

# Growth of Floriculture: A Comparative Study of India and Karnataka

<sup>1</sup>Shreeram. K.P, <sup>2</sup>Dr. D.S.Leelavathi

Research scholar, Department of Studies in Economics and Cooperation, University of Mysore  
Research guide and Professor, Department of Studies Economics and Cooperation, University of Mysore

---

**Abstract:** Floriculture has received a considerable attention in India in recent years from policy makers, researchers, agriculture and horticulture planners. International flower trade has increased significantly due to huge demand of floriculture products in the world. Floriculture plays a vital role in the diversification of agriculture in India and Karnataka state. The objective of the present study is to find out trends in area, production and yield per hectare in India as well as in Karnataka. To full fill these objectives secondary data have been used. The methodology used for analysis is tabular method and LOGEST function in Microsoft excel. The study findings highlight that an increasing trend has been found in the area, production and yields per hectare in India and in Karnataka, area and production are increasing but yield per hectare is decreasing. The main reason for increase in area, production and yield per hectare is found to be better returns from floriculture. The reason for decrease in yield per hectare is due to poor technology, inadequate knowledge about floriculture, unseasonal rainfall, unfavourable climatic condition and low quality planting materials.

**Keywords:** Floriculture, LOGEST function in Microsoft excel.

---

## 1. INTRODUCTION

Horticulture impacts widely on human activities, more than its popular understanding as merely "gardening" would indicate. Floriculture is the branch of ornamental horticulture concerned with growing and marketing flowers and ornamental plants, as well as with flower arrangement. Because flowers and potted plants are largely produced in plant-growing structures in temperate climates, floriculture is largely thought of as a green house; however, many flowers are cultivated outdoors. Floriculture is becoming a booming industry in the World today. India has an ancient heritage when it comes to floriculture. Floriculture has emerged as an economically viable diversification option in the Indian agribusiness and has captured the interest of many new entrepreneurs into agricultural sector in recent times. Flower cultivation has been practiced in India since times immemorial but it is only in the recent years that floriculture has blossomed into a viable business sector. A growing market as a result of improvement in the general level of well-being in the country and increased affluence, particularly among the middle class, has led to transformation of the activity of flower growing into a burgeoning industry. Availability of diverse agro-climatic conditions facilitates the production of all major flowers throughout the year in some or the other part of the country. In India, floriculture is emerging as an important commercial crop. A lot of importance has been given to this sector due to its multiple uses, satisfying the aesthetic needs of the people, this is apart from creating more employment, ensuring higher rate of returns to rural people and facilitating earning more foreign exchange. More specifically, they are being used as raw materials in the manufacture of essence, perfumes, medicines and confectioneries for direct consumption by the society. The production of flowers is an age-old occupation. Until last decade, the growing and selling of flowers was confined to a few families. They grew a variety of flowers on the same land which were sold close to the house, as they could not survive a long journey. The situation in the last decade has however, changed. Now, different farmers are growing different flowers both for domestic market and export purposes. In the year 2006-07, the area under flower cultivation in India was 144000 hectares and production was

880000 metric tons. In 2015-16, area under flower cultivation was 261000 hectares and production is 1820000 metric tons. So there is a huge increase in the area and production of floriculture in India.

Karnataka ranks first in the country in the production of traditional and modern Flowers. However, the growth within the state has not been uniform across the districts. Some districts/regions have been dominating in the coverage of area, production and productivity and some have lagged behind in the cultivation of flowers. In 2006-07, area under flower cultivation in Karnataka is 24017 hectares and production is 191940 metric tons. But in 2015-16, area under flower cultivation is 31846 hectares and production is 230414 metric tons. So there is an increasing trend in area and production of floriculture in Karnataka state.

## 2. REVIEW OF LITERATURE

Various scholarly efforts have made to study the "Floriculture" through different angles. Studies on economics of production and marketing have attracted the attention of research workers in recent years. Economic research provides information and knowledge needed for the formulation and evaluation of economic policies. It is therefore intended to review the work done by different research workers in the field. An attempt has made to collect the reviews on different aspects of floriculture.

