



A study of apple economy of Himachal “production growth and productivity of apple cultivation” A research paper

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Abstract

Apple is the main cash crop of mainly four district of Himachal namely Shimla, Kinnaure, Kullu and Mandi having approximately Rs 5000 Cr economy p.a. The advanced research in horticulture has invented new varieties of apple that is growing in lower altitude of Himachal now but it is not significantly affecting the economy boost as an opportunity. Because Production of apple is totally depended on snowfall and it requires 1000 chilling hours completion temperature at 4^o c or below and regular monsoon and timely rainfall. Production of apple has increased with 121.44% with the increase in area under apple cultivation by 28.72% as compare to the production and area under apple cultivation of 1990's decade with increase in productivity per hectare by 20.979 tonne per hectare in last decades of ten years which is average increase in productivity by 2.0979 tonne per hectare per year. There is fluctuation in apple production and productivity in year wise study of the data. Consistently negative and some sudden positive boosts in the fluctuation is a major cause of threat to the apple cultivation. The present research is decade wise and year wise changes in apple production. Key points: Production trend, productivity, growth in Cultivation, hypotheses testing chi square, Standard deviation, Fishers approximation chi square and Approximation rule for standard deviation from Range.

Keywords: Apple cultivation, Himachal Pradesh, Shimla, Kinnaur, Kullu, Mandi, cash crop economy, horticulture research, low-altitude apple varieties, chilling hour's requirement

Introduction

Himachal Pradesh is known for its mountain beauty, rivers, waterfalls, thick forest, religious values and Apple production. The economy of Himachal Pradesh is based on Agriculture industries, Tourism and Apple production. Apple production is the main agriculture product which has its value approximately 5000 crore p.a. The apple in Himachal was introduced by R.C. Lee in Kullu but that was not of sweet variety. Later the Apple is grown and developed by Smuelson Stokes in Kotgarh in Distt Shimla. Apple became the main crop for farmers in Distt Shimla, Kullu, Kinnaure and Mandi and for other distt of Himachal Pradesh now. This has become an attractive Source of income and self employment to the young educated youth of Himachal Pradesh. Govt of Himachal have special department in cabinet ministerial level for developing fruit cultivation in Himachal which has done a lots of efforts by opening horticulture department's offices in main cities and many plant protection centres in the villages to distribute plants of fruits trees and medicines of plant protection. These departments are administered by certified scientists and technicians who organizes seminars and in personal counselling to the fruit producers near their villages. Govt has opened training centres where the modern cultivation technique is imparted to the horticulturists.

Review of Literature

Singh Niranjana *et al* [1] Impact of climate change on apple production in India A Review 2015 A study is conducted on the variation in apple farming because of climate change. It is found there the traditional apple farming is under stress. Apple tree is facing some time early blooming, less chilling hours, and high temperature is affecting the production and harvesting time

Shilpa *et al* 2024 [2], a study was conducted on Perceptions of Apple Growers on Impact of Climate Change on Apple Production in Mid and High Hills of Himachal Pradesh, India. The study reveals that amount of high rain fall reduced the apple productivity by 68.5% hail storm affected the apple crop by 70% and low snow fall affected the chilling hours requirement by 73.5% the increase variability in apple yield by 71.5%.

Sen Vijayshri *et al* .2024 [3] A study was conducted on Impact of climate variability on apple production and diversity in Kullu valley, Himachal Pradesh. Authors revealed in the study that `since 1985 to 2009 the increase in temperature was found by 0.05^o c per year which shows warming trend in temperature affecting apple production.

Benojir Yasmin *et al* [4] 2023 . A study has been conducted on Challenges and Prospects of Apple Cultivation in Himachal Pradesh. Author has studied the production positivity reasons concluded by five strength factors as Ecological suitability combined with export facility, Growth of food processing industries, Use of green manures, Sufficient and well-managed cold storage facility, development of tourism industry. More than 80% of the respondents have accepted these strength factors in apple cultivation can support and encourage the apple farmers to produce more.

