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HORTICULTURE DEVELOPMENT IN UTTAR PRADESH

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Abstract: *Agriculture in India is the backbone of economy. A large segment of India's population is depend on agriculture and allied activities for their sustenance. India is leading country in production of a few agriculture commodities. It is largest producer of milk, cashew nuts, coconuts, tea, ginger, turmeric and black pepper. It also has also the largest livestock population. It is the second largest producer of wheat, rice, sugar, groundnut and inland fish. It is the third largest producer of tobacco. Uttar Pradesh is characterized by abundant natural resources such as diverse agro-climatic conditions, varied soil type and abundance of rainfall which has immense scope for growing the varieties of horticulture crops. The agriculture in the state is highly diversified due to comparative advantage of wide range of agro-climatic variability, the state produces many crops. Against this backdrop, the present paper purports to examine the emerging trends and patterns in growth and development of horticulture in Uttar Pradesh.*

India is leading country in producing of farm commodities. Agriculture sector provided livelihood to 69 percent of the population. The horticulture sector include fruit, vegetables, spices, medicinal & aromatic plants, flowers, mushroom and a variety of plantation crops like coconut, areca nut, cashew nut and cocoa (Mittal, 2007). Horticulture contributes 28 percent of the country's agricultural income and 54 percent of the agricultural exports. The state of Uttar Pradesh enjoys an important position in India in horticulture sector. It ranks third in the country in respect of area and production of fruits, second in vegetable and first in area and production of potato (Arora, 1998). Horticulture and floriculture have enormous potential in terms of high value addition to the farmers. However, factors such as high cost of cultivation, transportation and marketing bottlenecks are observed. Western Uttar Pradesh is better placed in horticulture and floriculture with better cold storage, marketing and processing facilities. Rose cultivation is popular in Ballia, Etah and Kannauj mainly for the purpose of extracting rose water and rose oil. Development of horticulture in Gangetic plains has not received much focus though tremendous potential exists in the region. It is because of the fact that agriculture credit has been limited (NABARD, 2004).

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The change in area under cultivation for different horticulture crops is presented in Table 1. There has been shifting of maximum area under conventional crops to horticulture crops. There has been increase of area under spices after 2000. The gain in area under spices is 43.3 per cent of the total area gain under horticulture. The total area gain for plantation has been 11.06 per cent with only 0.87 per cent area gain under flowers. The shifting of total area under fruits and vegetables was recorded 4.75 per cent which is almost equivalent to the spices area gain. There has been decline in the area under vegetables in 1990-95, however, area under vegetables increased later. There has been increasing trend of production of horticultural crops in India during the post-reform period (Govt. of India, 2006).

Table 1
Change in Area under Horticulture in India
(Unit: 000' hectares)

Commodities	*1990-95*	*1995-2000*	*2000-04*	*1990-2004*	*% change in area*
Fruits	483	512	1095	2090	28.75
Vegetables	-258	915	506	1163	16.00
Plantation	435	129	240	804	11.06
Spices	211	284	2655	3150	43.33
Flower	29	16	18	63	0.87
Horticulture	900	1856	4514	7270	100.00

Source: Agriculture Statistics, 2006, Ministry of Agriculture and Cooperation, Government of India.

There has been significant change in the ratio of production of various horticultural crops against total horticulture crops during 2010-11 to 2014-15. There has been nominal increase in percentage share of production in fruits, flowers and aromatics and plantation crops (Govt. of India, 2016) However, the share of production against total horticulture production has declined significantly in case of vegetables and spices (Table 2).

