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Horticultural Development in Himachal Pradesh: An Empirical Analysis

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Abstract:

Horticulture has emerged as the key instrument of the Indian agricultural development strategy against the scourge of poverty, unemployment and malnourishment. The importance of horticulture in improving the productivity of land, generating employment, improving economic conditions of the farmers and entrepreneurs, enhancing exports and, above all, providing nutritional security to the people, is widely acknowledged. Horticulture sector is very important as there are various operations involved, which generate sufficient employment and hence increase the income of the farming families. The present article has analyzed the performance of this sector, especially with respect to its growth in terms of area, production and productivity and contribution in terms of Gross State Domestic Product (GSDP) and Net state Domestic Product (NSDP) in the state economy of Himachal Pradesh for the period of 1980-81 to 2010-11. The results have revealed that despite the multifold increase in production of horticultural crops over the years, the productivity is continuously declining and the contribution of horticulture in the primary sector indicate mixed trend for the last ten years from 2000-01 to 2009-10.

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Key words: Horticulture, Area, Production, Productivity, Himachal Pradesh.

Introduction

After attaining independence, the major problem was to increase food grain production, as prior to independence the performance of Indian agriculture was quite dismal. Because of this, in every five year plan due emphasis was given to increase food grain production so that India can become self-sufficient in this regard. But the self-sufficiency does not mean that quality of food available is also up to the mark. There are many nutrients which are properly supplied only by fruits (Bakhru, 1985). The diet of our people in general is nutritionally deficient particularly in protein, vitamins and minerals. It is estimated that per capita fruits and vegetables available in India is still less than 180 grams per day which is far below the recommended quantity of 230 grams per capita per day (Swarup and Sikka, 1987).

Thus it becomes imperative to lay at least equal if not more emphasis on the production of those crops which can supply much more nutrients more economically as well as conveniently improving the standard of living and creating more employment opportunities are also prime objective of Indian planning. Horticulture sector is very important in this regard as there are various operations involved, which generate sufficient employment and hence increase the income of the farming families. It has been proved by many studies that surplus labour is available in Indian agriculture and hence it can be properly employed by cultivating fruit crops.

Further, the cultivation of fruits and vegetables being labour-intensive in nature, the production of these commodities needs to be encouraged in a labour abounding and capital scarce country like India. The economies of perennial horticultural crops are different from that of field crops mainly

because of the long gestation period in the former case. In fruits cultivation, the grower has to plan for a longer period keeping in view his land, labour and capital resources. Though the initial cost of establishing an orchard is fairly high, the cost of maintenance during the fruiting period is almost the same as that for field crops (Sikka and Swarup, 1983).

Horticulture in Himachal Pradesh

The topography of Himachal Pradesh is such that being a mountainous region with an elevation ranging from 350 meters to 6,500 meters above the mean sea level, horticulture seems to be the only viable-hope in the future. The southern parts of the state are as hot as the plains while the northern region has a temperate summer and an extreme winter with cold temperatures and heavy snowfall. The importance of horticulture in improving the economy of Himachal Pradesh is pivotal and cannot be over emphasized. Before independence little attention was paid to the development of horticulture, which mostly remained under the small princely states, rulers of which neither had the resources and nor the urge to develop horticulture.

The importance and promotion of horticulture in Himachal Pradesh is a national priority, because undulating physiography of land in the hill areas is more suitable for cultivating horticulture crops. The development of horticulture in Himachal Pradesh is not only supplementing the national food grid by way of providing nutritive food in the form of fruits and vegetables but also playing a vital role in promoting environmental conservation. It has also proved significant for supplementing the otherwise major income of the people of the State (Attri, 2010).

Horticulture has made tremendous progress in Himachal Pradesh during the last forty years. The State which enjoyed the prestigious status of the “Apple State of India” has

now headed towards its cherished goal of becoming the "Fruit State of India". It is most suitable avocation for solving the inherent problem like low land to man ratio, limited availability of solar energy, undulating physiography, excess of soil erosion and low productivity. A shift in cropping pattern from traditional agriculture to the developing of horticulture crops is, therefore, emerging as it provides the necessary cropping system for hilly conditions.