Kumar Rohit 2025 [5] Author has revealed the importance of apple cultivation to the farmers and political gain of the political parties in the state. Study reveals that growth in apple cultivation has reduced the poverty and increased the standard of living of the rural people which improved the education standard and increased the access of rural people to the improved health care. The study has revealed the political influence through policy formulation such as subsidy on inputs, infrastructural growth, better road connectivity, minimum supporting price, opening of

procurement center and crop insurance etc. by which the political parties gained the public support.

Objective of the Study

1. To know the trend in Apple production in Himachal Pradesh Since 1990-91.
2. To know the growth in apple production and area under Apple tree in Himachal Pradesh.
3. To know the changes in Apple production and productivity per hectare area under apple cultivation.
4. To find suggestive measures if any

Hypotheses

The study is focussed to know the growth in Apple production in Himachal Pradesh. So the assumption has been taken about the growth in total production in the state and area under cultivation of Apple. Following hypothesis has been constructed after studying the data available for the study.

1. "There is no fluctuation in the Production of Apple in the entire Apple growing area of Himachal Pradesh"
2. "There is no decrease in the productivity of Apple tree per Hectere in Himachal Pradesh"
3. "There is no significant increase in the production as per increase in the area of cultivation of Apple tree".
4. "There is no significant Growth in Apple Cultivation in Himachal Pradesh"

Scope of the Study

The present paper has focussed the trend in production of Apple, growth of area under apple cultivation and probable factors responsible for changes in apple production and increase in area under apple cultivation in Himachal Pradesh.

Data Analyses of Trend in Apple production And Hypotheses Testing

Table 1

Time (Decade)	Production lacs Metric tonne	Area under cultivation in hectere	Increase/ Decrease in area under cultivation in a decade	Average Productivity in metric tonne per hectere in a decade
1 st Decades 90's	2582622	88673	nil	29.125
2 nd Decades 2000's	4084240	99564	+10891	41.02
3 rd 2010's	5719155	114144	+25471	50.104
Total				

Source of data: Data collected From Govt record

In the above table the production of apple is 2582622 M.T. area under cultivation is 88673 hectere and the productivity per hectere for ten year period is 29.125 Metrec tone. In the last studied decade of 2010-11 to 2019-20 the production has increased to 5719155 and productivity has increased to 50.104 metrec tonne. The table shows in the 3rd decade there is increase in the area under apple cultivation is 25471 hectere with 28.72% increase in the area under apple cultivation.

Limitations of the Study

1. Data has been taken since 1990-91 only.
2. No physical verification of official data collection has done by researcher. Data is secondary.
3. Data on climate changes is not could not found.

Research Methodology

1. Sample Size

Distt. wise data on total production of Apple from entire area under apple cultivation in Himachal Pradesh has been taken for thirty four years since 1990-91 to 2023-24 from the entire state of Himachal Pradesh

2. Method of sampling

Census method of data collection has been used in data collection. But the data is secondary to the researcher in present research.

3. Types of data

Secondary data has been used⁶. No primary data has been used in hypotheses testing.

4. Methods of Hypotheses testing and data analyses:

1. Mean
2. Standard deviation (Simple and empirical rule of approximation for standard deviation R/\sqrt{N} e.i. R range N number of oservation)
3. Method of Time series taking each ten years data for study
4. Chi Square test

The expected production was 3224470 metrec tonne with increased area of apple cultivation in 3rd decade in the ratio of 29.125 Metrec tonne per hectere of the 1st decade. But the actual production was 5719155 Metrec tonne with increase in expected production by 2494685 Metrec tonne. Increase in expected production is 77.367% which shows the successful cultivation. Productivity of apple is increased to 50.104 metrec tonne with the increase in productivity by 20.979 Metrec tonne.

