

Trend in the Performance of grapes production in India

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Abstract

The study outlines the evolution of area, production, and yield for grapes over three decades (1991-92 to 2021-22). In the early 1990s, moderate growth in area was observed, followed by substantial increases in subsequent years, notably in 1993-1994 and 1994-1995. Production levels fluctuated, with significant surges and declines in different years, while yield showed a consistent decline initially. The early 2000s demonstrated steady positive trends, especially in area expansion. Notable periods include significant growth in the area from 2001-02 to 2010-11. However, yield experienced fluctuations with a negative CAGR in certain periods. Overall, the period from 1991-92 to 2021-22 showed positive CAGR values for area and production, reflecting overall growth, while yield exhibited minimal growth.

Key words : Grapes, Production, trends, India

Introduction

India is the seventh largest economy in the World. As measured in terms of its Gross Domestic Product (GDP). The Horticulture Sector is major contribution to the Agriculture Sector GDP. The Horticulture goods and proceeds products are very popular in national and international agriculture exports in India. The Horticulture food product Grape is the important fruit in India. Grape (*Vitis vinifera*) is an important fruit crop of India and its commercial production is possible in temperate and sub-tropical areas of the country. The Grape (*Vitis vinifera*) is basically a sub- tropical crop. but in India, grapes are cultivated for their excellence also under tropical conditions. In Indian region, Grapes are cultivated in an area of 111.4 thousand ha with a total production 1,234.9 thousand tons and productivity of 11.1 tons/ha. Because of special arbour training systems provided for grape cultivation in India, productivity is highest among the grape growing countries of the World.(Shinde.P.V.2016)

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Grapes have a rich history in India, dating back thousands of years to ancient times. The introduction of grapes in India can be traced to the time of the Indus Valley Civilization, where evidence suggests their cultivation for consumption and winemaking. Over the centuries, grape cultivation expanded across different regions of India, with notable developments during the Mughal era and later under British colonial influence. Today, India is one of the leading grape-producing countries globally, with diverse varieties grown in various states such as Maharashtra, Karnataka, Andhra Pradesh, and Telangana. The Indian grape industry has witnessed significant modernization and technological advancements, leading to improved quality, yield, and export opportunities. Grapes are not only consumed fresh but also processed into products like raisins, juices, and wines, contributing substantially to both domestic consumption and international trade, showcasing India's vibrant and evolving grape cultivation sector.

Review of literature

1. **Shinde P.V (2016)** in his paper revealed Modern technology in horticulture. It also enhanced horticulture grapes production, augmented farmer's income and strengthened nutritional security. This project is very surprising news for Indian Grapes, Indian Horticulture & Indian Economy. This paper suggested that Grape Growers should turn towards ne modern methods in Grapes Horticulture. Government should enhance farmers to use most advanced technologies by giving subsidies
2. **Kumar A.D.S & et.al (2020)** in their article focused on the export performance of fresh grapes in India during pre-WTO and post WTO period and destination- wise growth rate from 2001-02 to 2016-17.To analyse the export data and arrive at appropriate results, Growth Rate analysis, Instability analysis and Markov Chain analysis were used. The results indicated that the export of fresh grapes with the pre-WTO and post- WTO period when compared, the growth rate of post-WTO period decreased in terms of quantity, value and unit value of export. However, the overall growth rate was positive.

Objectives of the Study

1. To analyse the trends in area, production and productivity of grapes in India

Methodology

The methodology used involves analyzing annual changes and Compound Annual Growth Rates (CAGR) for a specific entity, focusing on the period from the early 1990s to 2021. The data is segmented into decades (1991-92 to 2000-01, 2001-02 to 2010-11, 2011-12 to 2021-22, and the entire period 1991-92 to 2021-22) for area, production, and yield. This analysis provides insights into the growth patterns of grapes, highlighting variations in cultivation area, production levels, and yield over different time frames, ultimately revealing the overall trends and growth rates for these key parameters.

Area Under Grapes in India

India is one of the largest producers of grapes in the world, and grape cultivation is an important part of the country's agricultural sector. Grapes are grown in various states across India, with Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, and Telangana being some of the leading grape-producing states.

Table 1 explains the evolution of a specific area's values over several years, highlighting annual changes and Compound Annual Growth Rates (CAGR). In the early 1990s, the area witnessed moderate growth, reaching 34 in 1992-1993, and showing a 4.94% increase. Subsequent years saw substantial growth, notably a 14.12% surge in 1993-1994 and an 8.51% rise in 1994-1995. However, a significant contraction occurred in 1995-1996, with a -15.44% change, before rebounding with a 20.51% increase in 1996-1997.

