



Horticulture Development In Himachal Pradesh: With Special Reference To Tribal Region

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Abstract:

Horticulture, accounting for over 20% of Himachal Pradesh's GDP, is a significant contributor to the state's economy, producing a diverse range of fruits, vegetables, and flowers, including apples, pears, peaches, plums, cherries, walnuts, almonds, citrus fruits, potatoes, tomatoes, and onions. This paper examines the growth trends in area and production of major fruit crops and vegetables and role of horticultural for the development of tribes. ¹ It was concluded that production of fruits and vegetables in Himachal Pradesh has fluctuated over the past decade, but the overall trend is slightly upward. This is likely due to a number of factors, including government support, improved horticultural practices, and growing demand. The increasing production of fruits is a good thing for the state, as it provides a number of economic, nutritional, and environmental benefits. Overall, horticulture is a valuable tool that can be used to promote the development of tribal areas. By improving income, food security, nutrition, and employment opportunities, horticulture can help to raise the standard of living and improve the quality of life for tribal communities.

Keywords – Agriculture, Horticulture, Area, Production, Productivity, Himachal Pradesh, Chamba, Kinnaur and Lahaul-Spiti.

I. INTRODUCTION

Agriculture is the main occupation of the people of Himachal Pradesh and has an important place in the economy of the State. Himachal Pradesh is the only State in the country whose 89.96 per cent population (Census 2011) lives in rural areas. Therefore, dependency on Agriculture/ Horticulture is eminent as it provides direct employment to about 62 per cent of total workers of the State. The rich diversity of agroclimatic conditions, topographical variations and altitudinal differences coupled with fertile, deep and well drained soils favor 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. ² Horticulture encompasses various sectors like fruit and vegetable production, ornamental plant production, novel crops, mushroom and bee-keeping. It has become a potential agricultural enterprise for accelerating economic growth, contributing to nutritional security, poverty alleviation, and employment generation. Horticulture offers farmers diverse crop diversification options and provides ample scope for sustaining numerous industries, generating significant employment opportunities. Addressing common issues and leveraging opportunities is crucial for horticulture's potential to contribute to the country's economic development. ³ The horticulture sector has been a key driver of agriculture growth for the past three decades, despite a slowdown. Policy support has been encouraging, and the unique agro-climatic advantages of the north-western and north-eastern Indian hilly states offer potential for broad-based horticulture-driven growth. ⁴ Chamba, Kinnaur, and Lahaul-Spiti are three districts in Himachal Pradesh that are particularly well-suited for horticulture. These districts have high altitudes, cool climates, and fertile soils, which are ideal for growing a variety of fruits and vegetables. Chamba is known for its production of apples, pears, peaches, plums, and

cherries. The district also produces a variety of vegetables, including potatoes, tomatoes, and onions. Kinnuar is known for its production of apples, apricots, and walnuts. The district also produces a variety of vegetables, including potatoes, tomatoes, and onions. Lahaul-Spiti is known for its production of apples, apricots, and sea buckthorn. The district also produces a variety of vegetables, including potatoes, tomatoes, and onions.⁵ The state of Himachal Pradesh (HP) is characterized by opportunities in high-value commodities due to its diverse agro-climatic conditions, potential for off-season markets, high education of producers, and proximity to terminal consumer markets. HP's agriculture is dominated by high-value horticulture commodities, accounting for about 44% of cropped area and contributing about 48% of agricultural gross state domestic product. Horticulture in HP has been responsible for employment, wages, and poverty reduction. However, the state faces several sectoral, institutional, and policy challenges that need to be addressed systematically to realize the potential of horticulture production in HP and translate it into sustainable development impact. The Indian government acknowledges the crucial role of agriculture in rural urban transformation and its potential for growth and job creation. To capitalize on this, the government has launched several policies and initiatives since 2014. These include a shift from food grain production to high value agriculture production of fruits, vegetables, and dairy, a shift from on-farm production to value addition in post-harvest segments of agriculture value chains, a shift from productivity to resilience of agriculture production systems for climate change effects, and a shift towards nutrition-sensitive agriculture.⁶

