CHAPTER-II
REVIEW OF LITERATURE

Review of literature is an essential part of any research work. In this chapter we have undertaken an extensive survey of literature, connected with the present research problem. For this purpose, we have consulted plethora of academic journals, conference proceedings, government reports, books etc. to present an exhaustive view of the available literature on the research theme and other connected issues. Importantly, since commercialization of floriculture is relatively an emerging activity in India, only a very few studies are available in this area. Despite an impressive growth rate of the floriculture industry in recent years, a comprehensive database and other information is not in place. Database is necessary for better planning for the orderly growth of floricultural activities. While reviewing the existing literature, we have followed chronological order and included all possible studies covering almost all facets of floriculture industry viz. production, area, product varieties, agro-techniques and quality of products, marketing and export connected problems, potential, challenges and threats, strategic planning and policies. Review in this chapter includes studies from India and even abroad.

* Narashimhan et. al. (1976) in a study on flower cultivation and marketing in the environs of Madurai city in Tamil Nadu found
that jasmine was a profitable crop fetching as much as Rs.6,000 as net income per acre per year. Even though the cultivator had to invest a sufficient amount of money in the first year without profit. However, the loss in first year was minimized by intercropping with crops like groundnut or onion which fetched roughly Rs.500 as net income per acre.

* Patel and Hiremath (1985) analysed the economics of integrating production and marketing of chrysanthemum and highlighted the problem confronting the growers and market functionaries in Dharwad district of Karnataka state. A positive association was observed between the size of holding and the proportion of total cropped area under chrysanthemum. The proportion of income from chrysanthemum was found to be nearly 26 per cent for small farmers, 27 per cent for medium and 27 per cent for large farmers. Net profit per kg for chrysanthemum was higher for large farms. The main problem encountered in the production of chrysanthemum was irrigation and limitation of market.

* Subrahmanyam (1986) evaluated the economic aspects of production of chrysanthemum in Kolar district of Karnataka state during 1985. The average cost of production which included marketing costs besides cost of inputs and fixed cost was around Rs.21,500 per hectare, indicating a very high capital outlay needed for
growing this crop. The higher proportion of marketing costs emphasised the need for encouraging self-marketing by cultivators instead of selling to pre-harvest contractors.

* Narayangowda and Gopinath (1987) highlighted the important problems and prospects of floriculture in Karnataka. The major constraints identified were inadequate infrastructure facilities, lack of trained and technical staff, non-availability of planting material, non-existence of scientific marketing system, absence of nursery regulation act, inadequate storage and transport facilities, export-import policy restrictions and lack of proper post-harvest handling techniques. Prospects of floriculture in the state included the lower cost of production of varieties of flower crops. The authors found that there existed scope for export of ornamental bulbs, live plants and dry flowers in addition to cut flowers.

* Katyayan’s (1989) study brought out that flowers are now becoming a commercial proposition of great potentiality. The volume of annual flower business in India runs in crores of rupees. The total area under flower cultivation extends to 20.6 thousand hectares. The states of Karnataka, Tamil Nadu, West Bengal and Andhra Pradesh are leading in floriculture. Karnataka ranks first in flower production in the country with an area of 6.9 thousand hectares and 34.2 thousand tonnes of flowers production during 1997-98. At international level,
Netherlands is ahead in flower trade with an export of Rs.45 crore. In comparison, India's share in international trade is pliable low. The export of flowers in India fetched just Rs.54 lakhs in 1980-86.

* Subrahmanyam (1989) conducted a study on economics of production and marketing of rose in Karnataka. He reported that rose, being perennial crop with an economic life span of 10 years, required about Rs.57.5 thousand for establishing the garden on one hectare of land. From second year onward a sum of Rs.22 to 27 thousand per hectare was required for maintaining the garden depending upon the age group. The total cost of cultivation which included fixed and marketing costs ranged from Rs. 53.0 to 56.6 thousand/hac. The rose crop yielded an handsome return of Rs.36 to 75 thousand per hectare over maintenance cost. The investment in rose crop was found to be economically sound giving benefit-cost ratio of 1.7 to 1.8 with hardly 2 to 3 years payback period.