The early 2000s demonstrated a steady positive trend, with an average CAGR of 3.77%. Notable periods include the years 2008-2009 and 2009-2010, experiencing remarkable growth rates of 16.54% and 33.67%, respectively. The subsequent decade displayed a more stable trajectory, with an average CAGR of 3.52%. The whole period from 1991 to 2021 reflects an overall growth of 5.55%.

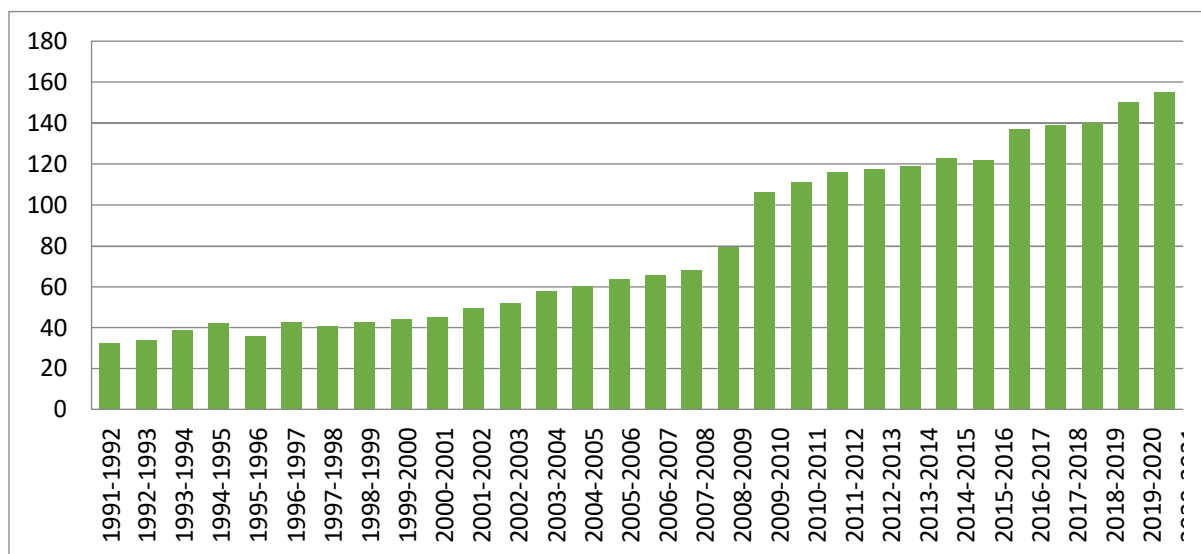
In summary, the area experienced fluctuations over the years, characterized by periods of both rapid expansion and contraction. The data suggests a general positive trend.

Table 1 : Area under grapes in India (1991-92 to 2020-21)

Year	Area	Annual Change
1991-1992	32.4	---
1992-1993	34	4.94%
1993-1994	38.8	14.12%
1994-1995	42.1	8.51%
1995-1996	35.6	-15.44%
1996-1997	42.9	20.51%
1997-1998	40.8	-4.90%
1998-1999	42.6	4.41%
1999-2000	44.3	3.99%
2000-2001	45.2	2.03%
CAGR	3.77 %	----
2001-2002	49.4	9.29%
2002-2003	52.1	5.47%
2003-2004	57.8	10.94%
2004-2005	60.5	4.67%
2005-2006	63.5	4.96%
2006-2007	65.8	3.62%
2007-2008	68.3	3.80%
2008-2009	79.6	16.54%
2009-2010	106.4	33.67%
2010-2011	111	4.32%
CAGR	9.23	----
2011-2012	116	4.50%
2012-2013	117.6	1.38%
2013-2014	118.7	0.94%
2014-2015	123	3.62%
2015-2016	122	-0.81%
2016-2017	137	12.30%
2017-2018	139	1.46%
2018-2019	140	0.72%
2019-2020	150	7.14%
2020-2021	155.3	3.53%
CAGR	3.52	----
Whole period	5.55	----

Source : Ministry of Agriculture and Farmers Welfare, Govt. of India.

