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FLORICULTURE EXPORT OF INDIA AND ITS TRENDS AND INSTABILITY IN EUROPEAN ZONE

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ABSTRACT

The present study was initiated with the objective of examining the export performance of Indian floriculture and its trends and instability in European Zone. The data were divided into pre-NHM period (1994-95 to 2004-05) and post-NHM period (2005-06 to 2018-19) and was analyzed by estimating growth rates and using instability analysis.

The results showed that floriculture exports of India grew with a compound growth rate of 11.03 per cent per annum throughout the overall study period. Other floriculture products are flourishing and performing relatively better in the export market. During all the periods of study there was positive and significant growth of Indian floriculture export to Netherland, UK, Germany and Italy in European zone and CV and instability remained lowest in Netherland indicated that, Netherland was stable country for floriculture export of India.

Keywords: *Export, Floriculture, Instability, Growth*

1. INTRODUCTION

Floriculture has become one of the important commercial trades among agriculture, an economical viable option in agri-business because of continuous increase in demand of flowers within the world. Its expansion as a trade got a boost with increasing expandable income. The expansion in area under floriculture in non-traditional regions has been one of a noticeable feature. There is a strong tradition of growing and consuming flowers in Netherlands, Italy, Germany and Japan. New production centers are also developing in Latin America, Africa and Asia to meet the increasing demand of importing countries and to expand their domestic market presently.

In the floriculture world market, the major players are Germany, Netherland, USA, UK and France. Globally more than 145 countries are involved in floriculture industry. Europe, the trade center of world floriculture shares more than 76 per cent of the global market. The per capita consumption of floriculture has increased strongly over the years. International consumption of cut flowers is mainly concentrated in three regions i.e. North America, Europe and Japan. The consumption patterns differ from country to country, however, consumption is mainly based on holding of special occasions at both individual and institutional levels for example during religious functions, parties, conferences. Largest international flower market is situated at Aalsmeer in the Netherlands. The Netherlands plays a key role in the global cut flowers trading with more than 40 per cent export share. In the international market, the mostly preferred cut flowers are roses, tulip, chrysanthemum, carnation, freesia, lillium, alstromeria, irris, gerbera, anthurium, orchids and gypsophilla

Germany, Netherland, USA, U K and France are the major players in the floriculture world market. India possesses a variety of agro climatic conditions blessed with plenty of sunshine, land, cheap and skilled manpower for the desirable development of floriculture industry. Government of India has identified floriculture as a sunrise industry.

Government of India has launched National Horticulture Mission (NHM) during the year 2005-06 (Tenth Plan) in which it provides 100 per cent assistance to the State Mission. The objective of this scheme is to provide holistic growth of horticulture sector in India and to enhance horticulture production. In India commercial floriculture has emerged as hi-tech activity-taking place under controlled climatic conditions inside greenhouse which is being viewed as a high growth industry. It is becoming important from the export angle. The new seed policy had already made it feasible to import planting material of international varieties. It has been found that, commercial floriculture has higher potential per unit area than most of the field crops and is therefore a lucrative business. The floriculture industry of India has been shifting from traditional flowers to cut flowers for export purposes. The liberalized economy has given an impetus to the Indian entrepreneurs for establishing export-oriented floriculture units under controlled climatic conditions.

Thus, considering the importance and scope of export, the present study has been taken with the study of export performance of Indian floriculture and examining its trends and instability in European Zone

2. RESEARCH METHODOLOGY

Data on export of flowers from India was collected for the period of 1994-95 to 2018-19. It was collected from annual published literature of APEDA and its website, WTO website, National Horticultural Board website and FAO year books. In order to assess the effect of National Horticulture Mission (NHM) programme (2005-06) the data were divided into two time periods as pre-NHM period (1994-95 to 2004-05) and post-NHM period (2005-06 to 2018-19). The important and invariable importing countries from European zone were considered.