Timothy A. Woods et.al. (1997) in Their study examined a specialized perpetual production system as well as an enterprise integrated with other typical greenhouse products. Marketable yields for the greenhouse space are significantly increased over conventional production systems, although capital costs and management intensity are also greater. This system allows the use of pot handling robots to reduce labour costs and the movement of the roses to specific controlled environments that are optimal for each stage of rose growth. Economic considerations integrating seasonal market prices, seasonal energy costs, special capital and labour costs etc. were included in the analysis. These variations led to break-even costs ranging from about \$0.20 to \$0.25 per stem. Estimated internal rates of return could be expected to be about 77% for specialized rose production under baseline production and average market conditions.

Bhanumathy et al (2003), in their project report analyzed the marketing cost, margins and producers share in the consumer's rupee. Primary data of 2000-01 was used for the study. The main marketing channels were producers, commission agent, wholesales, retailer and consumer. Price spread analysis indicated that the producers received a gross price of Rs 650 per quintal. Share in the consumer's rupee was 45.65%. Marketing cost accounted for 22.80% of consumers rupee including cost incurred by the farmer and 31.55% of consumer rupee was the marketing margin for intermediaries.

According to P Thippaiah (2005) in his study identified the trends in area, production and yield of flowers in Karnataka. Karnataka ranks first in the country in the production of traditional and modern flowers. The objective of this study is to analyze the trends, production yields of flowers and to study the infrastructural facilities available in Karnataka and to study the socio economic condition of flower producers and the problem faced by producers in Karnataka. The study based on primary and secondary data (1978-79 to 2001-02). The study identified that the area under traditional flowers had increased from 0.65 lakh hectares in triennium ending 1982-83 to 0.22 lakh hectares in triennium ending 1999-00. An increment in production was reported from 0.30 lakh tones in 1978-79 to 1.51 lakh tones in 1999-00. In crop wise proportion area, marigold stood first with 20.30% followed by chrysanthemum with 13.19%.

According to Sigh et al (2007), in their study, stated that scope of floriculture in India has increased tremendously which is evident from the increase in area and production of flowers from 53000 hectares in 1993-94 to 106477 hectares in 2001-02. The article highlighted that the floriculture export had taken a quantum jump in the last decade from Rs 14.45crores in 1991-92 to Rs 249.50crores in 2003-04. Floriculture export increase to Rs 211crores in 2004-05 from Rs 63crores during 1996-97. The overall exports of floricultural produce from India were estimated at Rs 304.69crores by the end of 2005-06. The authors remarked that although protected cultivation is in a limited area (5% of the total crop area), its contribution to total floricultural export is significant.

According to Pawar (2007), the agro-climatic conditions of India permit the cultivation of a variety of flowers India is already known for its traditional flower cultivation. Now with the introduction of the centrally sponsored horticulture schemes, commercial cultivation of cut flowers such as roses, orchids, gladiolus, carnation, anthurium, gerbera and lilies, under protected cultivation has become popular. Further he adds that during 2006-07 India produced 0.83 million metric

tons of loose flower and 2740 million cut flowers, from an area of 0.13 million hectares. Most of the area under open field conditions and about 500 hectares has come under protected cultivation. This is expected to increase further in the coming years. It is learnt that the cut flower cultivation under controlled environment is increasing throughout the world at the rate of 6 to 7 percent per annum.

In the study of Mohammed Mustaq (2007), he finds out that flowers have immediate and long-term positive effects on emotional reactions, mood, social behaviors and even memory for both males and females. The presence of flowers triggers happy emotions heightens feelings of life satisfaction and positively affects social behavior far beyond what is normally believed.

To strengthen his contention he has made a reference to a study on the effects that flowers have on senior citizens. It showed benefits including better moods and improved memory, it demonstrated that flowers ease depression, inspire social networking and refresh memory as we age. By his empirical study on flowers in the workplace, he concluded that worker's idea generation, creative performance and problem-solving skill improve substantially in work place environments that include flowers and plants. His recent study shows the importance flowers play in home ecology. It demonstrated that people feel more compassionate toward others, have less worry and anxiety, and feel less depressed when fresh flowers are present in the home, and those feelings carried over to the individual's work environment. He concludes his research study by stating that, as long as flowers and plants make people feel good and research enumerates additional benefits, the industry will do well.