II. Literature review

H. R. Sharma and R. K. Sharma (2000) have investigated the relationship between farm size and productivity in some districts of Himachal Pradesh. Primary data was collected for field survey from 1997-98. Regression method was used. The findings also indicated that small farms utilised more labour and fertiliser than larger farm size groups. In general, the study's findings challenge the idea that the use of modern agricultural technologies has eliminated the negative relationship between farm size and productivity.⁷

Sharma, Pathania and Lal (2006) examined emerging issues, the scope of transitions, and their implications for agriculture's sustainable and balanced development in Himachal Pradesh during the years 2002 and 2003. The primary study and data were tabulated, and various parameters were estimated. The indices, percentages and ratios were computed wherever required to elucidate the results. It concluded five major mountain farming systems (MFS) in Himachal Pradesh have seen changes in socio-economic milieu and agricultural practices, resulting in higher farm productivity per unit of land but high externalities. It was recommended growing externalities in the MFS also highlight the critical role of markets and marketing in agricultural development, which requires increased policy support in the future.⁸

Baba, Saini, Sharma and Thakur (2010) examined the trends of agricultural investment and how they affect the development of the agricultural sector and the reduction of poverty in Himachal Pradesh. In this study, a broad series of public and private investment in agriculture was constructed by considering all significant investment heads for a period from 1969-1970 to 2001-2002. Incremental capital-output ratio (ICOR), Growth Rate and Two Stage Least Squares (2SLS) procedure was employed using secondary data. The study suggests reversing the downward trend in public investment in rural development by investing in agricultural technology, infrastructure, irrigation, market development, and other social overheads. To promote private investment in agriculture, resources like finance, affordable power, and tubewell subsidies must be made available.⁹

Mohamad Aslam (2019) has made an attempt to study the relationship between farm size and productivity in district level analysis of Himachal Pradesh. The relationship between farm size and productivity has been intensely debated in India. The Descriptive statistics, as well as regression technique, have been used for the study. The study found a negative correlation between farm size and productivity in 9 out of 12 Himachal Pradesh districts, with output per bigha declining with larger hand holding sizes. This is primarily due to increased input expenditure on small farms.¹⁰

Kumar, Singh and Sharma (2019) investigated the structural changes in agricultural and economic growth in different agro climatic regions of Himachal Pradesh. Accordingly, time series secondary data were used to estimate the compound growth rate (CGR) of the (primary, secondary, and tertiary education subsectors), district-level per capita income, growth in the workforce of cultivators, zone-level per capita income and agricultural labour in Himachal Pradesh, as well as the state's overall GDP (1991-92 to 2011-2012). The study found that high hill and cold dry zones experienced more inclusive economic growth rates in state GDP and per capita income compared to low hill and mid hill zones. However, the low-hill region experienced instability in income growth and a decrease in the agricultural sector. The study suggests lowering cultivation costs, promoting organic vegetable production, and fostering youth skill development in agriculture.¹¹

Kumar, Saraswat and Bist (2021) examined the agrarian structure and its impact on the agricultural economy in the state of Himachal Pradesh over a nine-year period, from 1970-71 to 2010-11. Inequality in state land holding was described using well-known indices, namely the Ginni, Theil, and Atkinson indexes, which effectively represent the social welfare function. Secondary data was obtained from the Himachal Pradesh Directorate of Agriculture Census for the nine census periods covering 1970-71 to 2010-11. The study reveals that marginal holdings in Himachal Pradesh have grown due to land reform legislation and inheritance divisions. The distribution of operational holdings is inequitable, with self-operated holdings increasing and partly leased holdings decreasing. The report recommends inclusive growth, equitable access, and a lower viable holding limit.¹²

