

GROWING ERA OF HORTICULTURE IN INDIA: AN ANALYSIS OF ECONOMIC PERSPECTIVES AND POLICY IMPLICATIONS

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Abstract

The demand for horticulture has raised the organic way of living the life. The climatic prosperity that it brings is another futuristic sustainable aspect. From its produce to its market approach, horticulture is today the safest idea of securing plants and bio-diversity. This study thus focuses on the impact of horticulture in accelerating economic growth. It has highlighted the import and export of various species and vegetables which has impacted highly to our economic prosperities.

Keywords

Horticulture, vegetables, economy.

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Introduction

Introduction of Horticulture

The Latin words for “garden” and “to cultivate,” Hortus and color, are the origins of the word Horticulture. Agriculture’s section known as horticulture specializes in technologies for growing plants and fruits. It encompasses of nuts, herbs, seeds, sprouts, mushrooms, seaweeds, flowers, and non-food crops including grass and ornamental trees. Horticulture is primarily concerned with cultivating and managing plants used for food production and other reasons. It uses scientific methods to produce larger amounts of fruits, vegetables, and flowers. In many regions of the world, horticulture is regarded as one of the top agricultural industries. The horticulture study included huge groupings of fruits, vegetables, mushrooms, flowers, plantation crops like cashew, spices, and medicinal and aromatic plants that fall within the umbrella of the agricultural science discipline. The vast agro-climatic fluctuations, tremendous biodiversity, fertile soil, sizable cultivable land, and, most importantly, a long tradition of crop husbandry all contribute to India’s wealth in crop diversity.

1.1 Division of Horticulture



1.2 Horticulture in India

Fruits and vegetables make up most of the horticultural production in India. India’s climate is ideal for growing agricultural items like fruits, vegetables, spices, and aromatic plants. In India, the horticulture industry provides roughly 33% of the Gross Value Added and produces over 320 million tonnes of products (GDA).

Since it requires a lot of labor, it offers many employment prospects, particularly for those living in rural areas. Horticulture has implemented methodologies to improve productivity and export potential especially in India that promotes the development of fruits and vegetables of more than 40 different varieties. India stands second in Vegetable production in the world where it produces more than 10% of the world’s fruit productions. Most of the fruit is

produced in Indian states like Uttar Pradesh, Gujarat, Odisha, Andhra Pradesh, Tamil Nadu, Maharashtra, and Karnataka.

1.3 The Scenario at Hand (Present Status)

To combat the risks of market swings, one Integrated Processing Unit for Ginger has been developed at Birding, West district, under Rashtriya Krishi Vikash Yojna (RKVY). Gerbera, rose, and ileum production facilities have been added to the Model Floriculture Center in Namli. At Mani Ram, South district, another Model Floriculture Center has been established. In order to produce large quantities of planting materials and conduct trainings, the Cymbidium Development Center has been operationalized and is fully furnished with a tissue culture laboratory and training room. The most important role in integrating all ongoing projects has been played by the Technological Mission for Integrated Development of Horticulture, supported by the Indian government. The utilization of high-quality planting materials, the usage of clusters, and ongoing monitoring are the primary success elements for scheduled implementation.

1.4 Constraints in horticulture production

1. Poor production planning.
2. Lack of access to seeds from better cultivars.
3. Exorbitant price of inputs for production.
4. Insufficient plant protection techniques and a lack of resistant cultivars.
5. Poor marketing infrastructure.
6. Limitations on transportation.

1.5 Common issues with production, area, and productivity include

- (i) The inadequate supply of high-quality, disease-free planting material.
- (ii) Micropropagation methods are not used to their full potential.
- (iii) The slow spread and adaption of higher-quality cultivars and hybrids.
- (iv) A lack of suitable resources for diagnosing diseases and nutrient deficiencies
- (v) The absence of forecasting tools for disease and pest outbreaks.
- (vi) The absence of sophisticated intense integrated manufacturing systems; and
- (vii) The absence of quality standards and others

1.6 Major Initiatives in Indian Horticulture

- 1) **National Horticulture Board:** Based on the recommendations of the “Committee on Perishable Agricultural Commodities”, the Indian

government has brought National Horticultural Board into existence in April 1984. M.S. Swaminathan, a doctor, served as its leader.

