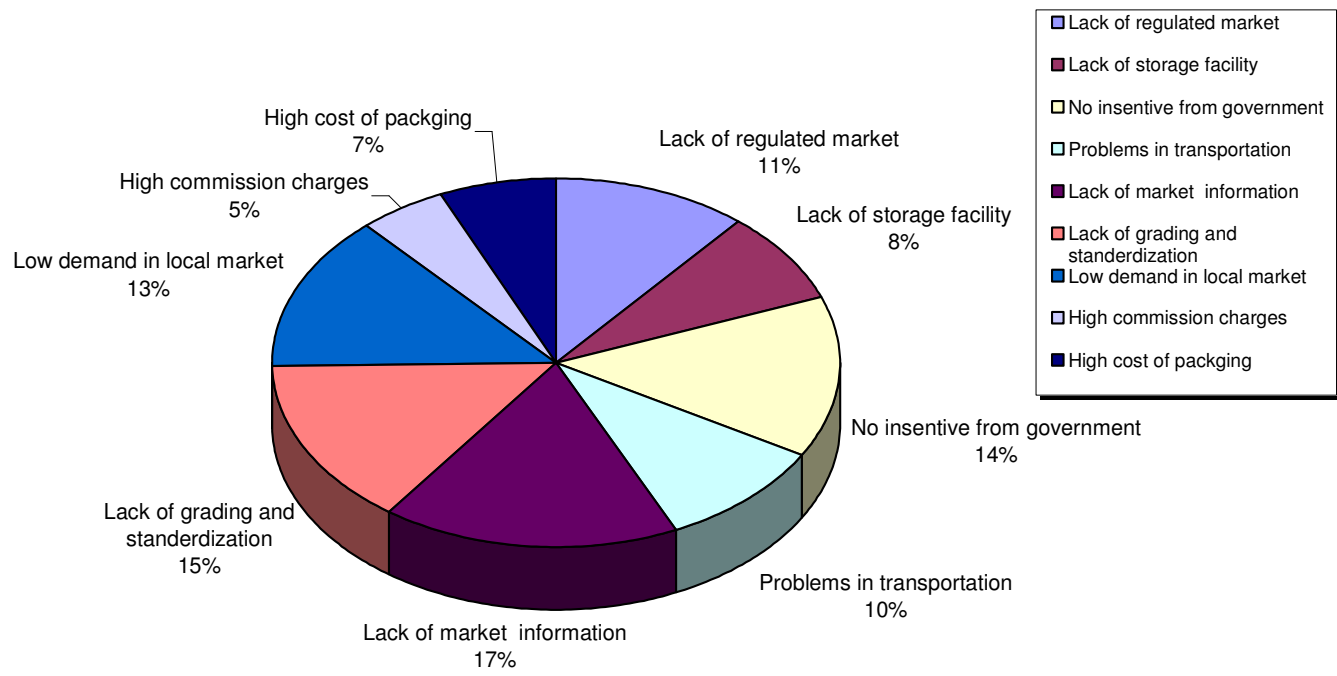


Fig. 6. Marketing problems faced by orchid growers

Fig. 6. Marketing problems faced by orchid growers

5. DISCUSSION

The results of the investigation presented in the previous chapter were discussed in this chapter. It throws light on the possible causes for the results in the study. This analysis is hoped to identify some of the policy measures and execute corrections that can be implemented to overcome the constraints encountered by orchid growers in the area of production and marketing management. Keeping objectives of the study in view, the results are discussed under following heads.

- 5.1 General characteristics of orchid growers
- 5.2 Documentation of different orchids produced in Uttar Kannada district
- 5.3 Investment pattern and maintenance cost in orchid production
- 5.4 Cost and return structure in orchid cultivation in Uttar Kannada district
- 5.5 Financial feasibility of investment in orchid gardens
- 5.6 Marketing management of orchids
- 5.7 Constraints in production and marketing of orchids

5.1 General characteristics of respondents

The general characteristics of the respondent farmers in the study area are presented in Table 4.1. From the Table, it could be observed that the average age of the orchid growers was about 50 years. Orchid is a high value crop and its cultivation requires more experience compared to other crops. Elderly and experienced farmers involved in production and marketing of the crop shows the relative importance of experience that is required in cultivation and marketing of the produce.

This was clear evidence that the risk of failure of the crop giving in the hands of young and inexperienced was avoided in the study area as the cultivation and marketing management was mostly done by the experienced people. As far as literacy was concerned, it was observed that all the respondents were literates ranging from primary to degree level. Orchid production is a high value enterprise, as has been perceived by these respondents because of its higher profitability. Because of their increased standard of living all the respondents could peruse better and higher level of education.