Table 2: Apple Production and Area under Apple Cultivation in Himachal Year wise Distribution

Year	Production in (metrec tonne)	Trend in percentage	Increase/decrease Production (year wise)	Apple Growing Area in HecTere	Productivity In metric tonne per hectere
1990-91	342071	100(%)		62828	5.44
1991-92	301730	88.20%	-40341	66767 (+3939)	4.51
1992-93	279051	81.576%	-22679	69439 (+2672)	4.01
1993-94	294734	86.161%	+15683	72406 (+2967)	4.07
1994-95	122782	35.893%	-171952	75469 (+3063)	1.62
1995-96	276681	80.884%	+153899	78292 (+2823)	3.53
1996-97	288538	84.350%	+11857	80338 (+2046)	3.59

1997-98	234253	68.480%	-54285	83056 (+2718)	2.82
1998-99	393653	115.079%	+159400	85631 (+2575)	4.59
1999-2000	049129	14.362%	-344524	88673 (+3042)	0.55
Total	2582622		-292942 decrease (-85.63%)	Increase +25845 (41.13%)	34.73
Mean	258262.2				3.473 29.125av/dec
standarddeviation	96400.36				

Source of Data: Data Collected from Govt Record

1. Above table represents the net apple production for ten years in Himachal Pradesh since 1990-91 to 1999-2000. Base year has been taken 1990-91. It is showing a downward trend except the year 1998-99 when there was 15.079% increase in the production of apple from the base year production.
2. The above ten year total production is showing the net decrease of 292942 metric tonne from the base production whereas there is increase of 25845 hectere in the area under apple cultivation during 1990-91 to 1999-2000 of ten year period from the base year 1990-91 area under apple cultivation of 62767 hectare. The study depict that the productivity of apple tree is decreasing. The productivity of apple in 1990-91 was 544.46% whereas productivity during 1999-2000 was 55.40% but this was not a normal year the production was very less because of climatic condition. Therefore the production of 1998-99 are taken for measurement of productivity of apple tree i.e 459.708% whereas increase in area under apple Cultivation was 41.13%. And decrease in production was 85.63% in the ten year period the productivity of apple tree is not constant too it is decreasing.
3. The average production for the period is 258262 metric tonne and value of Standard deviation is 96400. Variability is moderately low in the declining side.
4. The distribution is a normal distribution as per the value of standard deviation of the data. The data is consistent there is less variability and the results are more reliable.

Table 3: Apple Production and Area under Apple Cultivation in Himachal Year wise Distribution

Year	Production in {metrec tonne)	Trend in percentage	Increase/decrease Year wise production	Apple growing Area in HecTere	Productivity In meterec tonne Per hectare
2000-01	376736	100%		90347	4.16
2001-02	180528	47.918%	-196208	79561 (-10782)	2.26
2002-03	348283	92.442%	+167755	81630 (+2069)	4.26
2003-04	459492	121.961%	+111209	84112 (+2482)	5.46
2004-05	527601	140.045%	+68109	86202 (+2090)	6.12
2005-06	540356	143.430%	+12755	88560 (+2358)	6.10
2006-07	268402	71.244%	-271954	91804 (+3244)	2.92
2007-08	592576	157.292%	+324174	94726 (+2922)	6.25
2008-09	510161	135.416%	-82415	97438 (+3162)	5.23
2009-10	280105	74.350%	-230056	99564 (+2126)	2.81
Total	4084240 metric tonne		-96631 Decrease (-25.64%)	Increase +9671	45.57
Mean	408424				4.557
Standarddeviation	130312.46				

Source of Data: Data collected from Govt Record

In the above table total production of Apple is given in Metric tonne in the state since 2000-01 to 2009-10. To know the trend of apple production Method of Time Series for analysing trend has used. By taking 2000-01 as the vase year for study the time series value has been given in percentage in the table. The time Series table shows that Apple production has generally an upward trend. In the year 2003-04 there was 21.96% increase and in the year 2004-05 there was 40.045% increase in the production and in the year 2005-06 it was 43.43% increase and in the year 2007-08 it was 57.292% increase in production whereas in 2008-09 there was 35.416% in the total production of Apple in

Himachal Pradesh. The data on area under apple tree plantation was not appropriate for the period 2000-01 to 2009-10. There was decline in 2001-02 in the area under apple cultivation which was because of unknown reasons as per the interview answer reported by the horticulture research officer asked by researcher.

