**INTRODUCTION**

India has a long tradition of floriculture. References to flowers and gardens are found in ancient Sanskrit classics like the Rig Veda (C 3000-2000 BC), Ramayana (C 1200-1300 BC), Mahabharata (prior to 4th Century BC), Shudraka (100 BC), Ashvagodha (C 100 AD), Kalidasa (C 400 AD) and Sarangdhara (C 1200 AD). The social and economic aspects of flower growing were, however, recognized much later. 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 affluence, floriculture has assumed a definite commercial status in recent times and during the past 2-3 decades particularly. Appreciation of the 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 permit production of a wide range of temperate and tropical flowers, almost all through the year in some 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 and quality employment to scores of people.

**1.1 Present Situation of Cut Flower Production**

In spite of the long and close association with floriculture, the records of commercial activity in the field are very few. The information on the area under floriculture and the production generated is highly inadequate. As commercial floriculture is an activity which has assumed importance only in recent times, there are not many large farms engaged in organized floriculture. In most part of the country flower growing is carried out on small holdings, mainly as a part of the regular agriculture systems.

**1.1.1Production Areas**

The estimated area under flower growing in the country is about 65,000 hectares (Table 1). The major flower growing states are Karnataka, Tamil Nadu and Andhra Pradesh in the South, West Bengal in the East, Maharashtra in the West and Rajasthan, Delhi and Haryana in the North. It must, however, be mentioned that it is extremely difficult to compute the statistics of area in view of the very small sizes of holdings, which very often go unreported. This perhaps would be the reason for unrealistically small areas reported for floriculturally active states like Maharashtra, Uttar Pradesh and Madhya Pradesh.

More than two thirds of this large area is devoted for production of traditional flowers, which are marketed loose e.g. marigold, jasmine, chrysanthemum, aster, crossandra, tuberose etc. The area under cut flower crops (with stems) used for bouquets, arrangements etc. has grown in recent years, with growing affluence and people’s interest in using flowers as gifts. The major flowers in this category are rose, gladiolus, tuberose, carnation, orchids and more recently liliums, gerbera, chrysanthemum, gypsophila etc

**Table 1 Area Under Flower Production in India(2012)**

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| **State** | **Area (ha.)** |
| Karnataka  | 19,161 |
| Tamil Nadu  | 14,194 |
| West Bengal  | 12,285 |
| Andhra Pradesh  | 5,933 |
| Maharashtra  | 3,356 |
| Rajasthan  | 1,985 |
| Delhi  | 1,878 |
| Haryana  | 1,540 |
| Madhya Pradesh  | 1,270 |
| Uttar Pradesh  | 1,000 |
| Others  | 2,166 |
| Total | 64,768 |

The production of flowers is estimated to be nearly 300,000 metric tonnes of loose flowers and over 500 million cut flowers with stem. In the case of production also, the estimates could be at variance from the actual figures as some of the flowers like rose, chrysanthemum, and tuberose are used both as loose flowers and with stem.

It may be mentioned that almost all of the area reported here is under open field cultivation of flowers. Protected cultivation of flowers has been taken up only in recent years for production of cut flowers for exports. The estimated area in production is about 200 hectares, which is likely to increase to over 500 hectares by the year 2000.

Recognizing the potential for low cost production for export, in view of cheap land, labour and other resources, several export oriented units are being set up in the country. These projects, located in clusters around Pune (Maharashtra) in the West, Bangalore (Karnataka) and Hyderabad (Andhra Pradesh) in the South, and Delhi in the North, are coming up in technical collaboration with expertise mainly from Holland and Israel. More than 90 percent of these units are for rose production, on an average size of 3-hectare farm, while some projects for orchid, anthurium, gladiolus and carnation are also being set up. Nearly one third of over 200 proposed projects, have already commenced production and export.