S. Kumar and K. Kumar (2022) have investigated the relationship between operational holding, gross output value, and the value of the major inputs utilised in the production of particular field crops in low hill zone of Himachal Pradesh. Primary data for the year 2013–14 was collected using the survey method and by fitting the log-linear equation, the relationship between holding size and productivity was determined. The study found a negative correlation between operational holding and productivity in maize crops, but a positive one in paddy and wheat crops. Strengthening the extension network for agricultural technologies and technical know-how can improve farmers' risk-absorption capacity and productivity.¹³

Chadha and Srivastava (2022) analysed the effectiveness of crop insurance scheme is effective in comparing costs and returns during the period of 2019-20. The primary study used multistage stratified random sampling to select farmers, analysing crop insurance scheme standard treatment effect model was used. It was concluded that being a KCC holder was the most critical variable impacting crop insurance programme uptake. It resulted in a slight increase in net returns for tomato crops, but had no effect on wheat or maize crops. It was suggested that government intervention is required to boost its efficiency, particularly in the Himalayan states of the north.¹⁴

III. Objectives of the study

1. To study the changes in cropping pattern and Production of Horticulture in study area.
2. To identity problem face by concern farmers in the study area and to suggest measures.

IV. Data Sources and Methodology

The study used secondary data from 2011-12 to 2020-21 from Himachal Pradesh's tribal areas of Chamba, Kinnuar, and Lauhal-Sipti. The study used of compound growth rates to analyze the data and study trends in fruits and vegetables. The data was gathered from the Directorate of Horticulture, Directorate of Land Records, and Department of Economic and Statistical Analysis, Himachal Pradesh.

Area, Production, and Growth Rate of Fruits in Himachal Pradesh

The figure shows the Area and Production of fruits in Himachal Pradesh from 2011-12 to 2020-21. It also shows the Growth Rate Production of fruits in Himachal Pradesh.

Table 1
Area and Production of Fruits in Himachal Pradesh

Year	Area (in hectare)	Production (in tonnes)	Growth Rate of Production (in %)
2011-12	2,14,574	3,72,820	-
2012-13	2,18,303	5,55,710	0.49
2013-14	2,20,706	8,66,340	0.55
2014-15	2,24,352	7,51,940	-0.13
2015-16	2,26,799	9,28,790	0.23
2016-17	2,29,202	6,11,880	-0.34
2017-18	2,30,852	56,530	-0.90
2018-19	2,32,139	4,95,360	7.76
2019-20	2,33,000	8,45,420	0.70

2020-21	2,34,779	7,53,977	-0.12
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Source Computation of Growth Rate from Directorate of Horticulture, Directorate of Land Records

Note: CHM- Chamba, KNR- Kinnaur and LS- Lahaul-Spiti

Area and production of fruit cultivation in Himachal Pradesh

The area under fruit cultivation in Himachal Pradesh has increased from 2,14,574 hectares in 2011-12 to 2,34,779 hectares in 2020-21. However, there have been some fluctuations in area and production over the years. The food production declined from 8,66,340 to 7,51,940 in 2014-15 but it increased again in 2015-16. Similarly, the production of fruits decreased in 2016-17 to 6,11,880 tonnes and fall sharply in 2017-18 to 56,530 tonnes. However, production of fruits recovered to 4,95,360 tonnes in 2018-19 and increased in 2019-20 to 8,45,420 tonnes then again falls in 2020-2021 to 7,53,977 tonnes.

The growth rate of production of fruits in Himachal Pradesh has fluctuated over the years, both positively and negatively. The highest growth rate was recorded in 2018-19 at 7.76%. The growth rate remains negative in 2014-15, 2016-17, 2017-18 and 2020-21, i.e 0.13 %, 0.34%, 0.90% and -0.12 % respectively.