Estimation of growth rates

Trend analysis was done for year wise export values realized from exports. The exponential growth rates were worked out using the exponential growth function of the following form,

$$Y = ab^x e^u$$

Where,

Y = Dépendent variable

a = Intercept

b = Regression coefficient

x = Number of years

e^u = Error term

By using the semi-logarithmic form of the equation the growth rate was estimated as below:

Log Y = Log a + t Log b

Then, the compound growth rate (g) was computed using:

g = (Antilog of Log b – 1) x 100

Instability analysis

Instability Index was used to examine the extent of variation and risk involved in the parameter such as export of flowers. In order to study variability, an instability index was used as a measure of variability. The coefficient of variation (CV) was calculated by using the following formula:

$$CV\ (\%) = \frac{\text{Standard deviation}}{\text{Mean}} \times 100$$

The trend coefficient was tested for its significance. Whenever, the trend coefficient was found to be significant, the variation around the trend rather than variation around mean was used as an index of instability. The formula suggested by Cuddy and Della (1978) was used to complete the degree of variation around the trend.

$$\text{Instability Index } (\%) = CV \times \sqrt{(1-R^2)}$$

Where,

CV = Coefficient of variation

R^2 = Coefficient of multiple determination obtained from the time series

It is a better measure to capture instability in area, production and export in agriculture sector. A low value of this index indicates the low instability.

3. RESULT AND DISCUSSION

The export of floriculture products from India during 1995-96 to 2018-19 is shown in the Table.1. The export of floricultural products has increased during the study period of 25 years. The export units are mainly concentrated around Pune, Bangalore, Hyderabad, Delhi, Gurgaon, Coimbatore, Faridabad, Chandigarh, Lucknow, Chennai, Kolkatta, Nasik, Vadodara, Jalpaiguri and Amritsar. Europe and USA are the important markets for cut flowers of India.

Per cent share of floriculture exports was highest in the year 2006-07 which was 1.05 per cent of total agricultural export. Year 2006-07 definitely saw a boom in the floriculture sector justifying the Government's decision to give it a sunrise industry status with the introduction of National Horticulture Mission. Although, there was degradation from 2007-08, it should not be scare considering the depression that had influenced the markets worldwide. Again from 2007-08 there was increased demand and rising of sale of the flowers in the domestic market. India's exports of floricultural products in the year 2007-08 decreased to ₹34,014.41 lakhs, from ₹65,269.72 lakhs in 2006-07, which further decreased in the year 2008-09 and 2009-10. However, in 2008-09, in rupee terms, export of floriculture from India increased marginally than the export of 2007-08. From 2009-10 in rupee terms India's exports of floricultural products has increased.

Trends in export of Indian floricultural products

Category wise export of floricultural products from India is depicted in the Table 2. The export of cut flowers was of ₹2,257.63 lakhs in 1994-95 and it reached to ₹14,967.17 lakhs with a compound growth rate of 6.86 per cent per annum during 2018-19. During the same period the export of Bulbs, Tubers, Tuberous roots grew at a compound growth rate of 5.90 per cent which reached from ₹69.70 lakhs in1994-95 to ₹550.93 lakhs in 2018-19. Similarly, export of fresh foliage and branches, other bulbs and tubers, not fresh foliage and branches and roses grafted or not grew at a compound growth rate of 16.12 per cent, 9.31 per cent, 20.63 per cent and 11.24 per cent per annum, respectively during 1994-95 to 2018-19. In this period, export of fresh foliage and branches has increased from ₹24.60 lakhs to₹ 55.82 lakhs.

The export of other bulbs and tubers was of ₹ 44.39 lakhs in 1994-95 and it reached to ₹251.62 lakhs in 2018-19. The export of not fresh foliage and branches was of ₹103.49 lakhs in 1994-95 and it reached to ₹27,646.68 lakhs. The export of roses grafted or not was of ₹28.90 lakhs in 1994-95 and it reached to ₹329.93 lakhs. During 1994-95 to 2018-19 the export of no listed other category flowers have increased from ₹283.74 lakhs to ₹ 13,323.24 lakhs with a compound growth rate of 32.43 per cent per annum. The export of unrooted cuttings and slips has decreased from ₹271.35 lakhs to ₹15.88 lakhs with a negative growth rate of -10.05 per cent per annum during 1994-95 to 2018-19. A total floriculture export of India was reached from ₹ 3,083.80 lakhs in 1994-95 to ₹57,141.27 lakhs in 2018-19.

In category wise export of floricultural products from India during overall study period highest growth rate was of export of not fresh foliage and branches (20.63%) followed by fresh foliage and branches (16.12%) and roses grafted or not (11.24%) indicated that, the share of these products in Indian floricultural export has increased significantly. This gives an indication that, many other floriculture products are flourishing and entering the export market as can be seen from the floriculture category. The export market for cut flowers consists of a choice of product groups. It is extremely competitive market in which importers are continually looking for new, special and different products. The market is clearly searching for these kinds of novelties. A new innovative product also offers the expectation of making higher profits than those obtained from selling traditional floriculture products. Demand for foliage varieties is still increasing in Europe for making use in cheap bouquets. Because of this, share of other floriculture products like foliage and branches has increased. Total floriculture exports of India exhibited a compound growth rate of 11.03 per cent per annum.

