

An Analytical Study of the Fluctuations in Grape Exports from Nashik District

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Abstract

Nashik district, the undisputed grape capital of India, contributes over 80% of the nation's fresh grape exports and serves as the epicenter of a dynamic agricultural export economy. This study presents an analytical examination of fluctuations in grape exports from the Nashik district, exploring the multidimensional factors driving volatility in export volumes, values, and market destinations. Drawing upon empirical data from the 2017–18 to 2025–26 seasons, the study identifies weather variability and climate change as the primary drivers of production instability, with unseasonal rainfall and hailstorms causing up to 50% yield reductions and an estimated ₹3,500 crores industry loss. Geopolitical disruptions, including Middle Eastern tensions and the Suez Canal blockage, emerged as critical secondary factors exacerbating market instability. This study further analyzes structural constraints, including high production costs (18% GST on inputs), expensive protective cultivation (₹4 lakhs per acre for plastic covers), and unfavorable crop insurance policies that amplify vulnerability. Despite these challenges, the sector demonstrates resilience through export diversification, with non-European markets growing by 20.5% in 2024–25, and the emergence of weather-resilient proprietary grape varieties offering a pathway to stability. This study recommends a comprehensive policy framework encompassing climate-adaptive infrastructure, financial risk mitigation mechanisms, market diversification strategies, and institutional reforms to stabilize Nashik's grape export ecosystem.

Keywords: *Grape Exports, Nashik District, Export Fluctuations, Climate Change Impact, Agricultural Trade, Market Diversification*

1. INTRODUCTION

The Nashik district, located in Maharashtra's western region, has emerged as India's preeminent grape production and export hub. With cultivation spanning approximately 58,367 hectares across key talukas, including Niphad (22,000 ha), Dindori (15,758 ha), Nashik (11,671 ha), and Chandwad (5,148 ha), the district sustains over 65,000 grape farmers and a vast network of exporters, processors, and ancillary service providers. The district's contribution to India's grape export basket is substantial, accounting for over 80% of the nation's total fresh grape exports, making its performance critical to India's agricultural foreign-exchange earnings.

The significance of grape exports extends beyond regional economic development and national trade balances. In the 2024–25 season, India exported 271,253 metric tonnes of grapes, earning approximately ₹3,050 crores in foreign exchange. These exports flow primarily to European markets, including the Netherlands, Germany, the United Kingdom, and France, alongside growing destinations in the Middle East, Russia, Southeast Asia, and China. The grape export value chain represents a sophisticated system integrating smallholder farmers, producer organizations, exporters, cold chain logistics providers, and international buyers, all operating within a framework of quality standards mandated by the Agricultural and Processed Food Products Export Development Authority (APEDA).

However, this export-oriented agricultural system is volatile. Export volumes have fluctuated significantly across seasons, from a peak of 343,982 MT in 2023–24 to a decline to 271,253 MT in 2024–25, and further to an estimated 140,000 MT in 2025–26—a cumulative decline of nearly 60% from the peak. These fluctuations are not merely statistical anomalies but represent real economic distress for farmers, with reported farmer suicides and widespread vineyard plowing in response to the crisis. Therefore, understanding the drivers, patterns, and implications of these fluctuations is essential for designing effective policy interventions and building sectoral resilience.

This study aims to analytically examine the fluctuations in grape exports from the Nashik district, identify the key determinants of export volatility, assess their relative impacts, and propose evidence-based recommendations for stabilization. This study is situated at the intersection of agricultural economics, climate science, and international trade analysis, recognizing that export performance is shaped by a complex interplay of production-side constraints, market dynamics, and geopolitical factors.

2. STATEMENT OF THE PROBLEM

Grape exports from the Nashik district exhibit pronounced and increasing volatility, manifested in significant inter-seasonal variations in export volumes, values, and market composition. While India's grape exports demonstrated a broadly positive long-term trend from 2017–18 to 2023–24—growing from 188,221 MT to 343,982 MT—the subsequent two seasons witnessed a sharp reversal, with exports declining by 21% in 2024–25 and a further 9.6% in 2025–26. Alarming, production forecasts for the 2025–26 season indicate a potential 40–50% reduction in yields, threatening an estimated US\$420 million in industry value.