Figure 1: Area Under Grapes in India



Source : Ministry of Agriculture and Farmers Welfare, Govt. of India

Production of Grapes in India

The table 2 revealed the production levels of a specific entity over the years, presenting annual changes and Compound Annual Growth Rates (CAGR). In the early 1990s, production experienced fluctuations, with a notable 10.30% decrease in 1995-1996. A substantial 87.97% surge occurred in 1996-1997, followed by a decline in 1997-1998 (-14.57%). The late 1990s and early 2000s demonstrated positive growth, averaging a CAGR of 5.23%.

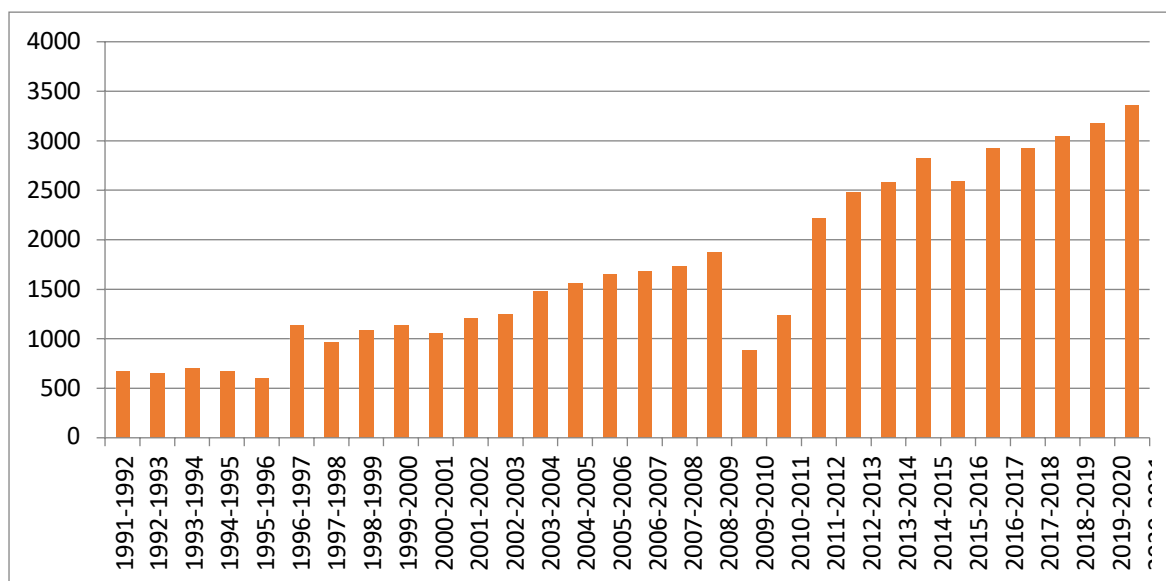
The early 2000s saw a remarkable 53.11% decrease in 2009-2010, followed by a substantial 40.23% increase in 2010-2011. However, the overall CAGR for this period was minimal at 0.23%. The subsequent years showed significant growth, particularly in 2011-2012 with a 79.83% increase. Despite fluctuations, the overall CAGR for the entire period from 1991 to 2021 was 5.72%, indicating a positive trend in production levels.

In summary, the entity experienced diverse production trends, including periods of rapid growth and decline. The data suggests resilience, with strong recovery following downturns and an overall positive trajectory in production levels over the analyzed years.

Table 2 : Production of Grapes in India (1991-92 to 2021-22)

Year	Production	Annual change
1991-1992	668.2	---
1992-1993	653.1	-2.26%
1993-1994	702.5	7.56%
1994-1995	672.9	-4.21%
1995-1996	603.6	-10.30%
1996-1997	1134.6	87.97%
1997-1998	969.3	-14.57%
1998-1999	1082.7	11.70%
1999-2000	1137.8	5.09%
2000-2001	1056.9	-7.11%
CAGR	5.23%	---
2001-2002	1209.7	14.46%
2002-2003	1247.8	3.15%
2003-2004	1474.8	18.19%
2004-2005	1564.7	6.10%
2005-2006	1649.6	5.43%
2006-2007	1685.3	2.16%
2007-2008	1734.7	2.93%
2008-2009	1878.3	8.28%
2009-2010	880.7	-53.11%
2010-2011	1235	40.23%
CAGR	0.23%	----
2011-2012	2220.9	79.83%
2012-2013	2483.1	11.81%
2013-2014	2585.3	4.12%
2014-2015	2823	9.19%
2015-2016	2590	-8.25%
2016-2017	2922	12.82%
2017-2018	2920	-0.07%
2018-2019	3041	4.14%
2019-2020	3181	4.60%
2020-2021	3357.7	5.55%
CAGR	4.70%	---
Whole period CAGR	5.72%	----

Source : Ministry of Agriculture and Farmers Welfare, Govt. of India



Source : Ministry of Agriculture and Farmers Welfare, Govt. of India

Yield of Grapes in India

The data provided reveals the annual changes and Compound Annual Growth Rates (CAGR) for the yield over a specified period. In the early 1990s, there was a consistent decline in yield, reaching -11.60% in 1994-1995. Subsequent years saw varied patterns, with a significant increase of 55.29% in 1996-1997, followed by fluctuations.