* Kolavalli, Atheeq and Jacob (1989) conducted an in-depth study on floriculture industry in India to understand the constraints in the growth of the industry. They found that traditional flowers are generally sold through the channels: producer-commission agents - wholesalers - retailers - consumers. Modern flowers passed through fewer intermediaries. They observed considerable deterioration of flowers during transport. Prices were found highly volatile for reasons
of seasonal nature of supply and demand combined with perishability characteristics of the flowers. The authors noted the scope for vertical integration through processing in some flowers like jasmine and rose. The study observed that diversification of existing farming systems through introduction of flowers will act as a big employment and income generating activity in the country. The study has discussed in detail the tremendous potential for the export of cut flowers, foliage plants, bulbs, live plants and other floricultural products. The study has amply stressed over the need for research to improve yields, development of new products and production support to the growers. The planners should strive towards forging a better linkage between research, production and marketing. The major reasons identified for India's lackluster performance were: low quality of produce, lack of production under proper conditions, restrictive trade policies, lack of premium for quality in the domestic market, lack of cold storage facilities, lack of cool chain system, inadequate market intelligence and small scale production etc. The study underscored the need for expansion and the nature of infrastructure available in the country. The new seed policy, inter alia, must permit the import of plant varieties acceptable in the international market. The government, in addition to supporting large scale export-oriented organizations in the industry, should strive to provide support to organizations of small growers. The
government needs to make its own investment in essential facilities at the airports to promote export. The important issues suggested by the author for further research are: (i) the economics of production under controlled environment, (ii) the buyers behaviour in the domestic market for both traditional and modern flowers and estimation of future demand, (iii) identification of zones in India where different flowers can be grown under natural and controlled conditions, (iv) strategies for developing Indian markets and potentials of international marketing, (v) institutional mechanisms for supporting production and marketing of traditional and modern flowers and (vi) research priorities for agricultural institutions based on the tastes and preferences in the market and difficulties faced by the producers.

* Mulder (1989) studied the trends in production and marketing of cut flowers and pot plants in the Netherlands. Growth in demand for floriculture products occurred as industry and population have grown, income has risen and consumer 'groups' have emerged with different income levels and spending habits, i.e., market segmentation has taken place. These groups ended to be targeted specifically and retail outlets can be broadened to increase the appeal to the convenience of the shoppers. New distribution channels need to be developed and quality improved as flowers moved away from speciality to commodity items. The industry needs to concentrate on
large-scale production, uniformity in the development of new varieties of higher quality to retain markets and to meet the demands of consumers.

* Attavar (1990) highlighting the prospects of the industry that suggested ornamental plants and flowers should be exported at regular intervals and mainly to European countries. These crops should be scientifically grown only in plastic, glass or fibre-glass greenhouses, or at least under partial cover. Packing and organisation of trade should be in line with that of other countries and simultaneously airfreight costs should be reduced so as to compete in the international market. Proper post harvest technologies should be adopted to make exports a successful venture. The units should be made available with coolers and facilities of grading and packing in vicinity of growing areas.

* Arora (1990) in a survey carried out in Bombay, Bangalore, Calcutta, Madras and Delhi reported that the annual production of marigold was to the tune of 1985.7 tonnes. The market price of marigold like any other product, depends upon demand and supply. During rainy and winter seasons under the North Indian conditions, it was sold at Rs.1-2/kg, whereas during summer season, it fetched Rs.4-5/kg. However, the study conducted at Bangalore revealed that a net
profit varying from Rs.7300 to 9300 per hectare was not uncommon even when it was sold at Rs.0.40/kg.

* Padamanabhan (1991) suggested that floriculture should be linked with employment and income generation programs and not viewed as an elitist adventure. The constraint in boosting up export, particularly, of cut flowers is generally due to delay in quarantine inspection of imported seeds and planting materials. This results in decay and degradation in the quality of products imported. This, in turn, affects exports of the product. This has now been removed with recent announcement of a specified procedures of quarantine by the Ministry of Agriculture. The lack of infrastructural facilities like a cold chain, inspection and certifying agencies are other deterrents. Air freight is high and, cargo space for flowers is not timely available on Air India. If the constraints are removed, the export of floriculture products can be stepped up by 100 per cent from the level of Rs.8.65 crores in 1990-91 to Rs.17.30 crores in 1991-92.

* Selvamurugan and Mohanasundaram (1991) reported that flowers are grown on a commercial basis throughout India. This activity offered better income and employment prospects for the rural poor, provided they received a fair share of the market price. This article argued that the price spread, taken as a measure of competitiveness, found too large in flower marketing, leading to
exploitation of growers by retailers. Such evidence has been provided from the Coimbatore district of Tamil Nadu, by using two types of flowers, i.e., roses and crossandra. Analysis of the costs and returns of flower cultivation and consequent marketing on the basis of sample study revealed that commission agents received up to 10 per cent of the price charged at the retail stage. It recommended that flower-marketing cooperatives be formed to conduct auctions of the products, as that would reduce the commission by about 8 per cent.

* The US Department of Agriculture (1991) discovered that world production and trade in greenhouse and nursery products continued to grow. Although more than two-thirds of floriculture trade occurred within the EC, but recent trends indicated that Western and Southern Hemisphere countries are making all-out efforts to increase their horticultural output and trade at a rapid rate. Consumer demand has been growing due to increased incomes in developing countries and greater product availability. This paper also examined the floriculture market, identified trends in demand and predicted future growth areas. Although Norway has the highest per capita demand for flowers and live-plants, but USA is the largest consumer. The effects of imports on US production decisions have been outlined.

