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Indian Floriculture: An Agribusiness for Diversification

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Diversification or specialization in agriculture sector may be the paramount issue for agrarian economy of India. A peep into the economic history of India after independence will show that India have passed through many revolutions in agriculture sector, e.g., blue revolution, yellow revolution, silver revolution, pink revolution, black revolution, white revolution and the most important of the above all the green revolution. The Green Revolution may further be categorized into two categories, i.e., first and second Green Revolution. At present the research question is whether India must focus on the Green Revolution that India specialized in foodgrains crops after devoting a time span of more than half a century in the direction. The other option before India may be for the adoption of diversification techniques in place of specialisation. Diversification may be categorized further into two parts. One is the income diversification when agricultural incomes are supplemented by the income earned other than agriculture. Second is the resource diversification in which resources from one crop are diversified to other crops. In this paper, resource diversification is being discussed at length. The specific purpose of the present study is to examine whether India should go for its green revolution or switch over to resource diversification. Floriculture is the area for resource diversification that is being examined here.

Flowers in Socio-Historic Context –

Ancient Indian literature is full of a lucid description of different flowers for different occasions. A number of flowers are associated with the names of gods and goddesses. A few may be discussed here. Flowers are considered as the precious gift of the nature since the time immemorial. The flower Lotus, earlier known as *Padma*, has been mentioned at many places. Kalidasa, a known poet during the ancient India, has described as red lotus and white lotus for the admiration of a woman. Vishnu, India's main God, liked the flower of lotus. In many paintings, one may find God Vishnu always holding lotus flower in his hands. Goddess Lakshmi has always seated in the mid of the lotus flower. Likewise God Brahma, the creator of this world, also took birth from the lotus flower that sprang away from the navel of the God Vishnu. The Buddhist literature described the life of a man in terms of lotus flower. As lotus flower grows in the mud and blooms, the same way a man leading materialistic life must always be free from all sins and attains the liberation of life, i.e., *moksha*. Like lotus, there is another flower Jasmine, earlier known as *Parijata* that finds a place in Hindu Mythology. There is a belief that the tree of *Parijata* was brought from the Lord Indra's palace by Lord Krishna. The tree was planted by Lord Krishna in the palace of his queen Satyabhama in such a manner that its flowers always fell in the courtyard of his another queen Rukmini. There are other stories also which are associated with *Parijata* flower. Like lotus and Jasmine, there is also mention of Ashoka tree, earlier known as *Sita-Ashok,* in ancient Hindu literature. The mother Sita, the wife of Lord Rama, was kept in *Ashok Vatika* by Ravana after her abduction. Like Lotus, Jasmine and Ashoka, there are numerous examples of other flowers like Kewra, earlier known as *Ketaki*; Blue Water-lily, earlier known as *Neel Kamal*; white water-lily, earlier known as *Kumud* and so on.

Hypothesis –

India have devoted so many decades to Green Revolution and attained a certain position where India not only became free from the US 480 PL but also self reliant in the production of the foodgrains. It is high time at the beginning of the 21st century to think over the issue to follow the traditional path of foodgrains crops or to switch over to other crops in modern times such as floriculture. Floriculture includes different types of flowers with thousands of varieties and ornamental plants and thus a part of the broader term Horticulture. The present study will focus on floriculture as an option for traditional crops of wheat and paddy under the tag of foodgrains. It seems that the study will prove quite interesting for the

academicians, very useful for the farmers of the nation and pabulum for the policy-makers of modern India.

Objectives of the Study –

The followings will be the specific objectives of the present study –

1) To study the All-India status of floricultural production.
2) To examine the State-wise scenario in floricultural production.
3) To explore the possibility of specialization or diversification in Indian agriculture.

Sources of Data and Research Methodology –

The study is based on the secondary sources of data collected from the Horticulture database, National Horticulture Board (NHB) and Horticultural Statistics at a Glance, various issues, Ministry of Agriculture and Farmers Welfare, Government of India. The data have collected for all-India variables in floricultural production as well as State-wise floricultural scenario so that more light may be put on the issue. For the objectives of the study, the area and production under floricultural crops have been taken into account and the productivity has been calculated. Therefore, the data have been collected from 2001-02 to 2014-15 on all-India basis. The State-wise data have been taken on two periods, 2006-07 and 2014-15 to know the dynamics in floriculture in India. Besides, the linear trends of area and production of floriculture have also been calculated for the period from 2006-07 to 2014-15 with the help of the following equation –

$$Y = a + bt$$

Where Y = Area or Production of Floricultural Products

a = the intercept term

b = linear trend

t = time

All the methodologies together will throw light on the problem to explore solution thereof.