Trends of floriculture exports in European zone

1. Netherland

The Table 4.8 revealed that, the average Indian floriculture export to Netherland was ₹1,958.29 lakhs in pre-NHM period. During post-NHM period, it was increased to ₹ 5,376.17 lakhs. At an overall level, average export of Indian floriculture exports to Netherland was registered to ₹3,872.30 lakhs.

The Indian floriculture exports to Netherland registered significant compound growth rate of 13.91 per cent in pre-NHM period and 4.87 per cent in post-NHM period. The estimated compound growth rate of export of floriculture to Netherland from India registered at 8.74 per cent per annum for the overall period.

The co-efficient of variations in export of Indian floriculture exports to Netherland were 40.62 per cent, 23.22 per cent and 52.33 per cent during pre-NHM period, post-NHM period and overall study period, respectively.

The instability of export was found 24.39 per cent in pre-NHM period which was higher than instability of export in post-NHM period and overall study period with 14.50 per cent and 21.85 per cent, respectively.

2. UK

The average Indian floriculture export to UK was ₹1,097.26 lakhs in pre-NHM period. During post-NHM period, an average Indian floriculture export to UK was increased to ₹ 4,604.89 lakhs. At an overall level, average export of Indian floriculture export to UK was registered to ₹3,061.54 lakhs.

The Indian floriculture export to UK registered compound growth rate of 20.62 per cent and 4.36 per cent in pre-NHM period and post-NHM period, respectively. At an overall level, the export earnings increased at 12.76 per cent and this growth was significant.

The co-efficient of variation of Indian floriculture export to UK was estimated at 66.12 per cent during overall period. It was 78.16 per cent in pre-NHM period which was higher than post-NHM period (23.49%).

Instability index for export of floriculture from India to UK was highest in pre-NHM period (27.92%) followed by overall study period (23.86%) and post-NHM period (14.77%).

3. Germany

In pre-NHM period, the average Indian floriculture export to Germany was ₹1,180.45 lakhs. During post-NHM period, an average Indian floriculture export to Germany was increased to ₹ 4,560.87 lakhs. At an overall level, average export of Indian floriculture exports to Germany was registered to ₹3,073.48 lakhs.

The growth rate of export of Indian floriculture to Germany in the pre-NHM period was estimated at 13.68 per cent per annum. In the post-NHM period export has been increased at the compound growth rate of 4.10 per cent per annum was obtained. The estimated compound growth rate of export of floriculture to Germany from India registered at 10.72 per cent per annum for the overall period.

The co-efficient of variations in export value of Indian floriculture exports to Germany were 47.57 per cent, 26.65 per cent and 63.96 per cent during pre-NHM period, post-NHM period and overall study period, respectively.

The instability of export value of Indian floriculture exports to UK was high in overall study period with 24.22 per cent followed by pre-NHM period with 22.15 per cent and post-NHM period with 21.50 per cent, respectively.

4. Italy

The Indian floriculture export to Italy was ₹504.82 lakhs in pre-NHM period which was increased to ₹ 1,219.20 lakhs in post-NHM period. At an overall level, average export of Indian floriculture to Italy was registered to ₹ 904.88 lakhs.

The export of Indian flowers to Italy was growing at the rate of 19.90 per cent, 4.06 per cent and 8.72 per cent per annum during pre-NHM period, post-NHM period and overall study period, respectively.

The co-efficient of variation in export of Indian floriculture to Italy in the overall study period was 51.00 per cent. However, it was higher in pre-NHM period with 62.01 per cent than post-NHM period with 22.61 per cent.

The instability of Indian floriculture export to Italy were 19.93 per cent, 15.53 per cent and 22.64 per cent during pre-NHM period, post-NHM period and overall study period, respectively.

5. Spain

In pre-NHM period, Indian floriculture export to Spain was ₹230.66 lakhs. During post-NHM period, an average Indian floriculture export to Spain was increased to ₹ 602.29 lakhs. At an overall level, Indian floriculture export to Spain was registered to ₹438.77 lakhs.