The overall CAGR for the entire period from 1991 to 2021 was 0.16%, indicating minimal growth in yield. Notably, there were periods of substantial decline, such as the -64.83% drop in 2009-2010, countered by a 33.73% increase in 2010-2011. The following years displayed modest changes, with an average CAGR of -8.42% for the period of 2009-2011.

The latter part of the provided data showed a more stable trend, with positive growth in some years and slight declines in others. The overall CAGR for the period from 2011 to 2021 was 1.38%, contributing to the marginal growth observed in the entire dataset.

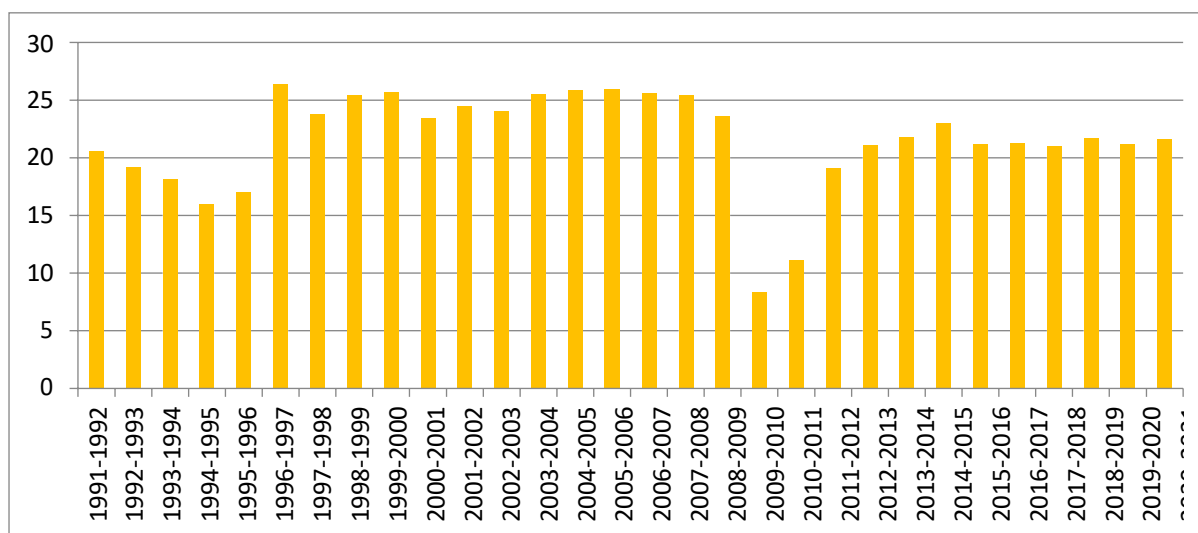
In summary, the yield experienced notable fluctuations and periods of decline, with the overall growth being minimal over the entire analyzed period. The data suggests a more stabilized trend in the later years compared to the earlier periods of significant variability.

Table 3 : Yield of Grapes in India (1991-92 to 2020-21)

Year	Yield	Annual change
1991-1992	20.6	---
1992-1993	19.2	-6.80%
1993-1994	18.1	-5.73%
1994-1995	16	-11.60%
1995-1996	17	6.25%
1996-1997	26.4	55.29%
1997-1998	23.8	-9.85%
1998-1999	25.4	6.72%
1999-2000	25.7	1.18%
2000-2001	23.4	-8.95%
CAGR	1.43%	---
2001-2002	24.5	4.70%
2002-2003	24	-2.04%
2003-2004	25.5	6.25%
2004-2005	25.9	1.57%
2005-2006	26	0.39%
2006-2007	25.6	-1.54%
2007-2008	25.4	-0.78%
2008-2009	23.6	-7.09%
2009-2010	8.3	-64.83%
2010-2011	11.1	33.73%
CAGR	-8.42%	----
2011-2012	19.1	72.07%
2012-2013	21.1	10.47%
2013-2014	21.8	3.32%
2014-2015	23	5.50%
2015-2016	21.2	-7.83%
2016-2017	21.3	0.47%
2017-2018	21	-1.41%

