



E-ISSN: 2663-1067
P-ISSN: 2663-1075
NAAS Rating (2025): 4.74
www.hortijournal.com
IJHFS 2025; 7(8): 155-159
Received: 19-07-2025
Accepted: 20-08-2025

Ram Chandra
Department of Horticulture,
Amar Singh College, Lakhaoti,
Bulandshahr, Uttar Pradesh,
India

Floriculture: Trends, challenges, and opportunities

Ram Chandra

DOI: <https://www.doi.org/10.33545/26631067.2025.v7.i8c.379>

Abstract

Floriculture, an important segment of horticulture, has emerged as a rapidly growing sector of agriculture worldwide. It contributes significantly to employment generation, rural income diversification, foreign exchange earnings, and environmental sustainability. Globally valued at USD 52-55 billion (2023), the industry is expanding at a CAGR of 6-7%, with the Netherlands, Kenya, Ethiopia, and Colombia leading the trade. India, with 3.24 lakh hectares under flower cultivation and exports worth ₹771 crore (USD 95 million) in 2022-23, has shown remarkable progress but contributes only 0.6% to global exports, indicating untapped potential. This review highlights global and Indian trends, identifies major challenges such as post-harvest losses, infrastructure gaps, and limited technology adoption, and explores opportunities in exports, value addition, e-commerce, agro-tourism, and sustainability. With focused investments, advanced technologies, and policy support, India's floriculture industry can emerge as a high-value enterprise contributing substantially to rural development and global trade by 2030.

Keywords: Floriculture, cut flowers, dry flowers, value addition, protected cultivation, export potential, India, sustainability, agro-tourism, e-commerce

1. Introduction

Floriculture, a specialized branch of horticulture, encompasses the cultivation, processing, and marketing of cut flowers, loose flowers, potted plants, bedding plants, foliage, and nursery plants. Globally, the floriculture industry is valued at over USD 52-55 billion (2023 estimates), growing at a compound annual growth rate (CAGR) of about 6-7%. The Netherlands remains the world leader, contributing nearly 40% of global exports, while developing countries such as India, Kenya, Ethiopia, and Colombia are increasingly emerging as key players due to favorable climatic conditions and cost-effective labor.

In India, floriculture has witnessed significant expansion in recent years. According to the National Horticulture Board (NHB, 2023) ^[6], an area of about 3.24 lakh hectares is under flower cultivation, producing approximately 3.2 million tonnes of loose flowers and 9,000 million stems of cut flowers annually. The sector's contribution to exports is noteworthy: as per the Agricultural and Processed Food Products Export Development Authority (APEDA, 2023) ^[1], India exported floriculture products worth ₹771 crore (USD 95 million) in 2022-23. Major destinations include the USA (23%), Netherlands (18%), UK (12%), UAE (10%), and Germany (6%).

India's domestic market for flowers has also grown rapidly, fueled by urbanization, rising disposable incomes, weddings, religious ceremonies, festivals, landscaping projects, and the hospitality industry. For instance, the demand for marigold and jasmine surges during festivals, while roses, orchids, and carnations dominate in weddings and hotel decorations. The retail flower industry, estimated at ₹15,000 crore in 2023, is projected to grow at more than 12% annually, with online and app-based delivery services accounting for nearly 25% of the urban flower market by 2025 (ICRA, 2023) ^[5].

Despite this promising growth trajectory, the Indian floriculture sector faces several constraints. Post-harvest losses are estimated to be as high as 25-30%, primarily due to inadequate cold chain facilities, poor handling, and lack of refrigerated transport. Only about 15% of India's flower cultivation area is under protected cultivation (polyhouses, greenhouses, or shade nets), which restricts year-round production of high-value flowers such as roses and orchids. Climatic variability, including unseasonal rains and temperature fluctuations, often affects crop quality and productivity. Moreover,

Corresponding Author:
Ram Chandra
Department of Horticulture,
Amar Singh College, Lakhaoti,
Bulandshahr, Uttar Pradesh,
India

the absence of standardized grading, certification, and branding systems limits India's competitiveness in the premium international markets dominated by countries like the Netherlands, Kenya, and Colombia.

Global Trends in Floriculture

1. Growing Cut Flower Industry

The global cut flower industry is valued at around USD 40 billion, accounting for nearly 75% of the global floriculture trade. Roses dominate with nearly 40% share, followed by chrysanthemums, carnations, tulips, lilies, and orchids (FAO, 2022) ^[2]. The Netherlands continues to be the hub of international flower auctions, particularly through the Aalsmeer Flower Auction, which handles more than 12 billion flower stems annually.