Instability is not merely quantitative but also structural. Market concentration risks persist, with European markets absorbing the majority of exports and creating vulnerability to regional demand shocks. Simultaneously, production costs continue to escalate—farmers face 18% GST on fertilizers and pesticides (amounting to approximately ₹50,000 per acre annually), while protective cultivation costs ₹4 lakh per acre without adequate government subsidy support. The cumulative effect is a sector in which farmers bear disproportionate risks while receiving inadequate institutional protection.

This problem is further compounded by the systemic nature of recent disruptions. Unlike isolated weather events, prolonged rainfall from May to October 2025 represents a structural breakdown in the crop cycle rather than a temporary delay. This shift from episodic to systemic risk demands analytical attention and policy recalibration.

3. RESEARCH OBJECTIVES

1. To analyze the trend and pattern of grape export volumes from Nashik district over the period 2017–18 to 2025–26.
2. To identify and assess the key factors contributing to fluctuations in grape exports, including climatic, geopolitical, economic, and institutional determinants.
3. To evaluate the impact of export fluctuations on the economic well-being of grape farmers and the broader export ecosystem.
4. To examine market diversification trends and their implications for export stability.
5. To propose evidence-based recommendations for stabilizing grape exports and enhancing sectoral resilience.

4. METHODOLOGY

4.1 Research Design

This study employs an analytical research design that combines quantitative trend analysis with a qualitative assessment of causal factors. This approach integrates secondary data analysis from government sources and industry reports with a review of stakeholder perspectives documented in industry communications.

4.2 Data Sources

Secondary Data: Export data for grape shipments from the Nashik district and India were compiled from multiple sources, including APEDA export statistics, Maharashtra State Agriculture Department records, and industry publications, including the Free Press Journal, Times of India, and FreshPlaza. The primary data period spans 2017–18 to 2025–26, enabling the analysis of both pre- and post-pandemic trends.

Industry Reports: Supplementary data were drawn from stakeholder communications by the Grape Exporters Association of India (GEAI), Sahyadri Farms, and Nashik Grape Growers Association. These sources provided qualitative insights into the constraints facing the sector and the adaptive strategies employed.

4.3 Analytical Framework

Time Series Analysis: Export data were analyzed using time series methods to identify trends, cyclical patterns, and structural breaks. Compound Annual Growth Rates (CAGR) were estimated for different sub-periods to assess changes in growth trajectories.

Instability Index: Following the established agricultural economics methodology, an Instability Index was computed to quantify the degree of volatility in export quantities. The index, measured as the coefficient of variation adjusted for trends, enables a comparison of instability across different periods.

Market Concentration Analysis: The Herfindahl-Hirschman Index (HHI) was used to assess market concentration and diversification trends. Although a full gravity model was not implemented, the analysis draws upon established gravity model frameworks from analogous grape export studies to contextualize the findings.

Causal Analysis: A thematic analysis of the reported causes of export fluctuations was conducted, categorizing factors into climatic, geopolitical, economic, and institutional dimensions. The relative significance of each factor was assessed based on the reported magnitudes of the impact.

4.4 Limitations

This study relies on secondary data and does not incorporate primary survey data from farmers. The accuracy of export estimates may vary among reporting agencies. Additionally, the analysis of causal relationships is constrained by data availability and does not establish a definitive causal inference.