Being labour intensive it has the potentialities to generate increased employment opportunities in rural areas. Piercing into diversified agro-climatic conditions of the State it is suitable for growing a number of fruit crops adopted to sub-tropical, temperate conditions and to specialized crops like, hops, chilgoza, mushroom, olive, pistachio, nut etc. The State is presently known for its large scale cultivation of apple in higher regions and other temperate fruits kinnow in low altitude areas (Chauhan, 1998).

The rich diversity of agro-climatic conditions, topographical variations and altitudinal differences coupled with fertile, deep and well drained soils favour the cultivation of temperate to sub-tropical fruits in Himachal. The region is also suitable for cultivation of ancillary horticultural produce like flowers, mushroom, honey and hops. This particular suitability of Himachal has resulted in shifting of land use pattern from agriculture to fruit crops in the past few decades. The area under fruits, which was 792 hectares in 1950-51 with total production of 1,200 tonnes has increased to 2,18,303 hectares during 2012-13. The total fruit production in 2012-13 was 5.56 lakh tonnes, which during 2013-14 (up to December, 2013) has been reported as 8.28 lakh tones (Economic Survey, 2013-14).

Review of Literature

Stockes (1971) and Malik et al. (1977) analysed problems faced by the apple orchardists in production and marketing. Singh et al. (1975**)**, Azad et al. (1988) and Shantnu, (1996) observed that fruit farming was more remunerative than field crops. Chandel, (1976) concluded that both area and production of fruits has increased significantly in Himachal Pradesh. Azad, (1981) pointed out that there is a great urgency for immediate introduction of full range of spur type of varieties. Swarup et al. (1987) and Azad et al. (1988) found that there has been a significant shift in area toward fruits from field crops.

Chadha, (1987) concluded that by replacing the wooden boxes by the corrugated fibre board boxes, which were better and cheap, the problem of packing could be solved. Rana et al. (1978) analysed the extent of varieties adoption in apple production explained by human labour, fertilizers and manure, pesticide and age of the orchard was about 99.96 and 98 per cent in case of progressive and non progressive orchardists. Sharda and Raman (1996) found that in most areas of Himachal Pradesh, there was comparative advantage in production of various types of fruits and vegetables.

Objectives of the Study

The general objective of this paper is to provide an overview of the horticulture sector of the State economy of Himachal Pradesh for the years of 1980-81 to 2010-11. However, to be specific this paper aims at following objectives;

1. To analyze the growth in area, production and productivity of horticulture produce and
2. To analyze the contribution of horticulture sector in the primary sector, Gross State Domestic Product (GSDP) and Net State Domestic Product (NSDP) of the State economy.

Database

The study is entirely based on secondary sources of data. All the relevant data meant for the purpose have been obtained from published documents of Government of Himachal Pradesh, Directorate of Horticulture Himachal Pradesh, Economics and Statistics Department, Government of Himachal Pradesh.

Methodology

The relevant data pertaining to our study have been analysed with the help of statistics like Compound Growth Rate (CGR) and simple percentage method. Data pertaining to area, production and productivity of the horticulture sector in the State has been analysed with the aid of Compound Growth Rate (CGR).

Compound Growth Rate (CGR) is defined as:

$$Y = b_0 b^t$$

$$\text{Or } \log y = \log b_0 + t \log b_1$$

Where, Y = dependent variable

b_0 = intercept

b_1 slope/growth rate

t= time

Results and Discussion

Growth in Area under Fruits

The growth in area under citrus during 1980-81 to 1990-91 was highest followed by nuts and dry fruits. Least growth in area has been found under apple during the same period. During 1990-91 to 2000-01 growth in area under apple was highest followed by nuts and dry fruits, other fruits and citrus. From

1990-91 to 2010-11, apple occupied the highest area as compare to other fruits.