Analysis –

Floriculture includes cultivation, production and marketing of flowers and foliage plants, e.g., loose flowers, cut flowers, garden-bedding plants, green houses under controlled conditions, dried flowers, etc. Floriculture is such an activity with gigantic potential for generating remunerative self-employment among small and marginal farmers. Floriculture is proliferating regarded as a viable diversification from the traditional crops on account of

increased returns per hectare. The huge genetic diversity, varied agro climatic conditions and versatile human resources render India a unique scope for diversification into new course of action that could not be explored to a great extent due to one reason or the other. Besides, the growing of loose flowers for worshipping or religious offerings, garland making and decoration for marriages or other social ceremonies; is the backbone of Indian floriculture since a majority of small and marginal farmers are involved in these activities. Therefore, floriculture may be termed as an emerging area with immense potential not only in domestic market but in foreign market as well. In the domestic market, there have been sharp changes in socio-cultural fabric of the society where there is an increased affluence especially in the middle class thereby increasing the demand for floricultural products. In this manner, floricultural products have been satisfying the aesthetic needs of the people by the multiple uses of these products. Moreover, different floricultural products have become a source of raw materials for perfumes, essence and aromatic medicines industry.

Table-1 shows the all-India data on area and production of floricultural products for the period 2001-02 to 2014-15. The production constitutes loose and cut flowers both. The area under floricultural cultivation had been 1,06,000 hectares in 2001-02 that increased almost more than doubled to 2,49,000 hectares in 2014-15. The production of loose flowers rose many times from 535 thousand metric tonnes in 2001-02 to 2,143 thousand metric tonnes in 2014-15. The productivity of loose and cut flowers had been 5.05 metric tonnes and 241.98 lakhs in numbers respectively in 2001-02 that rose to 8.61 metric tonnes of loose flowers in 2014-15. It is important to know that the unit of cut flowers changed from lakh numbers to thousand metric tonnes from the year 2013-14. Therefore, the comparative picture may be known for the 2012-13 to that of the beginning year 2001-02 of the present study. In 2012-13, the loose flowers' productivity 7.42 metric tonnes and 329.32 lakh numbers of cut flowers. The figures show that India has made tremendous progress in the area of floriculture.

Table – 1

Area and Production of Floricultural Products

(Area in '000 Hectares) (Production in '000 MT)

Sr. No.	Year	Area	Production		Productivity	
			Loose Flowers	Cut Flowers	Loose Flowers	Cut Flowers
1	2	3	4	5	6	7
1	2001-02	106	535	25650	5.05	241.98
2	2002-03	70	735	20600	10.50	294.29
3	2003-04	101	580	17931	5.74	177.53
4	2004-05	118	659	20714	5.58	175.54
5	2005-06	129	654	27623	5.07	214.13
6	2006-07	144	880	37158	6.11	258.04
7	2007-08	166	868	43644	5.23	262.85
8	2008-09	167	987	47942	5.91	288.81
9	2009-10	183	1021	66671	5.58	364.32
10	2010-11	191	1031	69027	5.40	361.39
11	2011-12	254	1652	75066	6.50	295.54
12	2012-13	233	1729	76732	7.42	329.32
13	2013-14	255	2297	543*	9.01	2.13*
14	2014-15	249	2143	484*	8.61	1.94*

Source: Horticultural Statistics at a Glance, Various Issues. **Note**: * Metric Tonnes

There is a need to put more light by analyzing the data state-wise. Therefore, the data of the 2006-07 was compared with 2014-15 by taking the variables of area and production of floricultural products in the Table-2. As per the

Table – 2

State-wise Area and Production of Flowers (Loose)

(Area in '000 Hectares) (Production in '000 MT)