* Pandey (1992) argues that India has the best agro-climatic advantages for growing rose, carnation, gladiolus and chrysanthemum
successfully especially around Delhi, and gladiolus and other bulbous plants around Solan. There is an urgent need to improve quality of seeds and bulbs produced in India. Regarding marketing, development of production base for export oriented cut flowers in the winters, refrigerated transportation vans and cold storage at production and export points were required. To have acceptability of our produce in international market, greenhouse technology at low price needs to be developed, quick quarantine inspection needed and airfreight should be subsidized.

* Lee and Kang (1993) brought out that floriculture in Korea Republic has concentrated on domestic consumption but likely to emerge a major export enterprise in view of the liberalization of world markets. Export production required high quality and low cost products, modernization and high investment.

* In his paper on the ‘Development of Floriculture in India’, Awasthi (1993) saw exports potential an important area of emphasis particularly when India grew a wide range of subtropical and tropical flowers. According to the study the main constraints to production lie in the non-acceptability in foreign markets due to substandard quality and cost disadvantages. Recommendations have also been made to set up modern floriculture centres at the important flower growing areas of the country.
* Ramphal (1993) reported that floriculture has now been emerging as an important and innovative venture in India and elsewhere. The paper examined the prospects of development of this industry in India and highlighted India's share in the world floricultural trade. The author has identified various constraints of floriculture industry in India and suggested recommendations and measures to overcome these to boost India's floriculture industry.

* The survey conducted by Baynes (1993) indicated that there is an increasing interest in launching the industry in Barbados on a reasonable scale. The paper has commented on the emerging markets and described the functioning of FLORAPE, a non-profit scientific institution whose overall function is to promote and protect the flower and the foliage industry in Barbados. The author has examined various measures for the improvement of floriculture industry in Barbados especially from the viewpoint of export promotion.

* Gill and Aulakh (1993) reported that cut-flower carnation is being produced all the year-round in a number of countries. The optimum day/night temperatures for cut-flower production are 16/10°C. The possibility of all the year round production in India has been explored. Western parts of Southern India such as Kodaikanal, Ooty and Coonoor, have temperature profiles that compare well with Europe and Kenya, making them suitable for all the year round
carnation production. The areas of Mercara in Karnataka, Pune and Nasik in Maharashtra would allow restricted cultivation. Similarly, Ludhiana, in the NW plains, could only produce carnations during March and April.

* Garware (1993) analysed the world-wide situation of floriculture and reported that the world floriculture industry is worth $25 billion and the industry is expected to grow to $40 billion by the turn of the century. Japan, USA, Netherlands, Italy, Germany are larger domestic consumer of flowers, whereas, Italy, Spain, Denmark, Belgium lead in production of floriculture. The Netherlands is the biggest trader of flowers in the world and exported flowers worth US $3.4 billion in 1991 i.e. Rs. 9790 crores. India can always remain a competitive supplier round the year. India has all the advantages in the world to be a major exporter of flowers not only in comparison to the Netherlands but to entire world.

* Pillay (1993) reported that the Indian entrepreneurs, enjoy certain basic advantages in floriculture business. The country is blessed with suitable agro-climate conditions. It has large and reputed tissue culture facility, expert and cheap manpower. Despite all these advantages, India’s share in the international trade is just about 0.10 per cent. In fact exporters have to face several hurdles. Firstly, they have to pay heavily for obtaining flower varieties from foreign
sources. Besides, there are numerous marketing, financial and technical difficulties.

* Das and Mitra (1994) conducted a study on some dimensions of marigold (Tagetes erecta L.) marketing in four villages of Ranaghat block of Nadia district of West Bengal. Fifty growers, ten vendors, five ferias, fifteen retailers were contacted for the study. The analysis revealed that the cost of cultivation came out to be Rs. 3827 excluding imputed family labour per acre and then the net profit of Rs.10,198 per acre.

* Gorsel (1994) concludes that as international trade in floricultural product increases, so does the demand for improved quality and quality control. Cut flowers account for most of the world trade, with the rest consisting of foliage, bulbs, nursery stock and live plants. The study analysis in depth some important determinants such as market structure and organization, government regulations, infrastructure and information exchange. Product requirements during post harvest handling including the importance of crop maturity stage, ability to withstand transport, temperature control, cleanliness, water availability and packaging have been discussed. A marketing chain evaluation and the tests to measure internal quality have been discussed.
* McNeill (1994) reported that the exports of cut flowers and nursery products from USA have been rising continuously. Canada, the EU and Mexico accounted for about 90 per cent of the total export value. Exports of cut flowers increased faster as compared to the exports of nursery products consisting of trees, shrubs, bushes, plants, bulbs etc. Similarly, the US flower imports reached an all time high in 1993 with a value of $ 382 million, up by 8 per cent from 1992. Colombian flowers continued to account for the majority of the US flower imports. The paper presented a brief update of the floriculture scenario individually for the USA, Colombia, the Netherlands, Costa Rica, Israel, Ecuador, Bolivia and Peru.