Although main occupation of the respondent farmers were agriculture, but some farmers were doing business and job. The average size of land holding was 1.65 ha. Orchid is a highly remunerative crop and at the same time requires huge initial investment. Low investment capacity of the farmers in these regions compelled to them to cultivate the crop in a smaller area. Most of the farmers were growing Sonia-16 and Sonia-28 varieties. These varieties were preferred by growers due to its special characters like shelf life (30 days), more yield, high demand in the retail market and best suitability to the climate. The plant population was 1000 plants per gunta.

5.2 Documentation of different orchids produced in Uttar Kannada district.

It was observed from Table 4.2 that Sonia-16 and Sonia -28 varieties were grown in large areas as compared to Singapore white, Singapore red and Burana jade varieties. Sonia-16 and Sonia-28 varieties have very high market demand in the terminal market and also have a shelf life up to 30 days whereas, Singapore white and Singapore red varieties having shelf life of 10-15 days and are having attractive colours. The farmers in Uttar Kannada district have to transport their product to the distant Panaji, Vasco and Madgaon markets of Goa state through Kan Flora Flower Growers Association, Sirsi. Hence, shelf life has become an important factor to decide about the varieties grown by the farmers. Burana jade variety is having less market demand hence, it is cultivated only in small parcels of land. Yielding ability is another factor which was also considered by the farmer to opt for Sonia-16 and Sonia-28 varieties as the yield more than 8 spikes / plant against 5-6 spikes in case of varieties of Singapore variety.

5.3 Investment pattern and maintenance cost in orchid production

The investment pattern in orchid is similar to the one found in any plantations or orchards. Heavy investment is needed for establishing of orchid house for cultivation. The cost of establishing orchid house up to bearing can be broadly classified into establishment cost and maintenance cost. So, the establishment cost included not only the costs incurred in the first year that is at the time of planting but also the costs incurred in maintaining the plants till the time of bearing that is up to one year of planting.

For establishing, orchid house investment has to be made on construction of green house, well, pipe line, pump set, pump house, plant material, sprinklers, foggers, sprayer, baskets and trolley and these costs together constituted the material costs of establishment. These costs have to be invested during the year of establishment of the green house and are considered as the costs incurred during first year in the study. Up to one year orchid growers has to maintain the orchid plants by applying fertilizers, manures, chemicals and irrigation, etc. The costs incurred by the farmers on all these items up to one year are grouped together as cost of maintenance.

The total costs of establishment (Table 4.3) were found to be ₹ 2 32,920 per gunta of which material costs constituted 94.67 per cent and maintenance costs 5.33 per cent. The construction of green house, well and planting material formed the bulk of the material cost of the total establishment cost.

The maintenance cost per year up to bearing stage was found to range from 5.33 per cent. This showed that during the establishment period plants require input factors like labour, manures, fertilizers and plant protection chemicals. Hence, the study indicates that the amount required for establishing one gunta of orchid garden is around ₹ 2, 50,000. The financial institutions like Cooperatives, Commercial Banks and Regional Rural Banks (RRB's) in agricultural finance for orchid cultivation can take this as supportive project cost to fix up the credit limit.

5.3.2 Maintenance cost of orchid garden during gestation period

The maintenance cost during gestation period mainly comprises of labour cost for various operations. These operations are very much essential during gestation period and hence, there is no possibility of economising under these costs if at all to reduce the cost of maintenance under gestation period.

The major material costs during gestation period were towards fertilizers and plant protection chemicals. These two put together account for ₹ 4500 per gunta during gestation period. On an average a gunta of orchid garden needs ₹ 12,420 for the maintenance of the garden till bearing.

5.3.3 Maintenance cost of orchids in different age group gardens during bearing period

The findings of the study revealed that the overall total cost of maintenance per gunta per year was ₹ 11,860 for second year age group gardens ₹ 14,360 in four to nine years age group gardens. This increase in the total cost was due to the combined effect of increased use of labour and material inputs in the age of the plants advanced. Among material costs plant protection chemicals was high indicating that orchid flowers are more susceptible to pest and diseases right from bud formation till the life of flowers which affects the quality of the flowers yielded. The orchid farmers had to take up prophylactic (preventive) measures regularly to maintain the market value of the flowers. Hence, among material inputs, the cost of plant protection chemicals was the most prominent which formed around 18 per cent of the total maintenance cost.