- 2) **The Mission for Integrated Development of Horticulture (MIDH):** It was put into effect in 2014. It is a centrally supported program with an emphasis on creating strategies and procedures to make horticultural production more productive and affordable. 60% of the total development costs paid by the various states are funded by the Indian government, with the other 40% coming from the state governments. The government's share for the states in northern India is 90%.
- 3) **Horticulture Cluster Development Programme (CDP):** It is a central sector proper designed to strengthen and expand re-recognized horticultural clusters so they can compete on a worldwide scale. A geographic or regional concentration of specific horticulture crops is known as a horticulture cluster. It is carried out by the National Horticulture Board of the Ministry of Agriculture and Farmer's Welfare. The states of Arunachal Pradesh, Assam, West Bengal, Manipur, Mizoram, Jharkhand, Uttarakhand, etc., identified with their primary/focus crops, would also be included in the list of 55 clusters.

Other initiatives include: the Paramparagat Krishi Vikas Yojana (PKVY), Crop Insurance Scheme, Pradhan Mantri Formalization of Micro Food Processing Enterprises Scheme (PM FME), Operation Green Schemes (TOP to TOTAL), External Aided Project (JICA), Mukhyamantri Ekikrat Bagwani Vikash Yojana, Madhugram.

Review of Literature

M.m. Kadam, V.J. Rathod, and S.H. (2015) evaluated the export performance of fruit and vegetable crops claiming it enhanced from 5.5 million tonnes in 1952–53 to 28.63 million tonnes in 1991–92, and then another nine times to 54.04 million tonnes by 2013, fruit production grew five times.

Dr. Sunil Kumar Choudhury (2021) in his article "Horticulture Development in India": Forward Way Ahead reveals that India's agricultural development requires some essential management inputs, particularly those of supply chain management, which involves effective vertical and horizontal integration and coordination across a variety of stakeholders.

Raka Saxena, Anjani Kumar, Ritambhara Singh, Ranjit Kumar Paul, MS. Raman, Rohit Kumar, Mohd Arshad Khan, and Priyanka Agarwal (2021) highlighted that vegetables with great potential for value addition, like tomatoes and capsicums, may be highlighted more in terms of effective production

technologies for export enhancement. Efforts must be made to maintain cost advantages, quality, technical standards, and investments in R&D in order to strengthen the grape supply chain.

S.P Ghosh in the article Carrying Capacity of Indian Horticulture asserted that the demand for high-value agricultural (HVA) products, such as fruits, vegetables, meat, eggs, milk, fish, and value-added food items, will rise as the population and income levels rise. Domestic demand for fruits and vegetables is predicted to increase annually at a pace of 3.03% and 3.4%, respectively. The horticulture sub-needed sector's growth rates for 2050 may be lower than the growth previously attained from 1998-1999 to 2006-2007.

S. Dattareviewed that the greatest worry facing humanity in the twenty-first century is global warming and climate change. Due to the climatic anomaly, the established commercial kinds of fruits, vegetables, and flowers will perform unpredictably poorly. The melting of the Himalayan ice cap will lessen the cooling impact necessary for the flowering of many horticulture crops, including apples, saffron, rhododendrons, orchids, and other physiological disorders like the black tip of the mango was intensified.

Objectives of the Study

- Study of horticulture and its division in respect of India, from its beginning to the current situation in hand.
- To evaluate the growth and trends in horticulture production in India for the decade 2011-12 to 2020 -21.
- To study the trends in divisions of horticulture in their production in India's major states, and total quantity export from India.

Research Methodology

- For the present research, secondary data was used which was collected from various sources. The research technique of secondary research, often called desk research, is combining already-existing material obtained from various sources.
- Secondary research is sourced through websites, libraries, and museums in addition to published statistics, reports, and survey results in a variety of formats. The present study is an exploratory study based on secondary information collected from various ministerial sites, official records of the Government, and through many reviewed journals, articles, newspapers and through relevant sources.

