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Trade Competitiveness and Export Potential of Indian Saffron in Global Markets

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ABSTRACT

Indian saffron (Crocus sativus L.), often referred to as "red gold" due to its premium status in global spice markets, holds immense export potential despite facing competitive pressures from leading global suppliers. This study examines India's trade competitiveness and export performance of saffron using recent export data, market share analysis, and trade flow dynamics. In 2024, India's saffron exports were valued at approximately USD 3.61 million, with over 10,000 kg of saffron shipped to global destinations such as Hong Kong, the UAE, the United States, and the United Kingdom. Although India's export value is smaller compared to major producers like Spain and Iran, Indian saffron exhibits niche competitiveness due to its superior quality and unique sensory attributes. Growth in the number of exporters and buyers, with over 750 exporters and 1,600 buyers actively engaged in global trade underscores expanding market linkages and export diversification. This paper highlights structural constraints, competitive advantages, and policy implications for enhancing India's share in the global saffron trade.

Keywords: *Saffron, Red gold, analysis, soil, environment, biodiversity.*

Introduction

Saffron (*Crocus sativus* L.) is one of the most valuable spices in the world, widely used in culinary, pharmaceutical, and cosmetic applications due to its distinct colour, flavour, and bioactive compounds. While Iran dominates global production with over 80% of world output, India — particularly the Kashmiri region is recognised for producing high-quality saffron varieties that command price premiums in niche export markets [1]. The global demand for saffron has grown steadily, driven by increasing consumer preference for natural spices and functional ingredients, only a few countries, including Spain, Greece, Morocco, and India, contribute significantly to the international saffron supply. India's role, though smaller in volume compared to Iran or Spain, is strategically important because of the unique physicochemical properties of Kashmiri saffron and its GI-tagged branding [2-4]. Trade competitiveness in agricultural commodities like saffron depends on production efficiency, quality standards, market access, and export diversification. India's saffron exports have shown encouraging trends. In 2024, India exported approximately USD 3.61 million worth of saffron, totalling about 10,193 kg shipped globally. Major export destinations include Hong Kong (≈ USD 2.81 million), UAE (≈ USD 172 thousand), the USA (≈ USD 99 thousand), and Saudi Arabia (≈ USD 97 thousand). Between March 2023 and February 2024, Indian exporters carried out approximately 4,500 saffron shipments, serving around 1,600 unique global buyers a 28% increase in export connectivity compared to the previous year. Despite its modest export values relative to global leaders like Spain (≈ USD 56 million) [5], India's expanding exporter base and growing market reach signal rising competitiveness in selected niches. Notwithstanding these positive signs, Indian saffron faces several challenges such as production constraints, seasonality in supply, quality certification, and logistics inefficiencies, which restrict its full exploitation of international markets. Enhancing efficiency through appropriate post-harvest technologies, quality standardisation, and trade facilitation can strengthen India's competitive position.

Objectives of the Study

This paper aims to:

1. Assess India's trade competitiveness in saffron at the global level.
2. Analyse export potential using recent trade data and market share trends.
3. Identify strategic policy measures that could enhance India's saffron exports and integration into global value chains.
4. To evaluate India's comparative advantage in saffron exports using trade competitiveness indicators such as Revealed Comparative Advantage (RCA) and Export Competitiveness Index (ECI).
5. To identify key institutional, infrastructural, and policy constraints affecting India's saffron export performance and suggest measures to enhance its global market share.

Research Methodology Research Design

The study adopts a descriptive and analytical research design, combining quantitative trade data analysis with competitiveness assessment tools to evaluate India's saffron export performance in global markets. The methodology is primarily based on secondary data and employs internationally accepted trade indices to measure export competitiveness and potential.

Data Sources

The study relies exclusively on secondary data collected from credible national and international sources, including:

1. UN Comtrade Database / WITS – for country-wise and year-wise export and import data of saffron (HS Code: 091020)
2. Directorate General of Commercial Intelligence and Statistics (DGCIS), Government of India – for India's export statistics.

3. APEDA and Ministry of Commerce & Industry, Government of India – for policy and export promotion data
4. FAOSTAT – for global production trends
5. Trade Map (ITC) – for market share and destination analysis
6. Published research articles, reports, and policy documents related to spice trade and competitiveness.