2018-2019	21.7	3.33%
2019-2020	21.2	-2.30%
2020-2021	21.6	1.89%
CAGR	1.38%	---
Whole period CAGR	0.16%	---

Source : Ministry of Agriculture and Farmers Welfare, Govt. of India



Source : Ministry of Agriculture and Farmers Welfare, Govt. of India

Table 4 :CAGR of area, Production and yield of grapes in India (1991-92 to 2021-22)

Decade	Area	Production	Yield
1991-92 to 2000-01	3.77%	5.23%	1.43%
2001-02 to 2010-11	9.41%	0.23%	-8.42%
2011-12 to 2021-22	3.29%	4.70%	1.38%
1991-92 to 2021-22	5.55%	5.72%	0.16%

Source : Author calculation

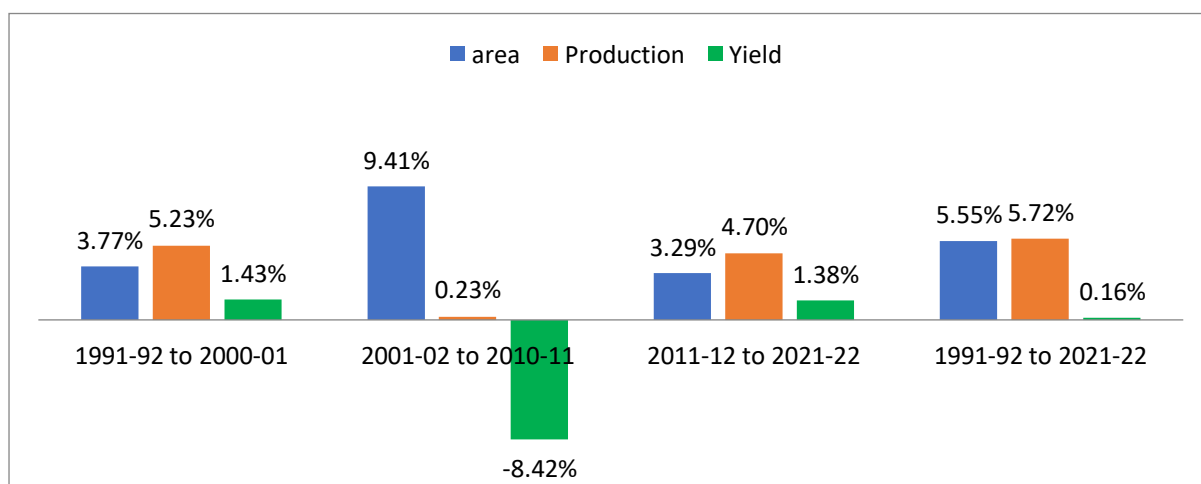
The data provides Compound Annual Growth Rates (CAGR) for different decades (1991-92 to 2000-01, 2001-02 to 2010-11, 2011-12 to 2021-22, and the entire period 1991-92 to 2021-22) for area, production, and yield in the context of grapes.

In terms of grapes, the CAGR for area, production, and yield varied across the decades. The 2001-02 to 2010-11 period witnessed significant growth in the area of cultivation (9.41%), while production experienced minimal growth (0.23%) and yield had a negative CAGR

(-8.42%). The subsequent decade (2011-12 to 2021-22) showed moderate growth in all three parameters. The overall period from 1991-92 to 2021-22 exhibited positive CAGR values for area and production, indicating overall growth, while yield saw minimal growth (0.16%).

These figures provide insights into the trends and changes in grape cultivation, production, and yield over the specified periods.

Figure 4 : CAGR of area, Production and yield of grapes in India (1991-92 to 2021-22)



Source: Author Calculation

Conclusion

The data provided reveals a dynamic evolution in the area, production, and yield of a specific entity, showcasing annual changes and Compound Annual Growth Rates (CAGR) from the early 1990s to 2021. Despite fluctuations, there is an overall positive trend in both area and production, with notable growth periods in the early 2000s and the subsequent decade. However, the yield experienced minimal growth overall, with periods of significant decline offset by occasional surges. In the context of grapes, different decades showed varying CAGR trends, with significant growth in area, minimal growth in production, and a negative CAGR for yield in the 2001-02 to 2010-11 period. The subsequent decade displayed moderate growth across all three parameters. Overall, the data indicates a complex but generally positive trajectory in the entity's agricultural metrics over the analyzed period.

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