* Singh (1994) explained that the world wide consumption of floriculture products is estimated to be worth $ 40 billion. Cut flowers contribute nearly 60 per cent. The per capita consumption of cut flowers has increased by 36 per cent in USA between 1985 and 1990. The Netherlands, the largest trader of floriculture products has shown significant increase in the export of floricultural products in 1991 and exported $ 3-4 billion worth of floricultural products, constituting 65 per cent of total cut flower export and 48 per cent of potted plant exports. Among the developing countries, Thailand’s share amounting 27 per cent constituted about 54 per cent of consumer’s price of which 27.04 per cent was incurred as marketing cost and 36.96 per cent was
retained as trader’s profit. The major current marketing problem faced by flower traders was non-availability of sufficient flowers at right time to meet the current demand.

* Rao (1994) reviewed that India despite its tremendous floriculture potentials could earn just US $ 7 billion by way of export of cut flowers. India, on account of its diverse topographical features and varied climatic conditions, is ideally suited for growing a wide variety of flowers that are in great demand in the West. Moreover, India also enjoys a clear cut labour cost advantage. But because of lack of technological inputs, the quality of flowers grown in India leaves much to be desired. The investment per acre of flower plot in India is US $50 as against US $ 400 in the Netherlands. Although there is a good scope for export of flowers and live plants, India does not have even peripheral presence in the global trade. Poor and inadequate infrastructure for the production of floral crops for exports, lack of appropriate planting materials, production technology, basic inputs like standard containers/growing media and quality packing materials information are some of pressing problems.

* Maiti (1995) concluded that three important conditions i.e. high quality, large quantity and regularity of supply must be fulfilled for successful export trade. Unless high quality standard is achieved, India’s flowers will not be accepted in the world market. With the
entry of big business houses in the domain of floriculture, in recent years, the prospects are bright. Foreign companies, particularly from the Netherlands are interested to provide technical setup and technological know-how, on a buy-back basis, to capitalize on cheap labour availability in India.

* Raha and Sultana (1995) studied marketing of flowers in Dhaka city of Bangladesh. The study was based on primary data collected from randomly selected 30 flower shops out of 47 permanent shops in Dhaka city. The results revealed that, on an average, marketing cost accounted for 18.67 per cent followed by damage (14.68%), and shop rent (13.46%). Jasmine is perhaps the only flower grown in open that is being exported regularly. The study revealed that floral export drive remains hampered by the non-availability of high quality plant and seeds, right post harvest technology and lack of modern processing facilities. Lack of basic infrastructural facilities such as cold storages either at producing centres or at airports are pressing bottlenecks in flower export rendering it a risky and unproductive venture.

* Sindhu (1995) evaluated the present status of floriculture industry in India. He discovered several constraints in export of floricultural products at production, transport and marketing levels. Low quality product, insufficient quantity of good quality plant
material, lack of technical expert, absence of cold chain from production site to airport, poor packaging of cut flowers and other products, inadequate incentives to the farmers have been identified as some serious constraints in air cargo.

* Pandey and Chaturvedi (1995) reported that fast changes have taken place in floriculture industry in India since late 1980s. The value of exports increased eight-fold between 1987-88 and 1992-93. There have been a number of joint ventures where foreign companies (mainly European) have set up production units in India. The Ministry of Commerce has identified floricultural products as an important source of potential exports and following this, a government study group has made a series of recommendations for enhancing production.

* Banagiri (1995) reported that, India currently contributes less than 0.1 per cent of the global cross border trade in flowers. Exports touched just Rs. 9.0 crores in 1991-92. It was estimated that the share would hardly be 0.5 per cent of the world trade by the year 1997-98. Thus, it is unlikely that India will be able to maintain its share of the incremental demand at world level. Lack of sufficient air cargo space, insufficient cold storage facilities at major airports, high freight costs and European import duties imposed on Indian flowers were some of the irritants, which required concerted efforts both by the
entrepreneurs and the government machinery. The ever-growing labour and other costs coupled with stringent environment restrictions, the western markets have certainly been looking for alternative production centres. India with all her natural resources may be such a low cost production centre.

* Kaul and Dadlani (1995) deals with the study of Himachal Pradesh. Important flower crops being presently grown in H.P., are gladiolus, marigold, carnation, chrysanthemum, lilium and other bulbous crops. Notwithstanding the potentials (agro-climatic, unexploited market, tourism, apiculture etc.) existing in the state, some inherent problems like non-availability of quality planting material, high capital intensiveness of the enterprise, requirement of higher levels of technology for commercial floriculture, absence of organised marketing facilities, absence of adequate research, development and training infrastructure etc. have been instrumental for the slow pace of development of floriculture in the state.