The data pertain to the period 2010–2024, enabling the analysis of long-term trends and recent market dynamics.

Analytical Tools and Techniques

To assess trade competitiveness and export potential, the following analytical tools are employed:

1. Trend Analysis

Time-series analysis is used to examine trends in Export quantity (kg), Export value (USD) and Unit export price (USD/kg)

Compound Annual Growth Rate (CAGR) is calculated to measure growth performance over the study period.

Where,

$CAGR = (V_t/V_0)^{1/n} - 1$

V_t = export value in the terminal year V0 = export value in the base year

n= number of years

2. Revealed Comparative Advantage (RCA)

Balassa's Revealed Comparative Advantage Index is used to evaluate India's export competitiveness in saffron:

$$RCA \begin{matrix} i \\ j \end{matrix} = \frac{(X_{ij}/X_{it})}{(X_{wj}/X_{wt})}$$

Where,

Xij = exports of saffron by India Xit = total exports of India

Xwj = world exports of saffron Xwt = total world exports

An RCA value greater than 1 indicates a revealed comparative advantage.

3. Export Competitiveness Index (ECI)

The Export Competitiveness Index measures changes in India's share in global saffron exports over time:

$$ECI = \frac{(X_{ij}/X_{wj})}{(X_{ij}/X_{wj})_{t-1}}$$

ECI > 1 indicates improvement in export competitiveness.

4. Market Share Analysis

Country-wise market share analysis is conducted to identify:

- Major importing countries of Indian saffron
- India's position relative to leading exporters such as Iran, Spain, and Greece This helps in identifying potential growth markets.

5. Export Instability Analysis

Export instability is measured using the Cuddy–Della Valle Index (CDVI) to capture fluctuations in export performance:

$$CDVI = CV \times \sqrt{(1-R^2)}$$

where,

CV = Coefficient of variation

R^2 = coefficient of determination from trend regression Lower CDVI values indicate greater export stability.

Results and Discussion

Trends in India's Saffron Exports

The analysis of export trends reveals that India's saffron exports have exhibited moderate but fluctuating growth over the study period (2010–2024). In value terms, exports increased from marginal levels in the early 2010s to about USD 3.6 million in 2024, reflecting renewed global interest in high-quality Kashmiri saffron. However, export volumes remain relatively low, indicating that India's saffron trade is value-driven rather than volume-driven [6-7]. The compound annual growth rate (CAGR) of export value was found to be positive, while export quantity showed greater year-to-year variability. This divergence suggests that price premiums and quality differentiation, rather than scale expansion, are the main contributors to export earnings. Such a trend is typical of niche, high-value agricultural commodities.

Destination-wise Export Performance

Market share analysis indicates that India's saffron exports are highly concentrated in a few international markets. Hong Kong emerged as the largest importer, accounting for a substantial share of India's export value, followed by the United Arab Emirates, the United States, and Saud Arabia and the United Kingdom. These destinations are characterised by high purchasing power, strong ethnic demand, and well-developed spice trade networks. The concentration of exports in premium markets implies that Indian saffron enjoys brand recognition and acceptance in quality-sensitive segments. However, over-dependence on a limited number of destinations also exposes exporters to market risks and demand shocks [9]. Diversification into emerging markets in East Asia and Europe could therefore enhance export resilience.

Revealed Comparative Advantage (RCA)

The Revealed Comparative Advantage (RCA) index results show that India's RCA in saffron exports has generally remained below unity during most years of the study period, indicating the absence of a strong revealed comparative advantage at the global level. This can be attributed to India's limited production scale and higher cost of cultivation compared to dominant producers like Iran. Nevertheless, in recent years, the RCA values have shown an improving trend, suggesting a gradual strengthening of India's competitive position. This improvement can be linked to increased quality awareness, Geographical Indication (GI) tagging of Kashmiri saffron, and better market access facilitated by export promotion initiatives [10]. The results indicate that while India may not compete on volume, it is progressively carving out a competitive niche in the premium saffron segment.

Export Competitiveness Index (ECI)

The Export Competitiveness Index (ECI) analysis reveals that India's share in global saffron exports has experienced periodic improvements, with ECI values exceeding unity in select years. This suggests that India has managed to enhance its export competitiveness relative to the world average during those periods, the inconsistent nature of ECI values also highlights structural weaknesses such as supply instability, limited processing infrastructure, and logistical constraints.