Sr. No.	States/UTs	2006-07		2014-15	
		A	P	A	P
1	2	3	4	5	6
1	Andhra Pradesh	21.7	116.2	15.68	134.44
2	Arunachal Pradesh	-	-	0.02	1.87
3	Assam	-	-	3.53	55.84
4	Bihar	0.02	2.3	1.43	16.44
5	Chhattisgarh	2.0	7.8	10.96	50.03
6	Gujarat	8.4	49.5	18.79	177.63
7	Haryana	5.6	52.1	6.07	67.77
8	Himachal Pradesh	0.6	3.6	0.80	38.76
9	Jammu & Kashmir	0.3	1.3	0.46	0.35
10	Jharkhand	0.2	0.3	1.60	74.84
11	Karnataka	23.0	192.1	30.90	290.77
12	Kerala	-	-	13.37	32.92
13	Madhya Pradesh	2.5	1.4	17.75	208.00
14	Maharashtra	14.8	88.9	7.25	38.53
15	Manipur	-	-	0.81	0.30
16	Meghalaya	-	-	0.6	2.61
17	Mizoram	0.0	0.0	0.20	183.37
18	Nagaland	0.0	0.0	0.01	0.00
19	Odisha	0.6	1.9	7.50	83.02
20	Punjab	1.0	74.0	1.37	10.65
21	Rajasthan	2.7	3.3	2.71	2.91
22	Sikkim	0.1	-	0.24	18.42
23	Tamil Nadu	26.7	218.1	55.03	356.52
24	Telangana	-	-	7.44	27.72
25	Tripura	-	-	0.00	0.00
26	Uttar Pradesh	8.4	12.3	17.21	34.37
27	Uttarakhand	0.7	0.5	1.63	16.77
28	West Bengal	18.06	43.7	25.32	216.18
29	Others	5.8	10.9	0.38	1.86
	Total	**143.9**	**880.2**	**248.51**	**2142.89**

Source: Horticulture Database, National Horticulture Board, Ministry of Agriculture, Government of India, New Delhi, Various issues.

table, the major floricultural states have been Andhra Pradesh, Chhatishgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu, Uttar Pradesh and West Bengal. Over the period from 2006-07 to 2014-15, it is a single state out of all major flowers producing states, i.e., Andhra Pradesh whose area in 21.7 thousand hectares declined to 15.68 thousand hectares. However, the production of loose flowers increased from 116.2 thousand metric

tonnes in 2006-07 to 134.44 thousand metric tonnes. The climatic conditions of major flowers producing states have been significantly supporting for such production. The highest area under floriculture in India has been Tamil Nadu, Karnataka, West Bengal, Gujarat, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Kerala, etc. Therefore, the floricultural production also has been maximum in the aforesaid states. India may specialize in floriculture in these states.

The Table-3 shows the State-wise linear trends of area and production in floriculture for the period once again from 2006-07 to 2014-15. The linear trend of 25.83 is the highest for the state of Madhya Pradesh for the production of flowers. However, the highest linear trend for the area of floriculture cultivation is 3.54 for the state of Tamil Nadu. Similarly the second and third highest in floricultural production linear trends have been for Mizoram and West Bengal respectively. In case of area, the linear trends are for Madhya Pradesh and Gujarat, i.e., 1.91 and 1.30 respectively. The information is quite useful for the decision makers.

Government Schemes and Incentives –

Currently the Government of India launched a new Mission for Integrated Development of Horticulture (MIDH) from 2014-15 during the Twelfth FYP Plan that will cover not only floricultural products but also fruits, vegetables, species, mushrooms, cocoa, coconut, cashew and bamboo. The new program of the MIDH subsumed other programs of the Government like the National Horticulture Mission (NHM), the Horticulture Mission for North East and Himalayan States (HMNEH), the National Bamboo Mission (NBM), the National Horticulture Board (NHB), the Coconut Development Board (CDB) and the Central Institute for Horticulture (CIH), Nagaland. The Government of India contributes 85 per cent of the total outlay for developmental programs throughout the length and breadth of India. A further introspection of the issue finds that the pattern of assistance by the Government of India is 60:40 between the Centre and the NHM states and 90:10 with those of the HMNEH states. All these states, whether the NHM or HMNEH, are covered under the comprehensive program of the MIDH. There is also a Central Institute of Post-Harvest Engineering and Technology (CIPHET) that calculates the post-harvest wastages of all horticultural crops. In case of floricultural produce, the post-harvest activity starts from the plucking of flowers, initial processing, sorting and grading; all these activities at farm level and then transportation to the market, storage and warehousing near the *mandis*.

