

GROWTH TRENDS AND STATUS EVALUATION OF HORTICULTURAL CROPS IN INDIA**Arvind Singh Yadav**

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Abstract: *Horticulture is a global phenomenon and practiced all over the world in diverse agro-climatic conditions. The country is facing an acute problem of population explosion. Food security and malnutrition are major constraints and crisis to the humanity. The Indian population is growing in leaps and bounds and its food security and nutritional requirements may suffer in near future. Problems of rapid soil erosion, decreasing productivity of food crops, forest degradation, increasing barren land, the small size of land holdings, unchecked and unsustainable land practices, etc. are increasing enormously. Horticultural exports are very less as compared to other agricultural crops in spite of having a healthy share in Gross Domestic Product (GDP) and also fetch more returns comparatively. In spite of continuous increase in area and production of horticultural crops (i.e. From the year 2001-02 to 2012-13; total horticultural area increased from 16,593 thousand hectares to 23,694 thousand hectares and total production from 1,45,784 thousand metric tonnes to 2,68,848 thousand metric tonnes, respectively) , while the percentage growth of the area and production is not continuous. The Co-efficient of Correlation between the cultivated area and production is 0.963 which shows a high degree of positive relation between them. It suggests that the area under horticultural crops should be increased by increasing use of horticultural tools and technology, proper application of fertilizers, manures and irrigational facilities, reclamation of culturable waste, uncultivable and barren land under horticultural crops and practicing productivity efficient, disease resistant varieties of crops etc., to attain a good production This paper aims to observe and evaluate the Indian horticultural status and growth trends of area, production and productivity. Thus, on the basis of the outcomes; future plans for horticultural development may be formulated accordingly, which may also prove to be a boon for agricultural scenario and crop diversification in the country.*

Besides all these, horticulture is more nearer to ecology and much environment friendly and positively helps in environmental regeneration.

Keywords: Agro-Climatic, Crop Diversification, Environmental Regeneration, Food Security, Horticultural Status.

INTRODUCTION

Origin of horticulture dates back to the pre-historic period with the origin of man itself as a gathering of forest fruits and nuts were the primary activities of man with hunting.

Horticulture is a part of agriculture, which is concerned with the cultivation of “garden crops” and can be defined as the branch of agriculture concerned with intensively cultured plants directly used by peoples for

food, for medicinal purpose or for aesthetic gratification (Singh, 2012).

Branch of horticulture includes cultivation of fruits, nuts, vegetables, medicinal and aromatic plants, flowers, etc. Importance of horticulture lies in the fact that it generates much income per hectare of land as compared to other agricultural crops, facilitates employment, food and nutritional security and industrialization too. Horticulture sector covering only 8 per cent of total crop area in the country contributes 24.5 per cent to GDP, and 54.55 per cent to export earnings in the agriculture sector. Horticulture has become an integral part of food and nutritional security and essential ingredient of economic security (Handbook of Horticulture, 2001). Horticultural development had not been a priority in India until recent years. In the period 1948-80, the main focus of the country was on cereals (Mittal, 2007). During 1980-92 there was consolidation of institutional support and a planned process for the development of horticulture then started. It was later in the post-1993 period that a focused attention was given to horticulture development through an enhancement of plan allocation and knowledge based technology (Dastagiri et al., 2013). The horticulture sector is perhaps the most profitable venture of all farming activities. It provides ample employment opportunities and scopes to increase the income of the horticulture crops growers in India (Kondal, 2014). At present horticulture contributes about 30 per cent of GDP in agriculture and about a half of export share in agriculture

(Chattopadhyay and Roy, 2011). India ranks first in the production of Mango, Banana, total Spices, Coconuts etc. but most part of its production consumed inside the country and foreign trade is very nominal. Increased production can provide a base to export besides self sufficiency.

Study Area:

India is a country of diverse climatic conditions, flora and fauna. The mainland of the country lies between 8°4' N to 37° 6' N latitudes and 68° 7' E to 97° 25' E longitudes, while the southernmost tip of the Nicobar touches the parallel of 6° 45' N the land of vulnerable Ganga and reversed as Bharat Mata (Singh, 1987). India commands a total geographical area of 32,87,263 sq.km (India, 1985, p.1) which is roughly 0.57 per cent of the area of the earth and 2.4 per cent of the total area of the land hemisphere (Tiwari, 2004). From 32,87,26.3 thousand hectares of total geographical area the reporting area for land utilization in the year 2009-10 was 3,05,611 thousand hectares (92.97 per cent). The net sown area was 1,40,022 thousand hectare about 45.82 per cent (excluding land under miscellaneous tree crops and groves which was 3,351 thousand hectares) of the total area available for land use. As in the year 2009-10 total area under horticulture crops was only 20,877 thousand hectares. According to the census of India 2011 the total population of the country is 1,21,01,93,422 with a sex ratio of 940 females per thousand males (Census, 2011).