Data Analysis and Interpretation**Table 1: Share of fruits and vegetables in total horticulture production from 2011 – 12 to 2020 – 2021. (Production in MT)**

Year	Fruits	Vegetables	Total Horticulture	Fruits (%)	Vegetables (%)
2011- 2012	76423	156325	257276	29.70%	60.76%
2012 - 2013	81285	162186	268847	30.23%	60.33%
2013 - 2014	88977	162896	277352	32.08%	58.73%
2014 -2015	86602	169478	280986	30.82%	60.32%
2015 - 2016	90183	169063	286187	31.51%	59.07%
2016 - 2017	92918	178172	300643	30.91%	59.26%
2017 - 2018	96446	184040	310674	31.04%	59.24%
2018 - 2019	97966	183169	311052	31.50%	58.89%
2019 - 2020	102006	188132	319969	31.88%	58.80%
2020 - 2021	102481	200445	334602	30.63%	59.91%

Source: Department of Agriculture and Farmers Welfare (2011 - 2021)

Interpretation: Table 1 shows the total horticulture production from 2011 – 12 to 2020 – 2021. The production of horticulture crops climbed in 2020 - 2021, from 257.26 million tonnes to 334.60 million tonnes. Between 2011–12 and 2020 - 2021, the production of fruits climbed from 76.42 million tonnes to 102.48 million tonnes and that of vegetables increased from 15.63 million tonnes to 200.44 million tonnes. The share of fruits in horticulture production rose to 30.63% in 2020 – 2021 from 29.70% in 2011 – 2012 and that of vegetables decreased to 59.91% in 2020 – 2021 from 60.76%.

Table 2: The trend of the top 5 fruits produced in India for the period 2016- 2017 to 2020 – 2021 (Production in MT)

Fruit Names	Years					Total
	2016 - 2017	2017 - 2018	2018-2019	2019-2020	2020 – 2021	
Banana	30,477	30,808	30,460	32,597	33,062	1,57,403
Guava	3,826	4,054	4,253	4,361	4,582	21,076
Mango	19,506	20,912	21,378	20,265	20,386	1,02,448
Papaya	5,940	5,989	6,050	5,780	5,540	29,299
Total Citrus	11,419	12,546	13,404	14,551	14,245	66,165

Source: Department of Agriculture and Farmer's Welfare

Interpretations: Total production of fruits from 2016 – 2017 to 2020 – 2021 stands at 491819.7 million tonnes, out of which banana production holds the largest share with 42% (with a total production of 157403mn tonnes), followed by mango with 27%(with a share of 102448mn tonnes), total citrus fruits with 17%, papaya with 8% and lastly guava with 6%. Thus, data concludes that the banana is the highest-produced fruit in India.

Table 3: India’s export of fresh fruits for the period 201 6 -17 to 2020 -21.

Fresh Fruits Export (Qty in Mt & Value in US \$)		
Year	Qty	Value in US \$
2016- 17	7,98,723	74,19,29,024
2017-18	6,57,175	73,60,73,705
2018-19	7,36,946	76,25,48,312
2019-20s	8,19,177	76,37,88,673
2020-21	9,56,961	76,56,65,758

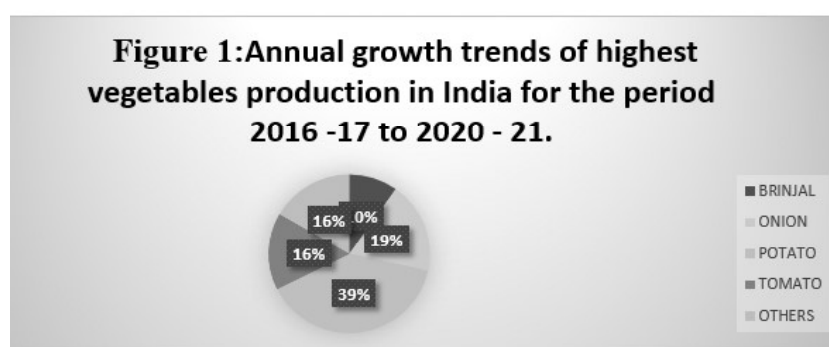
Source: APEDA

Interpretations: Table 3 shows the increasing export trend of fresh fruits from India for the period 2016 – 17 to 2020 – 21. Between 2016 – 17 to 2020 – 21, the quantity export of data climbed up to 9,56,961 from 7,98,723. Value in US \$ of the total export of fresh fruits stands at 76,56,65,758 in 2020 – 21. Data concludes the increasing trend of fruit export in India. The below table shows the top destinations for the export of Indian fresh fruits.