Table – 3

State-wise Linear Tends of Area and Production in Floriculture

(2006-07 to 2014-15)

Sr.No.	States/UTs	Area	Production
1	**2**	**3**	**4**
1	Andaman Nicobar	0.0218	- 0.2939
2	Andhra Pradesh	-0.7525	2.2750
3	Arunachal Pradesh	0.0039	0.6240
4	Assam	1.1767	18.6120
5	Bihar	0.1534	1.7681
6	Chhattishgarh	1.1201	5.2736
7	Delhi	-0.6875	-0.7125
8	Goa	0.0060	0.0765
9	Gujarat	1.2963	16.0163
10	Haryana	0.0525	1.9525
11	Himachal Pradesh	0.0278	4.3950
12	Jammu & Kashmir	0.0161	-0.1238
13	Jharkhand	0.1738	9.3138
14	Karnataka	0.9850	12.3338
15	Madhya Pradesh	1.9063	25.8250
16	Maharashtra	-0.9388	-6.2963
17	Manipur	0.4050	0.0150
18	Mizoram	0.0198	22.9213
19	Orissa	0.8635	10.1363
20	Pondicherry	-0.0194	-0.1478
21	Punjab	0.0530	-7.9188
22	Rajasthan	-0.0025	-0.0488
23	Sikkim	0.0178	2.2913
24	Tamil Nadu	3.5375	17.3075
25	Uttar Pradesh	1.1019	2.7538
26	Uttarakhand	0.1144	2.0388
27	West Bengal	0.8413	21.5625
	Total	**13.0763**	**157.8363**

Source: *Ibid.*, Table-2

Notes: (1) Calculations are author's own.

(2) Telangana came into existence in 2014, is not taken into account for the purpose of Linear trends.

According to National Centre for Cold Chain Development, there is highest loss of freshness, moisture, handling, etc. at the time of the transportation of horticultural products. Besides, Agricultural and Processed Food Products Export Development Authority (APEDA) and National Bank for Agriculture and Rural Development (NABARD) are also the major institutions supporting the floricultural farmers.

Role of Greenhouse Technology –

Such plants which require controlled climatic conditions, there are green houses or glass houses or hothouses. These are high tech commercial production facilities those are conducive for plants growth. The technique is not new. It was prevalent in Roman times as well. The technique requires heavy investment and electricity is one of the most significant recurring costs in the functioning of green houses across the globe. The flagship scheme of Mission for Integrated Development of Horticulture has been promoting these technologies in India by providing financial assistance for heavy investment with the help of the Ministry of Agriculture and Farmers Welfare, Government of India.

World Floricultural Scenario –

Flowers represent emotions of love, affection, peace and compliment the world over. Irrespective of the country, the increase in demand for flowers reaches maximum at the occasions of New Year's Eve, Valentine's Day, Christmas, etc. Besides, fast changing life styles and modernization at the global level, has further increased the quantum of global floral industry. Europe is the largest flower market in terms of production and trading. Netherlands has been the largest junction of flowers global trade. The U.S. flower market is also the most lucrative market that may be termed as the largest import market. The U.S. floral market went down with the global financial crisis of 2007-08 but showed signs of recovery since 2014 onwards. The countries like Colombia, Ecuador, Kenya and Ethiopia have gathered speed in cut flowers trade by acquiring 44 per cent in global cut flower exports in 2015 by just surpassing the share of the Netherlands. It shows that the dynamics of global floral trade have been changing and gaining momentum towards new trends.

Conclusion and Policy Implications –

The floriculture, a part of Ornamental Horticulture, has proved an emerging area in the first decade of the 21st century. India is an economy of continental proportion, therefore, there are diverse agro-climatic conditions. Such climate is quite conducive for floricultural production. One may claim that an increasing trend has been observed and analysed in the All-India area under cultivation, production and yield per hectare during the period 2001-02

to 2014-15. The floricultural activities provide employment opportunities, generation of income to farmers and foreign exchange earnings through exports. The state-wise focus gives immense picture of the present day status of floriculture in India. It will facilitate for specialization in floricultures as per climatic conditions. Floriculture is, in itself, a quite diversified economic activity comprising loose flowers, cut flowers, seeds, bulbs, bedding plants, shrubs, tubers, potted plants, etc. The present study showed a great potential in the diversification of traditional crops of wheat and paddy at least in some states like Tamil Nadu, Karnataka, West Bengal, Mizoram, Assam and some parts of Gujarat, Madhya Pradesh and Orissa. Floriculture will not only help in employment, income and foreign exchange earnings but also keep the good environment. The cycle of wheat and paddy has a very adverse impact on the water table that is going down year after year. India must maintain its achievements in foodgrains production but the economic activity may diversify selectively keeping in view the agro-climatic conditions, resources of the state and availability of skilled labour. It is very important to retain our achievements in agriculture which are attained through the efforts of many decades of planned development. At the same time, it is equally important to meet the current agricultural problems successfully in such a manner that a switch over to floriculture in a phased manner and selectively too may possible. Floriculture also becomes an important area keeping in view its export potential. In essence, floriculture may emanate as an economically and environmentally viable diversification option in a selective and phased manner in Indian agribusiness in the 21st century.

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