The quantity of fertilizers recommended per gunta of 1000 plants is 3 kg, 1 kg and 2 kg (20:20:20) N, P₂O₅ and K₂O, respectively. The quantity of these fertilizers used per gunta was the same for all age group of plants. Thus, these findings indicated that the respondents had applied recommended level of nitrogen, phosphorus and potash which helped to get good yields.

The cost of labour required to perform different operations per year during bearing was ₹ 8160 in second year, the same was increased up to 9360 during five to nine years age group of garden. However, higher requirement of labour (312 man hours was required during 4th to 9th year of orchid garden because more labour are required for harvesting as the yield increases during this period.

The use of labour per gunta for application of fertilizers and manures of orchid's flowers was maximum 90 man hours. This might be due to the fact that orchid flowers required more fertilizer application i.e. in four times in a week to get good yield.

5.3.3 Cost of production of orchids in different age group of gardens during bearing period

The important component of cost of production of orchid in different age group of gardens during bearing period presented in Table 4.6. The annual total cost per year, per gunta increased from ₹ 71,945.46 in the second year age group to ₹ 82,922.64 in 3rd year and ₹ 90,864 in five to nine years age group gardens. The increase in the cost of production was due to combined effect of increase in labour cost increases as well as was increase in marketing costs. However, the fixed costs remained more or less the same among the different age group of plants.

The cost of harvesting and management of spikes in the orchid gardens increased with the age of the garden due to increased yield of spikes. The gardeners had to engage more labourers for harvesting of spikes for this increased yield, which has led to increased labour cost in the later years of orchid gardens. Similarly the increased yield has also resulted in hike in the marketing cost during the same period in terms of increased commission charges, transportation and packing cost.

Commission charges were paid by the growers to the Kan Flora Flower Growers Association at a rate of ₹ 225 per box (Table 4.11). Out of this commission charges the growers association spent ₹ 160 (Table 4.12) towards transit cost to the distant retail market. Still a margin cost ₹ 65 (Table 4.13) would be retained at the association level for each box sold by the growers. This is the area where the association can think of economising the marketing cost incurred by the growers.

The commission charges constituted a big chunk in the marketing costs amounting to ₹ 21,937.5. The increase in commission charges was mainly due to the increase in income as a result of increase in quantity of flowers produced with the growth of plants. So it was imperative that the commission charges have to be reduced and the concerned policy makers have to take suitable measures to reduce the commission charges and help the farmers to get a larger share of the consumer's rupees.

Subramanyam (1989) on jasmine (kakada) also supported the above findings.

5.4. Cost and returns from different varieties of orchids in different age group gardens during bearing period.

The cost of production and selling price were same in all the varieties. But the yields were varied with different varieties.

5.4.1 Cost and returns from Sonia series orchids in different age group of orchid gardens during bearing period.

The quantity of spikes produced and gross returns realized annually per gunta over different costs have been discussed in this section (Table 4.7).

The annual gross return realized per gunta, ranged from ₹ 1, 20,000 in second year to ₹ 1, 65,000 in five to nine years age of plants. It was interesting to note that the gross return over a period of time was found to be increasing from second year onwards till the end of ninth year.

The increase in the gross return was due to increase in the yield of spikes. (i.e. 5 to 9 years.) Usually orchid plant bear 3-4 spikes during early ages of the garden and such value at ₹ 15 on an average while the plants of old aged gardens would contain 7-8 spikes.

The net return was increasing over period of time., the same was ₹ 46,704 during second year to ₹ 74,136 during four to nine years age group gardens. However, higher net returns are obtained at the older gardens because of the reason already stated.

5.4.2. Cost and returns from Singapore series orchids in different age group of gardens during bearing period

The cost and return structure of Singapore series orchid variety in different age group are presented in Table 4.8.

The Sonia orchid plants yield was 7600 spikes per gunta in second year and it increased to 10500 spikes per gunta in five to nine year age group of plants.

The net returns accounted to ₹ 40,704 during second year to ₹ 66,636 in five to nine year age group of orchid plant. The selling price at the producer level is based on per spike depending on the number of flowers in each spike. On an average ₹ 15 was obtained by the producers for each spike grown.

The gross returns worked out to be ₹ 1, 14,000 in the second year to ₹ 1, 57,500 during 5-9 years.

5.4.3 Cost and return structure of Burana jade variety during bearing period.

Burana jade variety can bear 25-30 flowers per spike. It can go up to 40 flowers per spike. But it had less market demand and fetched fewer prices comparative to the other variety grown by the farmers in the district.