**1.1.2 Major Cut Flower Crops**

Rose is the principal cut flower grown all over the country, even though in terms of total area, it may not be so. The larger percentage of the area in many states is used for growing scented rose, usually local varieties akin to the Gruss en Tepelitz, the old favorite to be sold as loose flowers. These are used for offerings at places of worship, for the extraction of essential oils and also used in garlands. For cut flower use, the old rose varieties like Queen Elizabeth, Super Star, Montezuma, Papa Meilland, Christian Dior, Eiffel Tower, Kiss of Fire, Golden Giant, Garde Henkel, First Prize etc. are still popular. In recent times, with production for export gaining ground in the country, the latest varieties like First Red, Grand Gala, Konfitti, Ravel, Tineke, Sacha, Prophyta, Pareo, Noblesse. Virsilia, Vivaldi etc. are also being grown commercially.

Gladiolus is the next most important cut flower crop in the country. Earlier it was considered a crop for temperate regions and its growing was restricted to the hilly areas, particularly in the north eastern region, which still continues to supply the planting material to most parts of the country. However, with improved agronomic techniques and better management, the northern plains of Delhi, Haryana, Punjab, Uttar Pradesh, as well as Maharashtra and Karnataka have emerged as the major areas for production of gladiolus.

Tuberose, a very popular cut flower crop in India is grown mainly in the eastern part of the country i.e. West Bengal, and also in northern plains and parts of south. Both single and double flower varieties are equally popular. Tuberose flowers are also sold loose in some areas for preparing garlands and wreaths.

The other main cut flower item is orchid. Its production is restricted mainly in the north-eastern hill regions, besides parts of the southern states of Kerala and Karnataka. The main species grown are Dendrobiums, Vanda, Paphiopedilums, Oncidiums, Phalaenopsis and Cymbidiums.

Among the traditional crops grown for loose flowers, the largest area is under marigold, grown all over the country. In most parts of the country only local varieties are grown for generations. African marigolds occupy more area as compared to the small flowered French types. Jasmine flowers in view of its scent are also very popular as loose flowers and for use in garlands and *Veni* (ornament for decoration of hair by women). The major areas under this crop are in Tamil Nadu, Karnataka in South and West Bengal in East. The varieties are mainly improved clones of *Jasminum grandiflorum,* J*. auriculatum* and J*. sambac*. The chrysanthemum, particularly the white varieties are much in demand as loose flowers during the autumn period of October-December when other flowers like jasmine, tuberose are not available for use in garlands etc. Among other traditional flowers grown in large areas are crossandra in southern states of Tamil Nadu, Karnataka and Andhra Pradesh and aster in Maharashtra.

**1.1.3 Research Support**

Research work on floriculture is being carried out at several research institutions under the Indian Council of Agricultural Research and Council of Scientific and Industrial Research, in the horticulture/floriculture departments of State Agricultural Universities and under the All India Coordinated Floriculture Improvement Project with a network of about twenty (20) centres. The crops which have received larger attention include rose, gladiolus, chrysanthemum, orchid, jasmine, tuberose, aster, marigold etc. The thrust till recently had been on crop improvement, standardization of agro-techniques including improved propagation methods, plant protection and post harvest management. In view of the fact that most of the cut flower production is being done under open field conditions, the research efforts generally relate to open cultivation. In recent years, however, technologies for protected cultivation and tissue culture for mass propagation have also received attention. A large number of varieties suitable for cut flower use, as well as garden display have been developed. Production technology, particularly the agronomic requirements and control methods for important diseases and insect pests have also been developed. Contribution by the private sector in research activities in floriculture is negligible.