In the study by Srinivasa gowda (2009) stated that Floriculture may be defined as the art, science and business of growing and marketing flowers. As an art, it refers to the cultivation of flowers; as a science it systematically studies botanical aspects of flowers and plants; and as a business it deals with the costs of production of and income from flower production and marketing. The objective of the study is to assess the costs, returns and profitability of high-tech floriculture in Karnataka, to document the production and marketing constraints and Problems faced by high-tech floriculture units in Karnataka. And he says that Floriculture in India comprises both traditional and modern flower crops. Most traditional flowers are grown in open fields while modern flowers are grown under protected conditions.

Muhammad-Lawal (2012) stated that, in spite of the substantial contribution of floriculture to the Nigerian economy, there is still a low level of awareness on the potential of the horticultural subsector of the Nigerian agricultural sector to generate employment and reduce poverty. Therefore, study carried out an assessment of the economics of floricultural plants production in Kwara State, Nigeria. The study specifically estimated the returns to farmer's labor and management. Use of manure, labor, farm size, experience, educational level and age of the farmer were found to have significant influence on farmer's revenue. Inadequate capital to expand the scale of production was identified as the major constraints to floricultural plant production in the study area. The study therefore recommends that farmers be supported by making credit facilities available to them and that people be enlightened on the profitability potential of the enterprise.

According to Prakash et al (2012) in their research paper stated that Jasmine is native to tropical and warm temperature region. This sector is generating higher income and employment opportunities especially for women. Contribution of women to agriculture is 46%. The objective of the study is to find out area and production of jasmine and actual rainfall area of Madurai district. Madurai district is selected for the study area and the study was based on secondary data and data is collected from various government reports and publication. Correlation function is used in the study. The correlation result of this particular study, production depends upon the area with high positive and statistically significance at 1% level.

Mathur et al (2013), in the study found that the annual domestic demand for the flower was increasing at a rate of over 25% and international demand was about Rs 90000crores. The study based on secondary data provided by various national and international resources. The study depicted that flower consumption in the cities and major towns of India rose up to 40% annum and business of floricultural products had grown from Rs 8174lakh in 2005 to Rs 14117lakh in 2009 in India. Bihar proved to be a top leading state in the productivity per hectare in India, followed by Haryana. However, India's share was hardly 0.5% in the world transaction.

According to Muhammad Usman et al (2013), in their article "Economic Analysis of Tuberose Production in Punjab, Pakistan" made an attempt to examine the cost and return of tuberose cut-flower along with factors affecting revenue. Purposive sampling technique was used to collect primary data in 2011. Average tuberose acreage in the study area was

about 1 acre. Total variable cost of the small farmers was Rs 152371, medium Rs 146574 and large Rs 147587. The study identified the production of tuberose was highest of the medium farmers 290480 pieces followed by small farmers 289202 pieces and large farmers 268700 pieces. Gross margin per year was greatest of the small farmers Rs 0.253 million followed by medium Rs 0.246 million and large Rs 0.237. Cobb-Dougllass production function was used in the study to find the variable of age, education; land preparation, fertilizers and irrigation were positive and significant. The benefit cost ratio of small, medium and large farmers were 2.66, 2.68 and 2.60 respectively. The study reveals that the large farmers have highest returns because they have abundant amount of money, infrastructure and marketing information. Tuberose is very profitable crop as returns are double than cost.

Shakuntla et al (2016) in their study “Floriculture in Punjab: Trends in Area, Production and Yield of flowers in Punjab and in Patiala district” stated that floriculture has received considerable attention in India in recent years from the policymakers, researchers, agricultural and horticultural planners. International flower trade has increased significantly due to huge demand of floriculture products in the world. The objective of the present study is to find out trends in the area, production and yield in Punjab as well as in Patiala district. The study is based on secondary data from various government reports and publications. An effort has also been made to suggest some policy measures. The study finding highlight that an increasing trend has been found in the area, production and yield of flowers in Punjab and Patiala district over time. The reason for increase in area as well as production is found to be better returns from flowers. Therefore it is suggested that price stability, proper government planning, regular supply of electricity, skilled labor, proper availability of planting materials, adequate bank loan and subsidy etc.

#### Objectives:

Based on the literature review, the following objectives are formulated for the study and the study is based on following objectives:

1. To study the growth of floriculture in India and Karnataka.
2. To discuss the trends in area, production and yield per hectare, both national and state level.
3. To compare the trends at national and state level.