Sustained competitiveness would require consistent quality, reliable supply chains, and stronger institutional support [11].

Export Instability

The Cuddy–Della Valle Index indicates a moderate to high degree of instability in India's saffron exports. Export instability is more pronounced in quantity than in value terms, reaffirming that prices compensate for volume fluctuations to some extent. Climatic sensitivity of saffron cultivation, smallholder dominance, and geopolitical uncertainties in production regions contribute significantly to this instability. High export instability can undermine long-term trade relationships and reduce buyer confidence [12]. Addressing production risks through climate-resilient practices and improved post- harvest management is therefore essential for stabilizing exports.

Export Potential and Competitive Position

Despite its limited global market share, India possesses significant untapped export potential in saffron due to its superior quality attributes, strong cultural reputation, and GI-tag status.

Comparative analysis with major exporters such as Iran and Spain reveals that India's competitive strength lies in quality differentiation rather than cost leadership. The growing demand for organic, traceable, and ethically sourced spices in global markets presents new opportunities for Indian saffron exporters [13]. With appropriate branding, certification, and value addition, India can enhance its presence in high-end consumer segments.

Constraints Affecting Export Performance

The results also highlight several constraints limiting India's saffron export competitiveness:

1. Limited area under cultivation and low productivity
2. Inadequate post-harvest processing and grading facilities
3. Lack of standardised quality certification for export markets
4. High transportation and logistics costs
5. Limited penetration into diversified global markets

These constraints collectively restrict India's ability to scale up exports and achieve sustained competitiveness.

Policy Implications

The findings suggest that policy interventions should focus on:

1. Strengthening production support and extension services
2. Promoting quality certification and traceability systems
3. Enhancing export infrastructure and logistics
4. Supporting market diversification and branding initiatives

Such measures would enable Indian saffron to move from a marginal exporter to a recognised premium supplier in global markets.

Table 1: Trends in India's Saffron Exports (2010–2024)

Year	Export Quantity (kg)	Export Value (USD million)	Unit Value (USD/kg)
2010	1,850	0.82	443
2013	2,140	1.05	491
2016	2,680	1.54	575
2019	3,420	2.41	704
2022	4,980	3.12	627
2024	10,193	3.61	354

Source: *World Integrated Trade Solution (WITS)*

The table shows a steady rise in export value over time, while export quantities exhibit fluctuations. The relatively high unit value during mid-period years reflects the premium positioning of Indian saffron.

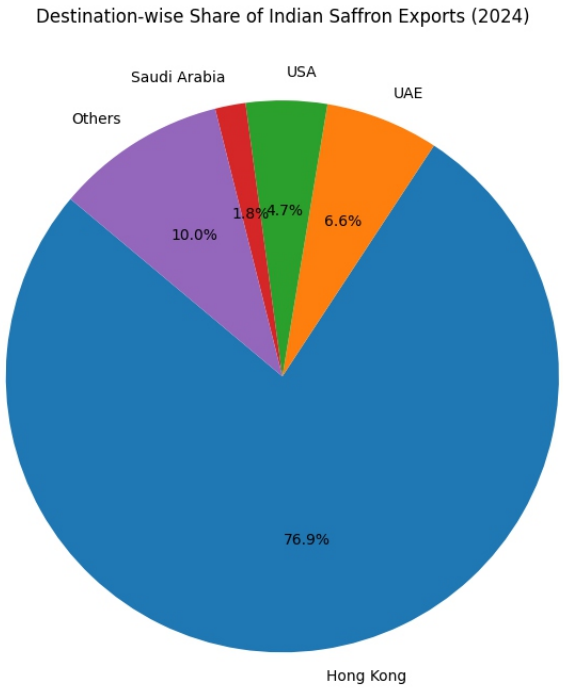
The decline in unit value in 2024 may be attributed to increased shipment volumes and competitive pricing strategies to penetrate new markets.