TABLE 4: The top 5 highest productions in vegetables for the period 2016 – 17 to 2020 – 21. (Qty in 1000 tonnes)

Vegetables	2016 - 2017	2017 - 2018	2018 - 2019	2019 -2020	2020 - 2021	TOTAL
Brinjal	12,510	12,801	12,680	12,682	12,874	63,547
Onion	22,427	23,262	22,819	26,091	26,641	1,21,242
Potato	48,605	51,310	50,190	48,562	56,173	2,54,839
Tomato	20,708	19,759	19,007	21,187	21,181	1,01,842
Others	21,557	22,320	21,118	21,577	21,550	1,08,122

Source: Department of Agriculture and Farmers Welfare



Interpretations: Table 4, shows the production of major vegetables produced in the last five years from 2016 – 2017 to 2020 – 2021. Potato with a total production of 56,173 (000) tonnes stands at the top position in 2020 – 21,

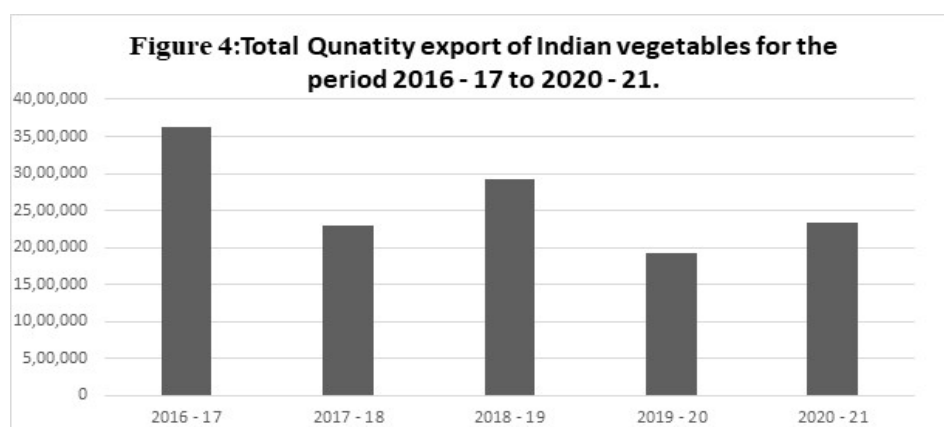
followed by onion with a total production of 26,641 (000) tonnes. Tomato and other vegetables have an equal share in production in total vegetable production. Data shows an increasing trend in the production of vegetables for the period 2016 -17 to 2020 – 21.

Table 5: Total export of fresh vegetables from India for the period 2016 – 17 to 2020 – 21.

(Qty in MT Value in US \$)

Year	QTY	US\$
2016 – 17	36,31,973	85,22,19,230
2017 – 18	22,96,075	77,54,95,352
2018 – 19	29,15,109	76,01,13,099
2019 – 20	19,27,788	65,15,66,239
2020 – 21	23,26,538	72,18,00,737

Source: APEDA



Interpretations: Table 5 shows the total quantity export of vegetables for the period of five years from 2016 – 17 to 2020 – 21. Data shows dynamics in the total export of vegetables. The total value of exports stands at 85,22,19,230 US\$ in 2016 – 17, however, in 20 – 21 value stands at 72,18,00,737 with a fall of quantity export with a total export of 23,26,538 on 20 – 21.

