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Export Competitiveness of India's Major Fruits: Evidence from Banana, Grapes, and Orange (1991–2024)

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Abstract

The present study analyses the revealed comparative advantage (RCA) and worldwide market position of India's selected fruit exporters—banana, grapes, and orange—during the post-liberalization period from 1991 to 2024. Despite being one of the top fruit producers, India's performance in the global fruit trade varies greatly depending on the commodity. The Food and Agriculture Organization database provided the secondary data on export values used in the study. The Balassa index of disclosed comparative advantage was used to gauge export competitiveness, and India's export share of world exports was calculated to assess market presence.

The results show significant variations among fruits. India's growing integration into international grape markets is demonstrated by the significant and persistent revealed comparative advantage in grape exports, especially since the mid-2000s. This advantage is reinforced by a constantly increasing percentage of world exports. For the greater part of the study period, banana exports indicated a sustained comparative disadvantage; however, in recent years, there has been a notable improvement, as both export share and RCA values show the rise of export competitiveness. Orange exports, on the other hand, continue to be somewhat disadvantaged over the course of the period, with consistently low export share and RCA values that reflect structural and competitiveness-related constraint.

The results highlight the necessity for crop-specific export strategies by indicating that India's fruit export competitiveness is commodity-specific rather than homogeneous. To maintain grape competitiveness, support the growing potential of bananas, and solve the on-going shortcomings in orange exports, export infrastructure must be strengthened, quality compliance must be improved, and market access must be improved.

Keywords: Fruit exports, export share, bananas, grapes, oranges, India, RCA

1. Introduction

India holds a significant place in world's horticultural sector due to its wide range of agro climatic conditions and substantial production base. Fruits are an important part of Indian agriculture, contributing to foreign exchange earnings, farm revenue, employment creation, and nutritional security.

Fruits like bananas, grapes, and oranges are among the many horticulture products with significant economic value because of their potential for production and export.

India's trade policy framework underwent an enormous shift in 1991 with the implementation of trade liberalization reforms. India's competitiveness in global trading was anticipated to improve with the removal of trade obstacles, greater connectivity with worldwide markets, and policy support for export-oriented agriculture. In order to determine whether India has been able to take advantage of its comparative advantages in international markets, it has become more crucial to evaluate the export performance of agricultural goods.

India is one of the world's top fruit producers, but its success in the international fruit trade has been inconsistent. While certain fruits have become popular in foreign markets, others still struggle with issues like poor infrastructure, post-harvest losses, quality standards, and competition from well-established exporting nations. Therefore, determining India's strengths, shortcomings, and policy priorities requires a systematic assessment of the country's fruit export competitiveness.

By evaluating a nation's export structure with that of the rest of the world, the idea of revealed comparative advantage (RCA) offers a helpful framework for evaluating a nation's export competitiveness. In trade studies, RCA has been widely used to determine which goods a nation has a relative advantage or disadvantage in. Furthermore, examining a nation's export share in world trade provides important information about its true market presence and level of market integration. When combined, these metrics offer an extensive understanding of export performance.

Due to their significance in India's fruit production and export basket, as well as the noted fluctuations in their export performance over time, bananas, grapes, and oranges were chosen for this study. A comparison analysis is necessary because bananas and oranges have showed inconsistent patterns, but grapes are frequently regarded as a successful horticulture export. However, there are still few comprehensive studies that use standardized metrics to look at these fruits' export competitiveness over a long post-liberalization period.

In considering this, the current study examines the export competitiveness of India's three main fruits from 1991 to 2024: bananas, grapes, and oranges. The study aims to provide insights into India's place in the global fruit trade and to obtain policy-relevant implications for boosting fruit exports by utilizing export share analysis and the revealed comparative advantage approach.

Objectives of the Study

1. To analyze India's share of world banana, grape, and orange exports.
2. To examine the post-liberalization comparative advantage of specific fruit exports from India.
3. To determine policy implications for improving India's fruit export performance by comparing the export competitiveness of bananas, grapes, and oranges.

Review of Literature

In the context of economic reforms and trade liberalization, the performance and competitiveness of India's agricultural exports have been thoroughly researched. A number of studies have shown that the post-1991 trade policy regime had a significant impact on the composition and direction of India's exports, including agricultural and horticultural commodities.

Veeramani (2008) examined India's export competitiveness throughout the post-liberalization era and found that while competitiveness varied significantly among commodities and industries, trade reforms helped to diversify exports. Instead of depending solely on aggregate indicators, the study highlighted the necessity of commodity-specific analysis to comprehend export performance.

Batra and Khan (2005) assessed India's revealed comparative advantage using trade data and found that a few agricultural products showed comparative advantage in the post-reform period. However, the study also noted that domestic supply conditions, governmental assistance, and global market dynamics all had an impact on India's competitiveness, which was not consistent across commodities.