Figure 1. a. Soil Map of India



Source: Commons.wikimedia.org
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b. Agro-Climatic Zones of India



Source:

* map not to scale

The climate of India belongs to the 'tropical monsoon type'. Although a sizeable part of the country lying north of the Tropic of Cancer falls in the northern temperate zone (Tiwari, 2004). Diverse types of soils (8 major soil groups according to the Indian Council of Agricultural Research; ICAR) and agro-climatic regions (15 major groups according to the Planning Commission of India) facilitate a large variety of tropical and sub-tropical horticultural crops throughout the year in the country.

Objectives:

- To discuss the patterns of area, production and productivity of various horticultural crops.
- To calculate the growth trends of area, production and productivity of horticultural crops and analyze them.

To find out the correlation between horticultural area and production.

Database and Methodology:

The study is primarily based on secondary data. Data have been compiled from various governmental agencies as National Horticulture Board (NHB), Agricultural and Processed Food Products Export Development Authority (APEDA), Handbook of Horticulture, Statistical Year Book and others. Different Books, Reports, and Research Papers have been concerned to generate the idea and literature. Statistical techniques and tools like Simple Linear Regression, Correlation, and Percentage Growth etc. have been applied in drawing results and analysis of data. Calculation of Co-efficient of Correlation has been done

with the help of Karl Pearson’s Co-efficient of Correlation formula.

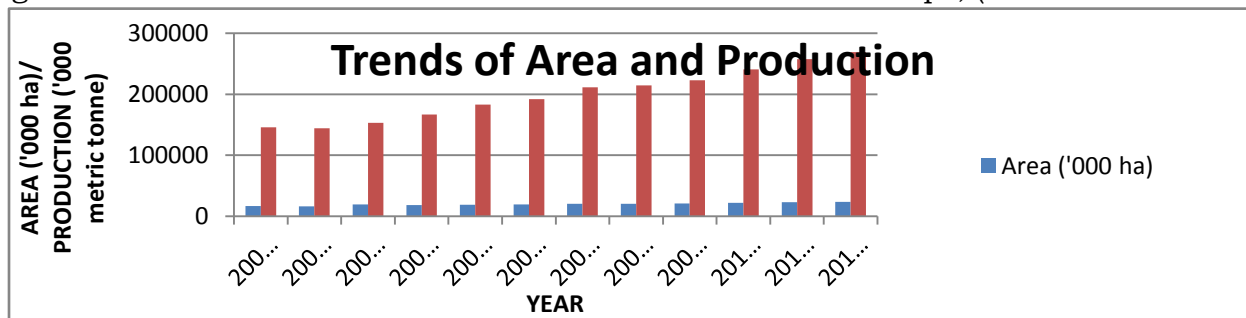
Results and Discussions:

Fruits, vegetables and plantation crops make the major component of horticultural crops. Besides these, flowers and nuts are also important. Analysis of (Table1. and 2.) shows that vegetables ranks first in terms of both area and production among all horticultural crops from the year 2001-02 to 2012-13; while the fruits are positioned on the second. Plantation crops ranks third in area and production terms.

Area of fruits was 4,010 thousand hectares which increased to 6,838 thousand hectares in the year 2012-13. Vegetables show a prominent growth in areal terms and the area under vegetables increased to 9,205 thousand hectares in 2012-13 from 6,156 thousand hectares in 2001-02. Area of flowers has been doubled during the study period from 106 thousand hectares (2001-02) to 233 thousand hectares in 2012-13. Area of aromatic and medicinal crops rose heavily from 131 thousand hectares in 2004-05 to 557 thousand hectares in 2012-13. Whereas nuts, have shown limited growth in terms

of area during the study period. Area under spices decreased during the study period as it was 3,220 thousand hectares in 2001-02 and decreased to 3,076 thousand hectares in 2012-13 (Table1.). Production statistics of horticultural crops show tremendous growth in production of various horticultural crops in the study period. Production of most horticultural crops have been doubled or increased more. Production of fruits was only 43,001 thousand metric tonnes in 2001-02 rose to 81,043 thousand metric tonnes in 2012-13. Production of vegetables followed the same trend. Production of vegetables increased from 88,622 thousand metric tonnes to 1,62,187 thousand metric tonnes in the study period from 2001-02 to 2012-13. Flower production rose 3.2 times, as it was only 535 thousand metric tonnes in 2001-02 and become 1,729 thousand metric tonnes in 2012-13. Production of plantation crops increased from 9,697 thousand metric tonnes to 16,985 thousand metric tonnes in the study period. Spices showed a growth of 1.5 times in production between the years 2001-02 to 2012-13 in spite of decreased area (Table2.).