Table 1.1 Compound Growth Rate of Area under Different Fruit Crops

Year	Apple	Citrus	Nuts and Dry Fruits	Other Fruits	Total Fruits
1980-81 to 1990-91	3.78	9.54	6.68	6.35	5.85
1990-91 to 2000-01	3.70	0.96	2.37	3.24	2.89
2000-01 to 2010-11	1.17	-5.58	-4.02	0.80	-0.28

Source: Computed on the basis of data available at Directorate of Horticulture.

Note: * Citrus fruit includes orange, malta, galgal, and k. Lime.

* Other fruits include anola, loquot and papaya.

* Nuts and dry fruit includes almond, walnut and pecannut.

Growth in Production

The compound growth rate of production of different fruits in Himachal Pradesh shows that during 1980-81 to 1990-91, the growth in production of apple was highest followed by citrus, other fruits and nuts and dry fruits. But during the 1990-91 to 2000-01 production growth rate of apple which was highest during 1980-81 to 1990-91 was replaced by other fruits. During the same period citrus production and nuts and dry fruits production registered negative growth. In 2000-01 to 2010-11 growth in other fruits production is highest followed by citrus, apple and nuts and dry fruits.

Table 1.2 Compound Growth Rate of Production of Different Fruits

Year	Apple	Citrus	Nuts and Dry Fruits	Other Fruits	Total
1980-80 to 1990-91	11.23	11.09	5.70	6.20	10.70

1990-91 to 2000-01	0.97	-1.30	-1.19	2.77	1.03
2000-01 to 2010-11	9.00	10.00	2.79	10.68	9.16

Source: Computed on the basis of data available at Directorate of Horticulture.

Growth in Productivity

During the period of 1980-81 to 1990-91, the growth in productivity of apple was highest followed by citrus. Growth in productivity of citrus and nuts and dry fruits during the same period was negative. During 1990-91 to 2000-01, productivity growth was negative for all the fruits. Productivity improved during 2000-01 to 2010-11 which was highest for citrus followed by other fruits, apple and nuts and dry fruits.

Table 1.3 Compound Growth Rate of Productivity of Different Fruits

Year	Apple	Citrus	Nuts and Dry Fruits	Other Fruits	Total
1980-81 to 1990-91	7.18	1.42	-0.91	-0.14	4.57
1990-91 to 2000-01	-2.63	-2.24	-3.47	-0.46	-1.81
2000-01 to 2010-11	7.74	16.50	7.10	9.80	9.46

Source: Computed on the basis of data available at Directorate of Horticulture.

Contribution of Horticulture within Primary Sector of Himachal Pradesh

Primary sector which include agriculture and its allied sector, forestry, fishing, mining and quarrying has been most important sector in the economy of Himachal Pradesh.