* Mehra (1996) studied Delhi flower market having a turnover of Rs.30 crores at the wholesale level. Nearly 800-1000 growers are involved in the wholesale business in this market from all over India and, on daily basis, at least 100 growers arrived in the market. In addition, 50 suppliers/wholesale commission agents facilitated the sale of produce of growers. The commission agents/supplier charged a
commission of 15 per cent on the sale value. Thirty per cent of the total wholesales business shared by roses, 25 per cent by gladiolus, 15 per cent by tuberoses, 15 per cent by exotic flowers and 15 per cent by others. In case of traditional flowers, a commission of 6 to 25 per cent to auctioneers has been reported. The study also reported that the flower trade in Delhi operated under poor conditions. The author recommends government interventions right from production stage to marketing for steady and orderly growth of the market.

* Narayanan (1996) examined the marketing efficiency of cut flower market with reference to Madras market. The important marketing channel involved in marketing of cut flowers in madras was: producers - wholesalers - retailers - consumers. The marketing margin for retailers selling rose, tuberose, China aster and gladioli were Rs.509, Rs.538, Rs.498 and Rs.616 for 100 units for each flower respectively. In comparison, the marketing margin in case of selling the flowers as arrangements fetched Rs.257, Rs.1072, Rs.264 and Rs.504 respectively. The respective marketing costs of these flowers were Rs. 1038, Rs. 2077, Rs. 1059 and Rs. 1530. Out of the total marketing costs incurred for all the cut flowers, nearly 90 per cent were incurred on four cost components, viz. spoilage, labour, rental, and transport and basket charges. Gini ratio and Lorenz curve were applied to assess the degree of business concentration of retailers for
different cut flowers. The Gini ratio worked out for rose, tuberose, aster and gladiolus were 0.4820, 0.4097, 0.3044 and 0.5875 respectively. It points to the fact that there existed more concentration of business with few retailers only.

* Narayangowda (1996) reported that India’s share in world trade at $0.36 million is quite meagre. Europe and South East Asia are very important markets for cut flowers from India. Market awareness and production efficiency were the factors for the success of future growth and development of floriculture in Karnataka. Lack of trained technical staff, inadequate extension network, non-availability of suitable planting material, inadequate infrastructure, poor market and credit facilities, lack of proper government support for exports, high freight charges and inadequate flower auction centres were, in general, the main constraints of Indian floriculture industry. To ensure consistency in quality and quantity of production, measures need to be initiated to minimise risk factor involved, emphasis should be given to grow flowers and plants in greenhouses.

* Dadlani (1996) in his study reported that world trade in floriculture was estimated worth $6 billion whereas the demand was estimated at $50 billion. Among the cut flowers, chrysanthemum is amongst the top three best selling flowers in almost all-major flower consuming countries like Germany, Japan, USA, Netherlands and the
United Kingdom. Chrysanthemums are favourite with florists due to their long vase life even in harsh nature. Among the different types of chrysanthemums, sprays have a major share and it is likely to increase further, whereas that of standards has been on decline. The total chrysanthemum sales in the Dutch auctions during 1993-94 were 581 million Dfl. The sale of sprays was much more than that of other types (Standards and Santinis) both in volume and total value of sales, though per unit price of spray type is lower. The top selling varieties belong to ‘Reagan’ family followed by ‘Spinders’. The major disadvantage for marketing is the high cost of airfreight in view of its bulky nature. During summer months, they are best sold in domestic market and the foreign markets nearby.

* Hamrick (1996) while analysing future trend predicts that as many as 40 per cent Dutch glasshouse growers will close down in the coming years due to financial difficulties. The situation is worse in the glasshouse vegetable sector and many flower growers are likely to experience similar problems. Growers can remain in business only by increasing productivity and reducing costs. Structural change is leading to fewer, larger nurseries, which benefit from economies of scale. The crisis has hit growers in the region mainly as they have not been highly market-oriented.
* Siddiqui and Seth (1996) reported that the world import of floricultural products is dominated by cut flowers with a share of 87.6 per cent. The government should enhance the development fund and include the Himalayan ranges for setting up model floricultural centres. Selective growing of flowers and establishment of cold storage is the need of the hour. The study further points out that potential for exports in the international markets particularly to middle-east and ethnic population of the USA and UK should be tapped. India needs to press for removal of discriminatory tax of 15 per cent imposed by EU.