It could be seen from Table 4.9 that the average total yield of Burana jade orchid variety obtained by the orchid growers worked out to be 8500 spikes during second year and increased up to 11500 spikes per gunta in five to nine year age group of plants. The selling price was ₹ 15. Gross returns worked out to be ₹ 1, 27,500 in the second year to ₹ 1, 72,500 during 5-9 years. Hence, a net return generated from one gunta of Burana jade orchid production was around ₹ 54,204 during second year to ₹ 81,636 in five to nine years age group of garden.

It could be summarised that Sonia series grown by more farmers, because as it is having more demand in market and high shelf life. Eventhough Burana jade yields more but, cultivated in by less number of farmers.

5.5 Financial feasibility of investment in orchid cultivation

To evaluate the feasibility of investment in orchid enterprise, the evaluation criteria such as Net Present Value (NPV), Benefit-Cost Ratio (BCR), Pay Back Period (PBP) and Internal Rate of Return (IRR) were employed. This analysis is considered for the orchid farmers of Sonia variety as this variety was largely grown in the study area.

5.5.1 Net Present Value (NPV)

In this study the Net Present Value (NPV) was positive ₹ 3, 05,931 at 9 per cent discount rate for orchid enterprise (Sonia variety). The formal selection criterion of NPV is to accept all the projects with positive values. Applying this principle, Net Present Value (NPV) of orchids clearly indicated its financial soundness and economic feasibility(Table 4.10).

5.5.2 Benefit – Cost Ratio (BCR)

This criterion indicated the return per rupee invested in orchid enterprise and wise investor always expects a higher ratio. The Benefit – Cost Ratio (BCR) in the present study was found to be 2.31 which indicated that each rupee invested in orchid enterprise yields ₹ 2.31 returns. Thus, it could be concluded that investment in orchid cultivation was economically feasible and financially viable. Similar findings were reported by Neeraja devi (1990) in which the Benefit – Cost Ratio (BCR) for investment pattern in jasmine gardens in Bangalore district was 2.3.

5.5.3 Internal Rate of Return (IRR)

It indicates average earning power of the money invested in the project. In the present study, the Internal Rate of Return (IRR) was found to be high (32.02%) as compared to the bank rate of interest which is around 9 per cent. Hence, it could be inferred that the investment in orchid enterprise was found to be economically feasible, financially sound and highly profitable.

The study related to perennial crops by Krishnaraja (1981) on arecanut (27%), showed that the Internal Rate of Return (IRR) was much higher than the discount rate used for evaluating the perennial crops.

5.5.4 Pay Back Period (PBP)

The period required to recover initial investment incurred in establishing orchid house was found to be 3.45 years. This clearly indicated that a shorter period of three and half years would be required to get back the initial investment made in orchid gardens. The Pay Back Period (PBP) in flower crops was found to be lower than that of other perennial horticulture crops such as areca nut (with gestation period of 7 years) by Krishnaraja (1981). Subrahmanyam (1982) had observed that pay back period in the case of Coorg Mandarin in Karnataka was nine years. From this it could be concluded that pay back period of orchid cultivation was shorter than that of other perennial crops. However, this criterion does not take into account the returns generated after Pay Back Period (PBP) and the time value of money.

5.6 Marketing of orchids

5.6.1 Marketing channels

As indicated in the results, the only one channel of marketing of orchid was identified in the study regions. Channel consisted of sale of produce by the producer to the Kan Flora Flowers Growers Association to the retailers in the distant whole sale market as there was practically no local market for the orchid.

Channel: Grower _ Kan Flora Flowers Growers Association _ Retailer _ Consumer

In the channel grower himself brought the produce to grower's association premises after packing. The growers association sort the flowers according to the number of flowers per spike, spike length, colour and variety and sell them to the retailers at distant market. The retailers sell the flowers to the individual consumer or flower merchants according to their demand. The growers association charge ₹ 225 per box to the producers for the services it renders.

5.6.2 Marketing cost incurred by the market intermediaries

Analysis of the marketing cost incurred by the market intermediaries are presented in Table 4.12.

Total marketing cost incurred by grower's association per box was ₹ 160 of which transportation cost (37.50 %) contributed more to the total cost of marketing because growers association will make arrangements to transport orchids to the distant markets situated in Panaji, Madgoa and Vasco of Goa state. Labour charges, packing and loading were the other marketing cost incurred by the growers association to the extent of ₹ 50, ₹ 30 and ₹ 20 respectively for each box transported. Next major cost was labour cost (31.25%). Other cost contributes comparatively less to the total marketing cost like loading (12.50%), and packaging charges (18.75%).

Total marketing cost incurred by the retailer is also presented in Table 4.12. Retailer paid high labour charges (50%), remaining cost includes loading (25%), transportation cost (25 %). Total marketing cost incurred by the retailer was ₹ 200.

