**International Journal of Multidisciplinary Research and Development**
**Online ISSN: 2349-4182, Print ISSN: 2349-5979, Impact Factor: RJIF 5.72**
**www.allsubjectjournal.com**
**Volume 3; Issue 7; July 2016; Page No. 71-75**

# Analysis of growth trends in production and export of Indian cut flowers with special reference to contribution of Maharashtra

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**Abstract**
The State of Maharashtra is also leading in Cut Flowers and Floriculture and hence the state of Maharashtra was also studied critically. Floriculture/Flowers indicated significant growth in Indian floriculture and acceptability of Indian flowers in the global market. It can also be noted that the Indian floriculture is steadily increasing. This has resulted in becoming India as globally competitive with the new global trade rules under the WTO regime.
The analysis of the present study will provide the information of trade and the list of the countries where the product can be exported and in which country the floriculture fetches more prices.
This will also provide guidelines to small and marginal farmers engaged in Floriculture, NGOs, State and Central Government for future planning and betterment of floriculture. Keeping in view the above aspects, the present research study was undertaken.

**Keywords:** Cut Flowers, Floricultural, flowers crops

## 1. Introduction
The present study is carried out to study the present status of area and production of Cut flowers in the country as a whole and for various states in India. The countries where there is stability for exporting Indian flowers have been proposed in the present study. The data on the floriculture is also available and can be utilized. Further, there is a growing demand of flowers in the domestic as well as the export markets. Therefore, the export of Flowers and total Floriculture from India over a period of time 1995-96 to 2012-13 was also studied critically in this study. The potential countries where the exporters/Farmers can export their products have been proposed.
it is proposed to undertake the research study on the topic entitle Statistical Analysis of Growth Trends in Production and Export of Indian Cut Flowers with Special Reference to Contribution of Maharashtra.

### 1.1 Background
**1 Trends in Area and production of flowers in Maharashtra (1995-96 t0 2013-14)**
To study the trends in Area and production of floriculture in the Maharashtra State the available data for the last 19 years for the period 1995-96 to 2013-14 were collected from Hand Book on Horticulture Statistics, Govt. of India Reports and Directorate of Agriculture, Govt. of Maharashtra, Pune. National Horticulture Board reports etc. The collected data were tabulated and presented here. It can be seen from the analysis that both Area and Production is increasing steadily that in the Maharashtra State.

**2 Present Status of All India: Arithmetic Mean, Standard Deviation of Area, Production of Cut Flowers**
To study the present status of Area, Production of cut flowers the available data for the last 18 years for the period 1995-96 to 2012-13 were analyzed and presented here. The analysis indicated that on an average the area under flower crops was 127.68 thousand ha. However, there are many fluctuations in area as the standard deviation value was 57.15 thousand.

### 1.2 Trade of Cut- Flowers in India (Export-Import)
The research paper aims at studying the growing business of cut flowers in India. This is done by analyzing the imports and exports of cut-flowers to and from India respectively.
According to a recent research by APEDA, India's share in the world market is less than 1%. Exports from India the cultivation of flowers especially cut flowers is quite popular all over the world. Flowers have a huge demand in the global market. Many countries export flowers and India is one of them.
According to APEDA, India has exported to 139 countries from 2009-10. It has exported to the countries like Belgium, France, and Singapore etc.

### 1.3 Imports of Cut Flowers to India
Based on the research made by APEDA, there are 26 countries which have exported cut flowers to India. In 2009, the total import qty is 4060 mt with a value of 12$US Million. It is researched that the maximum export is from Netherlands with a qty of 11176 mt and a value of 4 US$ Million. In 2008, the total import was 5627 mt with a total value of 17 US$ Million, which means that the import of floriculture products including cut flowers has decreased. From this we can say that both import and export have decreased which is not good for the growth of flower business.