* Pasannavar and Raj Kumar (1996) reported that gladiolus stands fourth in the international cut flower trade after carnation, rose and chrysanthemum. An estimated area of 300 hectares was under this crop with the production of around 500 lakh spikes in the country. The congenial agro-climatic conditions, lower cost of production, recent liberalization policy have been enlisted as some of the advantages for gladiolus cultivation in India. The important constraints highlighted in the production and trade include poor quality germplasm, inaccessibility to basic inputs, poor infrastructural facilities, non-availability of improved production technology, lack of pre-cooling and refrigerated storage facilities, absence of market survey and price information, exorbitant freight charges and lack of regional central coordinating organisation for export promotion.
Acharya and Panda (1996) attempted to analyse the floriculture industry in India as a promising foreign exchange earner. India’s share in the multi billion global floriculture market, growing by 15 to 16 per cent per annum, is less than one per cent. India’s poor performance in the global market is because of its inadequate infrastructure for the production of floral crops for export. This leads to unnecessary surplus which could have been exported. Lack of appropriate planting materials, production, technology, basic inputs like standard variety packing materials etc. are critical bottlenecks. Suitable market surveys and pricing information are not available. Exorbitant freight charges around $ 3 per kg ex-India is a daunting problem. Domestic market is unorganized and there is no established marketing channels.

Chhabra (1996) discussed the prospects of floriculture in India. He reported that floriculture is fast emerging as a major venture on the world scene. The Government of India has taken various steps to encourage the industry of floriculture by granting soft loans, creating infrastructure facilities like cold storage and auction houses, etc. at airports. With the improvements in quality of planting materials mainly bulbs, appropriate training programmes in production, harvesting and post harvesting management techniques alongwith adequate marketing support, floriculture industry has bright future for prospective small and medium entrepreneurs in India.
Dahiya (1996) conducted a study of 47 flower growers in Sonepat district of Haryana state. He analysed cost of cultivation of major floriculture crops grown with traditional competing crops. Marigold was found to be considerably more profitable (net return Rs. 20295/ha) over paddy (Rs. 9827/ha) and arhar (Rs. 3380/ha). Rose is perennial crop and bears flowers satisfactorily upto 10 years. Similar to marigold and rose, gladiolus was also found to be highly profitable (net return Rs. 78,808/ha) over mustard (Rs. 3958/ha) and wheat (Rs. 1372/ha). The most important marketing channel adopted by the sample growers was producer - commission agent - retailer - consumer, as more than 50 per cent of marigold and rose flowers were marketed through this channel followed by agent. Lack of adequate demand round the year, absence of regulated market in local area and wide fluctuation in prices were the major problems faced by the flower growers in marketing of their produce.

Bhatia (1997) interviewed 120 farmers of Sonepat and Gurgaon districts of Haryana state to ascertain farmers’ knowledge and adoption level about the package of practices recommended for cut flowers cultivation. He also conducted the post harvest problems of cut flowers and prospects of cut flower cultivation. Lack of knowledge about recommended practices, non-availability of inputs, lack of conviction about recommendation, high cost of inputs and
skilled labour, problem of adulteration were the pre-harvest problems faced by the farmers. The important problems with regard to post-harvest practices faced by the farmers were absent of storage facilities, irregular transport facilities, wide fluctuation in prices, high marketing expenses, lack of market demand and unawareness about provision of export.

* Sindhu and Misra (1997) on the basis of a survey conducted on marketing system of flowers in Delhi reported that cut flowers were high remunerative during February but so less during August. Of the total flower trade (Rs.250 crores), the share of Delhi market was Rs.30 crores during 1995-96. Interestingly, the trade of flowers has also increased inspite of the shrinking of the land near cities due to rapid urbanization and industrialisation.

* Witmer (1997) attempted to work out solutions of various problems in overall development of floriculture in India. Major problems encountered by floriculture companies in cash flow are: lower average export sales price than expected, lower exportable production than expected, lack of income during May to September and small scale of the projects. The solutions offered are: to diversify the products, to choose more and different markets, commitment of the entrepreneurs towards business, to reap economies of scale, and to grow flowers in those areas where they have comparative advantages.
It was also observed further that the quality of product is the most important factor for the success of flower project. The project, therefore, be such that quality and production risks are minimal. In these projects, a variation in investments has very little influence on internal rate of return; it is the production, sales prices and marketing costs that are the factors determining its failure or success.

* Balasubramaniam (1997) summarized mass of information on the technical and economic aspects of raising carnation cut flower. Regarding marketing, the author has laid stress on the availability of cold storage chain from production point to the auction centre. The economics of production has been worked out to be Rs. 30 lakh per acre. He further argued that the costs could even be greater if the marketing is done in the international market because of the additional carriage expenses. Net benefit per acre has been worked out to be Rs. 16.90 lakhs in the second year and Rs. 9.53 lakhs in third year.

* Poland (1997) suggested on the cultivation of bulbous crops especially gladioli and lilimus for product diversification in floriculture industry. The study revealed that the investment in gladioli bulbs is low compared to other floriculture crops. The crop grows in the open and does not need much additional infrastructure. Returns on the crop are marginal in the first year. However, by re-growing the corms in successive years and corms getting multiplication,
investment costs are reduced considerably ensuring good returns. For lilium the initial investments are quite high largely due to high cost of bulb.