Table 2 shows the area cultivation for Apple, Plum, Apricot, Pear, Almond and Walnut of Chamba Kinnaur and Lahaul -Spiti from 2011-2012 to 2020-2021. The area under apple cultivation in Chamba decreased from 12509 hectares in 2011-2012 to 12405 hectares in 2020-21, while in Kinnaur, it increased from 10100 hectares to 10911 hectares, and in Lahaul -Spiti, it increased from 1410 hectares to 1766 hectares. The area under plum cultivation in Chamba decreased from 364 hectares in 2011-2012 to 303 hectares in 2020-21, a decrease of 61 hectares. However, the area under plum cultivation increased in both Kinnaur and Lahaul- Spiti. Kinnaur saw an increase of 2 hectares, going from 10 hectares in 2011-2012 to 12 hectares in 2020-21. Lahaul- Spiti experienced an increase of 5 hectares, growing from 14 hectares to 19 hectares over the same period. The area under apricot cultivation in Chamba decreased from 359 hectares to 333 hectares between 2011-2012 and 2020-21 while in Kinnaur increase from 319 to 325 hectares, and Lahaul Spiti increase from 23 to 24 hectares during the same period. The cultivation area of Pear in Chamba decreased from 358 hectares in 2011-2012 to 302 hectares in 2020-21, while it was increased from 65 hectares to 79 hectares in Kinnaur and increased from 9 hectares to 13 hectares in Lahaul Spiti. The area under almond cultivation in Chamba decreased from 248 hectares to 207 hectares between 2011-2012 and 2020-21. Similarly, Kinnaur decrease from 1005 to 937 hectares. In contrast, Lahaul Spiti's almond cultivation area remained stable during this period. Between 2011-2012 and 2020-21, Chamba's walnut cultivation area increased from 1288 hectares to 1291 hectares while Kinnaur's decreased from 239 to 223 hectares and Lahaul Spiti's area remained stable. It was revealed that Chamba has the largest area under apple production, followed by Kinnaur and Lahaul Spiti. The CAGR for apple production area in Chamba is -0.1% which indicates a decline in apple production year over year. The CAGR for apple production area in Kinnaur is 0.9% and 2.5% in Lahaul Spiti which is the highest among the three districts. Also, Chamba has the largest area under cultivation of Apple, Plum, Apricot, Pear, and Walnut compare to other two districts. Kinnaur has largest area under cultivation of Almond. The CAGR for plum production area in Chamba Kinnaur and Lahaul Spiti was -2% ,2%And 3.5 % respectively which shows that area of Plum was decreased over the years in Chamba and increased in Kinnaur and Lahaul Spiti. However, the CAGR for apricot, pear, almond production in Chamba is negative 0.8%, 2%, and 2% which means area of cultivation is declining over the years. Further, the area cultivation of walnut in Chamba, almond cultivation in Kinnaur, and walnut cultivation in Lahaul Spiti remains stagnant. In Kinnaur area under cultivation of almond and walnut was negative 1%. The cultivation area for apricot and pear in Kinnaur and Lahaul Spiti was found to be positive which was 0.2% and 0.5 % for apricot respectively and 2% and 4% for pear respectively.

Table 2
District wise Area under different fruits (In Hectare)