Shinoj, Raju, and Mathur (2009) examined India's comparative advantage in agricultural commerce with a focus on agricultural exports. They found that India had a demonstrated comparative advantage in a few core agricultural commodities. The authors emphasized that the growth of agricultural exports was limited by infrastructure constraints, high transaction costs, and adherence to international quality standards.

Kumar and Rai's (2013) Research on horticultural exports in particular has given significant insights into India's export potential. Fruits like grapes and bananas demonstrated higher export possibilities than a number of other horticultural crops, analysis of the export performance and competitiveness of Indian horticultural products. The study highlighted how export-oriented production, cold chain infrastructure, and post-harvest management might improve competitiveness.

Singh and Singh (2016) examined patterns in India's fruit exports and found significant variations in export performance over time. The study ascribed this unpredictability to shifting global demand conditions, price volatility, and production instability. The results indicate that constant quality, market access, and governmental assistance are necessary for long-term export competitiveness.

Kumar, Sharma, and Dhir (2018) looked at India's agricultural export performance over a longer time frame and found that export competitiveness increased after liberalization. The study did point out that the performance of horticultural exports remained inconsistent among various fruits, suggesting that crop-specific export strategies are necessary.

Gulati et al. (2021) In order to improve export competitiveness, highlighted the significance of fortifying agricultural value chains. The report emphasized that maintaining India's competitiveness in high-value agricultural commodities, such as fruits, requires advancements in logistics, cold storage facilities, quality certification, and export infrastructure.

While previous research has examined India's agricultural and horticulture export performance, the majority of these studies are either restricted to specific commodities or cover shorter time periods. There are still few thorough studies analyzing the export competitiveness of key fruits over an extended post-liberalization period utilizing both export share and revealed comparative advantage. By examining the export competitiveness of bananas, grapes, and oranges from India between 1991 and 2024, the current study aims to close this gap in the literature and offer insights that are pertinent to policy.

Data and Methodology

The study is based on secondary data on the export performance of selected fruits from India. The FAO database, which offers comprehensive and worldwide comparable trade statistics, were the source of the export value data. An evaluation of changes in export competitiveness over time is made possible by the analysis, which covers an extensive post-liberalization period from 1991-2024.

The study's chosen fruits include oranges, bananas, and grapes, all of which are significant components of India's horticultural export basket. To provide consistency in international trade comparisons, export values are expressed in USD.

Two indicators were used to analyze India's role in world fruit trade:

(i) India's export share in world exports

(ii) Revealed Comparative Advantage

Export Share Analysis

The comparative market position of Indian fruit exports in international trade was evaluated by estimating India's export share in world exports. The following formula was used to calculate the export share:

$$\text{India's Export Share } (\%) = \left(\frac{\text{India's export value of a fruit}}{\text{World export value of the same fruit}} \right) \times 100$$

This indicator offers a descriptive assessment of India's involvement in the world fruit industry.

Revealed Comparative Advantage (RCA)

The Balassa index of revealed comparative advantage, which is expressed as follows, was used to evaluate export competitiveness:

$$RCA = \frac{(X_{ij}/X_{it})}{(X_{wj}/X_{wt})}$$

Here, Xij = India's exports of fruit *j*
Xit = India's total agricultural exports
Xwj = World exports of fruit *j*
Xwt = World total agricultural exports

Revealed comparative advantage is indicated by an RCA value larger than one, whereas comparative disadvantage is shown by a number smaller than one.

India's Share in World Exports of Selected Fruits

To determine India's position in the world fruit market, the country's percentage of world exports of a few fruits bananas, oranges, and grapes were evaluated. In additional to supporting the findings of the provided comparative advantage, the export share study provides an overview of India's market participation.

The findings show that India's participation in world banana trade was limited, as seen by the country's extremely low share of worldwide banana exports over the most of the study period. India's

export share remained below 1% in the 1990s and early 2000s. Nonetheless, there has been a slow increase in recent years, with the export share rising steadily after 2015 and surpassing 1% by 2024. In line with the recent improvement in RCA values, this upward trend suggests to a growing presence of Indian bananas in foreign markets.

India's proportion of global orange exports fluctuated within a small range and stayed significantly below 1% over the study period. There is not a significant rise in export share, despite slight year-to-year fluctuations. The structural issues with orange exports, such as quality limitations, a small export surplus, and intense competition from major exporting nations, are reflected in the consistently low export share. The RCA results, which show a persistent comparative disadvantage in orange exports, are supported by these data.