Table 2
Percentage Share of Production of various Horticultural Crops in Total Horticulture

Crops	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15 (Provisional)*
Fruits	31.1	29.7	30.2	32.1	31.3
Vegetables	61.0	60.8	60.3	58.7	59.4
Flowers & Aromatics	0.7	0.9	1.0	1.0	1.1
Plantation Crops	5.0	6.4	6.3	5.9	6.0
Spices	2.2	2.3	2.1	2.1	2.1
Total Horticulture	100.0	100.0	100.0	100.0	100.0

Source: Horticulture Statistics Division, DAC&FW

There has been significant change in area under horticulture and plantation crops during 1990-91 to 2008-09. A significant increase was recorded in the state of Andhra Pradesh, Bihar and Jharkhand, Gujarat, Haryana, Himachal Pradesh,

Karnataka, Madhya Pradesh and Chhattisgarh, Maharashtra, Uttar Pradesh and Uttarakhand as well as West Bengal. However, it has significantly declined in the state of Jammu and Kashmir and Tamil Nadu. Similarly, there has been significant increase in the area under commercial crops during the corresponding period. This was found more pronouncing in Gujarat, Kerala, Madhya Pradesh and Chhattisgarh, Maharashtra, Rajasthan and Bihar and Jharkhand. However, area under commercial crops has declined over the period in the state of Assam, Himachal Pradesh, Jammu and Kashmir, Orissa, Punjab, Tamil Nadu, Uttar Pradesh and Uttarakhand (Table 3).

Table 3
Percentage Change in Area under Crop Category

State	*1990-91*			*2008-09*		
	Food Crops	*Commercial Crops*	*Horticultural and Plantation Crops*	*Food Crops*	*Commercial Crops*	*Horticultural and Plantation Crops*
Andhra Pradesh	66.42	30.78	4.45	53.59	30.33	9.85
Assam	69.87	10.78	8.33	66.65	7.11	9.11
Bihar and Jharkhand	90.20	2.91	10.64	99.33	4.13	15.30
Gujarat	42.99	33.62	1.86	34.49	48,03	6,25
Haryana	72.94	16.76	1.32	70.27	17.91	5.18
Himachal Pradesh	84.38	2.39	19.93	81.54	1.70	28.42
Jammu and Kashmir	83.63	6.34	29.18	79.60	5.74	23.38
Karnataka	58.99	20.28	6.60	60.06	22.92	9,45
Kerala	21.17	1.29	45.45	9.09	9.24	48,36
Madhya Pradesh and Chhattisgarh	74.34	9.18	1.09	61.97	28.82	3.03
Maharashtra	71.69	22.42	2.55	50.52	34.98	8.47
Odisha	72.37	10.02	9.42	59.64	3.97	11,13
Punjab	74.45	14.59	2.18	81.41	9.45	3.07
Rajasthan	70.62	13.99	0.49	56.67	21.98	0.69
Tamil Nadu	59.70	26.04	19.05	54.26	17.08	16.97
Uttar Pradesh and Uttarakhand	79.38	14.41	3.49	76.87	13.38	5.95
West Bengal	76.72	6.11	7.15	66.62	7.42	15,87

Source: Computed from Agriculture Statistics and Horticulture Statistics.

The state of Uttar Pradesh is the second largest producer of vegetables in the country after West Bengal. Production of vegetables in the state has increased from 10.8 million tons in 1988-89 to 28 million tons in 2006-07. Significant increase in area under vegetables has been reported. Studies have revealed that small and marginal farmers are diversifying a part of their land to crops like vegetables in order to increase and stabilize their income. The vegetable production requires more labour. It is utilizes water more efficiently in terms of both production and economic efficiency. There is tremendous scope to increase vegetable and fruit production in eastern and central Uttar Pradesh as in several districts farmers are

small and marginal. Agri-Export Zone at Agra, Mango Agri-Export Zone at Lucknow and Saharanpur and a Vegetable Agri-export zone at Lucknow have already been set up in the State (Matoo, A. *et al.,* 2007). In view of the growing importance of horticulture in the economy, a systematic and scientific effort to develop horticulture in the state has been made with the objective to formulate programmes aimed at developing the potential which exists for growing a variety of horticultural crops in order to raise income and also to generate employment.

There has been remarkable growth in horticultural production and productivity in the state of Uttar Pradesh during the period of 2006-07 to 2015-16. The area under fruits against total horticultural crops was recorded 28.19 per cent which slightly increased to 28.91 per cent in 2015-16. Similarly, area under vegetables was recorded 54.45 per cent in 2006-07 which increased to 59.28 per cent. However, area under potato has declined from 17.35 per cent in 2006-07 to 11.80 per cent in 2015-16. The growth in area under fruits crops was recorded 93.57 per cent while growth of area under vegetable crops was recorded as high as 105.53 per cent. The production of fruits grew by 157.77 per cent while production of vegetables grew by 155.05. There has been 3.57 percentage points increase in productivity of fruits and 4.03 percentage points in the productivity of vegetables over the corresponding period (Table 4).