**1.1.3 Planting Material**

The requirement of planting material to cater to the large area under flower crops, is largely met from domestic production. Since efforts to set up large commercial farms generally suffered due to lack of quality planting material in sufficient quantities, this aspect has received greater attention in recent years in the breeding centres, which are producing sufficient quantity of planting material. Most of the nurseries propagating planting material are in the private sector. In the absence of any mechanism to register nurseries, it is very difficult to ascertain their exact number, but at a very conservative estimate there are more than 100,000 nurseries, spread out all over the country, producing seeds and other planting materials for flower growers. The states with larger numbers of nurseries include Maharashtra, West Bengal, Karnataka and Tamil Nadu. Most of the nurseries are small, with little or no improved facilities like mist propagation unit, green houses/net houses etc. For meeting the demand of flower seeds, several large seed companies have production units in Punjab, Himachal Pradesh and Jammu & Kashmir in the North, Karnataka in the South and West Bengal in the East. A few of the leading multinational seed companies have tied up with local seed companies or producers for custom production of seeds of their varieties. In the case of bulbous plants, most of the planting material is produced in the north eastern hilly regions of West Bengal (Kalimpong) and Sikkim, though for some crops, it is also produced in hilly regions of northern India. The introduction of a revised seed policy by the government of India in 1989 has enabled unrestricted introduction of many new and superior varieties into the country, increasing the variety in the floral basket.

Tissue culture has, in recent years, been recognized as an important tool in agriculture development. With its diverse climatic zones and qualified manpower, India is well placed to exploit the benefit of tissue culture based applications to floriculture crops. Most popular application of tissue culture has been micro propagation using *in vitro* technique for mass multiplication of planting material. Tissue culture plants of ornamentals have found ready acceptance by the commercial growers and their production increased significantly from 130 million plants in 1985-86 to 680 million in 1994-95. At present 30 commercial tissue culture units with annual capacities of 0.5 to 15 million plants each are in operation, resulting in total capacity of about 110 million plants. While most of it is exported, a small percentage of cut flower crops like carnation and gerbera are finding good market within the country.

**1.1.4 Marketing**

Marketing of cut flowers in India is very unorganised at present. In most metropolitan cities, with large market potential, flowers are brought to wholesale markets, which mostly operate in open yards. A few large flower merchants generally buy most of the produce and distribute them to local retail outlets after significant mark up. The retail florist shops also usually operate in the open on-road sides, with different flowers arranged in large buckets. In the metros, however, there are some good florist show rooms, where flowers are kept in controlled temperature conditions, with considerable attention to value added service. The government is now investing in setting up of auction platforms, as well as organized florist shops with better storage facilities to prolong shelf life.

The packaging and transportation of flowers from the production centres to the wholesale markets at present is very unscientific. The flowers, depending on the kind, are packed in old gunny bags, bamboo baskets, simple cartons or just wrapped in old newspapers and transported to markets by road, rail or by air. The mode of transportation depends on the distance to the markets and the volume. Mostly, flowers are harvested in the evening time and transported to nearby cities by overnight trains or buses. In recent years, the government has provided some assistance for buying refrigerated carriage vans. A large number of export oriented units have built up excellent facilities of pre-cooling chambers, cold stores and reefer vans and their produce coming for domestic market sales are thus of very good quality and have longer vase life and command higher price. The government programs for floriculture development include creating common facilities of cool chain in large production areas to be shared on cooperative basis. Formation of growers’ cooperatives/associations are being encouraged.

In view of the unorganized set up, it is difficult to estimate the size of flower trade, both in terms of volume and value. A study conducted in 1989 estimated the trade to be worth Rs. 2050 million. It is in the period of the last five years or so that this business has really boomed in India, which is reflected in the number of new florist outlets in all cities and increase in the public’s purchase of flowers as gifts. This would put the current trade at several times the earlier estimate. A recent study of Delhi market alone put the value of flowers traded on wholesale as Rs. 500 million.

The loose flowers (traditional crops like marigold, jasmine etc.) are usually traded by weight. The average price of different flowers in major markets varies considerably depending on the period of availability (Table 2).