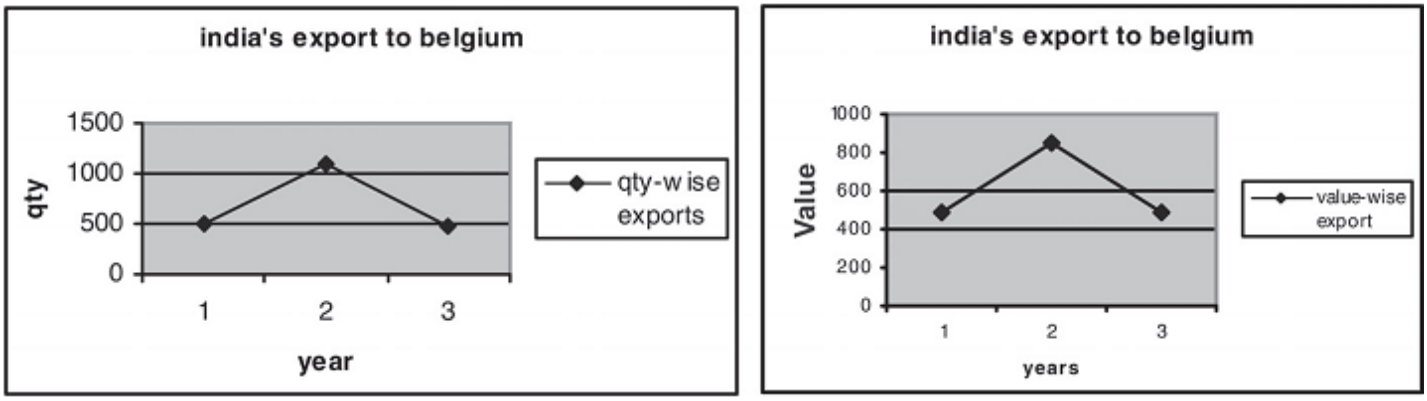
### 1.4 Related Researches
Research by floriculture today magazine under the heading "Indian floriculture awaits a serious action plan to take growth targets forward" states that the imports are rising and exports are decreasing and soon India will become a regular importer of flowers. It says china looks like an emerging significant supplier. But he says that the despite of falling export and rising import the domestic demand is rising. Also, the

government of India is taking steps to provide support to the sector. Corporate houses are encouraged to set up units with global scale and size so that they can meet global quantity demands.

**Graphical Representation of Export & Import of Cut Flowers between India and Five Countries of the World**

**Trade of Cut Flowers with Belgium**

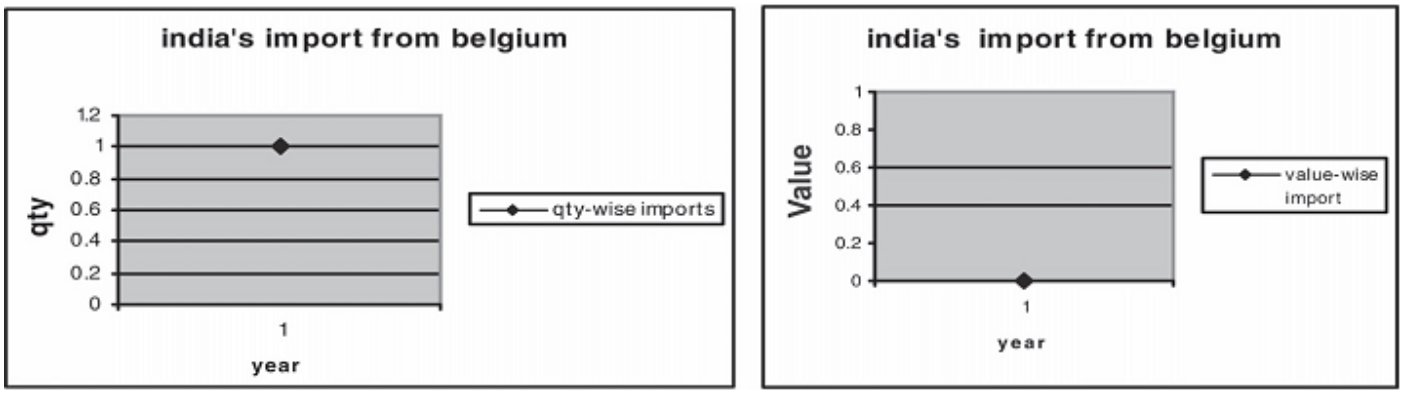
India's Export of Cut Flowers to Belgium