India's Position

- India has emerged as a significant supplier of roses, carnations, and orchids.
- In 2022-23, India exported about 6,500 metric tonnes of cut flowers, valued at approximately ₹458 crore (USD 56 million) (APEDA, 2023) ^[1].
- Major export destinations for Indian cut flowers include USA (28%), Netherlands (19%), and Germany (7%).

2. Emergence of Developing Countries

Countries like Kenya, Ethiopia, Colombia, and Ecuador have emerged as global leaders in cut flower exports due to favorable agro-climatic conditions, abundant labor, and proximity to European and American markets. For example, Kenya alone supplies about 38% of cut flowers to the EU market, valued at USD 1.1 billion annually (ITC, 2022) ^[4].

India's Position

- India's production is primarily concentrated in Karnataka, Tamil Nadu, Maharashtra, West Bengal, and Andhra Pradesh.
- With 3.24 lakh hectares under floriculture, India is among the top 10 flower-producing nations (NHB, 2023) ^[6].
- However, India contributes only about 0.6% of global cut flower exports, indicating untapped potential.

3. Diversification into Value-Added Products

Globally, value-added floriculture products such as dry flowers, essential oils, floral teas, perfumes, and natural colors are gaining prominence. The dry flower trade alone is valued at USD 2 billion, with major markets in the USA, Europe, and Japan.

India's Position

- India is one of the world leaders in dry flower exports, accounting for over 70% of India's total floriculture exports.
- In 2022-23, India's dry flower exports were valued at ₹310 crore (USD 38 million) (APEDA, 2023) ^[1].
- West Bengal, Odisha, and Uttarakhand are the leading states for dry flower production and processing.

4. Technological Integration

Advanced technologies such as tissue culture, hydroponics, greenhouse farming, and vertical farming are

revolutionizing floriculture globally. Controlled environment agriculture ensures year-round production, higher yields, and better quality for exports. For instance, greenhouse cultivation in the Netherlands covers more than 10,000 hectares dedicated to floriculture.

India's Position

- India has adopted protected cultivation (polyhouses, greenhouses, shade nets) on only 15% of its flower-growing area, compared to over 90% in the Netherlands.
- Karnataka leads with over 3,500 hectares under polyhouse floriculture, mainly for roses and orchids.
- Tissue culture is expanding for crops like orchids, gerbera, and anthuriums, supported by biotech firms and research institutions.

5. Sustainability Concerns

Globally, there is increasing focus on eco-labeling, organic cultivation, biodegradable packaging, and carbon footprint reduction. The European market, in particular, demands flowers certified under schemes such as Fairtrade, Rainforest Alliance, and Florverde.

India's Position

- India is gradually moving towards organic floriculture, especially in states like Sikkim, Uttarakhand, and Himachal Pradesh.
- The use of biodegradable floral packaging and solar-powered greenhouses is being promoted under government schemes such as the Mission for Integrated Development of Horticulture (MIDH).
- Despite progress, less than 5% of Indian floriculture exports are eco-certified, highlighting a need for greater sustainability integration to tap premium markets.

Floriculture in India: Current Scenario

India ranks among the top 10 flower-producing countries, and floriculture has become one of the most dynamic components of horticulture. As per the National Horticulture Board (NHB, 2023) ^[6].

- **Area under floriculture:** ~3.24 lakh hectares
- **Production:** ~3.2 million tonnes of loose flowers and ~9,000 million stems of cut flowers annually
- **Exports (2022-23):** ₹771 crore (~USD 95 million) (APEDA, 2023) ^[1]
- **Major markets:** Netherlands, USA, UK, UAE, Germany
- **Share in global exports:** ~0.6% (showing untapped potential)

Key Producing States & Crops

- **Karnataka:** Roses, orchids, gerbera (under polyhouses, ~3,500 ha)
- **Tamil Nadu:** Jasmine, tuberose, marigold (largest jasmine producer)
- **West Bengal:** Chrysanthemum, gladiolus, and dry flowers (largest dry flower exporter)
- **Maharashtra:** Roses, marigold, aster
- **Andhra Pradesh:** Jasmine, tuberose, chrysanthemum