Grape exports, on the other hand, have a significant and growing export proportion in global trade. Over time, India's portion of the world's grape exports grew considerably, especially after the mid-2000s. India's increasing integration into the global grape market is demonstrated by the export share, which surpassed 1% in following years and kept growing. Grapes have become one of India's most competitive fruit exports in the post-liberalization era, according to the growing export share, which supports the RCA results.

Table 1: India's Share (%) in World Exports of Selected Fruits

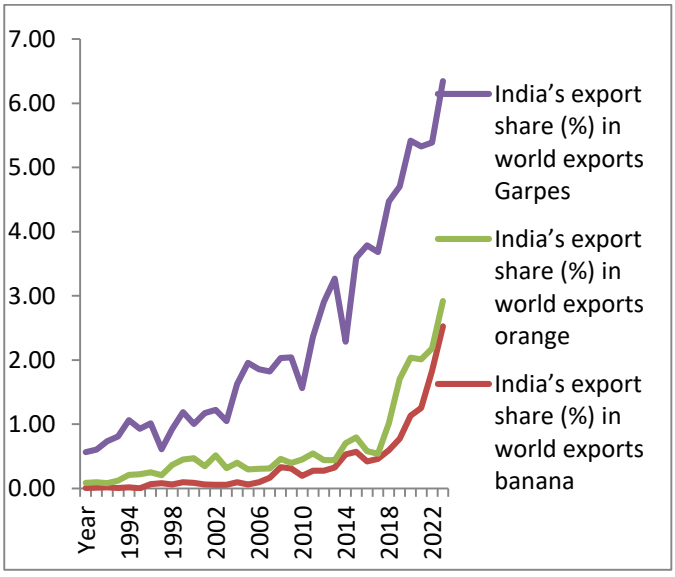
Year	Banana	Orange	Grapes
1991	0.00	0.08	0.48
1992	0.01	0.09	0.51
1993	0.01	0.07	0.65
1994	0.01	0.12	0.69
1995	0.02	0.20	0.85
1996	0.00	0.22	0.71
1997	0.07	0.18	0.77
1998	0.08	0.12	0.41
1999	0.06	0.30	0.56
2000	0.09	0.36	0.74
2001	0.08	0.38	0.54
2002	0.06	0.28	0.83
2003	0.05	0.46	0.71
2004	0.06	0.26	0.73
2005	0.09	0.31	1.23
2006	0.06	0.24	1.66
2007	0.10	0.21	1.56
2008	0.17	0.14	1.51
2009	0.33	0.13	1.57
2010	0.31	0.08	1.65

2011	0.20	0.25	1.11
2012	0.27	0.27	1.82
2013	0.27	0.17	2.46
2014	0.33	0.12	2.83
2015	0.53	0.17	1.58
2016	0.57	0.22	2.80
2017	0.42	0.16	3.21
2018	0.46	0.08	3.14
2019	0.59	0.42	3.46
2020	0.77	0.94	3.00
2021	1.13	0.90	3.38
2022	1.25	0.76	3.32
2023	1.83	0.35	3.21
2024	2.53	0.39	3.43

Sources: FAO STAT

All things considered, the export share analysis reveals notable variations among fruits. While orange exports are still low, bananas have shown growing export potential in recent years, while grapes have developed a strong and growing presence in international markets. The findings highlight the necessity of export strategies customized to various fruits in order to boost India's competitiveness in the global fruit trade.

Figure 1: India's Share (%) in World Exports of Selected Fruits (1991–2024)



The growth rate of India's percentage in world exports of the following fruits bananas, grapes, and oranges from 1991 to 2024 is shown in Figure 1.The results shown in Table 1 are supported by the figure, which displays a persistently low export share for oranges, a gradually improving export share for bananas in recent years, and a constantly increasing export share for grapes.

Revealed Comparative Advantage of India's Major Fruit Exports

In order to evaluate India's export competitiveness in particular major fruit categories bananas, oranges, and grapes the revealed comparative advantage (RCA) indices were calculated between 1991 and 2024. A comparative advantage in exporting the commodity is indicated by an RCA value larger than one, whereas a value less than one indicate a comparative disadvantage.

Banana

For the majority of the study period, India's banana exports had RCA values below unity, showing a continuous comparative disadvantage in the global banana market. RCA values were incredibly low, ranging from 0.00 to 0.07, during the early years of the post-liberalization period (1991–2005), indicating India's inadequate competitiveness in banana exports while being one of the biggest exporters in the world.

RCA values show a steady improvement after 2010. The RCA rose from 0.17 in 2010 to 0.53 in 2022, indicating a gradual but consistent development in export competitiveness. Recent years have seen a notable structural change, with RCA increasing to 0.83 in 2023 and beyond the unity level to 1.13 in 2024, indicating the appearance of revealed comparative advantage. Better export infrastructure, more quality compliance, and rising demand for Indian bananas abroad could all be responsible for this improvement. However, the findings indicate that banana exports were not competitive for a significant portion of the research period, with competitiveness increasing in recent years.