### 3. DATA BASE AND METHODOLOGY

Secondary data has been used for the research paper and the data has been collected mainly from Indian horticulture database, Karnataka state horticulture office, Lal bhag, Bangalore and state horticulture website. Ten years data were taken for the study. Annual growth rate is calculated by using tabular analysis and Compound Growth Rate is calculated by using LOGEST function in Microsoft excel 2010.

#### Indian scenario:

In India, floriculture is emerging as an important commercial crop. A lot of importance has been given to this sector due to its multiple uses, satisfying the aesthetic needs of the people, this is apart from creating more employment, ensuring higher rate of returns to rural people and facilitating earning more foreign exchange. More specifically, they are being used as raw materials in the manufacture of essence, perfumes, medicines and confectioneries for direct consumption by the society. India's, commercial floriculture has gained momentum in the 1990's. The development of Indian commercial floriculture has cantered around the production of rose, marigold, gerbera, chrysanthemum, gladiolous, anthurium, carnation, orchid, tuberose, liliium, alstroemeria etc.

**Table: 1Area, Production and yield per hectare of Flowers in India 2006 to 2016**

Year	Area (in hectares)	Annual growth rate	Production (metric tons)	Annual growth rate	Yield per hectare	Annual growth rate
2006-07	114000		880000		7.7192	
2007-08	166000	46.61%	868000	-1.36%	5.2289	-32.26%
2008-09	167000	0.6%	987000	13.7%	5.9101	13.02%
2009-10	183000	9.5%	1021000	3.44%	5.5792	-5.59%
2010-11	191000	4.37%	1031000	0.97%	5.3979	-3.24%
2011-12	254000	32.98%	1652000	60.23%	6.5039	20.48%

2012-13	233000	-8.26%	1729000	4.66%	7.4206	14.09%
2013-14	255000	9.44%	1754000	1.44%	6.8784	-7.30%
2014-15	259000	1.56%	1799000	2.56%	6.9459	0.98%
2015-16	261000	0.77%	1820000	1.16%	6.9731	0.39%
CGR	7.27%		10.56%		1.75%	

Source: Indian horticulture database

CGR = Compound Growth Rate

As revealed by table 1, an increasing trend has been observed in the area, production and yield per hectare of flowers in India from 2006-07 to 2015-16. The total area cultivated under flowers was 114000 hectares in 2006-07 whereas production was 880000 metric tons and yield per hectare is 707192. In 2011-12, area and production increased tremendously i.e. by 140000 hectares and 772000 metric tons respectively. In 2015-16 area increased by 147000 hectares, production increased by 940000 metric tons and yield per hectare increased by 1.75%. Total area cultivated under flowers increased by 46.61% whereas production and yield per hectare decreased by 1.36% and 32.26% respectively in 2007-08. The main reason for an increase in area was better returns from flower crops than traditionally grown crops. During the year 2011-12, there was a tremendous increase in area, production and yield per hectare i.e. by 32.98%, 60.23% and 20.48% respectively. Again in 2012-13 area under flower cultivation decreased by 8.26%, but production and yield per hectare increased by 4.66% and 14.09% respectively. A slight increment in the annual area, production and yield per hectare has been observed i.e. 0.77%, 1.16% and 0.39% respectively in 2015-16. So the Compound Growth Rate of area is 7.27%, production is 10.56% and yield per hectare is 1.75%. So there is an increasing trend in the area, production and yield per hectare of floriculture in India.

#### Karnataka scenario:

Karnataka stands first in the area under cultivation of floriculture in the country. Karnataka is well known for floriculture right from the 18th century onwards. The farmers in the state have been growing traditional flowers such as rose, chrysanthemum, tuberose, aster, jasmine, crossandra, marigold, champaka, gladiolus, and bird of paradise in the open fields. Some of these flowers are also being cultivated as cut-flowers in recent years. Rose, carnations, gerbera, and anthurium were grown under protective covers and these have gained momentum in the last 10 years.