The export of Indian flowers to Spain was growing significantly at the rate of 34.76 per cent and 11.54 per cent per annum during pre-NHM period and overall study period, respectively. In the post-NHM period export has been increased at the compound growth rate of 2.71 per cent per annum and growth rate was insignificant.

The co-efficient of variation in export of Indian floriculture to Spain in the overall study period was 63.65 per cent. However, it was higher in pre-NHM period with 71.44 per cent than post-NHM period with 39.87 per cent.

The instability of Indian floriculture export to Spain were 42.52 per cent, 37.94 per cent and 42.45 per cent during pre-NHM period, post-NHM period and overall study period, respectively.

6. Belgium

The Indian floriculture export to Belgium was ₹223.32 lakhs in pre-NHM period which was increased to ₹ 643.68 lakhs during post-NHM period. At an overall level, average export of Indian floriculture export to Belgium was registered to ₹458.72 lakhs.

The export of Indian flowers to Belgium was growing significantly at the rate of 34.21 per cent and 11.75 per cent per annum during pre-NHM period and overall study period, respectively. In the post-NHM period export has been increased at the compound growth rate of 0.36 per cent per annum.

The co-efficient of variation in export of Indian floriculture to Belgium in the overall study period was 56.62 per cent. It was 77.32 per cent in pre-NHM period which was higher than 20.76 per cent in post-NHM period.

The Indian floriculture export to Belgium showed 30.30 per cent, 20.71 per cent and 33.48 per cent of instability during pre-NHM period, post-NHM period and overall study period, respectively.

7. France

In pre-NHM period, Indian floriculture exports to France was ₹346.12 lakhs, ₹ 487.65 lakhs and ₹425.38 lakhs during pre-NHM period, post-NHM period and overall study period, respectively.

The Indian flowers export to France was growing significantly at the rate of 28.35 per cent and 5.70 per cent per annum during pre-NHM period and overall study period, respectively.

The co-efficient of variation in export of Indian floriculture to France in the overall study period was 43.67 per cent. It was 71.84 per cent in pre-NHM period which was higher than 16.73 per cent in post-NHM period.

The Indian floriculture export to France showed 19.95 per cent, 15.75 per cent and 34.01 per cent of instability during pre-NHM period, post-NHM period and overall study period, respectively.

8. Greece

In pre-NHM period, the average Indian floriculture export to Greece was ₹66.38 lakhs. During post-NHM period, an average Indian floriculture export to Greece was increased to ₹ 228.18 lakhs. At an overall level, average export of Indian floriculture to Greece was registered to ₹156.98 lakhs.

The Indian flowers export to Greece was growing significantly at the rate of 31.16 per cent and 10.86 per cent per annum during pre-NHM period and overall study period, respectively. In the post-NHM period export represented the compound growth rate of 1.24 per cent per annum only.

The co-efficient of variations in export of Indian floriculture export to Greece were 89.80 per cent, 71.92 per cent and 96.16 per cent during pre-NHM period, post-NHM period and overall study period, respectively.

The Indian floriculture export to Greece showed 25.19 per cent, 71.79 per cent and 70.03 per cent of instability during pre-NHM period, post-NHM period and overall study period, respectively.

9. Switzerland

In pre-NHM period, the average Indian floriculture export to Switzerland was ₹138.31 lakhs which was slightly increased to ₹ 150.88 lakhs during post-NHM period. At an overall level, average export of Indian floriculture export to Switzerland was registered to ₹145.35 lakhs.The Indian flowers export to Switzerland was growing significantly at the rate of 46.96 per cent and 7.23 per cent per annum during pre-NHM period and overall study period, respectively.

The co-efficient of variations in export of Indian floriculture exports to Switzerland were 85.50 per cent, 71.70 per cent and 76.01 per cent during pre-NHM period, post-NHM period and overall study period, respectively.

The Indian floriculture export to Switzerland showed 46.28 per cent, 70.65 per cent and 67.83 per cent of instability during pre-NHM period, post-NHM period and overall study period, respectively.

Total European zone

In pre-NHM period, the average Indian floriculture export to total European zone was ₹6318.00 lakhs. During post-NHM period, Indian floriculture export to total European Zone was increased to ₹ 19,963.21 lakhs. At an overall level, average export of Indian floriculture export to total European zone was registered to ₹13,959.32 lakhs. The Indian flowers export to total European zone was growing significantly at the rate of 19.54 per cent, 4.16 per cent and 10.36 per cent per annum during pre-NHM period, post-NHM period and overall study period, respectively.