**(a) Qty-wise export of cut flowers** **(b) value-wise exports of cut flowers**

**Fig 1**

India's Import of Cut Flowers from Belgium

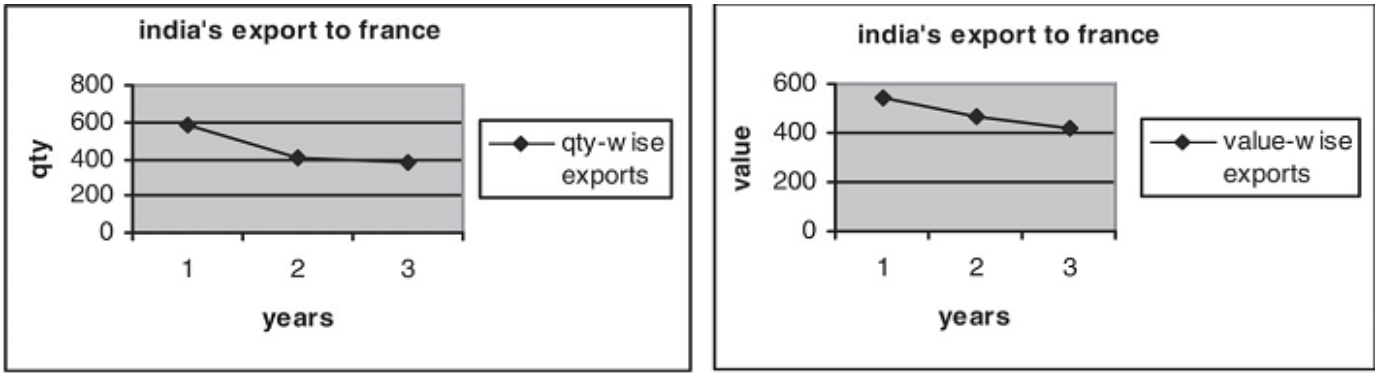



**(a) qty wise import of cut flowers** **(b) value wise import of cut flowers**

**Fig 2**

**Trade of Cut Flowers with France**

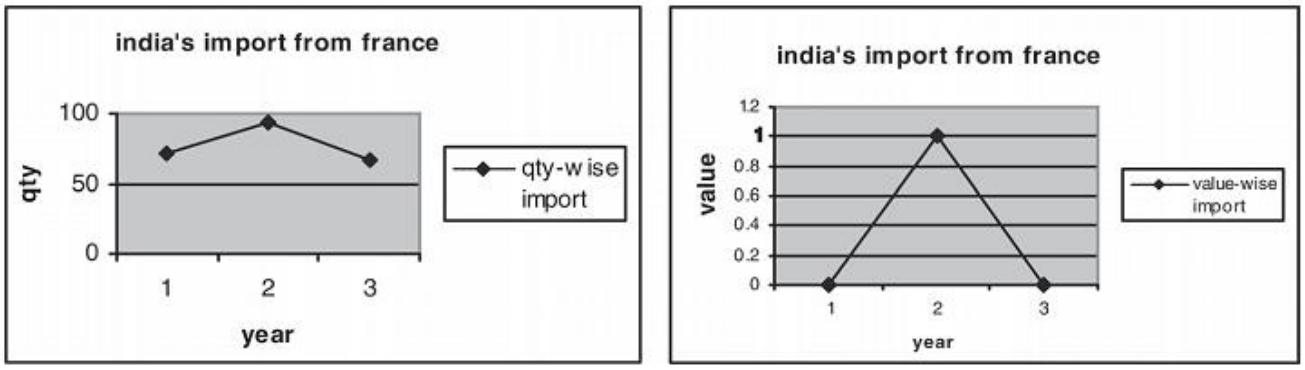
India's Export of Cut Flowers to France




**(a) qty-wise export of cut flowers** **(b) value –wise export of cut flowers**

**Fig 3**

India' Import of Cut Flowers from France




**(a) qty-wise import of cut flowers** **(b) value-wise import of cut flowers**

**Fig 4**

**1.5 Area under Flowers**

The Linear Growth Rates (LGR) and Compound Growth Rates (CGR) was estimated for area under flowers, production of cut flowers independently and the results are presented here. It can be noted here from the analysis of data that the area under flower crops is increasing per year by 9.502 thousand ha. This value was also tested by t test whether it is significant or not. The t test indicated that the Linear Growth Rates (LGR) is statistically significant at 1 per cent level of significance. The increase in area is due to increase in demand for flowers in domestic and international market. The protected cultivation i.e. green houses and poly houses are also increasing due to subsidy to these units.

The Compound Growth Rate (CGR) indicates per annum percent increase in the area. The analysis indicated that the area under flowers has increased significantly by 7.40 Per Cent Per Annum. Its significance was also tested and presented in the SPSS output Tables. The increase in area at all India level was statistically significant. The rate of increase was satisfactory because the farmers are diverting to cash crops in the country. As traditional crops are not giving more returns. Also there is no scope to traditional crops for export.

**2. Objectives of the study**

- To study the Trends in Area and Production of Cut flowers/Floricultural in the Maharashtra as compared to India. To find the compound growth rates in Area and Production of major Cut flowers/Floricultural in India and Maharashtra.
- To understand the contribution of Maharashtra State in Country's growth of cut flowers/ floricultural Production.
- To assess over a period of time the instability in Area and Production of major cut flowers in the state and at overall country level.
- To study the trends in trade of export in terms of quantity and export value of important cut flowers/floriculture at current and constant prices.
- To estimate the Linear and compound growth rates in Export of major cut flowers/floriculture from India.