5. ANALYSIS

5.1 Trend Analysis of Grape Exports

National Export Trends (2017–18 to 2024–25):

Season	Export Volume (MT)	Value (₹ Crore)	Year-on-Year Change (%)
2017-18	188,221	1,900	---
2018-19	246,133	2,335	+30.8%
2019-20	193,690	2,177	-21.3%
2020-21	246,107	2,298	+27.0%
2021-22	263,075	2,302	+6.9%
2022-23	267,950	2,543	+1.9%
2023-24	343,982	3,460	+28.4%
2024-25	271,253	3,050	-21.1%
2025-26 (est.)	~140,000	~1,600	-48.4%

Source: APEDA and Agriculture Department data

This trend reveals a cyclical pattern characterized by alternating growth and contraction phases. The pre-pandemic period (2017–2020) exhibited volatility with a modest growth trajectory (CAGR: 1.5). Post-pandemic recovery (2021–2024) demonstrated stronger growth, culminating in a peak in 2023–24. However, the subsequent sharp decline highlights the sector's vulnerability to external shocks.

Nashik Export Trends: Nashik's exports for 2024–25 remained stable at 157,000 MT, matching the previous season's volume. However, this stability masks significant market composition shifts: exports to European markets declined by 6.8% (from 118,000 MT to 110,000 MT), whereas exports to non-European destinations increased by 20.5% (from 39,000 MT to 47,000 MT). The 2025–26

season witnessed a 9.6% decline to 140,000 MT, with early indications of a further 40–50% production reduction threatening the 2026 export season.

5.2 Factors Contributing to Export Fluctuations

5.2.1 Climatic Factors

Weather variability is the most significant and recurring driver of export fluctuations. The 2025–26 season exemplifies the catastrophic impact of adverse weather, as continuous rainfall from May to October 2025 disrupted critical phenological stages, including flowering and fruit set. Approximately 45,000 hectares of vineyards were severely damaged, with agricultural experts estimating a 40–50% reduction in production in the affected areas. The damage is structural rather than episodic—unlike the 2024 rains, which merely delayed production, the 2025 rainfall caused systemic failure of the crop cycle, forcing farmers to plow established vineyards.

The mechanism of weather impact operates through multiple pathways: (1) disruption of photosynthesis due to insufficient sunlight during critical growth periods, (2) increased susceptibility to fungal diseases, including downy mildew and anthracnose, under humid conditions, (3) physical damage to fruit bunches, and (4) impossibility of standard agronomic operations (pruning, spraying, canopy management) due to waterlogged conditions. The cumulative effect is a 25–30% reduction in exportable yield, with localized losses reaching 80% in severely affected areas.

5.2.2 Geopolitical Factors

Geopolitical disruptions constitute the second major category of destabilizing factors. The 2025–26 season witnessed rising tensions involving Iran, Israel, and the United States, destabilizing Middle Eastern markets and slowing export demand. Nashik's exports fell by 35% during this period, with only 54,825 MT exported compared with 83,146 MT in the previous season.

The Suez Canal blockage in 2023–24 provided another demonstration of geopolitical risk. The disruption extended shipping times to European markets from 30–35 days to up to 45 days, raising concerns about product quality degradation and increasing transportation costs and insurance premiums. Although sustained European demand mitigated the damage, this episode underscored the vulnerability of just-in-time perishable supply chains to global chokepoint disruptions.

5.2.3 Economic and Structural Factors

Production Cost Escalation: The cost of cultivation has increased substantially. Farmers pay 18% GST on fertilizers and pesticides, amounting to approximately ₹50,000 per acre annually. Protective cultivation using plastic covers, essential for mitigating weather damage, costs ₹4 lakhs per acre without adequate subsidy support. Despite a decade-old government promise of a 50% subsidy, this support has not materialized. Rising costs coupled with declining yields have severely compressed profit margins.

Export Market Barriers: Bangladesh, which accounts for 28% of India's grape exports (approximately 60,000 MT), imposes a heavy import duty that rose from ₹65/kg to ₹104/kg in the last season, reducing exports by more than 20%. This unilateral trade barrier adjustment created significant market disruptions, forcing exporters to seek alternative destinations.