The co-efficient of variations in export of Indian floriculture export to total European zone were 55.59 per cent, 18.72 per cent and 55.72 per cent during pre-NHM period, post-NHM period and overall study period, respectively. The Indian floriculture exports to total European zone showed 15.13 per cent, 9.38 per cent and 20.10 per cent of instability during pre-NHM period, post-NHM period and overall study period, respectively.

In European zone maximum floriculture exports of India observed to Netherland in all the periods of study. During overall study period highest growth in floriculture exports of India in European zone registered to U. K. with significant growth rate of 12.76 per cent (Table 3). During post-NHM period and pre-NHM period of study, highest growth in floriculture exports of India in European zone registered to other category nations of European zone with compound growth rate of 5.14 per cent and 48.79 per cent indicated that, there was better demand for floriculture products of India in other category nations of European zone. During post-NHM period export of floriculture products to the other category countries like Hungary (13.54%), Czech Republic (13.46%), and Poland (8.41) is increased significantly. It was also observed that, during all the periods of study in European zone there was positive and significant growth of Indian floriculture export to Netherland, UK, Germany and Italy. West Germany was the biggest consumer and importer of cut flowers followed by UK while the Netherlands was the biggest exporter. CV was observed highest in Greece during overall study period and post-NHM period indicated greater variability in export value of India's floriculture export. The co-efficient of variation in export value of Indian floriculture exports to other category countries of European zone was highest during pre-NHM period. The instability index of export of Indian floriculture in European zone showed that, during pre-NHM period highest instability was observed in other category countries and during post-NHM period and overall study period, high instability was found in Greece. During all the periods of study CV and instability remained lowest in Netherland indicated that, Netherland was stable country for floriculture export of India which is the leading nation in the floriculture exports worldwide.

4. CONCLUSIONS

[1] Floriculture exports of India grew from ₹ 3,083.80 lakhs in 1994-95 to ₹ 57,141.27 lakhs in 2018-19 with a compound growth rate of 11.03 per cent per annum. There has been an upward trend in floriculture exports of India.

[2] In category wise export of floricultural products from India, highest growth rate was of export of "not fresh foliage and branches" (20.63%). The export of cut flowers was increased with a compound growth rate of 6.86 per cent per annum. Share of not fresh foliage and branches, fresh foliage and branches and roses grafted or not has been increasing in the export indicated that, other floriculture products are flourishing and performing relatively better in the export market.

[3] Share of floriculture exports in agricultural exports was highest in the year 2006-07 which was 1.05 per cent of total agricultural export. Government has given sunrise industry status to floriculture sector. National Horticulture Mission was initiated in the year 2005-06.

[4] In European zone maximum floriculture exports of India observed to Netherland in all the periods of study. During overall study period highest growth in floriculture exports of India in European zone registered to U. K. with significant growth rate of 12.76 per cent. During all the periods of study in European zone there was positive and significant growth of Indian floriculture export to Netherland, UK, Germany and Italy.

[5] CV and instability remained lowest in Netherland during all the periods of study indicated that, Netherland was stable country for floriculture export of India which is the leading nation in the floriculture exports worldwide.

Table 1 Export of floriculture products from India (₹ Lakhs)

Sl. No.	Year	Value	Percentage to total value	Share of floriculture exports in agricultural Exports (%)
1	1994-95	3,083.80	0.42	0.23
2	1995-96	6,014.15	0.81	0.29
3	1996-97	6,339.86	0.85	0.26
4	1997-98	8,120.68	1.09	0.33
5	1998-99	9,660.98	1.43	0.42
6	1999-2000	10,515.65	1.57	0.46
7	2000-01	12,310.04	1.59	0.41
8	2001-02	11,532.52	1.72	0.43
9	2002-03	16,575.10	2.44	0.52
10	2003-04	24,954.80	3.37	0.67
11	2004-05	22,110.99	3.00	0.54
12	2005-06	30,144.65	4.06	0.61
13	2006-07	65,269.72	8.79	1.05
14	2007-08	34,014.41	4.58	0.43
15	2008-09	36,881.40	4.97	0.43