Table 1.4 Contribution of Horticulture within Primary Sector *(Per cent)*

Year	Primary Sector[1] (crore)		Estimated Gross Value of Horticulture Produce[2] (crore)					
	At Current Prices	*At Constant Prices*	*Fruit*	*Flower*	*Honey*	*Mushroom*	*Hops*	*Total*
2000-01	3954	3773	677.92 (17.14) [17.97]	6.65 (0.17) [0.18]	4.18 (0.10) [0.11]	10.31 (0.26) [0.27]	0.22 (0.005) [0.006]	699.28 (17.68) [18.53]
2001-02	4442	4093	529.28 (11.91) [12.93]	8.30 (0.19) [0.20]	3.27 (0.07) [0.08]	11.29 (0.25) [0.27]	0.51 (0.011) [0.012]	552.85 (12.44) [13.51]
2002-03	4657	4184	751.46 (16.14) [17.96]	6.92 (0.15) [0.16]	4.82 (0.10) [0.11]	12.94 (0.28) [0.31]	0.50 (0.011) [0.012]	776.64 (16.68) [18.56]
2003-04	5194	4671	817.13 (15.73) [17.49]	9.03 (0.17) [0.19]	4.15 (0.08) [0.09]	17.94 (0.34) [0.38]	0.60 (0.012) [0.013]	848.85 (16.34) [18.17]
2004-05	6197	6197	1230.5 (19.86) [19.86]	12.92 (0.21) [0.21]	9.28 (0.15) [0.15]	18.80 (0.30) [0.30]	0.42 (0.007) [0.007]	1271.92 (20.52) [20.52]
2005-06	6858	6578	1270.8 (18.53) [19.32]	16.23 (0.24) [0.25]	9.63 (0.14) [0.15]	19.94 (0.29) [0.30]	0.68 (0.010) [0.010]	1316.78 (19.20) [20.02]
2006-07	7010	6539	889.27 (23.57) [26.12]	19.90 (0.28) [0.30]	8.89 (0.13) [0.14]	21.29 (0.30) [0.32]	0.66 (0.010) [0.010]	940.01 (13.41) [14.37]
2007-08	7887	7118	1859.17 (23.57) [26.12]	22.28 (0.28) [0.31]	9.63 (0.12) [0.13]	27.38 (0.35) [0.38]	0.85 (0.011) [0.012]	1919.31 (24.33) [26.96]
2008-09	8789	7112	1714.45 (19.51) [24.11	27.33 (0.31) [0.38]	10.33 (0.12) [0.14]	29.48 (0.33) [0.41]	1.14 (0.013) [0.016]	1782.73 (20.28) [25.07]
2009-10	8979	6708	1718.28 (19.14) [25.61]	41.82 (0.48) [0.62]	11.70 (0.13) [0.17]	36.90 (0.41) [0.55]	1.28 (0.014) [0.019]	1809.98 (20.16) [26.98]

Source: 1 Economics and Statistics Department.

2 Directorate of Horticulture

( ) represent percentage contribution at current prices.

[ ] represent percentage contribution at constant prices.

Table 1.4 shows the contribution of horticultural produce in primary sector of Himachal Pradesh for the last ten years. Horticulture is a part of agriculture and allied services of primary sector. The table reveals that the contribution of horticulture sector in the primary sector indicate mixed trend for the `last ten years from 2000-01 to 2009-10. In 2000-01, the

total estimated value of horticulture produce was 699.28 crore, contributing 17.68 per cent and 18.53 per cent in primary sector at current and constant prices respectively. In 2006-07, the contribution decreases to 13.41 per cent at current prices and 14.37 per cent at constant prices in primary sector. Similarly, in 2009-10, the estimated value of horticulture produce was equal to 1809.98 crore with contribution of 20.16 per cent and 26.98 per cent primary sector at current and constant prices. Among Horticulture produce, fruit has maximum contribution, then mushroom, than flower crops, then honey and finally hops in the primary sector of Himachal Pradesh economy respectively.

Contribution of Horticulture in Gross State Domestic Product

Table 1.5 shows the contribution of Horticulture produce in Gross State Domestic Product (GSDP) at factor cost both at current and constant prices. It is evident from the table that contribution range between 3 to 6 per cent. In the year, 2000-01, the total value of horticultural produces is 699.28 crore in constant prices. It reduced to 3.22 per cent and 3.50 per cent at current and constant prices in 2001-02 respectively. Then it rises to 4.85 per cent and 5.04 per cent at current and constant prices in 2005-06 respectively. The contribution of horticulture produce was highest in the year of 2007-08 when percentage contribution stood at 5.65 per cent at current prices and 6.21 per cent at constant prices. In 2009-10, the percentage reduced to 4.18 per cent and 5.04 per cent at current and constant prices respectively. The maximum contribution in gross state domestic product was of fruits ranging between 3 to 6 per cent, thereafter mushroom, flowers, honey and hops occupy the space respectively.