* Oberoi (1997) argued that domestic market for floriculture in India should be given due emphasis. The commission agents or wholesalers charge a commission of 10-15 per cent. The study found that the domestic flowers market has seen a steady growth of almost 35 per cent per annum as compared to that of the world flower market whose growth rate is 12 per cent per annum. It is predicted that by the year 2000, India will be amongst the top five flower exporters of the world. For achieving this position, marketing and production impediments should be overcome. Regulated auction houses should be set up. Loans or special schemes for the domestic growers should be drafted. The producers should have an access to appropriate chemicals to combat various diseases and pests. To support the growers in the form of crop/infrastructure insurance will go a long way in instilling confidence in them to invest more in this new venture.

* Nawalany (1997) identified Russia, with total imports of $100 million, as a potential cut flower market for India. The Netherlands, Israel, Ecuador, Colombia, Uzbekistan and Finland are the primary suppliers and account for over 80 per cent of Russian imports. There is need to lower import tariff on cut flowers.
* Dwivedi (1997) reported that Himachal Pradesh was supplying floricultural produce worth Rs. 3.5 crores to different parts of the country, Delhi being the main market. A floriculture centre opened at Chail in Solan district with central assistance would be of great help. In 1992-93, only 10 hectares of area was under floriculture, which increased to 76 hectares in 1995-96. The Horticulture Department is putting emphasis on the cultivation of flowers in a cluster of villages and organising growers through the formation of cooperative societies for marketing their produce. There are 31 cooperative societies registered in the state.

* Singh and Pathania (1997) emphasised that floriculture can be a viable diversification option in Himachal Pradesh on account of the prevalence of varied agro-climatic conditions representing four zones. Gladiolus spikes can be produced in the hills from April to October, while its flowers in the plains are generally harvested during December to March. Similarly, other flowers like carnation, lilium, daffodils, tulips, temperate orchids, iris and statice are produced during off season and sold at premium prices in plain’s markets. Mid hills and high hills of the hilly states are congenial for producing rooted carnation cuttings for almost throughout the year which cannot be produced in plains because of high temperatures. Polyhouse cultivation in hills is less expensive than in plains where the polyhouses need artificial cooling.
for 6-8 months in a year. However, polyhouse in hills need to be heated for 3-4 months during winters. Constraints like inadequate research in different situations in each zone, poor quality, lack of timely availability of planting material, lack of technical know-how, lack of cold chains and organised marketing channels from production points to consumption points, inadequate financial assistance etc.; can, however, be overcome by establishing co-operative growers societies at district levels.

* Thakkar (1997) discussed in his study that India is fully equipped with indigenous technology and capable of producing quality crops of flowers at a highly competitive price. All these do not require initially a large sized floriculture unit. From the success of small models, they can be multiplied so as to repeat successive successful units only. Indian fabricators have been successful in developing all the inputs at low cost. Drip irrigation at subsidized rate ideal fertilizer grades, indigenously developed fan and pad system, refrigerated vans, cold storage have helped to produce quality flowers. Besides, Indian agricultural universities, churning out a large number of agriculture graduates, are making considerable contribution.

* Modak, Mitra and Das (1997) examined the current global floriculture situation. Four issues have been addressed in particular:-

(i) flower consumption trends in different global regions, i.e., Western Europe, Japan and the USA,
(ii) export position of the Netherlands, Colombia, Israel, Italy and Thailand and import position of Germany, France, USA, UK, the Netherlands, Italy and Switzerland,

(iii) domestic per capita consumption of cut flowers and floricultural products for selected countries such as Japan, Netherlands, Italy, Switzerland, Belgium, Sweden, Denmark, Austria, France, USA, UK, Spain, Norway and Israel, and

(iv) prospects for flower trade and emerging floricultural industry in India.

* N. Laws (1998) focused on the Indian floriculture industry with particular reference to export opportunities and the potential for production for the domestic market. Constraints facing the newly developed industry have been outlined and approaches to overcome these constraints have also been suggested.

* Dahiya (1999) studied adoption of floriculture in Faridabad district of Haryana. He observed that lack of awareness about large number of varieties for commercial cultivation, fear of natural hazards, lack of irrigation facilities, lack of standard containers, high incidence of spoilage during storage facilities, unfavourable temperature range and lack of packing materials are the major constraints. A large amount of commission paid by the farmers, wide fluctuations in
prices, monopoly of traders in fixing prices and absence of support price were the marketing constraints faced by the farmers.

* Jadhav et. al. (2000) reported that Karnataka, Tamil Nadu and Andhra Pradesh states are contributing much in terms of area and production of floriculture in the country during the period 1993-1996. At international level Japan, Netherlands and USA are leading in the business of floriculture in terms of area and output in the world in the same period. European countries have the maximum demand for the cut flowers, flower buds and dried flowers. While studying the price spread aspect, it was observed that as the number of intermediaries in the marketing of selected flowers increases, the producer’s share in consumer’s rupee decreases.