16	2009-10	29,446.96	3.97	0.33
17	2010-11	29,604.04	3.99	0.25
18	2011-12	36,532.15	4.92	0.19
19	2012-13	42,344.61	5.71	0.19
20	2013-14	45,549.17	6.14	0.17
21	2014-15	46,077.22	6.21	0.19
22	2015-16	48,341.34	6.51	0.22
23	2016-17	54,670.73	7.34	0.24
24	2017-18	50,731.23	6.83	0.20
25	2018-19	57,141.27	7.69	0.21
	Total	7,42,357.00	100.00	

Source: Directorate General of Commercial Intelligence and Statistics, Kolkata

Table 2 Trends in export of floricultural products (₹ lakhs)

Sl. No.	Years	Cut flowers	Bulbs,tubers,tuberous roots	Unrooted cuttings and slips	Fresh foliage and branches	Other bulbs and tubers	Not fresh foliage and branches	Roses grafted or not	Others	Total
1	1994-95	2,257.63	69.70	271.35	24.60	44.39	103.49	28.90	283.74	3,083.80
2	1995-96	4,648.86	128.29	220.41	19.52	63.87	358.28	129.09	445.83	6,014.15
3	1996-97	5,042.56	100.17	58.22	0.53	28.26	256.22	87.88	766.02	6,339.86
4	1997-98	7,221.42	288.12	31.24	0.34	9.96	483.54	81.99	4.07	8,120.68
5	1998-99	7,615.68	95.60	49.07	0.01	15.13	1,816.51	63.95	5.04	9,660.98
6	1999-00	7,348.05	101.59	44.98	3.95	26.12	2,925.46	37.88	27.62	10,515.65
7	2000-01	9,596.41	308.56	173.39	29.10	19.60	2,156.54	18.75	7.69	12,310.04
8	2001-02	8,988.49	312.66	125.16	45.14	49.14	1,938.28	69.39	4.26	11,532.52
9	2002-03	10,133.13	288.43	113.49	145.00	40.13	5,804.33	27.33	23.26	16,575.10
10	2003-04	11,414.35	218.01	37.61	236.17	53.27	10,870.66	36.09	2,088.64	24,954.80
11	2004-05	9,891.72	205.67	68.68	42.55	81.15	9,630.69	23.28	2,167.25	22,110.99
12	2005-06	13,941.35	220.35	25.97	77.33	58.33	12,836.94	252.33	2,732.05	30,144.65
13	2006-07	40,956.91	197.62	18.72	47.02	429.52	15,670.96	206.82	7,742.15	65,269.72
14	2007-08	11,906.81	207.21	17.86	238.42	159.28	15,790.13	59.96	5,634.74	34,014.41
15	2008-09	11,337.28	285.99	57.25	100.88	149.43	18,082.07	257.24	6,611.26	36,881.40
16	2009-10	9,988.76	302.88	43.98	119.96	95.65	13,584.02	1,181.40	4,130.31	29,446.96
17	2010-11	11,707.43	215.25	11.89	36.78	134.09	12,983.31	765.40	3,749.89	29,604.04
18	2011-12	15,571.73	268.25	49.93	17.31	43.84	15,158.39	805.25	4,617.45	36,532.15
19	2012-13	18,018.98	347.91	48.38	11.01	86.38	17,258.88	1,712.36	4,860.71	42,344.61
20	2013-14	25,276.43	301.19	11.42	29.63	260.02	11,438.22	724.96	7,507.30	45,549.17
21	2014-15	29,447.56	588.59	11.24	25.96	129.86	9,717.58	178.95	5,977.48	46,077.22
22	2015-16	21,085.57	299.43	9.89	176.33	103.40	19,608.72	117.70	6,940.30	48,341.34
23	2016-17	20,670.87	372.55	7.49	89.42	98.33	25,133.43	141.45	8,157.19	54,670.73
24	2017-18	15,814.69	446.08	14.64	77.42	173.67	24,632.38	219.36	9,352.99	50,731.23
25	2018-19	14,967.17	550.93	15.88	55.82	251.62	27,646.68	329.93	13,323.24	57,141.27