The distribution is a normal distribution as per the value of standard deviation of the data. During the period 2000-01 to 2009-10 variability is moderately low the data is consistent there is very less variability and the results are more reliable and showing constant decline.

Table 4: Apple Production and Area under Apple Cultivation in Himachal Year wise Distribution

Year	Production in {metrec tonne)	Trend in percentage	Increase/decrease Year wise production	Apple growing Area in HecTere	Productivity In metrec tonne Per hectare
2010-11	892112	100%		101485	8.79
2011-12	275036	30.829%	-617076	103644 (+2159)	2.65
2012-13	412395	46.226%	+137359	106440 (+2796)	3.87

2013-14	738723	82.806%	+326328	107686 (+1246)	6.85
2014-15	625199	70.080%	-113524	109553 (+1867)	5.70
2015-16	777126	87.110%	+151927	110679 (+1126)	7.02
2016-17	468134	52.474%	-308992	111896 (+1217)	4.18
2017-18	446574	50.058%	-21560	112634 (+738)	3.96
2018-19	368603	41.318%	-77971	113154 (+518)	3.25
2019-20	715253	80.175%	+346650	114144 (+990)	6.26
Total	5719155		-176859decrease (-19.82%)	Increase +12657	52.53
Mean	571915.5				5.253
Standrddeviation	195153.7				

Source of Data: Data Collected from Govt Record

Table 5: Apple Production and Area under Cultivation in Himachal Year wise Distribution

Year	Production in (metrec tonne)	Trend in percentage	Increase/decrease Year wise production	Apple growing Area in HecTere	Productivity Per hectare In Metric ton
2014-15	625199	100%		109553	5.70
2015-16	777126	124.300%	+151927	110679 (+1126)	7.02
2016-17	468134	74.877%	-306992	111896 (+1217)	4.18
2017-18	446574	71.429%	-21560	112634 (+738)	3.96
2018-19	368603	58.957%	-77971	113154 (+520)	3.25
2019-20	715253	114.404%	+346650	114144 (+1000)	6.26
2020-21	481062	76.945%	-234191	114646 (+502)	4.19
2021-22	611901	97.872%	+130839	115016 (+370)	5.31
2022-23	672343	107.540%	+60442	115680 (+664)	5.81
2023-24	506687	81.044%	-165656	116240 (+560)	4.35
Total	5672882		-116512 decrease (-18.95%)	Increase +6697	50.03
Mean	567288.2				5.003
standarddeviation	12624.92				

Source: Data collected from Govt published record

The Time series value of the Apple Production of the state for the period of ten years starting from 2010-11 to 2019-20 is given in the above table. Time series value shows a decreasing trend in the apple production in the state. The distribution is a normal distribution hence using the formula of empirical rule of approximation of standard deviation from range the value of standard deviation of the data depicts that the data is consistent there is moderately less variability and the results are more reliable.

The Time series value of the Apple Production of the state for the period of ten years starting from 2014-15 to 2023-24 is given in the above table. Time series value shows a

decreasing trend except 2019-20 with 114.404% and in 2022-23 with 107.540% in the apple production in the state. Average production during the above period was 567288.2 The distribution is a normal distribution as per the value of standard deviation of the data. The data is consistent there is very less variability and the results are more reliable. The results are showing consistent decline as compare to the increase in the area of cultivation.