5.6.3 Price spread in marketing of orchid flowers

The total marketing cost incurred by the producer accounted for 9 per cent of consumer's price. Out of this, major portion was (₹ 225/box) paid as commission to growers association.

Hence, net price received by the producer was only around 41 per cent of the consumers price. Growers association spends around ₹ 160 on each box of orchids. Out of ₹ 225 commission that it collects from the growers. It means growers association saves ₹ 65 on each box which it can conveniently reduced by economising its operations and can help to increase of share in consumer's rupee.

But of all, the retailers margin was the matter of great concern. Retailer purchasing each box of orchids ₹ 1500 and make around ₹ 3000 it by retail sale. In other words, retailers earn ₹ 1300 on each box of orchid sold. Here is the scope to increase the producer share in consumer rupee. It is learnt during the study that farmers association preferred to sell the commodity to the retailers at the distant market because uncertainty in the retail prices in the terminal market. Their problem is much more complicated because of the inability of the association to meet the required quantity of required variety on given day. Therefore, they have to sell at whatever price the retailers quotes while purchasing their product. The flower is in very less demand in the local market. Therefore, the growers are under the mercy of the retailers at a distant market (Table 4.13).

5.7 Constraints in production and marketing of orchids

5.7.1 Problems faced in production of orchid flowers

The orchid grower's responses revealed the problems in production of orchids were subjected to Garrett Ranking Technique to organise them based on the relative importance of the problem. The results of the opinion survey presented in Table 4.14 are discussed here.

Among the nine factors considered, lack of credit facility, lack of technical guidance, and high cost of planting material were the major problems. As the flower cultivation has been a highly capital intensive enterprise, the farmers had taken up this enterprise on a small scale. The planting materials of orchids are to be transported from distant areas like Chennai and Bangalore where the transportation and labour cost of planting material use to be very high. Growers association can think of developing planting material and supply them to the members of the association at cheaper rates in order to bring down the cost of cultivation.

Other problems like non-availability of pesticides, high rate of plant protection measures, non availability of skilled labour, non-availability of pesticides are not so serious which can be rectified locally by collective action.

5.7.2 Problems in marketing of orchid flowers

The farmers revealed that with the marketing of orchid they have problems. Totally nine problems were considered for analysis.

The opinion survey was conducted regarding the problems faced by the farmers in marketing and were subjected to Garrett's Ranking Technique. The results of the opinion survey presented in Table 4.15 are discussed here.

Garrett's Ranking Technique revealed that with respect to marketing problems among nine problems, the lack of market information, lack of grading and standardization were the major problems. Efforts on part of growers association to identify the markets for the commodity in other destination and also introduce grading and standardization in marketing of the commodity would improve the condition of marketing and would improve marketing efficiency.

There is also necessity to strengthen market information and intelligence system through growers association. So that growers would be in a position to know the day today prices of orchids in distant terminal is would help in improving the terms of trade between growers association and retailers. So that a more favourable situation created in which growers can retain lions share in consumer rupee. Co-operative and coordinated effort in this line is also essential on part of growers association.

6. SUMMARY AND POLICY IMPLICATIONS

Orchids are most fascinating and beautiful of all flowers. They exhibit a wide range of diversity in form, size, colour and texture of flowers beyond the imagination of human mind. This manifold and perplexing range of floral structures arouse our highest admiration. Orchids constitute an order of royalty in the world of ornamental plants and they are of immense horticultural importance and play a very useful role to balance the forest ecosystem.

The evolution of orchid culture from hobbyist to commercial grower is very slow as most of the orchids collected from different regions do not adapt to local conditions, and hence died. The methods of propagation are not known and most of the orchids which flower under utmost care were found to be self sterile. Further, it is difficult to germinate the seeds, which lacks any functional endosperm. The seeds sown in the nursery beds require long period of germination and any disturbance to the soil or physical environment destroy the whole population.

The major developments in cultivation of orchids in the world have been due to modern scientific technology which has been suitably used in case of orchid seed germination and meristem culture. Today orchids are grown on assembly- line method in extensive glasshouses with controlled environment and the sale of orchid flowers runs in millions of dollars. The modern methods of propagation have brought orchid cultivation on par with other commercial crop.

Orchids have emerged as an important constituent in the global cut flower trade. Cymbidium, Dendrobiums, Phaphilopedilums, Phalaenopsis, Vandas, Cattleyas, and Orchidiums are the types especially used for cut flower production. Over all, orchids have gained immense popularity in both domestic and international market as they possess long vase life and have inherent therapeutic value. India accounts for nearly 7 per cent of world's genetic diversity contributing 1300 species of orchids. The distribution pattern of orchids in India shows that they are mostly inhabited in Western Ghats and Andaman and Nicobar group of Islands.