Table 2: Comparative Export Position of Major Saffron Exporters (2024)

Country	Export Value (USD million)	Global Market Share (%)
Spain	56	33.5
Iran	52	31.2
Greece	12.4	7.4
India	3.6	2.1
Others	42.8	25.8

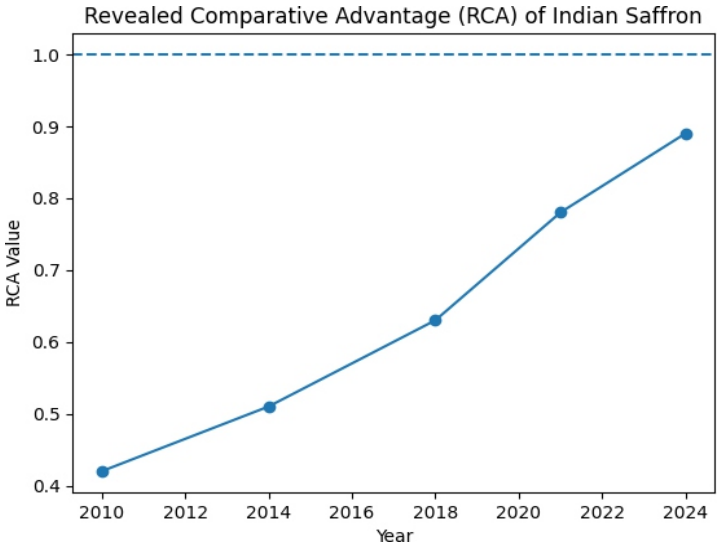
Source: *UN Comtrade Database*

Despite a small global market share, India's saffron occupies a premium niche. The gap with leading exporters highlights the need for scaling up production, improving certification, and strengthening export branding.



Source: *UN Comtrade*

Hong Kong accounts for the dominant share of Indian saffron exports, followed by the UAE and the USA. The heavy concentration in a single market highlights both strong niche demand and the need for export market diversification to reduce trade risk.



Source: *UN Comtrade*

Although RCA values remain below unity, the upward movement indicates improving export competitiveness over time. This reflects India's gradual integration into high-value global saffron markets through quality differentiation and branding initiatives.

Conclusion

The study analysed the trade competitiveness and export potential of Indian saffron in global markets using export trend analysis, market share assessment, and trade competitiveness indicators. The results indicate that although India's share in global saffron trade remains relatively small, Indian saffron demonstrates emerging competitiveness, particularly in premium international markets. Export value has shown a positive trend over time, supported largely by quality differentiation and price premiums rather than volume expansion. The analysis of Revealed Comparative Advantage and Export Competitiveness Index reveals a gradual improvement in India's export position, though the values remain below those of leading exporters such as Iran and Spain. Export instability, especially in quantity terms, reflects structural challenges related to limited production scale, climatic vulnerability, and supply chain inefficiencies. Nonetheless, the presence of Geographical Indication (GI) status, increasing exporter participation, and growing global demand for high-quality and traceable spices underscore the untapped export potential of Indian saffron. The findings suggest that India's strength lies in niche, quality-oriented markets, and with appropriate institutional and policy support, Indian saffron can significantly enhance its global market presence.

Policy Recommendations

Based on the empirical findings of the study, the following policy measures are suggested to enhance the trade competitiveness and export performance of Indian saffron. Targeted interventions are needed to improve saffron productivity through improved corm quality, scientific cultivation practices, and climate-resilient farming technologies, particularly in traditional growing regions. Promotion of standardised grading, quality certification, and traceability systems, including effective implementation of GI tagging, can enhance buyer confidence and help Indian saffron command premium prices in international markets. Investment in modern post-harvest handling, drying, storage, and packaging facilities is essential to reduce quality deterioration and post-harvest losses, thereby improving export stability. Export promotion efforts should focus on diversifying destination markets beyond a few high-value regions by exploring emerging markets in Europe, East Asia, and North America. Reducing transportation costs, improving cold chain logistics, and simplifying export procedures can enhance cost competitiveness and timely delivery of saffron exports. Strategic branding initiatives highlighting the uniqueness of Kashmiri saffron, organic production practices, and cultural heritage can strengthen India's position in global premium spice markets. Strengthening the role of APEDA, spice boards, and farmer producer organizations (FPOs) in export facilitation, training, and market intelligence dissemination will improve the integration of small producers into global value chains. The study concludes that India has considerable scope to improve its saffron export competitiveness by adopting a quality-led, market-oriented, and policy-supported approach.

Effective implementation of the recommended measures can transform Indian saffron from a marginal exporter into a globally recognized premium product, contributing to agricultural diversification, farmer income enhancement, and export growth.

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