Shipping and Logistics Challenges: Rising transportation costs and higher insurance premiums, exacerbated by global uncertainties, have increased the frictional costs of trade. For the 2026 season, exporters report that elevated cost prices require sustained European market sales prices of €13.75–14 per carton to remain sustainable, compared to the typical expectation of €9–10 per carton for Indian grapes.

5.2.4 Institutional Factors

Unfavorable Insurance Policies: Current crop insurance policies are implemented in October; however, heavy rains often damage vineyards in September, leaving farmers without compensation. Additionally, temperature drops below 5°C in November, which halts fruit growth and affects overall production, are not covered by insurance policies. These exclusions leave farmers bearing climate risk without adequate institutional protection.

Limited Government Support: Despite persistent demands from farmer organizations, key support mechanisms are inadequate. The promised subsidy for plastic covers has not been implemented, support for solar pumps to address load-shedding challenges remains insufficient, and government procurement schemes for raisin production (diverting to school mid-day meals) have not been materialized.

5.3 Export Market Dynamics and Diversification

Market Concentration: The Dutch market continues to dominate Nashik's grape exports, absorbing 53,655 metric tons (MT) (3,781 containers) in the 2025–26 season. Germany (605 MT), the United Kingdom (280 MT), Norway (117 MT), France (63 MT), and Belgium (52 MT) are the primary European destinations. While European markets have historically provided price premiums and stable demand, this concentration creates vulnerability to regional economic shocks and regulatory changes.

Emerging Market Diversification: Despite the persistent dominance of European markets, recent trends indicate meaningful diversification in emerging markets. Exports to non-European destinations increased by 20.5% in 2024–25, reaching 47,000 MT. Key emerging destinations include the UAE, Russia, Saudi Arabia, Malaysia, Singapore, Oman, China and Sri Lanka. This diversification, while still modest relative to European volumes, provides a buffer against concentrated-demand shocks.

Strategic Implications: The growing importance of non-European markets, particularly the Middle East and Southeast Asia, suggests opportunities for export portfolio optimization. Shorter transit times to these markets may reduce quality risks and shipping costs, potentially improving their competitiveness. However, these markets may not command the same price premiums as European buyers, requiring careful balancing of volume and value objectives to ensure profitability.

5.4 Varietal Shifts and Adaptation Responses

A significant development in this sector is the shift toward new proprietary grape varieties with superior weather resilience. Varieties such as Cherry Crunch, Fire Crunch, and Allison have demonstrated substantially better performance under rainy conditions compared to traditional varieties like Thompson Seedless, which experienced yields of only 50% of normal levels and, in some blocks, as low as 10%.

Early adopters of these varieties are experiencing better outcomes, with exporters noting that these varieties “withstood the rains well.” The shift toward red varieties represent an adaptation strategy that could enhance the sector's resilience to climate variability, albeit with implications for production systems and market positioning.

5.5 Instability Analysis

Quantifying the degree of export instability using the Instability Index reveals increasing volatility in recent years. While the pre-pandemic period exhibited moderate instability (Index: 0.21), the post-2020 period demonstrated higher instability (Index: 0.34), driven by the compound effects of pandemic disruptions, climate events, and geopolitical shocks. The 2025–26 season represents an acceleration of this trend, with current indicators suggesting volatility levels exceeding historical ranges.

6. RECOMMENDATIONS

6.1 Climate Adaptation and Risk Mitigation

1. Accelerated Subsidy for Protective Cultivation: The long-standing demand for subsidized plastic covers must be urgently addressed. A comprehensive subsidy program targeting 50% of the ₹4 lakh per acre cost should be implemented with transparent distribution mechanisms. This investment would provide immediate climate protection while reducing the long-term vulnerability.

2. Develop Climate-Resilient Varieties: Government and industry should accelerate the introduction and dissemination of weather-resilient grape varieties through the National Agricultural Research System. The success of proprietary varieties, such as Cherry Crunch, demonstrates the viability of this approach. A public-private partnership model should be established for varietal development and distribution.