Table 4
Area, Production and Productivity of Horticultural Crops in Uttar Pradesh

(Area in Lac. Hact.)
(Production in Lac. Ton)
(Productivity in Ton/Ha.)

Year	*Fruits*			*Vegetables*			*Potato*			*Total*		
	Area	*Prod.*	*Pvty.*	*Area*	*Prod.*	*Pvty.*	*Area*	*Prod.*	*Pvty.*	*Area*	*Prod.*	*Pvty.*
2006-07	8.24	88.87	10.79	15.91	266.06	16.72	5.07	122.30	24.12	29.22	477.23	16.33
2007-08	8.40	91.06	10.84	17.76	296.20	16.68	5.17	125.65	24.30	31.33	512.91	16.37
2008-09	9.53	109.60	11.50	19.21	332.00	17.28	5.27	108.00	20.49	34.01	549.60	16.16
2009-10	10.15	122.52	12.07	21.10	359.56	17.04	5.29	137.00	25.90	36.54	619.08	16.94
2010-11	11.00	136.74	12.43	23.18	401.72	17.33	5.50	145.00	26.36	39.68	683.46	17.22
2011-12	11.76	145.28	12.35	23.50	433.00	18.43	5.55	135.00	24.32	40.81	713.28	17.48
2012-13	12.81	166.22	12.98	25.80	494.40	19.16	5.79	144.00	24.87	44.40	804.62	18.12
2013-14	13.86	187.17	13.50	28.10	555.80	19.78	6.03	153.00	25.37	47.99	895.97	18.67
2014-15	14.90	208.11	13.97	30.40	617.20	20.30	6.27	162.00	25.84	51.57	987.31	19.15
2015-16	15.95	229.06	14.36	32.70	678.60	20.75	6.51	171.00	26.27	55.16	1078.66	19.56

Source: State Horticulture Mission.

Area under horticulture in Uttar Pradesh is shown in Table 5. As per information available from U.P. Horticulture Mission, area under horticultural crops in the state is 5.24 lakh hectares. Out of total area, area under banana constituted about 23.85 per cent while area under guava and mango recorded the share of about 1/3rd of total area under horticultural crops. Other fruits crops such as Aonla, litchi, citrus and papaya were found prominent.

Table 5
Area under Horticulture in Uttar Pradesh

Crops	*Area in Ha.*
Mango	80,000
Guava	95,000
Citrus	30,000
Litchi	40,000
Papaya	30,000
Banana	1,25,000
Bel	10,000
Aonla	65,000
Other Fruits	49,000
Total	5,24,000

Source: State Horticulture Mission, 2015-16

The state has about 3.05 million hectares under various horticultural crops. Given the demand which is estimated at 40 per cent by the household sector and about 20 per cent by the processing units, there is considerable surplus of about 40 per cent which is sent to other major cities by traders and commission agents. More than 70 per cent of the vegetables sold in Delhi are supplied by Uttar Pradesh. Vegetables like bottle-gourd, snake-gourd, bitter-gourd, pumpkin, etc., are sent out of the state to places like Gujarat, Maharashtra, Madhya Pradesh, Haryana and Punjab.

With an annual production of about 100 lakh MT, potato is the single largest horticulture produce requiring cold store facilities for long term storage. Marketable surplus requiring temporary storing and long distance transportation of 200 lakh MT of other vegetables and about 100 lakh MT of fruits produced in the state also require cold chain facilities for reducing the post-harvest losses which are estimated to be 15-25 percent .There has been significant growth in horticultural produces in Uttar Pradesh over the period of 2012-13 to 2013-14. There has been increase in area and production of fruits, vegetables, spices and flowers in the state over the period (Table 6).

