

# *Horticulture Scenario in India: Challenges and Future Prospects*

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## **ABSTRACT**

Horticulture, a vital component of Indian agriculture plays a key role in nutritional security, employment generation and economic growth. India stands as the second-largest producer of horticultural crops globally with significant outputs in fruits and vegetables. Despite its potential, the sector faces numerous challenges including climate change, water scarcity, post-harvest losses and limited market access. Government initiatives such as National Horticulture Mission (NHM) and Mission on Integrated Development of Horticulture (MIDH) aim to support the sector's growth. The way forward involves promoting climate-resilient practices, sustainable farming, advanced irrigation, market integration and technology adoption. Strengthening policies, infrastructure and farmer capacity will be essential for harnessing horticulture's full potential as a driver of inclusive rural development.

## **INTRODUCTION**

**H**orticulture is the branch of agriculture which deals with cultivation, production and sale of fruits, vegetables, flowers, herbs, ornamentals, plantation crops etc. The word horticulture is

derived from Latin word 'hortus' means garden and 'cultura' means cultivation. M. H. Marigowda is the 'Father of Indian Horticulture' and Food and Agriculture Organization (FAO) announced year 2021 as

‘International Year of Fruits and Vegetables’ with slogan of ‘*Fruits and Vegetables, your dietary essentials*’ and the theme is awareness about the nutritional and health benefits of fruit and vegetables for balanced and healthy diet and attention to reduce losses and wastage in supply chain (Ananthakumar *et al.*, 2019). Horticulture sector has become comparatively more remunerative than the agricultural sector (mainly food grains). It enables the population to eat diverse and balanced diet for a healthy lifestyle. The importance of horticulture can be substantiated by its benefits in economic proposition as they give higher returns per unit area in terms of energy, income and employment, high export value, best utilization of wasteland, provision of raw materials for industries, whole engagement by a grower / labourer, better use of undulating lands, women empowerment, religious significance, aesthetic consideration and environment protection (Patil & Hosamani, 2018).

### HORTICULTURE SCENARIO:

Globally, 1,850 million tonnes of fruits and vegetables are produced, contributing 22 per cent share in total food production with market value of US\$ 20.77 billion. China is the largest producer of horticulture crops contributing 40 per cent of global production, followed by India (12%), USA (3%) and Brazil (3%) (FAOSTAT, 2021). India is the second largest producer of horticulture crops in the world with total area and production of 27.74 million hectares and 341.63 million tonnes respectively during 2020-21 (DES, 2021). It is the largest producer of Mango, Banana, Guava, Papaya, Citrus fruits and Okra and second largest producer of potato, tomato, onion, cabbage, cauliflower and brinjal. In India, Uttar Pradesh is the leading producer of horticulture crops constituting 13 per cent of total production, followed by West Bengal and Madhya Pradesh contributing each 10 per cent. Whereas, Karnataka stands in eighth position

in total horticulture production with an area of 23.93 lakh hectares and production of 200.46 lakh MT (INDIASTAT, 2021).

### MAJOR SCHEMES AND PROGRAMMES:

- 1. National Horticulture Mission (NHM):** NHM is launched under 10<sup>th</sup> five-year plan in 2005-06 by Government of India. The objective is to develop horticulture to the maximum potential available in the state, augment production, improve nutritional security and income support to farm households.
- 2. Mission on Integrated Development of Horticulture (MIDH):** It is a centrally sponsored scheme, launched in 2014 by Ministry of Agriculture and Farmers Welfare (MoAFW), Government of India. The main aim of the scheme is holistic growth of the horticultural sector. It is an integrated scheme, which includes Coconut Development Board (CDB), National Horticulture Board (NHB), Horticulture Mission for North East and Himalayan states (HMNEH), National Horticulture Mission (NHM), and Central Institute of Horticulture (CIH).
- 3. Schemes on Micro Irrigation:** It is a centrally sponsored scheme under ‘Pradhan Mantri Krishi Sinchayee Yojana’, launched in July 2015, with an objective to enhance water use efficiency in agriculture by promoting appropriate technology like drip and sprinkler irrigation.

### MAJOR CHALLENGES OF HORTICULTURE SECTOR IN INDIA

The horticulture sector in India is an important contributor to the country’s agriculture and economy but it faces several major challenges that hinder its full potential. These challenges include:

**1. Climate Change and Weather**

**Variability:** India's horticulture crops are vulnerable to unpredictable weather patterns such as unseasonal rains, droughts and temperature fluctuations. These erratic climatic conditions lead to crop failures, reduced yields and loss of quality making it hard for farmers to plan production and harvest.