**2.1 Maharashtra State Level: Instability Analysis of Area and Production of Flower.**

To study the instability in Area and Production of Flowers in the Maharashtra State, the available data presented were analyzed. The instability is measured in statistics by estimating the Coefficient of Variation (CV %). The time series data of 19 years for the period 1995-96 to 2013-14 were analyzed in SPSS 21.0 version software and presented here.

**2.2 Area under Flowers**

The instability in Area analysis indicated that in the state on an average the area under flower crops was in the state 11297.00 ha. However, there are many fluctuations in area as the standard deviation value was 5965.66 ha. The Coefficient of Variation (CV %) for the area is 52.80 %. This clearly indicated that the area fluctuates about 53 per cent. Thus much variability is observed in Area under the crop in the Maharashtra state. This clearly shows instability in Area under the Flower crop in the state. The more than 50 per cent variation in area clearly indicates that there is much variation i.e. instability in the area under flower crops in the state. This may be due to many reasons i.e. pricing fluctuations, weather conditions, Govt. policies etc. The State Govt should take many efforts to bring stability in area under the crop. The assured domestic markets and educating the farmers in cultivation of the crop and providing knowledge of export of flowers and its benefits.

**2.3 Production of Flowers**

The instability analysis for production of flowers is also presented in this study. It was 64864 MT. In the recent years the production in the state has taken momentum due to subsidy policy of state government and also the demand for flowers in day to day festivals and religious functions. Also Mumbai and Pune are international markets in the state. However, there are many fluctuations in the production as the standard deviation was 31056.66 MT. The Coefficient of Variation (CV %) for the production of loose flowers is 47.87 %. This clearly indicated that the production of flowers fluctuates about 48 per cent. Thus, much variability is observed in production of flowers under the crop in the Maharashtra State. This clearly shows instability in production of flowers in the state. The instability in production was more than that of area under the crop. This may be also because of weather, climate and price fluctuations in domestic and export /import markets. Also the flowers are mostly grown in the green or poly houses or under controlled conditions and hence there is less instability as compared to lose flowers production.

- **State wise Analysis: Instability Analysis of Area under Flowers compared to**

**Maharashtra.**
To study the instability in Area under Flowers in the all the flower growing states, the data were collected.

**2.4 Area under Flowers**
The analysis presented here indicated there are many fluctuations in area as the standard deviation value was more for all the states. The Coefficient of Variation (CV %) for the area was highest in Orissa State. This was followed by Himachal Pradesh and Maharashtra. The stability in area as compared to Maharashtra was observed in Karnataka and Tamil Nadu state. The overall instability of all India was 44.76 Per Cent which was stable than the Maharashtra.

**2.5 Trends in trade of export in terms of quantity and export value of important flowers.**
The contribution of India in the global floriculture trade cannot be neglected as there is a resonate contribution of India both in production and export of floriculture and its byproducts. Singh1 and Trends in Floriculture Export during 1996-97 to 2012-13
To study the trends in flowers/floriculture export the available data for the last 19 years for the period 1996-97 to 2012-13 were collected and analyzed. It can be noted from that during 1996-97 the export of floriculture was Rs. 6339.87 lakh which increased to Rs 42344.00 lakh during 2012-13.

**2.6 Analysis and Discussion**
The results obtained from the analysis of data are discussed and presented below.

**2.7 Present Status of Area and Production of Cut flowers/Floricultural in India:** The time series data of Area and production of cut flowers for the period 1994-95 to 2012-13 has been collected from Government reports/ web sites and analyzed. The analysis revealed that during 2012-13 i. e. recent available data of area under flowers crops indicated that flowers are grown in 233,000 ha area. The production of loose flowers during the year was 1729,000 MT and that of cut flowers was 76732 lakh numbers which has been depicted in the report of NHB 2013 database and Horticulture data base, Govt of India.
As regards Cut Flowers the production was 51900 lakh numbers in 1994-95 which increased to 76732 lakh numbers. The increase is one and half times the initial year. The production boost is seen during last five years. It also note worthy that most of the produce may not be reported in the reports. However, the trend can be judged through this data.

**2.8 State Wise Analysis: Production Share of Cut Flowers Producing States in India:** It is also necessary to know the state wise positions and contribution of each state in the production of flower/floriculture.