“There is no fluctuation in the Production of Apple in the entire Apple growing area of Himachal Pradesh”

Apple production in Himachal Pradesh Year wise distribution

Table 6: Testing Hypotheses

Year	Production In Lacs metric tonne	Year	Production In Lacs metric tonne	Year	Production In Lacs metric tonne	Year	Production In Lacs metric tonne
1990-91	3.42	2000-01	3.76	2010-11	8.92	2020-21	4.81
1991-92	3.02	2001-02	1.80	2011-12	2.75	2021-22	6.11
1992-93	2.79	2002-03	3.48	2012-13	4.12	2022-23	6.72
1993-94	2.94	2003-04	4.59	2013-14	7.38	2023-24	5.06
1994-95	1.22	2004-05	5.27	2014-15	6.25		
1995-96	2.76	2005-06	5.40	2015-16	7.77		
1996-97	2.88	2006-07	2.68	2016-17	4.68		
1997-98	2.34	2007-08	5.92	2017-18	4.46		
1998-99	3.93	2008-09	5.10	2018-19	3.68		
1999-2000	0.49	2009-10	2.80	2019-20	7.15		

Source of data: data collected from govt record as secondary data

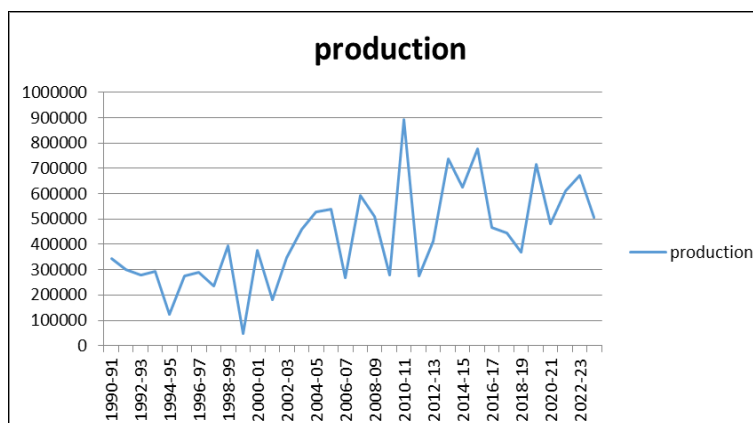


Fig 1: Production in Himachal Pradesh Apple

Chi square test has been employed to test whether or not the variation in apple production exists with the passage of time and all influential factors. The calculated value of chi square is 30.35. The degree of freedom is ν 33. The distribution is normal because the value of degree of freedom is more than 30. Therefore to know the critical value of chi square the formula of approximation has been used. Fisher's formula of calculating chi square approximation has been used to analyse chi square test. According to the fisher's formula of approximation Critical value is 34.713 and calculated value

is 30.35. The hypotheses accepted. There is no significant fluctuation in the apple production in Himachal Pradesh since 1990-91. The factors responsible in continues declining production is significant.

The average production of apple for 34 years is 431117.94 metric tonne and the value of Standard deviation is 2.67lac metric tonne. The data is consistent and the variability is average in the production the value of standard deviation is less than the mean and hence the results are more reliable.

Table 7: Changes in Apple Production Decade wise Distribution

Time Period	Production (M.T)	Increase /decrease in production	Decade to decade change in production	Rate of change in production
1 st Decade	2582622	Nil	100	Nil
2 nd Decade	4084240	+1501618	+58.14%	+158.17%
3 rd Decade	5719155	+1634915	+63.30%	+221.49%
Total		+3136533	+121.447%	

Testing Hypotheses: "There is no decrease in the productivity of apple tree per Hecetere in Himachal Pradesh"

Productivity of Apple Tree Area covered under Apple Cultivation per hectere wise Distribution