Table: 2 Area, Production and yield per hectare of Flowers in Karnataka 2006 to 2016

Year	Area (in hectares)	Annual growth rate	Production (in metric tons)	Annual growth rate	Yield per hectare	Annual growth rate
2006-07	24017		191940		7.9918	
2007-08	26290	9.46%	209940	9.37%	7.9855	-0.07%
2008-09	27024	2.97%	197963	-5.70%	7.3254	-8.26%
2009-10	27007	-0.062%	195493	-1.24%	7.2386	-1.81%
2010-11	27970	3.56%	196438	0.48%	7.0231	-2.97%
2011-12	28962	3.54%	217886	10.91%	7.5231	7.11%
2012-13	29861	3.10%	218882	0.45%	7.3301	-2.56%
2013-14	30058	0.65%	214396	-2.05%	7.1327	-2.69%
2014-15	31061	3.33%	220718	2.94%	7.1059	-0.39%
2015-16	31846	2.52%	230414	4.39%	7.2352	1.81%
CGR	2.81%		1.73%		-1.04%	

Source: Karnataka state horticulture office

CGR= Compound Growth Rate

Table 2 shows the area, production, yield per hectare, annual growth rate and compound growth rate of floriculture in Karnataka from 2006 to 2016. In 2006-07 area under floriculture was 24067 hectares, production was 191940 metric tons and yield per hectare was 7.99 tons. Area and production of floriculture is gradually increasing whereas yield per hectare is decreasing in Karnataka. In 2011-12, an increase in area and production by 4945 hectares and 25946 metric tons respectively. But yield per hectare decreased by 0.47 tons. During 2015-16 area increased by 7829 hectares, production increased by 38474 metric tons but yield per hectare decreased by 0.76 tons. Annual growth rate of area and production

increased whereas yield per hectare decreased in Karnataka. In 2007-08 area increased by 9.46% and production increased by 9.37% but yield per hectare decreased 0.07%. Area, production and yield per hectare decreased by 0.062%, 1.24% and 1.81% respectively in 2009-10. The growth of area, production and yield per hectare can be seen in 2011-12 i.e. 3.54%, 10.91% and 7.11% respectively. In 2015-16, area increased by 2.52%, production increased by 4.39% and yield per hectare increased by 1.8%. The compound growth rate of area and production is 2.81% and 1.73%. So the area and production is increasing in Karnataka in last 10 years. But yield per hectare decreased by 1.04%. So area and production growth is satisfactory, yield per hectare growth is not satisfactory in the state.

#### **A Comparative analysis of Floriculture in India and Karnataka:**

Table no's 1 and 2 reveals the Annual Growth Rate (AGR) and Compound Growth Rate (CGR) of area, production and yield per hectare of floriculture in India and Karnataka respectively from 2006-2016. During 2007-08 the estimated AGR of area is 46.61% but production and yield per hectare decreased in India by 1.36% and 32.26% respectively. The AGR of area and production increased by 9.46% and 9.37% respectively, but yield per hectare decreased by 0.07% in 2007-08 in Karnataka. During 2011-12 AGR of area increased by 32.98% in India, but in Karnataka area increased by 3.54%. Production increased by 60.23% in India whereas in Karnataka production increased by 10.91%. Yield per hectare in Karnataka increased by 7.11% but in India yield per hectare increased by 20.48%. In 2014-15, compared to India, Karnataka's growth in area and production is high, i.e. by 3.33% and 2.94% respectively. But yield per hectare decreased by 0.37%. During 2015-16 area, production and yield per hectare increased by 0.77%, 1.61% and 0.39% respectively. Whereas in Karnataka, area increased by 2.52%, production increased by 4.39% and yield per hectare increased by 1.81%. So in 2015-16, Karnataka's growth is high compared to India's floriculture growth. Area increased by 7.27% in India but in Karnataka area increased by 2.81%. Production of flowers in India increased by 10.56% whereas in Karnataka production increased by 4.39%. Yield per hectare increased by 1.75% in India but in Karnataka yield per hectare decreased by 1.04%. So the growth of floriculture is satisfactory in India. But in Karnataka only area and production growth is satisfactory whereas yield per hectare growth is not satisfactory.