**2. Water Scarcity and Poor Irrigation**

**Systems:** Significant portion of Indian agriculture including horticulture depends on rainfed and many regions suffer from acute water shortages. The lack of efficient irrigation systems (like drip or sprinkler systems) and over-reliance on traditional, inefficient water management techniques lead to poor water use efficiency.

**3. Post-Harvest Losses:**

Large percentage of horticultural produce in India wasted due to inadequate post-harvest management practices, including improper storage and transportation. The absence of cold storage facilities, proper handling during transportation and lack of processing infrastructure result in the wastage of a significant portion of fruits, vegetables and flowers.

**4. Pests and Diseases:**

Horticultural crops are highly susceptible to various pests, diseases and fungal infections that affect both yield and quality. Farmers often rely on chemical pesticides, which can have environmental and health risks. Integrated pest management and sustainable practices are still not widely adopted.

**5. Limited Market Access and Poor Supply Chain Infrastructure:**

Smallholder farmers often lack access to organized markets and are at the mercy of middlemen who exploit them. The absence of efficient supply chain infrastructure, including storage, transportation, and wholesale

markets, results in farmers receiving low prices for their produce while consumers face high prices.

**6. Fragmented Land Holdings:**

Many Indian farmers have small and fragmented landholdings, which make it difficult to adopt modern farming techniques or increase scale. Small land sizes reduce the potential for mechanization and efficiency, leading to higher costs of production and lower profitability.

**7. Access to Credit and Financial Support:**

Horticulture farming requires substantial investment in quality seeds, fertilizers, irrigation systems, and technology. Farmers often face difficulties in accessing credit from formal financial institutions due to high-interest rates and the high-risk nature of horticulture farming.

**8. Lack of Technological Advancement:**

The adoption of modern technology, such as precision farming, soil health monitoring, and automated irrigation, is still low in India's horticulture sector. Limited access to technology, knowledge gaps, and financial constraints prevent farmers from implementing more efficient, sustainable practices.

**9. Soil Degradation:**

Continuous cultivation of high-value horticulture crops can lead to the depletion of soil nutrients and reduced soil health. Poor soil management practices, including overuse of chemical fertilizers, result in soil degradation, reducing crop productivity in the long term.

**10. Labor Shortages and Skill Gaps:**

Horticulture farming requires skilled labor for tasks such as grafting, pruning, and harvesting.

The migration of youth from rural areas to urban centres for better job opportunities has led to a shortage of labor, while there is also a



lack of formal training and skill development programs for the existing workforce.

**11. Policy and Institutional Support:** While there are government schemes to promote horticulture, they are often not well-implemented, and there is limited coordination between state and central policies. The absence of a clear, comprehensive policy framework, as well as bureaucratic hurdles, hampers the growth of the sector.

**12. High Input Costs:** The cost of inputs such as seeds, fertilizers, pesticides, and labor is rising, impacting the profitability of horticulture farming. High costs combined with low productivity and market volatility can make horticulture farming unprofitable for many small-scale farmers.

**13. Global Market Competition:** With the increasing globalization of agriculture, Indian horticultural products face stiff competition in the international market. Indian exporters often struggle with issues like inconsistent quality, lack of global certifications, and inadequate packaging, making it difficult to compete in global markets.

Addressing these challenges requires coordinated efforts from both the government and private sectors, including policy reforms, infrastructure development, technological innovations and increased investment in education and skill-building for farmers.

## WAY FORWARD OF HORTICULTURE SECTOR IN INDIA

The horticulture sector in India has tremendous potential for growth, but to unlock this potential, a comprehensive and multifaceted approach is required. Below are some key strategies and ways forward to strengthen and develop the horticulture sector in India:

### 1. Promoting Climate-Resilient Practices:

Encourage farmers to adopt climate-resilient practices, including the use of drought-resistant crops, water-efficient irrigation systems like drip irrigation and the implementation of agroforestry. Government support for research on climate-smart crops, incentives for water-efficient technologies and weather forecasting services can help farmers adapt to changing climatic conditions.

### 2. Improving Water Management and Irrigation Systems:

Implement advanced irrigation technologies such as drip and sprinkler irrigation, along with water harvesting and conservation methods. Subsidies or low-interest loans for setting up irrigation systems, and promoting rainwater harvesting, can address water scarcity issues and ensure more reliable water supply.