	CAGR (%)	6.86 ***	5.90 ***	-10.05 ***	16.12 **	9.31 ***	20.63 ***	11.24 ***	32.43 ***	11.03 ***

Table 3 Trends of floriculture exports of India in European zone

Sl. No.	Country	Particulars	Floriculture exports in		
			Pre-NHM period	Post-NHM period	Overall period
1	Netherland	Average (₹ lakhs)	1,958.29	5,376.17	3,872.30
		CAGR (%)	13.91 ***	4.87 ***	8.74 ***
		CV (%)	40.62	23.22	52.33
		R^2	0.639	0.610	0.826
		Cuddy Della Index (%)	24.39	14.50	21.85
2	UK	Average (₹ lakhs)	1,097.26	4,604.89	3,061.54
		CAGR (%)	20.62 ***	4.36 ***	12.76 ***
		CV (%)	78.16	23.49	66.12
		R^2	0.872	0.604	0.870
		Cuddy Della Index (%)	27.92	14.77	23.86
3	Germany	Average (₹ lakhs)	1,180.45	4,560.87	3,073.48
		CAGR (%)	13.68 ***	4.10 **	10.72 ***
		CV (%)	47.57	26.65	63.96
		R^2	0.783	0.349	0.857
		Cuddy Della Index (%)	22.15	21.50	24.22
4	Italy	Average (₹ lakhs)	504.82	1,219.20	904.88
		CAGR (%)	19.90 ***	4.06 ***	8.72 ***
		CV (%)	62.01	22.61	51.00
		R^2	0.897	0.528	0.803
		Cuddy Della Index (%)	19.93	15.53	22.64
5	Spain	Average (₹ lakhs)	230.66	602.29	438.77
		CAGR (%)	34.76 ***	2.71	11.54
		CV (%)	71.44	39.87	63.65 ***
		R^2	0.646	0.094	0.555
		Cuddy Della Index (%)	42.52	37.94	42.45
6	Belgium	Average (₹ lakhs)	223.32	643.68	458.72
		CAGR (%)	34.21 ***	0.36	11.75 ***
		CV (%)	77.32	20.76	56.62
		R^2	0.846	0.005	0.650
		Cuddy Della Index (%)	30.30	20.71	33.48
7	France	Average (₹ lakhs)	346.12	487.65	425.38
		CAGR (%)	28.35 ***	-1.34	5.70 ***
		CV (%)	71.84	16.73	43.67
		R^2	0.923	0.114	0.393
		Cuddy Della Index (%)	19.95	15.75	34.01
8	Greece	Average (₹ lakhs)	66.38	228.18	156.98
		CAGR (%)	31.16 ***	1.24	10.86 ***
		CV (%)	89.80	71.92	96.16
		R^2	0.921	0.003	0.470
		Cuddy Della Index (%)	25.19	71.79	70.03
9	Switzerland	Average (₹ lakhs)	138.31	150.88	145.35
		CAGR (%)	46.96 ***	2.86	7.23 **
		CV (%)	85.50	71.70	76.01
		R^2	0.707	0.029	0.204
		Cuddy Della Index (%)	46.28	70.65	67.83
10	Others	Average (₹ lakhs)	572.40	2,089.41	1,421.92
		CAGR (%)	48.79 ***	5.14 ***	17.60 ***
		CV (%)	114.71	26.43	68.02
		R^2	0.797	0.548	0.712
		Cuddy Della Index (%)	51.73	17.76	36.52
11	Total European zone	Average (₹ lakhs)	6,318.00	19,963.21	13,959.32
		CAGR (%)	19.54 ***	4.16 ***	10.36 ***
		CV (%)	55.59	18.72	55.72
		R^2	0.926	0.749	0.870
		Cuddy Della Index (%)	15.13	9.38	20.10

Note: ***& ** significance at 1% and 5% level, respectively.

REFRENCES

[1] Cuddy, J. D. A. and Della Valle, P.A., 1978, Measuring the instability of time series data. Oxford Bull. Econs. and Stats., 40 (1): 79-84.

[2] Kadli, V., Lokapur S., Gurikar R. and Hosali R. 2014, Growth and instability analysis of fruits crops in India - An economic analysis. J. Environ. Sci. Comp. Sci. Engin. Tech., 3 (4): 1808-1813.

[3] Misra, D. and Ghosh, S. 2016, Growth and export status of Indian floriculture review. Agric. Re., 37 (1): 77-80.

[4] Mokashi, P. and Hosamani, S. B., 2014, Growth and instability analysis of Indian grapes export. Agric. Update., 9 (1): 132-135.

[5] Neethu S. Kumar, Brigit Joseph and Muhammed Jaslam P. K. 2018, Growth and instability in area, production, and productivity of cassava (Manihot esculenta) in Kerala Int. J. Ad. Res., Ideas Inno. Tech., 4(1): 446-448.

[6] www.apeda.com

[7] www.indiastat.com.

[8] www.nhb.gov.in.