Year	RCA Banana	RCA Orange	RCA Grapes
1991	0.00	0.10	0.58
1992	0.02	0.11	0.63
1993	0.01	0.07	0.67
1994	0.01	0.14	0.85
1995	0.01	0.16	0.71
1996	0.00	0.18	0.58
1997	0.06	0.15	0.64
1998	0.07	0.10	0.35
1999	0.06	0.28	0.52
2000	0.08	0.29	0.61
2001	0.07	0.30	0.42
2002	0.05	0.23	0.66
2003	0.04	0.37	0.57
2004	0.05	0.22	0.63
2005	0.07	0.22	0.89
2006	0.04	0.15	1.06
2007	0.05	0.11	0.81
2008	0.10	0.09	0.93
2009	0.20	0.08	0.95

2010	0.17	0.05	0.89
2011	0.08	0.11	0.48
2012	0.10	0.10	0.64
2013	0.09	0.06	0.81
2014	0.13	0.05	1.11
2015	0.24	0.08	0.70
2016	0.28	0.11	1.36
2017	0.19	0.07	1.48
2018	0.22	0.04	1.49
2019	0.29	0.21	1.70
2020	0.36	0.44	1.40
2021	0.47	0.38	1.42
2022	0.53	0.32	1.40
2023	0.83	0.16	1.46
2024	1.13	0.18	1.53

Sources: FAO STAT

Orange

For orange exports, the RCA values show a persistent comparative disadvantage over the course of the study. RCA values fluctuated between 0.04 and 0.44 between 1991 and 2024, staying well below one and showing no indication of achieving revealed comparative advantage. Even though there were slight improvements in several years, especially in 2020 and 2021, the values remained low of the crucial unity barrier. The persistent comparative disadvantage points to structural limitations in orange exports, including a small export surplus, phytosanitary and quality problems, and fierce competition from well-established international exporters. Orange exports from India have not reached global competitiveness despite the country's capacity for production, underscoring the need for targeted policy support, better post-harvest management, and market diversification.

Grapes

In India's export basket, grapes show a strong and persistent demonstrated comparative advantage over bananas and oranges. RCA values for grapes were less than unity in the early years of the study period, indicating comparative disadvantage. But starting in the mid-2000s, there is a noticeable improvement.

RCA values increased from 1.06 in 2006 to 1.53 in 2024, continuously surpassing one since 2006. The steady rise is a reflection of India's growing competitiveness in grape exports, which is bolstered by export-oriented production systems, adherence to global quality standards, and growing demand in international markets. Grapes have become one of India's most competitive fruit exports in the post-liberalization era, according to the comparatively steady and increasing RCA trend.

Comparative Assessment

Grapes have the strongest revealed comparative advantage, according to a comparative analysis of RCA values, followed by bananas, which have become more competitive in recent years, and oranges,

which have continuously been non-competitive during the study period. In order to improve India's performance in the international fruit trade, the results highlight the significance of fruit-specific export strategies as opposed to a homogeneous strategy competitive fruit exports from India during the post-liberalization era.

Conclusion and Policy Implications

The study examined India's export competitiveness in selected fruits—banana, grapes, and orange—during the post-liberalisation period from 1991 to 2024, using export share analysis and the revealed comparative advantage approach.

The findings show that India's success in the international fruit trade varies significantly depending on the commodity.

Rising export share and continually high RCA values demonstrated grape exports' substantial and sustained export competitiveness. For the most of the study period, banana exports exhibited a sustained comparative disadvantage; however, recent improvements in export share and RCA values suggest growing competitiveness. Orange exports, on the other hand, continued to be relatively disadvantaged throughout, with low export share and RCA values.

The results demonstrate that India's fruit export competitiveness is commodity-specific, highlighting the necessity of distinct policy approaches as compared to standard export strategies.

Policy Implications

1. Emphasis on competitive fruits: Through market diversification and the promotion of value-added exports, policy support should give priority to fruits with a proven comparative advantage, especially grapes.
2. Encourage new exports: Given the recent increase in banana exports, export incentives, improved cold-chain infrastructure, and assistance with quality certification are all necessary.
3. Address weak segments: To enhance post-harvest management, quality compliance, and access to global markets, orange exports need targeted interventions.
4. Strengthen export infrastructure: To maintain and improve fruit export competitiveness, investments in logistics, storage, and export-oriented supply chains are essential.
5. Research scope: To provide a more thorough evaluation of India's fruit export performance, more studies may take price competitiveness, instability, and trade orientation into account.

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