Figure1. Trends of Total Area and Production of Horticultural Crops; (2001-02 to 2012-13)



Source: NHB Database, 2013

(Figure1.) shows the trends of total area and production of horticultural crops. Total area under horticultural crops

increased from 16,593 thousand hectares of 2001-02 to 23,694 thousand hectares in the year 2012-13. Meanwhile, total

horticultural production increased to 2,68,848 thousand metric tonnes in 2012-13 from 1,46,784 thousand metric tonnes of 2001-02. But in the year 2002-03 total horticultural area decreased from 16,593 thousand hectares of the year 2001-02 to 16,271 thousand hectares. Total area under horticultural crops, which was

19,207 thousand hectares in 2003-04 decreased to 18,445 thousand hectares in the year 2004-05, while overall production decreased only once in the year 2002-03 from 1,44,378 thousand metric tonnes of the year 2001-02 to 14,578 thousand metric tonnes (2002-03).

Table1. Area Under Various Horticultural Crops (in '000 ha); (2001-02 to 2012-13)

Year	Fruit s	Vegetable s	Flowers (Loose)	Aromatic and Medicinal Crops	Plantation Crops	Spice s	Nuts (Almonds + Walnut)	Total
2001-02	4010	6156	106	NA	2984	3220	117	16593
2002-03	3788	6092	70	NA	2984	3220	117	16271
2003-04	4661	6082	101	NA	3102	5155	106	19207
2004-05	5049	6744	118	131	3147	3150	106	18445
2005-06	5324	7213	129	262	3283	2366	130	18700
2006-07	5554	7581	144	324	3207	2448	132	19390
2007-08	5857	7848	166	397	3190	2617	132	20207
2008-09	6101	7981	167	430	3217	2629	136	20661
2009-10	6329	7985	183	509	3265	2464	142	20877
2010-11	6246	8495	191	510	3306	2940	137	21825
2011-12	6533	8989	254	506	3577	3212	172	23243
2012-13	6838	9205	233	557	3641	3076	144	23694

Source: NHB Database, 2013

Note: Data may slightly differ due to rounding off.

Table2. Production of Various Horticultural Crops (in '000 metric tonne); (2001-02 to 2012-13)

Year	Fruits	Vegetables	Flowers	Aromatic and Medicinal Crops	Plantation Crops	Spices	Nuts	Mushroom	Honey	Total
2001-02	43001	88622	535	NA	9697	3765	114	40	10	145784
2002-03	45203	84814	735	NA	9697	3765	114	40	10	144378
2003-04	45942	88334	580	NA	13161	5113	121	40	10	153301
2004-05	50867	101246	659	159	9835	4001	121	40	10	166938
2005-06	55356	111399	654	202	11263	3705	149	35	52	182815
2006-07	59563	114993	880	178	12007	3953	150	37	51	191812
2007-08	65587	128449	868	396	11300	4357	177	37	65	211236
2008-09	68466	129077	987	430	11336	4145	173	37	65	214716
2009-10	71516	133738	1021	573	11928	4016	193	41	65	223091
2010-11	74677	146554	1031	605	12007	5350	201	41	65	240531
2011-12	76136	156325	1652	566	16359	5951	288	NA	NA	257277
2012-13	81043	162187	1729	918	16985	5744	242	NA	NA	268848

Source: NHB Database, 2013

Note: Data may slightly differ due to rounding off.

Table3. Annual Area, Production and Productivity Growth Trends of Total Horticultural Crops); (2001-02 to 2012-13)

Year	%Growth in Area	%Growth in Production	Productivity (metric tonne/ha)	%Growth in Productivity
2001-02	-	-	8.79	-
2002-03	-1.9	-1.0	8.87	0.9
2003-04	18.1	6.2	7.98	-10.0
2004-05	-4.0	8.9	9.05	13.4
2005-06	1.4	9.5	9.78	8.1
2006-07	3.6	4.9	9.89	1.1
2007-08	4.2	10.1	10.45	5.7
2008-09	2.3	1.6	10.39	-0.6
2009-10	1.0	3.9	10.69	2.9
2010-11	4.5	7.8	11.02	3.1
2011-12	6.5	7.0	11.06	0.4