**Table 2 Average Market Price for Major Flower Crops**

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| **Flowers** | **Unit** | **Price** **Rs./kg or doz or each stem** |
| Marigold | kg. | 3-60 |
| Jasmine | kg. | 15-150 |
| Crossandra | kg. | 20-120 |
| Chrysanthemum | kg. | 5-25 |
| Tuberose | kg. | 5-30 |
| Rose | kg. | 6-60 |
| Gladiolus | doz. | 20-75 |
| Carnation | doz. | 30-75 |
| Gerbera | doz. | 36-75 |
| Orchids | each stem | 10-45 |
| Liliums | each stem | 10-45 |
| Anthuriums | each stem | 15-45 |

The net returns to the growers depend on the packaging and transportation costs. The cut flowers with stem have a limited overall market in terms of volume. The share of cut flowers has almost doubled from 30 to 60% in the last decade.

**1.1.5 Exports from India**

POST globalization, floriculture has become one of the important commercial activities in Indian agriculture. Indian floriculture industry comprises the florist trade, nursery plants, bulb and seed production, apart from production of micro propagation material, and extraction of essential oils from flowers. The industry has been growing at a CAGR of 25 percent over the past decade, with production area growing at a CAGR of 6.89 percentsince2000-01.

A number of Export Oriented Units (EOUs) have been set up in the country; most of them are largely dependent on foreign collaborations for technological support. In the recent years, a number of large Corporate Houses such as ESSAR group, TATA group, Birla, Nagarjuna and Pariwala have also invested in the flower sector. Protected cultivation is not a common practice in India, the greenhouse designs and structures for the modern floriculture units are mostly imported from countries like Holland, Israel, France, and the USA. In India, there are three types of greenhouse production technologies, viz., low-tech units, mid-tech units and hi-tech units, with the investment costs varying significantly among the three groups. Marketing of cut flowers in India is much unorganized at present. Packaging and transportation of flowers is also very unscientific. In the metros, however, in the recent years, some modern florist show rooms have come up, where flowers are kept in controlled temperature conditions, with considerable attention to value added services. To facilitate flower trade, two auction centres have also been established one at Bangalore and the other at Mumbai.

Commercial floriculture in India is going through a paradigm shift, where traditional flower cultivation is giving way to modern hi-tech flower cultivation, which is evident from India's rising production and exports. Exports of floricultural products have been growing at a CAGR of 15 percent over the past decade. However, the growth of the industry has been significantly affected by the recent global recession largely due to decline in demand in all major markets. India's exports of floricultural products in the year 2007-08 decreased by 41 percent to US$ 84.5 million (Rs. 340 crores), from US$ 144 million (Rs. 653 crores) in 2006-07, which further decreased by 5.18 percent in the year 2008-09 to US$ 80.19 million. However, in 2008-09, in rupee terms, export of floriculture from India increased marginally. In the recent years, dried flowers and foliage have been forming a large part of floricultural product exports from India. During 2008-09, dried flowers constituted over 60 percent of cut flowers exports, and dried foliage constituted over 95 per cent of total foliage exports from India. Fresh cut flowers are mainly exported from Tamil Nadu, Karnataka and Maharashtra. Dried flowers are exported mainly from Tamil Nadu and West Bengal, with the later accounting for around 70 per cent of the dried flower exports from the country. Europe continues to be the largest destination for Indian floriculture exports. However, in the recent years Indian exports of floriculture products have also been to the Japanese and Australian markets.

**1.1.6** **Challenges**

The Indian floriculture industry is faced with a number of challenges mainly related to trade environment, infrastructure and marketing issues such as high import tariff vis-a-vis African countries, low availability of dedicated perishable carriers, higher freight rates, inadequate support infrastructure, constraint in achieving economies of scale, and inadequate cold chain management. At the production level the industry is faced with challenges mostly related to availability of basic inputs, including quality seeds and planting materials, quality irrigation and skilled manpower, and ageing plantations. With regard to marketing, major challenges faced by the Indian flower exporters are related to low level of product diversification and differentiation, vertical integration and innovation, and challenges associated with quality and environmental issues. With increasing involvement of supermarkets in flower trade, organizing logistics is also becoming a critical factor for the Indian flower exporters.