Table 8: Productivity of Apple tree per hectare in Metric Tonnes since 1990-91 to 2023-24

year	productivity	year	productivity	year	productivity	year	productivity	year	productivity	year	productivity
1990-91	5.44	1996-97	3.59	2002-03	4.26	2008-09	5.23	2014-15	5.70	2020-21	4.19
1991-92	4.51	1997-98	2.82	2003-04	5.46	2009-10	2.81	2015-16	7.02	2021-22	5.31
1992-93	4.01	1998-99	4.59	2004-05	6.12	2010-11	8.79	2016-17	4.18	2022-23	5.81
1993-94	4.07	1999-2000	0.55	2005-06	6.10	2011-12	2.65	2017-18	3.96	2023-24	4.35
1994-95	1.62	2000-01	4.16	2006-07	2.92	2012-13	3.87	2018-19	3.25		
1995-96	3.53	2001-02	2.26	2007-08	6.25	2013-14	6.85	2019-20	6.26		

Source: Data Collected through published government record

In the above table productivity of apple tree per hectare is given in metric tones. For testing hypotheses of productivity of apple tree per hectare chi square test has been employed at 0.01% level of significance for the ν 33 Degree of freedom by using the fisher's approximation methods to know the critical value because the distribution is normal. Calculated value of chi square is 22.751. Whereas the critical

value as per fishers approximation is 11.37. Critical value of chi square is less than the P Value. Hence the Hypotheses rejected. There is no significant decrease in the productivity of apple tree per hectare in the entire state.

Average production and Area Covered under Apple Cultivation Decade wise Distribution

Table 9: Testing Hypotheses: there is no significant increase in the apple production as per increase in the area under Apple cultivation

Time in decade	Average production in Lacs of Metric tonnes	Area under Cultivation in Hectere in lacs
1 (1990-91's)	2.58	0.89
2 (1999-2000's)	4.08	0.99
3 (2010-11's)	5.71	1.14
4 (2014-15's)	5.67	1.16
Total	18.04	4.18

Source: Data collected through Published Government Record

In the above table average production of Apple in one decade is given with the total area under Apple cultivation. Last decade is taken from 2014-15 to analyse the production and area under cultivation for uniformity and relevance of study. To test the hypotheses chi square has been employed for Degree of Freedom V 9 at 0.01% level of significance, the Critical value of chi square is 36.191. The calculated value of chi square is 11.365. Calculated value is less than

the critical value. Hence hypotheses accepted. That concludes there is no significant increase in the apple production as per increase in the area under Apple cultivation.

Growth in Area under Apple Cultivation in Himachal Pradesh Decade wise distribution

Table 10: Testing Hypotheses: "There is no significant Growth in Apple Cultivation in Himachal Pradesh"

Time (in Decades)	Growth Rate area under cultivation of Apple (in percentage)	Average Growth Rate area under cultivation of Apple (in hectere)
1990-91 TO 1999-2000	41.136%	2584.5
2000-01 TO 2009-10	12.557%	967.1
2010-11 TO 2019-20	12.471%	1265.9
2020-21 TO 2023-24	1.390%	531.33

Source: Data collected from Govt record

In the above table Growth rate of area under Apple Cultivation in decade has given in percentage of the base year. And average growth rate in the area under Apple Cultivation in decade of time three decade and three years has given. The Data has taken only for three commencing from 2020-21 to 2023-24 because of availability of the data till date today. The Chi square test at 0.01% level of significance has been used to know whether the average growth rate in the area under apple cultivation in Himachal Pradesh is Significant or not. Calculated value of Chi Square test is 1755.437 whereas the Critical value for V 3 degree of freedom at 0.01% is 11.3449. And hence the hypotheses rejected. There is significant growth in the apple cultivation in Himachal Pradesh Since 1990-91 till date today.