### 3. Reducing Post-Harvest Losses:

Investment in cold storage facilities, refrigerated transportation and modern processing units to reduce wastage of perishable produce. Public-private partnerships can help create infrastructure for handling, packaging, and storing horticultural products. Training farmers on post-harvest handling techniques will also improve product quality and reduce waste.

### 4. Market Access and Supply Chain Development:

Strengthen market linkages by promoting direct sales channels such as farmer-producer organizations (FPOs), farmers' markets, and e-commerce platforms. Improving supply chain infrastructure (transportation, storage, etc.) and connecting farmers with retail and export markets can lead to better price realization and market access.

### 5. Encouraging Sustainable Farming Practices:

Promote organic farming,

integrated pest management (IPM), and soil health restoration techniques to reduce dependence on chemical fertilizers and pesticides. Government incentives for organic certification, subsidies for organic inputs, and training programs on sustainable farming methods can help transition farmers to environmentally friendly practices.

#### 6. Technological Innovations and Digital Transformation:

Encourage the adoption of technology such as precision farming, soil health monitoring, drones for pest control, and farm management software. Provide training programs to educate farmers on the use of technology and offer financial support to invest in high-tech solutions. Collaboration with tech companies to offer affordable solutions to small-scale farmers will be crucial.

#### 7. Access to Finance and Credit:

Improve farmers' access to affordable credit and financial products tailored to horticulture needs.

Strengthening agricultural credit schemes, offering low-interest loans, and developing insurance products that cover horticultural crops can help mitigate the financial risks associated with farming.

#### 8. Capacity Building and Skill Development:

Empower farmers with the necessary skills to manage modern farming techniques, pest control, and post-harvest processing.

Establish skill development centers and mobile training units that focus on horticultural practices. Collaboration with agricultural universities to provide extension services will be key to enhancing the skill base.

#### 9. Policy Support and Reforms:

Formulate a clear, farmer-centric horticulture policy that supports the sector through subsidies, tax

exemptions, and streamlined regulatory processes. Implement schemes for diversification of crops, encourage private investment in the sector, and ensure policies are aligned with international standards to improve export potential.

#### 10. Promotion of Agri-Exports:

Enhance the quality and global competitiveness of horticultural products to tap into international markets. Implement quality assurance standards, provide export incentives, and help farmers obtain global certifications (e.g., GlobalGAP) to enter high-value international markets.

#### 11. Diversification of Crops:

Encourage farmers to diversify into high-value horticultural crops like exotic fruits, medicinal plants, and niche vegetables. Promote the cultivation of non-traditional and export-oriented crops through awareness programs and pilot projects to reduce dependency on staple crops and boost profitability.

#### 12. Research and Development:

Strengthen research and development to develop high-yielding, pest-resistant and climate-resilient horticultural varieties. Support public and private sector investments in research and development ensuring that new technologies and crop varieties are disseminated to farmers through extension services.

#### 13. Fostering Public-Private Partnerships (PPPs):

Foster collaboration between government agencies, private sector players, and agricultural institutions to bring in investment, technology, and infrastructure development. Develop models for private investment in rural agricultural infrastructure, supply chain management and food processing units to enhance the overall horticulture ecosystem.



**14. Soil Health Management:** Improve soil health through organic farming, crop rotation, and the use of biofertilizers. Promote soil testing and the adoption of balanced fertilization practices, along with offering subsidies for organic inputs to help restore soil fertility.

**15. Promotion of Farmer Producer Organizations (FPOs):** Strengthen FPOs to enable collective bargaining, access to better market prices, and collective investment in processing, storage, and transportation infrastructure. Provide training, capacity building, and financial assistance to FPOs to enhance their operational efficiency and market reach.

## CONCLUSION

Horticultural crops constitute a significant segment of the total agricultural production of a country, which assumes a greater role and importance in the national economy. Rapidly growing demand for horticultural products especially for fruits and vegetables is evidence of the phenomenon, which is mainly responsible for the accelerated horticultural growth. Apart from income enhancement, these high-value crops have potential to generate additional employment opportunities in farming due to their labour-intensive character (Ananthakumar *et al.*, 2019). Therefore, there is a great scope for the

accelerating agricultural development through expansion of horticultural crops, which has potentials to become a strong organised industry that stimulate and sustain growth.

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