3. Strengthening Weather Forecasting and Advisory Services: Investments in high-resolution, crop-specific weather forecasting and decision-support systems are essential. This should provide location-specific guidance on agronomic operations, disease management, and harvest timing to help farmers optimize operations under variable weather conditions.

6.2 Financial Risk Management

1. Reforming Crop Insurance: The crop insurance regime requires comprehensive reform. Coverage should commence earlier (pre-monsoon), include temperature-related losses, and provide compensation for pre-harvest losses. Simplified claim processes and timely disbursements are essential to build farmer confidence.

2. Establish an export stabilization fund: An export stabilization fund, capitalized through a small levy on export proceeds and government contributions, could provide compensation to exporters during periods of acute market disruption, mitigating the impact of geopolitical or trade shocks.

3. Credit Support for Transition: To facilitate the shift toward weather-resilient varieties and protective cultivation, concessional credit through the Kisan Credit Card system should be expanded. Special packages for vineyard replanting and rehabilitation after weather-related damage should be introduced.

6.3 Market Development and Diversification

1. Target Market Diversification: A strategic approach to market development should aim for a more balanced export portfolio, reducing reliance on any single market. Focus markets should include the Middle East, Southeast Asia, and Russia, where logistics advantages and growing demand offer expansion opportunities.

2. Strengthening Brand Positioning: The quality and distinctive characteristics of Nashik grapes provide a foundation for premium market positioning. Investments in branding, certification, and compliance with international quality standards should be increased.

3. Engaging in Trade Diplomacy: The issue of import duties—particularly Bangladesh's punitive tariffs—requires active diplomatic engagement. Trade negotiations should seek to reduce market barriers while ensuring reciprocity and sectoral advantages.

6.4 Institutional and Policy Reforms

1. GST Rationalization: The 18% GST on fertilizers and pesticides imposes a significant burden on grape farmers. Removing or substantially reducing this levy would directly reduce production costs and improve the industry's competitiveness.

2. Enhanced Extension Services: Strengthened agricultural extension services focusing on modern cultivation practices, integrated pest management, and post-harvest handling would improve productivity and quality simultaneously.

3. Address Farmer-Trader Trust Deficit: The exploitation of farmers by unscrupulous traders, which has led to widespread losses in nearby grape-growing regions, requires institutional intervention. Mandatory registration of traders, transparent auction mechanisms, and dispute resolution frameworks would build trust and stability.

7. CONCLUSION

This analytical study reveals that grape exports from the Nashik district are subject to pronounced and increasing volatility driven by the complex interplay of climatic, geopolitical, economic, and institutional factors. Climate change, manifested in unseasonal rainfall and hailstorms, has emerged as the most significant driver, with the 2025 rains causing systemic crop failure rather than temporary disruption. Geopolitical shocks, including Middle East tensions and the Suez Canal blockage, compound this vulnerability, while economic constraints, including high production costs, punitive import duties, and inadequate insurance coverage, amplify the sector's exposure.

However, the sector demonstrates remarkable resilience. Export diversification toward non-European markets, the adoption of weather-resilient varieties, and the adaptive capacity of farmers and exporters provide a foundation for recovery and future growth. The key challenge for policy is to address systemic vulnerabilities while nurturing the sector's inherent strengths.

The urgency of reform cannot be overstated. With farmers facing financial ruin, reported suicides, and widespread vineyard plowing, the stability of Nashik's grape-export ecosystem is at a critical juncture. A comprehensive policy framework encompassing climate adaptation, financial risk management, market diversification, and institutional strengthening is essential to safeguard the livelihoods of over 65,000 families and preserve India's position in the global grape market.

The path forward requires partnerships among the government, industry, research institutions, and farmers. By addressing the structural determinants of export fluctuations while building on the sector's adaptive capacity, Nashik can transition from vulnerability to resilience, ensuring the sustainability of its grape export economy for future generations.

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