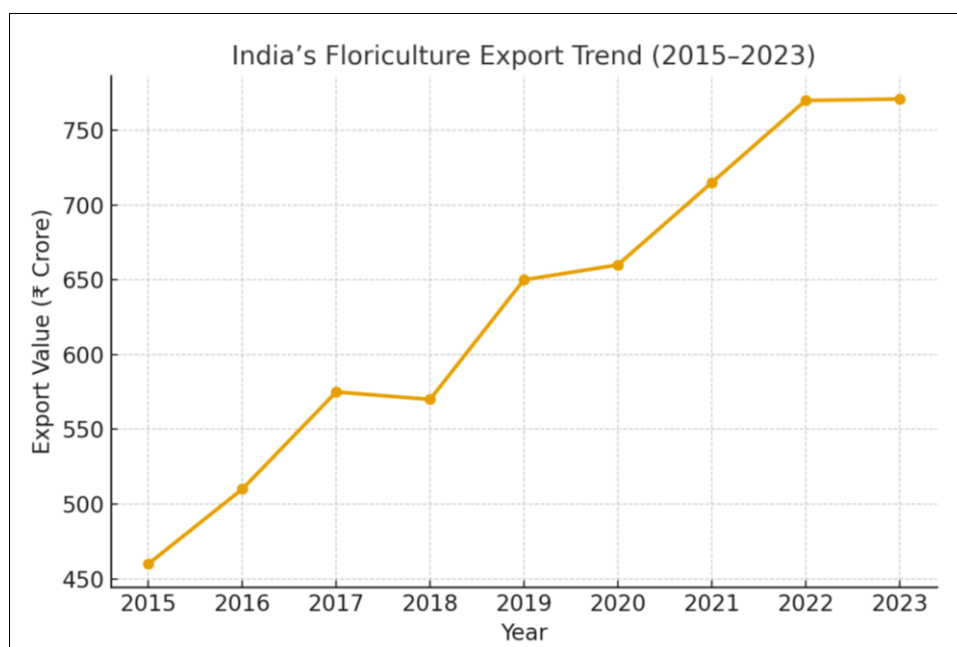
Table 1: Major Flowers, Leading States, and Export Destinations from India

Major Flowers	Leading Producing States	Export Destinations	Export Value (2022-23)
Roses	Karnataka, Maharashtra, Tamil Nadu	Netherlands, USA, UAE, UK	~₹320 crore (41% of total exports)
Jasmine	Tamil Nadu, Karnataka, Andhra Pradesh	Middle East (Saudi Arabia, UAE), Europe	~₹65 crore (8%)
Marigold	Maharashtra, West Bengal, Tamil Nadu	UK, Germany, Nepal, Bangladesh	~₹45 crore (6%)
Gladiolus	West Bengal, Himachal Pradesh, Uttarakhand	USA, UAE, Europe	~₹70 crore (9%)
Chrysanthemum	Karnataka, West Bengal, Maharashtra	Netherlands, Japan, Singapore	~₹55 crore (7%)
Dry Flowers	West Bengal, Odisha, Uttarakhand	USA, Netherlands, Japan, Germany	~₹310 crore (40%)

India's Floriculture Export Trend (2015-2023)

The floriculture export sector in India has shown a steady increase over the last decade. Exports rose from about ₹460 crore in 2015 to approximately ₹771 crore in 2023 (APEDA, 2023) ^[1]. Despite fluctuations due to global trade

disruptions and the COVID-19 pandemic, the sector has demonstrated resilience and is expected to grow further with increased adoption of protected cultivation, value addition, and e-commerce-driven retail expansion.

**Challenges in Floriculture****1. Production Constraints**

- India's floriculture is still largely unorganized, with over 85% of flower growers being small and marginal farmers (NHB, 2023) ^[6].
- Seasonal fluctuations reduce the year-round supply of high-value cut flowers like roses and orchids.
- Limited access to quality planting material (certified seeds, tissue culture plants) reduces productivity.
- Pest and disease outbreaks, such as powdery mildew in roses and leaf blight in marigold, cause 15-20% crop losses annually.

2. Post-Harvest Losses

- Estimated 25-40% of total flower production is lost post-harvest due to inadequate handling, lack of pre-cooling, and poor packaging (APEDA, 2023) ^[1].
- For perishable flowers like roses and gladiolus, poor cold chain management reduces shelf life from 10-12 days (global standard) to just 4-5 days in India.
- Absence of refrigerated transport means flowers lose freshness during long-distance domestic and export shipments.

3. Infrastructure Gaps

- Only 15% of India's floriculture area is under protected

cultivation (polyhouses, greenhouses), compared to 90% in the Netherlands.

- Cold storage facilities are limited, with less than 20% of districts having specialized floriculture pack-houses.
- High input costs for greenhouse installation (₹800-1,000 per sq.m) discourage small farmers despite subsidies under MIDH/NHM.