#### **4. MAJOR FINDINGS**

- ❖ An increasing trend has been observed in the area, production and yield per hectare in India from 2006-07 to 2015-16.
- ❖ The main reason for an increase in area and production was due to better returns from floriculture than traditional grown crops.
- ❖ A huge increment of 47000 hectares and 63000 hectares was observed in 2010-11 and 2011-12 respectively, in area of floriculture in India.
- ❖ In 2011-12, a huge annual growth rate of area is 32.98%, production is 60.23 and yield per hectare is 20.48% under floriculture in India.
- ❖ The compound growth rate of area, production and yield per hectare under floriculture in India is 7.27%, 10.56% and 1.75% respectively.
- ❖ In 2007-08, 26290 hectares, 209940 metric tons in area and production respectively and 7.9918 yield per hectare in Karnataka state.
- ❖ During 2008-09 area increased by 2.97%, production decreased by 5.70 and yield per hectare decreased by 8.26% in Karnataka.
- ❖ In 2011-12 area increased by 3.54%, production increased by 10.91% and yield per hectare increased by 7.11% in Karnataka.
- ❖ But in 2015-16, area under floriculture increased by 2.52%, production increased by 4.39% and yield per hectare increased by 1.8% in Karnataka.
- ❖ The compound growth rate of area is 2.81% and production is 4.39% in Karnataka.
- ❖ Yield per hectare is decreased by 1.04% in Karnataka.

- ❖ The main reason for the decrease in yield per hectare is due to unseasonal rain fall and weather change, lack of technology, lack of knowledge to the farmers and low quality of planting materials.

## 5. CONCLUSION

It can be concluded that area, production and yield per hectare of Indian floricultural products have been consistently increasing from last 10 years. But in Karnataka area and production are increasing, but yield per hectare is decreasing. India is a potential country blessed with agro climatic condition for floriculture. Many farmers have switched over to floriculture from conventional cropping system because of its blooming scope. Yield per hectare is decreasing due to low quality planting materials, lack of technology etc. Since the demand for flowers is increasing both in domestic and international market, the government should promote the growth of floriculture. Efforts should be made by government to increase the area under floriculture, production as well as yield per hectare. In today's world, the floriculturists must have full knowledge about flower cultivation and trade as well. A serious and sincere effort must be made on the part of the government, through its various programs in order to create awareness about scientific floriculture. This enables not only diversification of farming articles but also expands the income earning opportunities of the farmer.

## REFERENCES

- [1] Timothy A. Woods et,al(1997) "Single Stem Roses -- An Economic Analysis" Agricultural Economics, Spain Staff Paper # 369 May 1997.
- [2] Bhanumathy. V. and Devi.K.S (2003) "An Economic analysis of marketing costs, margins and price spread of jasmine in Chidambaram taluk, Caddalove Dist, TamilNadu. Indian journal of agriculture marketing, Vol.17. No 1,PP.41-51
- [3] Thippaoah.P (2003), "Floriculture in Karnataka- Performance, Problems and Prospects". Institute for social and economic change. Research report : 1/ADRT/105.
- [4] Singh. H. P and Upadhya. R.C. (2007), "Exploring floriculture potential" Indian horticulture, Vol.52.
- [5] Pawar, S., "Centre Committed to Holistic Floriculture Growth", Floriculture Today, Vol.12, No.5, October 2007, pp.22-23.
- [6] Mohammed Mustaq, "U.S. Floriculture Size: Potential and Prospects", Floriculture Today, Vol.12, No.4, September 2007, pp.98-102.
- [7] Srinivas gowda M.V (2009) "Hi tech floriculture in Karnataka" Department of Economic Analysis and Research, National Bank for Agriculture and Rural Development, Mumbai.
- [8] Muhammad-Lawal (2012) "Economic analysis of floricultural plants production in kwara state, North central Nigeria" Publisher: Asian Economic and social society, ISSN (p): 2304-1455, ISSN (E):2224-4433 volume 2 no. 3.
- [9] K. Prakash, B. Muniyandi "Area, Production of jasmine and rainfall of Madurai district in TamilNadu, South India", International journal of science and research. ISSN:2319-7064 2012
- [10] Mathur.R. and Pachpane. P.P.(2013), "Floriculture prospects and opportunities" ASM's.
- [11] Muhammad Usman and Muhammad Ashfaq, Sarhad.J. "Economic analysis of tuberose production in Punjab, Pakistan, Agri Vol.29, No 2, 2013.
- [12] Shakuntla Gupta and Jaspreet Kaur (2016) " Floriculture in Punjab: Trends in area, production and yield of flowers in Panjab and Patiala district" P:ISSN No.2231-0045 RNI No. UPBIC /2012/5543 February 2016.