Table 6
Status of Horticultural Produces in Uttar Pradesh

Sl. No.	*Crops*	*2012-13*		*2013-14*	
		Area (Ha)	*Prod. (MT)*	*Area (Ha)*	*Prod. (MT)*
1.	Fruits	321858	5404754	329522	5635200
2.	Vegetables	820674	16930918	862768	16333834
3.	Spices	60695	214375	614491	243212
4.	Flowers	16379	37022	16699	38289
4.1	Rose (Loose)	8140	25389	8221	26315
4.2	Rose (cut)	1820	1820	1866	1866
4.3	Gladioloi (cut)	3025	3025	3116	3116
4.4	Marigold (loose)	3394	6788	3496	6992

Source: Department of Horticulture & Food Processing, U.P, Lucknow.

The horticulture crops comprises of a wide range of crops viz. fruits, vegetables, flowers, spices, nuts, aromatics and medicinal plants, beekeeping, mushroom cultivation betel vine and other crops.. The state is blessed with diverse agro climatic conditions, conducive for cultivation of varied horticultural crops round the year. The state has varied agro-climate which is ideal for growing large number of horticultural crops round the year. The state has enormous potential for the development of horticulture. There has been a substantial increase both in area and production of horticulture crops during the 10th Five Year Plan. The area under fruits crops was expected to increase from 11.36 lakh hectare during 2009-10 to 12.25 lakh hectares during 2010-11 and production was also likely to increase from 135-85 lakh MT to 149.43 Lakh MT. The production of vegetable crops was also expected to increase from 365.20 Lakh MT to 401.72 Lakh MT during 2010-11. The increase in production of Potato has also been significant as the production during 2009-10 was likely to the tune of 120 Lakh MT. The state is the pioneering state in the country to declare fruit growing areas as fruit belts. The state has declared major areas of mango, guava and aonla as fruit belts. The present share of state in total horticulture production of the country is about 30 percent. The state ranks third in fruits, second in vegetable and first in potato production among all states. Important fruits grown in the state are mango, guava, aonla, papaya, banana, litchis, jack-fruit ber and citrus. The major vegetables being grown in the state are peas, chilies, okra, tomato, brinjal, cauliflower, cabbage, spinach, melon, radish, carrot, turnip and cucurbits. The state has about 30.00 lakh hectare under various horticultural crops. The state is the second largest producer of vegetables in the country after West Bengal. Remarkable increase in area under vegetables has been recorded on small and marginal farms. The productivity of fruits was recorded 11.5 MT/Hectare during 2008-09 which is likely to increase to 12.18 MT/ha during 2009-10.

The state is endowed with agro climatic conditions suitable for a variety of horticultural crops. The state has also plenty of sunshine and large area of fertile soil and water. The state has wide network of research infrastructure to support the development of horticulture. However, the state lacks adequate quantities of quality planting material and improved/hybrid seeds. The productivity of various horticultural crops in the state is also found low as compared to various other states. . The state is lacking efficient technology and technical knowledge at various levels. The farmers and vegetables and fruits growers of state are not awareness regarding improved pre and post harvest management practices. State lacks proper marketing infrastructure and efficient marketing system having forward and backward linkages. The facilities for processing of horticultural produce, value addition and storage in are also poor in the state. There is problem of human resource development and professional capability staff in horticulture sector. There is lack of reliable statistical data and information pertaining to area, production and productivity of horticultural crops in district and regional level..

We have adequate availability of raw material for processing industries. The state has sufficient number of institutions viz. ICAR, CSIR, etc. and SAU's to backup

the development programmes in horticulture sector. The state has adopted approach for minimizing the post harvest losses during the handling of horticultural produce. The State Horticulture Mission is likely to take care of environment. The state is an agro-based and about 70 percent of the population is dependent on agriculture. Traditional agriculture crops may provide limited income per hectare however, by adopting horticulture crops farmers may increase the cropping intensity and income per unit area.. The implementation of different activities under National Horticulture Mission, Commercial Horticulture Development in Intensive Areas, Special Component Plan, Diversified Agriculture Support Project and other schemes have been instrumental in augmenting production of horticultural production.

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