	Apples			Plum			Apricot		
Year	CHM	KNR	LS	CHM	KNR	LS	CHM	KNR	LS
2011-12	12509	10100	1410	364	10	14	359	319	23
2012-13	12766	10116	1473	367	10	15	369	319	24
2013-14	12997	10487	1579	379	12	16	380	326	24
2014-15	12818	10953	1653	368	13	18	378	366	25
2015-16	12554	11164	1673	364	14	19	381	336	25
2016-17	11734	60210	305	79	4	3	97	258	28
2017-18	12594	11179	1702	346	12	18	362	332	25
2018-19	12539	10973	1746	348	12	18	358	329	25
2019-20	12442	10911	1766	303	12	19	350	325	24
2020-21	12405	10911	1766	303	12	19	333	325	24
CAGR%	-0.1	0.9	2.5	-2.0	2.0	3.5	-0.8	0.2	0.5
	Pear			Almond			Walnut		
Year	CHM	KNR	LS	CHM	KNR	LS	CHM	KNR	LS
2011-12	358	65	9	248	1005	6	1288	239	2
2012-13	358	65	10	249	1005	6	1259	239	2
2013-14	360	77	10	250	1004	6	1299	239	2
2014-15	359	78	11	243	1007	6	1280	239	2
2015-16	351	80	11	232	996	6	1255	237	2
2016-17	252	21	3	41	29	6	406	64	0
2017-18	328	78	12	212	960	6	1238	229	2
2018-19	323	78	12	205	950	6	1233	227	2
2019-20	301	79	13	207	930	6	1231	232	2
2020-21	302	79	13	207	937	6	1291	223	2
CAGR%	-2	2	4	-2	-1	0	0	-1	0

Source: Computaion from Directorate of Horticulture, Directorate of Land Records

Note: CHM- Chamba, KNR- Kinnaur and LS- Lahaul-Sipti

It was found that the cultivation area of Apples, Plums, Apricots and Pears in Chamba experienced a negative CAGR, while the cultivation area of Almonds and Walnuts experienced a negative CAGR in both Chamba and Kinnaur districts which indicates a consistent decline in the land area over a specific period. A declining trend may suggest a shift in agricultural priorities, wherein farmers transition to cultivating more profitable or sustainable crops that align with changing market demands or environmental conditions.

The table 3 reveals that the three districts (Chamba, Kinnaur and Lahaul Spiti) production of Apple, Plum, Apricot, Pear, Almond and Walnut. The study reveals trends in fruit production across the three districts. While apple production in Chamba increased from 10,789 tonnes in 2011-12 to 18,240 tonnes in 2020-2021, it declined in Kinnaur from 63,781 tonnes to 48,678 tonnes. Lahaul Spiti production increase from 302 tonnes to 751 tonnes. Plum production showed a decline in Chamba from 303 tonnes to 57 tonnes, while Kinnaur production increase from 2 to 4 tonnes. Lahaul Spiti maintained a steady production of 4 tonnes from 2011-12 to 2020-2021. Similarly, apricot production decreased in Chamba 333 tonnes to 116 tonnes, but increased in Kinnaur from 325 tonnes to 381 tonnes. Lahaul Spiti's apricot production increase from 24 tonnes to 16 tonnes. Pear production decreases in Chamba from 302 tonnes to 237 tonnes and an increase in Kinnaur from 15 tonnes to 20 tonnes. Lahaul Spiti's pear production also increased from 2 tonnes to 10 tonnes. Almond production experienced a decline in Chamba from 42 tonnes to 14 tonnes, while Kinnaur production increases from 93 tonnes to 98 tonnes. Lahaul Spiti's almond production decreased from 4 tonnes to 2 tonnes. However, walnut production increased significantly in Chamba from 129 tonnes to 1,346 tonnes, while it decreased in

Kinnaur from 223 tonnes to 66 tonnes. Lahaul Spiti did not report any walnut production during the study period.

It was observed that Chamba has the highest production of Apple, Plum, Pear, and Walnut, while Kinnaur has the highest production of Apricot and Walnut. Further, Lahaul Spiti has lowest production in Apple, Plum, Apricot, Pear, Almond and no production of Walnut. It was seen that Apple production in Chamba and Lahaul Spiti is experiencing positive CAGR of 6% and 11% respectively while Kinnaur's apple production is decreasing at a rate of 3%. There is no production of Plum in Lahaul Spiti while production is increasing in Chamba and decreasing in Kinnaur as CAGR is negative 17% and 8% respectively. The production of Apricot in Chamba and Lahaul Spiti is declining at a negative 11% and 4% CAGR, respectively, while Kinnaur has a positive CAGR of 2%. Pear production in Chamba was experiencing negative growth rates of 3% while both Kinnaur Lahaul Spiti has positive CAGR 3% and 20 %. The CAGR for almond production in Chamba and Lahaul- Spiti is negative 11% and 7% while positive in Kinnaur which was 1% which indicating growth.