* Singh, H.P. (2000) dealt with the current status of floriculture industry in India. The flower production, consumption and trade have grown manifold with increased export awareness of growing flower crops among growers. The study has succinctly discussed the development of floriculture sector in chronological order during the planning era. The study reveals that the Export-Oriented Units (EOUs) in floriculture have helped in earning foreign exchange to the country. Besides, there have been two major advantages for the start of such units. Firstly, the availability of good quality flowers in the domestic market has been made possible. The second gain has
been the improvement in product range due to introduction of liberalised plant material imports regime.

* Rajagopalan, D. (2000) emphasised the need for policy environment for export potential of Indian floriculture. After exploring the position of Indian floriculture industry in the global market, he analysed the APEDA’s initiatives to boost the export of flowers from India to Europe, Japan, U.S., Australia and Singapore. To achieve this objective, APEDA has offered assistance to South Indian Floriculture Association (SIFA), and Karnataka Agro Industries Corporation (KAIC), for establishment of a modern flower auction centre at Bangalore. The study further revealed that the proposals for such auction centres at Chennai, Delhi and Mumbai are under active consideration of the government and are being pursued vigorously by the respective state governments. The APEDA has also extended financial assistance for establishment of a floriculture infrastructure park at Hosur, Tamil Nadu. Similar efforts have been underway for setting up floriculture infrastructure parks in Uttar Pradesh, Himachal Pradesh and Karnataka.

* Singh, H.P. and Dadlani, N.K. (2000) evaluated the FAO assisted project relating to technological aspects of greenhouse floriculture especially for small-scale farmers. Under this project, the crops that were suggested for cultivation in small-scale greenhouses
were based on climatic suitability, the market demand, level of inputs and technology. Availability of quality planting material, insufficient quantity, was also an important consideration. Accordingly, carnation has been found the focus crop for Bangalore, gerbera for Pune and alstromeria for Srinagar. In addition, to add to the flower basket and improving the product-mix, calla lily was recommended to the Bangalore region. Coloured hybrids of calla lily, would have sizeable export market.

* Vidyavathi, K. and Desai, R.G. (2001) conducted an exhaustive study of Bangalore and Pune regions regarding cost-benefit analysis of floriculture industry. The cost-benefit ratio explains the relationship between gross income and the total cost of production of flowers in one hectare per year. The cost benefit ratio in case of floriculture in Bangalore region indicated that an investment of one rupee in floriculture would yield a gross return of Rs.1.60 as against Rs. 1.51 in Pune region. The returns generally indicate the economic viability and profitability of floriculture in both the regions. Several factors have been found responsible for this variation in cost of production of two regions. Climate is one such significant factor. The extreme climate in Pune, though it is for a short period, has its effect on the cost of production. Bangalore region has an edge over Pune region in this regard.
Kamble and Jadhav (2001) worked out that the area under flower is 85,000 hectares during the year 1999-2000. The highest share in area and production was of Karnataka followed by Tamil Nadu and Andhra Pradesh. Regarding international trade, the highest increase of export of fresh cut flowers was observed in the case of Japan, UK, Australia and Hongkong. The major markets for Indian floriculture export was Germany, France, Gulf, England and Singapore. Given the necessary support, India can really push up its floriculture trade in European market.

* Dadlani, N.K. (2002) evaluated post-harvest management of cut flowers in which the factors those played key role in the longevity of cut flowers, have been discussed. The problems and prospects of the floriculture industry in India have also been discussed alongwith the workable suggestions for the growth of the floriculture industry. The study emphasises the post-harvest handling and marketing of the floriculture products.

* Jhamtani and Sharma’s (2003) article appearing in a book published in 2003 have discussed various issues relating to exports of floriculture. After having presented the world current scenario, the current status of India’s floriculture has been discussed. The studies briefly discussed the government programs and policies and some workable suggestions to increase flower export from India, have also been adduced.
* Desai (2004) has examined mainly the economics of floriculture. The study brings out the importance of floriculture industry since liberalisation in 1991 and now government of India has identified floriculture as a ‘Sunrise’ industry. Now the opportunities for floriculture exports, with the emergence of WTO in 1995, have opened up. Floriculture industry holds potential for the export of floriculture products. The issues as how to go about it, have been discussed scientifically and in a dispassionate manner.

* Nair and Sujatha (2004) have analysed the factors affecting orchid growth. While doing so, the factors such as light and temperature, water quality and watering, humidity levels and air movement, propagation, tissue culture, potting materials and repotting, fertilizing, harvesting, plant protection from fungicides and insecticides, proper sanitation and prophylactic spray schedules have been discussed vividly.

Besides these studies, APEDA, NABARD, NBH and ministries of Agriculture and Commerce, government of India and Agricultural Universities, have been preparing and issuing reports and status papers from time to time on floriculture. Industrialists, financial institutions and NGOs have also analysed the problem from their own perspective which find mention in the thesis appropriately.