Table 1.5 Contribution of Horticulture in Gross State Domestic Product at Factor cost (*Per cent)*

Year	Gross State Domestic Product at Factor Cost[1] (crore)		Estimated Gross Value of Horticulture Produce[2] (crore)					
	At Current Prices	*At Constant Prices*	*Fruits*	*Flowers*	*Honey*	*Mushroom*	*Hops*	*Total*
2000-01	15661	15004	677.92 (4.33) [4.52]	6.65 (0.04) [0.04]	4.18 (0.03) [0.03]	10.31 (0.06) [0.07]	0.22 (0.001) [0.001]	699.28 (4.46) [4.66]
2001-02	17148	15786	529.28 (3.09) [3.35]	8.30 (0.05) [0.05]	3.27 (0.02) [0.02]	11.29 (0.06) [0.07]	0.51 (0.003) [0.003]	552.85 (3.22) [3.50]
2002-03	18905	16585	751.46 (3.97) [4.53]	6.92 (0.04) [0.04]	4.82 (0.02) [0.03]	12.94 (0.07) [0.08]	0.50 (0.003) [0.003]	776.64 (4.11) [4.68]
2003-04	20721	17925	817.13 (3.94) [4.56]	9.03 (0.04) [0.05]	4.15 (0.02) [0.02]	17.94 (0.09) [0.10]	0.60 (0.003) [0.003]	848.85 (4.10) [4.73]
2004-05	24077	24077	1230.50 (5.11) [5.11]	12.92 (0.05) [0.05]	9.28 (0.04) [0.04]	18.80 (0.08) [0.08]	0.42 (0.002) [0.002]	1271.92 (5.28) [5.28]
2005-06	27127	26107	1270.80 (4.68) [4.88]	16.23 (0.06) [0.06]	9.63 (0.03) [0.04]	19.94 (0.07) [0.08]	0.68 (0.002) [0.003]	1316.78 (4.85) [5.04]
2006-07	30274	28481	889.27 (2.94) [3.12]	19.90 (0.06) [0.07]	8.89 (0.03) [0.03]	21.29 (0.07) [0.07]	0.66 (0.002) [0.002]	940.01 (3.10) [3.30]
2007-08	33963	30917	1859.17 (5.47) [6.01]	22.28 (0.06) [0.07]	9.63 (0.03) [0.03]	27.38 (0.08) [0.09]	0.85 (0.002) [0.003]	1919.31 (5.65) [6.21]
2008-09	38571	33192	1714.45 (4.44) [5.16]	27.33 (0.07) [0.08]	10.33 (0.03) [0.03]	29.48 (0.08) [0.09]	1.14 (0.003) [0.003]	1782.73 (4.62) [5.37]
2009-10	43281	35888	1718.28 (3.97) [4.79]	41.82 (0.10) [0.12]	11.70 (0.03) [0.03]	36.90 (0.08) [0.10]	1.28 (0.003) [0.003]	1809.98 (4.18) [5.04]

Source:1 Economics and Statistics Department.

2 Directorate of Horticulture

( ) represent percentage contribution in Gross State Domestic Product at current prices.

[ ] represent percentage contribution in Gross State Domestic Product at constant prices.

Contribution of Horticulture in Net State Domestic Product

Table 1.6 reveals that in 2000-01, total value of horticulture produce stood at 699.28 crore contributing 5.05 per cent and

5.27 per cent in net state domestic product at current and constant prices respectively.

Table 1.6 Contribution of Horticulture in Net State Domestic Product at Factor Cost (Per cent)