Orchids belong to the family Orchidaceae. The family Orchidaceae contains the largest number of species than any other family of flowering plants, with possibly as many as 25,000 species. Orchids have been occupying a pride place in horticulture and floriculture not only for their aesthetic value but also for their therapeutic value right from the Vedic Age. Proportionately orchids take eight percent of the total flower market in the world with Thailand contributing almost 85 per cent of total orchid trade. Sri Lanka and Malaysia are the other major contributors. Cymbidium has the highest demand, followed by Dendrobium, Phalaenopsis, Oncidium, Vanda and Mokara. Though, India is blessed with all varied climatic conditions of the world, it has not made any head way in cut flower production for both the international and national markets.

They are most pampered of the plants occupy top position among all the flowering plants valued for cut flower production and potted plants. They are known for their long lasting and bewitchingly beautiful flowers which fetch a very high price in the international market.

Cultivation of orchids has become a very profitable occupation as it is one of the most important ornamental plants. Development of new hybrids and commercial production of cut flowers in orchids has expanded tremendously. Presently, orchids are grown as subsidiary crop in major producing area. So there is vast market potential in the domestic and export market which is yet to be tapped. There is tremendous scope for orchid improvement and development of industry based on these wonderful plants. The findings of the study would be helpful to policy makers and researchers for applying to similar conditions prevail. This would throw further light on the avenue for future research in the area of floriculture in general and orchids in particular. Due to the diversity of environmental condition in India, it is possible to grow all types of orchids in suitable places in open conditions without creation of any artificial environment.

The present study has been designed to undertake the problems on orchid cultivation, production and marketing system with special emphasis to generate information concerned to the orchid production and its marketing management and to estimate the cost, returns and net profit in cultivation of orchids in Uttar Kannada district.

The analysis of marketing efficiency would be useful indicator to select the most profitable marketing channel which is one of the prime ingredients in making marketing decision.

Specific objectives of the study

- 1) To document the different orchids produced in Uttar Kannada District.
- 2) To analyze the investment pattern in orchid production in Uttar Kannada district.
- 3) To estimate the cost and returns in production of different orchids.
- 4) To analyze marketing management in orchid production.
- 5) To study the problems faced in the production and marketing of orchid.

Methodology

Since the numbers of cultivators of orchids in the district were very small, the entire population was considered for the study. In all about 50 orchids growing farmers were identified for eliciting detailed information with regard to production and marketing aspects of the crop.

In order to accomplish the various objectives outlined for the study, the research was exclusively based on primary data. The data were collected from the orchid growers on various aspects at production and marketing at the crop with the help of pre-tested, comprehensive questionnaire exclusively designed for the study. The respondents were interviewed personally to elicit the information required for the study.

Analytical tools and techniques employed

Cost of production, marketing cost and profit accrued to the farmers were worked out and presented in the tabular form. In order to know the financial feasibility of investment in orchid cultivation the measures of project evaluation namely, Net Present Value (NPV), Benefit Cost Ratio (BCR), Pay Back Period (PBP) and Internal Rate of Return (IRR) were employed. Garrett's Ranking Technique was used to analyze the problems faced by the farmer respondents.

Findings:

1. It was found that the farmers were growing mostly Dendrobium species. These are Sonia-16, Sonia-28, and Singapore white, Singapore red and Burana-jade. Most of the farmers grown Sonia varieties as those varieties are having high market demand, high yield and high shelf life.
2. The cost of establishment per gunta of orchid cultivation was found to be ₹ 2, 32,920 of which material cost and maintenance cost constituted 94.67 and 5.33 per cent respectively.
3. The investment appraisal analysis revealed that the Pay Back Period (PBP) was found to be 3.45 years The Net Present Value (NPV) of investment for the orchid enterprise was found to be ₹ 3,05,931 per gunta at 9 per cent discount rate. The discounted Benefit Cost Ratios (BCR) was found to be 2.31 and the Internal Rate of Return (IRR) was found to be 32.02 per cent.
4. The marketing cost incurred by the growers sold to the growers association for each box (100 spikes) was ₹ 270. The study revealed that commission charges, transportation costs and cost of packing material were the major components of marketing cost incurred by the orchid growers.
5. The cost of marketing incurred by the intermediaries for each box was ₹160 which include labour charges, loading, packaging cost and transportation cost.
6. Only one marketing channel was identified for the marketing of orchid flowers in Uttar Kannada district wherein produce were transferred from growers to growers association to retailers at distant market and then to consumers.