Factors Responsible for constructing a fluctuating trend in production

(i). Reduced chilling hours. (ii) Less snow fall. (iii) Dry weather (iv) irregular rain fall (v) Rising trend of temperature since 1990-91 (vi) increase in Disease like alterneria (vii) costly disease management for small farmers (viii) decrease in water resources (ix) weak bud development (x) Irregular flowering (xi) lack of friendly insects like bee butterfly etc (xii) weak fruit set (xiii) Deforestation

Findings of the study

1. Increase in the area under apple cultivation is 25471 hectere with 28.72% increase as compare to 90's decade.
2. The Productivity of apple cultivation per hectare in the 90's decade was 29.125 metrec. In the 3rd decade productivity has been increased to 50.104 metrec tone per hectare for ten years. It is found in the study that there is increase in the productivity of apple cultivation by 20.979 metrec tone for ten years period of 3rd decade in the study.
3. The apple production in the 1st decade of 90's is 2582622 metrec tone. With 29.125 metrec tone productivity. The production in 3rd decade Of 2010-11 is 5719155 metrec tone with productivity of cultivation by 50.104 metrec tone per hectare for ten years period of 3rd decade. There is 121.44% increase in the production of apple by 3136533 metrec tone with the increase in

area under apple cultivation by 25471 hectere as compare to 90's decade.

4. It is found in the study that the expected production of apple has been increased by 77.367%. The expected production at 29.125 metrec tone productivity rate for the 3rd decade was 3224470 metrec tone with the increase in the area under apple cultivation. But the actual production 5719155 metrec tone with the increase in expected production of 2494685 metrec tone. The apple cultivation is showing a huge success of apple producers in Himachal Pradesh.
5. The time series analysis for the period 2000-01 to 2009-10 found most productive period for the production of Apple in the state. It is found in the study that during this period apple production trend was showing upward trend.
6. It is found in the study that the area under Apple Cultivation has been increased year by year but it could not give constantly proportionate increase in the production of Apple year to year in the state which is a considerable point. Which shows there is fluctuation in the apple production.
7. Year wise study shows that there is overall declining trend in the apple production in the state. The considerable declining years were 1999-2000 with 85.638% decline as compare to the base year 1990-91. 2011-12 with 69.171% decline. The year 2001-02 with total decline of 52.082% and the year 2006-07 with 28.576% decline as compare to the base year 2000-01 whereas 50.328% decline as compare to its preceding year 2005-06 with total production from 540356Metric tonne to 268402Metric tonne.
8. Unfavourable Climate , Disease in the apple tree, Heavy use of chemical, lack of friendly insects to the apple tree are some fundamental causes responsible for variation in the production of apple cultivation. These factors are question itself for the further study but climate is the main cause which concluded the study of different studies by the author.

Suggestions

1. There is need to protect the environment and water resources, protection of forests by stopping deforestation and increasing forestation, reduction in carbon emission gasses in the environment.

2. Take steps to protect the apple trees from disease by timely supply of medicines and manure and by spreading the Apple cultivation knowledge by organizing training camps in the villages near apple orchards to the farmers for free.
 3. Contract Apple farming should be promoted that big capital will do the apple farming with efficient finance and with efficient horticulture technocrats and workers with advanced technology which can fetch maximum profit from the apple business. No marketing fluctuation will affect the apple farmers then.
 4. In the govt. waste land having the quality to grow the Apple tree Govt should plant Apple trees there instead of planting other wild trees. This will become a source of good revenue to the Government and this will open the opportunity of employment also. Govt can develop the orchard with the help of belonging villagers as their contributory efforts by fixing equal share of the villagers in the income which can be derive from such cultivated govt orchards.
 5. The apple orchard developed in the govt land as illegal encroachment by the farmers should not be destroyed but should be leased to the farmers that will protect grown tree plantation which shall be all good in economic and environmental aspect also. This concept will develop the corporatization of traditional farming to the modern farming standing with rest of the developed nations.
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Conclusion of the Study

Apple production is significantly positive to the economy of Apple cultivated area in Himachal Pradesh and to the Country. There is Significant Growth in the Apple farming in Himachal in past three decades. Average production has been doubled as compare to the first decade of 1990-91-to the last decade of 2014-15

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