Table 6: Share of total plantation and total spices in horticulture production for the decade. (2011-12 to 2020-21) Production in MT

Year	Plantation	Spices	Horticulture	Plantation (%)	Spices (%)
2011 - 2012	16359	5951	257277	6.36%	2.31%
2012 - 2013	16985	5744	268847.5	6.32%	2.14%
2013 - 2014	16301	5908	277352	5.88%	2.13%

2014 -2015	15575	6108	280986	5.54%	2.17%
2015 - 2016	16658	6988	286187.7	5.82%	2.44%
2016 - 2017	17972	8122	300643	5.98%	2.70%
2017 - 2018	18082	8497	310674.8	5.82%	2.74%
2018 - 2019	16592	9500	311052.3	5.33%	3.05%
2019 - 2020	15679	10298	319969.3	4.90%	3.22%
2020 - 2021	16629	11117	334602.7	4.97%	3.32%

Source: Department of Agriculture and Farmers Welfare (2011 - 2021)

Interpretation: Table 6 shows the share of total plantation and spices in the total horticulture production of India. Data conclude that the production of plantations has climbed from 16359 (2011 - 2012) to 16629 (2020 - 2021); however, in percentage terms, the share of total horticulture production plantation share has decreased to 4.97% from 6.36 % in 2020 - 21. The share of spices has increased from 2.31 % to 3.32 % with the producing 11,117 million tonnes in 2020 – 21.

Conclusion and Suggestions

Horticulture is becoming more and more recognized as a sunrise industry because of its ability to increase farm revenue, ensure a stable source of living, and generate foreign cash through export. The horticulture sector's growth story differs significantly from that of the entire agriculture industry. India introduced numerous technological and policy measures for increasing horticulture in response to the new demands. The newest technological packages that cover production and postharvest are the most significant. Some examples of this trend include the use of biotechnology, protected cultivation, and precise technologies, including automation. Also, more recent measures were undertaken to improve infrastructure, such as cold storage, quality control, streamlining, and assistance in entering export markets.

The proportion of horticultural commodities in the value of output has increased as a result of the horticulture sector's rising productivity and changes in area and price. The advancement of crop husbandry techniques and better crop types have been the key drivers of the productivity significant increase. Horticulture crops have been acknowledged by the Indian government to diversify agriculture while protecting the environment by making the most use of available resources, both natural and human. Horticulture aims to offer a lot of work options, especially for females and young people who are unemployed.

Indian policymakers and researchers have increasingly paid more attention to horticultural exports. The government has also given priority to developing the horticultural industry's export diversification, which has strengthened India's involvement in the world's horticultural trade. Horticultural commerce and

production are more influenced by seasonality both internationally and in India. The varying Agro-climatic settings influence the export trends of global trading partners. The potential for creating jobs in the horticultural industry is enormous. By developing horticulture-based agro-processing units, more jobs can be created. The export of horticulture has enhanced smallholders' chances to earn more money, and empirical analysis has demonstrated that the considerably larger plots of land they own are either a cause of or a result of their involvement in the industry.

Suggestions

- Diversification towards high-value horticulture crops is a key technique to increase farmers' revenue
- A multifaceted approach is necessary to boost productivity. With the restricted ability to grow the area under cultivation beyond a certain point, intense cultivation with an eye toward sustainability may be the solution.
- Farmers should receive fast and dependable market data. To boost India's total horticulture, supply chains, and storage facilities should be maintained.
- The government should foster an atmosphere that will ensure a partnership between the organized sector and farmers that is mutually beneficial.
- By interplanting horticultural and non-horticultural crops, horticultural crop diversification should be promoted. More food, more money, and healthier soil will result from doing this.
- The manufacturing plan should focus on satisfying both the demand for processed products and fresh products in the domestic and international markets.
- The processing, storage, and marketing of fresh and processed product postharvest procedures need to be improved.
- Governments will need to put more effort and money into improving market access, food security, and post-harvest operations. Public investments in infrastructure, education, and allotments supporting vegetable value chains may also help the job market.
- Vegetable production, processing, and marketing present potential changes that can be appealing, especially to youth. Production requires only minimal landholdings, is technology-skilled, and guarantees significant returns in a relatively short period of time.

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