7. The producer's share in consumer's rupee in marketing channel was found to 41 per cent. The total marketing cost incurred by producers accounted for 9 per cent of consumer's price. The total marketing cost incurred by intermediaries amounted to ₹ 160. The price spread in the channel was ₹ 1770 (59%). Share of retailer amounted to ₹ 1300 (43.33%).
8. The farmers expressed that lack of credit facility, lack of technical guidance and cost of planting material were the major problems in orchid production followed by high incidence of pest and disease, high rate of plant protection measures, non-availability of pesticides and insecticides, non availability of skilled labour, high cost of maintenance and high wage rate.
9. Lack of market information, lack of grading and standardization, no incentives from government, low demand in local market, and lack of regulated market were the major problems faced by the orchid growers in marketing of orchids.

POLICY IMPLICATIONS

- 1) The returns of the production of orchids grown by farmers reveal that majority of them were cultivating Dendrobium species on a large scale compared to other varieties. In view of the large Export and Domestic market potential, the farmers may be advised to cultivate such varieties with scientific technology and in respect there is need to strengthen R& D facilities and export policies to boost cultivation of such varieties.
- 2) In view of higher profitability in the production of orchids as revealed by the analysis, the farmers may be encouraged to increase productivity and area through farmer incentive programmes like developing adequate raw material, cold storage, efficient transportation combine with adequate marketing information to farmers.
- 3) The result of the study revealed that the producer's share in consumer's rupee was found to be very less, as the farmers were incurring high cost of production and marketing cost. The producer share could be increased through efficient methods of cultivation, provision of input incentives and encourage farming orchid growers association at village/taluk level and creating exclusive market for such high value products.
- 4) The results also shown that the investment in the orchid cultivation has been exorbitant to the extent of ₹ 2.5 lakh as initial investment which poses difficulty for other farmers to invest, hence there is need to encourage investment through interest free /subsidy scheme and other government policies for encouraging investment in orchid cultivation.
- 5) The results on the study of problems faced by the orchid growers revealed that the lack of credit facilities found to be highest order for which the local banks can come forward to advance soft loans in view of the existing potential for orchids flower. Other problems such as technical guidance, grading and marketing information bottlenecks can be over come through establishing an exclusive marketing organization to boost orchid cultivation and promote its products.

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APPENDIX I

Production and Marketing Management of Orchids in Uttar Kannada District Farmers Schedule

I. General Information

a) Name of the orchid cultivator:

b) Age:

c) Village:

d) Taluk:

e) Education:

2) Total Area of orchid cultivation:

S.No	Variety	Spacing	Area cultivated (in gunta)	Bearing area (in gunta)	Reasons for cultivation of particular area

3) Year of establishment:

4) Method of adoption: Open/Closed?

5) No of orchids plants per gunta

6) Experience in cultivation

II) Land holdings

a) Operational land holdings (in acre)

Types Of Land	Owned	leased-in	leased-out	Total
1)Dry				
2)Irrigated				
3)Garden				
Total				

b) Orchid cultivated

1) Irrigated area

2) Unirrigated area (Rainfed)

c) Particulars of orchids

Variety	Area	Yield	Selling (₹ /spike)

d) Land rent/gunta(₹)

Dry land :

Irrigated land :

Garden land :

e) Labour wages (₹/gunta/day/week)

Male :

Female :

Bullock pair :

f) Sources of irrigation

Sl. No	Particulars	No	Area covered	Crops
1)Well				
2)Tube well				
3)Others				

III) Investment pattern in orchid production

A) Initial investment (cost during zero year) (per gunta)

a) Orchid house

I) Type: Closed /Open structure

II) Materials used for construction of structure

Material	Quantity(No's)	Price(₹)	Total(₹)
1)Poles, Wires			
2)Shade net			
3)Labour cost i)Bed preparation ii) Orchid house construction iii)Planting			
3)Others i) ii)			

III. a) Inventory of farm machinery and equipments

S.No	Name of the machinery/ equipments	No of years of service	Purchase value (₹)	Junk value (₹)
1.	Land development			
2.	Farm buildings			
3.	Pipeline			
4.	Pump set			
5.	Pump house			
6.	Sprinklers/Irrigation equipment			
7.	Sprayers			
8.	Water storage tank			
9.	Fogger			
10.	Harrow			
11.	Piaxe			
12.	Spades			
13.	Agriculture sickels			
14.	Baskets and Trolley			
15.	Drip irrigation			

a) Material inputs

Particulars of inputs	Quantity	Price (₹)
a)Planting material		
1)Sand		
2)Charcoal		
3)Bricks		
4)Coir pith		
4)Others(if any)		