Table 3
District wise Fruits Production (in tonnes)

	Apples			Plum			Apricot		
Year	CHM	KNR	LS	CHM	KNR	LS	CHM	KNR	LS
2011-12	10789	63781	302	303	2	4	333	325	24
2012-13	2739	52020	169	193	2	4	129	111	45
2013-14	7189	54044	200	211	3	5	220	126	22
2014-15	26054	59196	277	234	2	5	246	200	27
2015-16	24018	75202	272	301	5	4	269	381	28
2016-17	11734	60210	305	79	4	3	97	258	28
2017-18	18959	52189	300	159	3	6	176	328	20
2018-19	12688	61673	302	86	3	2	92	354	19
2019-20	28083	56864	302	270	4	4	322	482	18
2020-21	18240	48678	751	57	4	4	116	381	16
CAGR%	6%	-3%	11%	-17%	8%	0%	-11%	2%	-4%
	Pear			Almond			Walnut		
Year	CHM	KNR	LS	CHM	KNR	LS	CHM	KNR	LS
2011-12	302	15	2	42	93	4	129	223	0
2012-13	245	12	2	42	41	5	415	184	0
2013-14	266	17	3	44	72	4	538	59	0
2014-15	285	11	4	42	154	6	521	53	0
2015-16	597	25	4	46	141	6	597	51	0
2016-17	252	21	3	41	29	6	406	64	0
2017-18	221	18	5	25	2	6	619	143	0
2018-19	93	20	1	16	125	4	342	50	0
2019-20	320	23	3	31	26	5	653	55	0
2020-21	237	20	10	14	98	2	1346	66	0
CAGR%	-3%	3%	20%	-11%	1%	-7%	30%	-13%	0

Source Directorate of Horticulture, Directorate of Land Records and Self Computaion

Note: CHM- Chamba, KNR- Kinnaur and LS- Lahaul-Spiti

Lahaul Spiti has no walnut production and the CAGR for walnut production in Kinnaur is negative 13 %, which is also a decline. The CAGR for walnut production in Chamba is 30%, which indicates increasing production.

It was revealed that the CAGR for production was negative for plums, apricots, pears, and almonds in Chamba, while it was negative for apples and walnuts in Kinnaur. In Lahaul Spiti, apricot and almond production also experienced a negative CAGR which indicates declining production over a specific period

Conclusion

The study confirms the critical role of fruit cultivation in the state's economy and horticulture sector. The study brings out that cultivation of fruit crops over the study period (2011-12 to 2020-21). The study indicates that Chamba districts have seen significant growth in walnut production and area, while Kinnaur has seen growth in Plum, Apricot, Pear, and Almond production, and Lahaul Spiti has seen growth in Apple and Pear production, indicating stability in cultivation. Chamba districts experienced negative growth in Plum, Apricot, Pear, and Almond production, while Kinnaur saw negative growth in Apple and Walnut production, and Lahaul Spiti saw negative growth in Apricot and Almond production. The findings of the study provide valuable insights for policymakers and stakeholders to develop strategies that promote sustainable agricultural development. By understanding the factors influencing fruit production in specific districts like Chamba, Kinnaur, and Lahaul Spiti, more effective interventions and policies can be implemented. To mitigate risks and promote sustainable fruit production, strategies like crop diversification, climate-resilient varieties, and government support are essential. Farmers can adopt high-yielding varieties, expand orchards, and adopt good agricultural practices. Research into pest- and disease-resistant varieties is crucial, and improving post-harvest infrastructure can reduce wastage and enhance product quality. To boost overall fruit production and support the agricultural economy, it's essential to expand fruit cultivation areas and address specific issues in each district.

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