4. Market and Trade Issues

- Domestic trade is highly fragmented and dominated by middlemen, who capture 30-40% of the price share, leaving farmers with low returns.
- Lack of organized flower auctions and wholesale markets reduces transparency compared to the Dutch auction system.
- On the global stage, India faces stiff competition from Kenya, Ethiopia, and Colombia, which have established logistics and trade agreements with EU and USA.
- India's share in global floriculture exports is only 0.6%, highlighting competitiveness issues.

5. Environmental Challenges

- Excessive use of chemical fertilizers and pesticides in cut flower production degrades soil and water quality.
- Water scarcity is a major issue, as flower crops like roses require up to 8,000-10,000 m³ water/ha/year.

- Climate change (erratic rainfall, heatwaves, unseasonal frosts) increasingly disrupts flowering cycles and quality.
- Carbon footprint concerns are rising in export markets, with EU customers demanding eco-labeled and certified flowers.

6. Skill & Knowledge Gaps

- Limited technical training: Only about 25% of flower growers have access to professional training in advanced cultivation, post-harvest handling, and export standards (ICAR-DFR, 2022) ^[3].
- Lack of awareness about grading, certification, and quality protocols reduces India's export competitiveness.
- Farmers are not fully integrated with digital marketing platforms (e-commerce, B2B exports), which limits direct-to-consumer opportunities.

Opportunities in Floriculture

Export Potential

- The global floriculture trade is valued at USD 55 billion, with strong demand in Gulf, European, and Asian markets.
- India exported floriculture products worth ₹771 crore (~USD 95 million) in 2022-23 (APEDA, 2023) ^[1].
- Dry flowers constitute over 70% of India's floriculture exports, with the USA, Netherlands, and Germany as key buyers.
- With better logistics and certification, India could capture a larger share of the USD 10 billion cut flower segment, where its current share is only 0.6% globally.

2. Value Addition

- Value-added products such as dry flowers, floral teas, essential oils, perfumes, dyes, and nutraceuticals offer high export margins.
- India already earns ₹310 crore (40% of floriculture export earnings) from dry flowers.
- Global demand for natural fragrances and herbal cosmetics is growing at 8-10% annually, offering huge scope for floriculture-based raw materials.

3. Urbanization and Landscaping

- Rapid growth of real estate, hotels, corporate offices, malls, and smart cities is boosting ornamental plant demand.
- The Indian landscaping industry is projected to grow at ~15% annually, with floriculture supplying indoor plants, vertical gardens, and rooftop gardens.
- Public sector initiatives like urban beautification drives (e.g., Delhi, Bengaluru, Chandigarh flower shows) further increase demand.

4. Agro-Tourism and Floriculture Parks

- Linking floriculture with rural/agro-tourism can generate additional income for farmers.
- Successful examples include the Kashmir Tulip Garden (Asia's largest), which attracts 2.5-3 lakh tourists annually.
- Flower valleys, exhibitions, and seasonal festivals (rose shows, chrysanthemum shows) can significantly boost local economies.

5. Digital Marketing & E-Commerce

- The online flower delivery market in India is expected to grow at ~20% CAGR, with platforms like FernsPetals, FlowerAura, and BigBasket driving demand.
- By 2025, nearly 25-30% of urban flower sales are projected to happen through online channels.
- Direct-to-consumer e-commerce reduces middlemen involvement, ensuring better returns for growers.

6. Research & Development

- Advanced technologies like tissue culture, hydroponics, vertical farming, and climate-resilient breeding are expanding.
- ICAR-Directorate of Floricultural Research (Pune) and state universities are developing disease-resistant rose, marigold, and gladiolus varieties.
- Biotechnology offers potential for longer vase life, improved fragrance, and color innovations.

7. Sustainability Pathways

- Growing consumer preference for eco-certified flowers (Fairtrade, Rainforest Alliance) opens premium market opportunities.
- States like Sikkim and Uttarakhand are promoting organic floriculture, which has high export potential.
- Use of solar-powered greenhouses, biodegradable packaging, and integrated pest management (IPM) enhances both sustainability and profitability.

Future Outlook

The floriculture industry is expected to witness sustained growth in the coming decade, driven by shifting consumer preferences, technological innovations, and global trade opportunities. According to FAO (2023) ^[2], the global floriculture market is projected to grow at a CAGR of 6-7%, reaching nearly USD 80 billion by 2030. India, with its favorable agro-climatic diversity and expanding domestic market, is positioned to emerge as a major player.

Export Growth: With systematic investment in cold chains, certification, and logistics, India's floriculture exports could grow from ₹771 crore (2023) to ₹1,500 crore by 2030, doubling its current global share.