IV) Establishment cost till bearing (up to 1year)/ Maintenance cost

A) Labour requirements

B)

Operations	Labour						Machine		Bullock pair		
	Family			Hired			Owned	Hired	Owned	Hired	
	M	F	C	M	F	C					
1)Pot filling											
2) Planting											
3)Irrigation											
4)Weeding											
5)Reporting											
6)PPC application											
7)Fertilizers application											
8)Harvesting											
9)Others											

M: Male F: Female C: Children

C) Material costs

Particulars	Quantity	Price (₹)
1)Fertilizers		
N		
P		
K		
2)Micro nutrient		
3)Plant Protection Chemicals(PPC)		
4)Others (if any)		

D) Return for orchids

Age group of gardens	Variety	Yield(spikes/gunta)	Sale price/Spike (₹/)	Gross return (₹/)	Net returns (₹/)
1					
2					
3					
4					
5					
6					

V) Marketing management

a) Particulars of sales by orchid growers through agency system

Agencies to whom sold	Frequency of sale	Total quantity sold	Sale price (₹)	Marketing cost				
				Cleaning charges	Loading and unloading charges	Transportation charges	Commission charges	Others

b) Particulars of sales(self marketing) by orchid growers directly to the consumers

Agencies to whom sold	Frequency of sale	Total quantity sold	Sale price (₹)	Marketing cost				
				Cleaning charges	Loading and unloading charges	Transportation charges	Commission charges	Others

c) Grading and Standardization

a) Whether the produce was graded? Yes/No?

If yes:-

- 1) The basis of grading:
- 2) Number of grades:
- 3) Whether it was done at the market/field?
- 4) Labour required and amount spent

- 6) Details of packing (for sale in the market)
- Method of packaging: (Polythene sheets/ Basket/Box)
 - Capacity of the pack
 - Number of packs required for packing the produce
 - The cost of packing material
 - Who bears the cost of packing material?
 - Cost incurred by producer
- a) Maintenance cost
- VI) Production problems encountered by orchid growers

S No	Problems	Ranks
1.	High incidence of pest and diseases	
2.	High rate of plant protection measures	
3.	Non-availability of pesticides and insecticides	
4.	Non-availability of skilled labour	
5.	High wage rate	
6.	High cost of planting material	
7.	Lack of credit facility	
8.	Lack of technical guidance	
9.	High cost of maintenance	

VII) Marketing problems faced by farmers.

S No	Particulars	Ranks
1.	High packaging cost	
2.	Lack of regulated market facility	
3.	Lack of storage facility	
4.	No incentives from government	
5.	Problems in transportation	
6.	Lack of market information	
7.	Lack of grading and standardization information	
8.	Low demand in local market	
9.	High commission charges	

APPENDIX II

GARRETT RANKING CONVERSION TABLE

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

Per cent	Score	Per cent	Score	Per cent	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		

PRODUCTION AND MARKETING MANAGEMENT OF ORCHIDS IN UTTAR KANNADA DISTRICT

SHREEDEVI B. C.

2012

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ABSTRACT

Orchids are most fascinating and beautiful of all flowers and have emerged as an important constituent in the global cut flower trade. Uttar Kannada district is purposively selected as it is one of the major orchid growing region. In all about 50 orchids growing famrers were identified for eliciting detailed information with regard to production and marketing aspects of the crop. The study conducted was exclusively based on primary data. For analysis of data tabular presentation method and financial analysis were adopted. Most of the farmers grown Sonia varieties as those varieties are having high market demand, high yield and high shelf-life.

The total cost of establishment per gunta was ` 2,32,920. The investment appraisal analysis revealed that the Pay Back period (PBP) was found to be 3.45 years. The Net Present Value (NPV) of the investment for the orchid enterprise was found to be ` 3,05,931 per gunta at 9 per cent discount rate. The discounted Benefit Cost Ratios (BCR) was found to be 2.31 and the Internal Rate of Return (IRR) was found to be 32.02 per cent. The producer's share in consumer's rupee was found to be very less, as the farmers were incurring high cost of production and marketing. The producer's share could be increased through efficient methods of cultivation, provision of input incentives and encouraging orchid growers association at village/taluk level and creating exclusive market for such high value products. Lack of credit facility and high cost of planting material were the major problems in production of orchids. Similarly in marketing lack of market information and lack of grading and standardization were the major problems.