- **Flower Production (Cut Flower)**

The Production Share of leading Cut Flower Producing States is studied and presented here. The production share of different states in country's production of cut flowers indicated that the West Bengal was the topmost state in the country with production of 25429.10 thousand MT. Its percentage share was 33.14 per cent. The Karnataka stands second with production of 9441.80 thousand MT. The contribution in terms of percentage was 12.30 per cent. The Maharashtra state even though seventh in area stands third in terms of production with production of 7914.00 thousand MT. Its percentage share was 10.31 per cent. The Andhra Pradesh was at fourth position with contribution of 9.00 percent.
Estimation of Growth Rates in Export of Major Floriculture/Cut Flowers in India. The export of floriculture is important because even though there is growth in production of flower crops the country needs foreign exchange for economic development of the country. Before studying the growth rates the present status of export data were also studied. The results are presented in the following sections.

**2.9 Present Status of Country Wise Cut flower Export from India**
Present Status of Country Wise Cut Flower Export from India to Various countries in the globe and their export earnings. The analysis of data is given below.

- **Quantity Exported to Various Countries**

It can be noted that during the period under study the countries namely USA, Japan, Netherlands, UK, Germany, France, Switzerland, Australia, were important as markets for India's Cut Flower export. The analysis further revealed that the average quantity exported of Cut Flowers from India was 11174 MT. Further, maximum quantity exported from India was to Japan, Netherland and USA. The Coefficient of Variations (CV %) for Quantity exported was maximum 179.22 percent at an overall level. However, there is also much variation in quantity exported to other countries. More stability in quantity exported was for Netherland (3.87 %). This clearly indicated that there is stability in quantity exported to only Netherland as compared to other countries.

- **Export Value Received from Other Countries**

The value received from export of Cut Flowers from various countries is also presented studied. It can be revealed from the analysis that the average value received from export of Cut Flowers was Rs. 7214 Lakh. Japan, Newzeland and France are the important countries from which India received more foreign exchange through cut flower export.
The Coefficient of Variation measures the average variation from arithmetic mean. It is the ratio of Standard deviation to Arithmetic Mean. The CV % value was maximum 183.85 % for Japan. This was followed by Newzeland 161.11%. More stability in export value was observed for Netherland (4.44%) and USA (45.58 %). The CV analysis indicated that quantity and value of export was stable over period of time in case of Netherland and USA. In other countries both quantity and export were instable.

**3. Conclusions**
As the Indian economy is changing, the government of India should initiate the growth of cut flower industry. Efforts should be made by government of India to increase the export of cut flower. In today's scenario, the dealers of the cut flowers i.e. growers, retailers etc must have full knowledge about the flower trade. New irrigational techniques should be introduced to increase the production of cut flowers to improve the exports.

**3.1 The Broad Conclusions Drawn from the Analysis of Data Is Presented Here**

- The time series data analysis revealed that the area under the flowers in the country during 1994-95 was 60 000 ha. Which increased to 233000 during 2012-13? The increase is about four times. The increase is steady during last five years. This is because of the introduction of modern production technologies, improved varieties and Govt. efforts for boosting floriculture production.
- The Cut Flowers production was 51900 lakh numbers in 1994-95 which increased to 76732 lakh numbers. The increase is one and half times the initial year. The increase in production is seen during last five years.
- As regards state wise production, it was highest in the Tamilnadu state. The production was 312.97 thousand MT. Its contribution in the nation's production of loose flowers was 18.10 per cent. It was followed by Andhra Pradesh 224.41 thousand MT. Its contribution in the nation production of loose flowers was 12.98 per cent. However the Karnataka (207.50 thousand MT) was at third place. Its contribution in the nation's production of loose flowers was 12.00 per cent.
- As regards comparison of Maharashtra state with other states, its contribution was 119.00 thousand MT. In terms of percentage it was 6.88 per cent. This clearly indicated that even though the Maharashtra is leading state and has Mumbai and Pune as international market its contribution is less as compared to Tamilnadu, Andhra Pradesh and Karnataka.
- The production share of different states in country's production of cut flowers indicated that the West Bengal was the topmost state in the country with production of 25429.10 thousand MT. Its percentage share was 33.14 per cent. The Karnataka stands second with production of 9441.80 thousand MT. The contribution in terms of percentage was 12.30 per cent.
- It is revealed from the data that Rose and Marigold are the major flowers grown in Maharashtra state. Rose is grown in about 30.22 Per cent area and Marigold in about 27.10 Per cent area. Which is followed by Chrysanthemum and Jasmine flowers? Thus we can see from the data that Rose, Marigold, Chrysanthemum and Jasmine are popular flowers grown in Maharashtra.

  The growth rate analysis indicated that area under flower crops is increasing significantly per year by 9.502 thousand ha. The t test indicated that the Linear Growth Rates (LGR) is statistically significant at 1 per cent level of significance. The increase in area is due to increase in demand for flowers in domestic and international market.

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