- **Technology Adoption:** Wider adoption of protected cultivation, tissue culture, hydroponics, and vertical farming will enable year-round production of high-value flowers such as roses, orchids, and gerberas.
- **Domestic Market Expansion:** Rising urbanization and lifestyle changes are projected to boost India's domestic flower consumption from 0.5 kg per capita (current) to 1.2 kg per capita by 2030, creating a market worth ₹25,000-30,000 crore.
- **Value-Added Products:** Dry flowers, essential oils, herbal teas, and eco-friendly fragrances will drive diversification. The global natural fragrance and essential oil market is projected to grow at ~10% CAGR, presenting opportunities for Indian floriculture entrepreneurs.
- **Sustainability:** Demand for eco-certified, organic, and biodegradable floral products is set to increase, especially in Europe and North America. States like Sikkim, Uttarakhand, and Himachal Pradesh may

pioneer India's entry into premium organic floriculture exports.

- **Policy Support:** Enhanced government focus under schemes like MIDH, NHM, and APEDA export subsidies will further promote floriculture as a key contributor to India's horticultural GDP.
- **Agro-Tourism Linkages:** Flower tourism models (e.g., Kashmir Tulip Garden, Bengaluru Lalbagh Flower Show) can be replicated in other regions to combine agriculture with tourism-driven revenue.

Vision for 2030

By 2030, India's floriculture industry could evolve into a USD 2-3 billion enterprise, contributing significantly to employment generation, rural diversification, women empowerment, and foreign exchange earnings. Achieving this requires collaborative efforts among farmers, researchers, policymakers, entrepreneurs, and e-commerce platforms.

Conclusion

Floriculture is no longer limited to aesthetic or cultural practices; it has evolved into a commercially significant and globally competitive sector. While India is among the top 10 producers, its global export share (0.6%) remains modest due to production, marketing, and infrastructural constraints. The sector faces issues such as seasonal fluctuations, post-harvest losses (25-40%), inadequate cold chain facilities, and fragmented marketing channels, but at the same time presents immense opportunities in exports, value-added products, urban landscaping, and agro-tourism.

The future of Indian floriculture depends on wider adoption of advanced technologies (tissue culture, hydroponics, protected cultivation), strong supply chain infrastructure, global certification systems, and integration with digital marketing platforms. With policy support, private investment, and farmer participation, India's floriculture industry could transform into a USD 2-3 billion enterprise by 2030, playing a crucial role in employment generation, women empowerment, and rural diversification.

References

1. APEDA. Floriculture Export Statistics 2015-2023. Agricultural and Processed Food Products Export Development Authority, Government of India; 2023.
2. FAO. The State of Horticulture and Floriculture. Food and Agriculture Organization of the United Nations, Rome; 2022.
3. ICAR-DFR. Annual Report: Directorate of Floricultural Research, Pune. Indian Council of Agricultural Research; 2022.
4. ITC. Trade Map: International Trade Statistics for Global Cut Flowers. International Trade Centre, Geneva; 2022.
5. ICRA. Industry Outlook: Retail and E-Commerce in Floriculture Sector. Investment and Credit Rating Agency of India; 2023.
6. NHB. Indian Horticulture Database. National Horticulture Board, Ministry of Agriculture & Farmers Welfare, Government of India; 2023.
7. Rathore DS, Singh B, Sharma V. Challenges and opportunities in floriculture sector. *Int J Agric Sci*. 2019;11(2):115-123.
8. Kumar R, Sharma V. Value addition in floriculture: Emerging trends. *J Appl Hortic*. 2020;22(1):12-18.
9. Singh A, Patel R. Trends in floriculture: Opportunities for sustainable development in India. *Indian J Agric Econ*. 2021;76(3):451-460.
10. Chauhan K, Bhattacharya P. Floriculture supply chain management in India: Issues and prospects. *J Agric Mark*. 2020;12(4):33-42.
11. Sharma R, Meena H. Protected cultivation and its role in Indian floriculture. *Hortic Sci J*. 2022;17(2):97-108.
12. Ministry of Agriculture & Farmers Welfare. Horticultural Statistics at a Glance. Government of India; 2022.
13. Kapoor S, Rani P. Dry flower industry in India: A potential export opportunity. *Asian J Hortic*. 2021;16(1):56-63.
14. Floriculture Today. Market trends in Indian floriculture industry. *Floriculture Today*. 2022;34(6).
15. Pandey D, Kumar A. Impact of e-commerce on the floriculture sector in India. *Int J Rural Dev Manag Stud*. 2020;4(2):22-31.