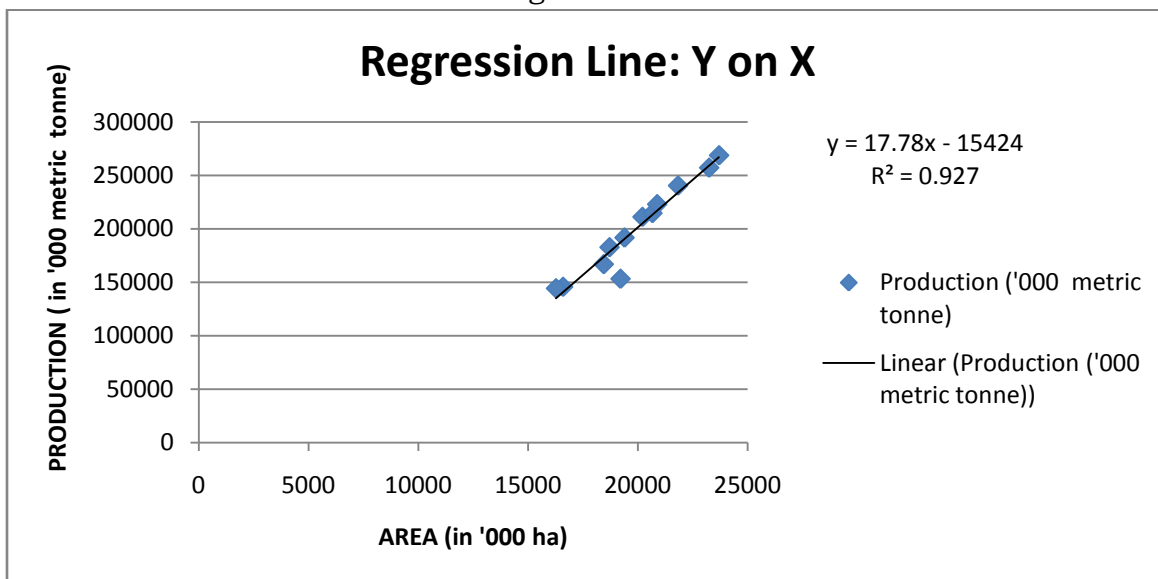
decades; the area under horticultural crops increased from 12,770 thousand hectares in 1991-92 to 23,242 thousand hectares in the year 2011-12. Production increased 2.7 times in the last three decades, which was only 96,562 thousand metric tonnes in 1991-92 and increased to 145785 and 2,57,277 thousand metric tonnes in the year 2001-02 and 2011-12, respectively. Increase in productivity is 1.5 times from the year 1991-92 to 2011-12.

The Correlation Co-efficient is 0.963 with positive sign. It shows that there is a high degree of positive correlation between

horticultural area and production. But other factors, like rainfall, irrigation facilities, use and availability of fertilizers and manures, technical advancement, socioeconomic values, etc. are also important in governing the production of horticultural crops.

(Figure3.) shows distribution of production trends in relation to the area and a line of best fit, on considering productions as a dependent variable on the area. This regression line of Y on X shows the present and future trends of production.

Figure3. Distribution of Production and Regression of Y on X



Source: NHB Database, 2013 and calculated by the Author

Conclusions:

Above results and discussions clearly predicts that area and production of fruits and vegetables have been doubled in the study span, flowers, aromatic and medicinal crops have also done well. Area under spices has decreased or is more or less same but production of spices increased a lot; thus it may be concluded that farmers producing spices are more prone to the diffusion of technological advancements

in spice cultivation. Such practices may further diffused to the production of other horticultural crops too. There are huge differences in area, production and productivity among various horticultural crops. Some crops are far behind in terms of area, production and productivity and some are doing well. Regression analysis and Correlation Co-efficient between area and production, which is 0.963 is of very high degree;

predicts that India should increase its area under horticultural crops keeping in mind the present and future needs of the country. India is most probably a country of agriculture economy; as a huge amount of population, one way or another seek their livelihood in agriculture. Big problems against Indian agriculture are small land holdings, fragmented farm land, soil degradation and infertility, water logging due to excess irrigation, drought, decreasing agriculture land and productivity, etc. In such drastic situations horticulture may prove to be beneficial in many folds. The need of the time is to increase the area under horticultural crops by reclamation of culturable waste, uncultivable and barren land under horticultural crops and facilitating productivity efficient, disease resistant varieties of crops etc. proper application of fertilizers, manures and irrigational facilities; as all these will surely enhance production and facilitate diversification of horticultural crops too. Measures should be taken to increase productivity by applying modern tools and techniques of horticultural practices. Research must also be facilitated in this field, so that horticulture may prove to be more economical and sustainable.

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