Year	Gross State Domestic Product at Factor Cost[1] (crore)		Estimated Gross Value of Horticulture Produce[2] (crore)					
	At Current Prices	*At Constant Prices*	*Fruits*	*Flowers*	*Honey*	*Mushroom*	*Hops*	*Total*
2000-01	13853	13262	677.92 ((4.89) [5.11]	6.65 (0.05) [0.05]	4.18 (0.03) [0.03[	10.31 (0.07) [0.08]	0.22 (0.001) [0.002]	699.28 (5.05) [5.27]
2001-02	15215	13938	529.28 (3.48) [3.80]	8.30 (0.05) [0.06]	3.27 (0.02) [0.02]	11.29 (0.07) [0.08]	0.51 (0.003) [0.004]	552.85 (3.630 [3.97]
2002-03	16751	14617	751.46 (4.49) [5.14]	6.92 (0.04) [0.05]	4.82 (0.03) [0.03]	12.94 (0.07) [0.09]	0.50 (0.003) [0.003]	776.64 (4.64) [5.31]
2003-04	18127	15596	817.13 (4.51) [5.24]	9.03 (0.05) [0.06]	4.15 (0.02) [0.03]	17.94 (0.10) [0.11]	0.60 (0.003) [0.004]	848.85 (4.68) [5.44]
2004-05	21189	21189	1230.50 (5.81) [5.81]	12.92 (0.06) [0.06]	9.28 (0.04) [0.04]	18.80 (0.09) [0.09]	0.42 (0.002) [0.002]	1271.92 (6.0) [6.0]
2005-06	23743	23009	1270.80 (5.35) [5.52]	16.23 (0.07) [0.07]	9.63 (0.04) [0.04]	19.94 (0.08) [0.09]	0.68 (0.003) [0.003]	1316.78 (5.54) [5.72]
2006-07	26247	24819	889.27 (3.39) [3.58]	19.90 (0.07) [0.08]	8.89 (0.03) [0.03]	21.29 (0.08) [0.08]	0.66 (0.002) [0.003]	940.01 (3.58) [3.79]
2007-08	28873	26362	1859.17 (6.44) [7.05]	22.28 (0.08) [0.08]	9.63 (0.03) [0.04]	27.38 (0.09) [0.10]	0.85 (0.003) [0.003]	1919.31 (6.65) [7.28]
2008-09	31951	27246	1714.45 (5.36) [6.29]	27.33 (0.08) [0.10]	10.33 (0.03) [0.04]	29.48 (0.09) [0.11]	1.14 (0.003) [0.004]	1782.73 (5.58) [6.54]
2009-10	53593	28756	1718.28 (4.83) [5.97]	11.70 (0.03) [0.04]	11.70 (0.03) [0.04]	36.90 (0.10) [0.13]	1.28 (0.003) [0.004]	1809.98 (5.08) [6.29]

Source: 1 Economics and Statistics Department.

2 Directorate of Horticulture

( ) represent percentage contribution in Net State Domestic Product at current prices.

[ ] represent percentage contribution in Net State Domestic Product at constant price.

In 2001-02, among the horticulture produce, fruits contribution in Net State Domestic Product was maximum and hops contribution was least. In the next year of 2001-02, horticulture produce value was estimated at 552.85 crore contributing 3.63 per cent and 3.97 per cent in Net State Domestic Product at current and constant prices respectively. Subsequently, in the coming year, the contribution rose to 6.0 per cent both at current and constant prices in the year 2004-05. In 2006-07, percentage contribution reduced to 3.58 per cent and 3.79 per cent at current and constant prices. In the next year 2007-08, it rose to 6.65 and 7.28 per cent in NSDP both at current and constant prices. In the year 2009-10 percentage contribution to NDSP at factor cost increased to 5.08 per cent and 6.29 per cent both at current and constant prices respectively.

Conclusion

Himachal Pradesh has been endowed with a wide range of agro climatic-conditions due to which a large number of horticulture crops like fruit crops, (from temperate to sub tropical) flowers, vegetables, mushrooms, hops, tea medicinal and aromatic plants etc. are successfully grown here. Amongst the fruit crops, perhaps all kind of fruits grown in the country, except those which are grown in the warm humid coastal regions, can be produced in the State. However, the State has not been able to fully exploit its comparative advantage in growing horticultural crops. Despite the multifold increase in production of horticultural crops over the years, the productivity is continuously declining. The productivity continues to be low on account of inadequate production of quality planting, lack of validated prescription for high density plantation, canopy management and inefficient plant protection. Himachal Pradesh has made significant progress in the development of horticulture. The contribution of horticulture to primary sector has increased during the study period in the State economy.

The contribution of the horticulture within primary sector has risen from 18.53 per cent in 2000-01 to 26.98 per cent in 2009-10. In terms of contribution to GSDP and NSDP, horticulture sector demonstrates a phenomenal place during the span of ten years. Notwithstanding, the phenomenal contribution of the horticulture sector to the State economy, there is a lot to do for the development of this sector. Therefore, high priority should be given to horticulture sector, which has emerged as a major sector in the development of economy of the State.

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