



International Journal of Agriculture and Food Science

ISSN Print: 2664-844X
 ISSN Online: 2664-8458
 NAAS Rating (2026): NAAS
 Rating (2026): 4.97
 IJAFS 2026; 8(9): 662-668
www.agriculturaljournals.com
 Received: 29-07-2026
 Accepted: 30-08-2026
 Published: 21-09-2026

Shravani Babasaheb Shinde

Postgraduate Scholar, Division of Agribusiness Management, Dr. Sharadchandra Pawar College of M.B.A. (Agri.), Baramati, affiliated to Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahilyanagar, Maharashtra, India

RB Shinde

Research Guide and Assistant Professor, Division of Agribusiness Management, Dr. Sharadchandra Pawar College of M.B.A. (Agri.), Baramati, affiliated to Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahilyanagar, Maharashtra, India

Corresponding Author: Shravani Babasaheb Shinde

Postgraduate Scholar, Division of Agribusiness Management, Dr. Sharadchandra Pawar College of M.B.A. (Agri.), Baramati, affiliated to Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahilyanagar, Maharashtra, India

A comparative assessment of WTO policies and tariff changes: Evidence from developed and developing economies

Shravani Babasaheb Shinde¹, RB Shinde²

DOI: <https://www.doi.org/10.33545/2664844X.2026.v8.i9i.1932>

ABSTRACT

Agriculture continues to occupy a central place in international trade, with direct implications for food security, farmer income and export competitiveness. Since the World Trade Organization's (WTO) Agreement on Agriculture (AoA) came into force in 1995, member countries have operated under differentiated commitments on market access, domestic support and export competition, yet three decades on, the practical effects of this framework remain uneven between developed and developing economies. The present study examines WTO-related trade policy at three levels: the global/country level, the comparative developed-versus-developing tariff and support-regime level, and the firm level, through a primary survey of 205 agricultural exporters across five districts of Maharashtra — Pune, Nashik, Sangli, Kolhapur and Satara. Secondary data drawn from the WTO, OECD, APEDA, FAO and UNCTAD were used to describe country-wise agricultural exports and compare tariff and domestic-support regimes, while primary data, analysed through composite Likert-scale indices, Pearson correlation and multiple linear regression, were used to test whether tariff and quota exposure are significantly associated with export performance and to profile the risk-management issues exporters face. The findings show that developed economies operate with low bound and applied agricultural tariffs, while India, like Brazil, China and Indonesia, maintains a wide gap between bound and applied rates, an asymmetry that persisted rather than narrowed between 2023 and 2024/25. At the firm level, 81.0 per cent of sampled exporters reported that tariffs had raised their product cost and 25.9 per cent reported facing explicit quota restrictions. A multiple regression of the Export Performance Index on the Tariff Impact Index and Quota Restriction Index was statistically significant, $F(2, 202) = 741.368, p < 0.001$, explaining 88.0 per cent of the variance (Adjusted $R^2 = 0.879$), with both predictors significant at the one per cent level ($\beta = 0.510$ and $\beta = 0.415$ respectively). Documentation errors and labelling non-compliance, rather than residue failure, emerged as the leading causes of consignment rejection (25.4 per cent of exporters affected), and a gap between nearuniversal APEDA registration (94.6 per cent) and actual incentive utilisation (72.7 per cent) was identified. The study concludes that tariff and quota conditions are a genuine and statistically strong driver of export performance, and that continued WTO-level negotiation on tariff escalation should be paired with operational and informational support — simplified documentation, market intelligence and SPS/TBT capacity-building — for Maharashtra's agricultural exporters.

Keywords: World Trade Organization, Agreement on Agriculture, Tariff and quota, Agricultural exports, SPS/TBT compliance, Export performance, Maharashtra

Introduction

Agriculture plays a crucial role in the global economy by ensuring food security, employment, income generation and foreign exchange earnings, particularly for developing countries such as India. The establishment of the WTO, 1995 [38] marked a turning point in global agricultural trade through the Agreement on Agriculture (AoA), which rests on three pillars — market access, domestic support and export competition — and required members to convert non-tariff measures into bound tariffs, cap trade-distorting domestic support and reduce export subsidies. The pace of these commitments was deliberately differentiated: developed countries agreed to cut tariffs by an average of 36 per cent over six years (1995–2000), while developing countries committed to a 24 per cent cut over ten years (1995–2004), with least-developed countries exempted altogether.

Three decades on, the practical effects of this differentiated framework remain uneven. Developed countries continue to provide substantial domestic support to their farm sectors through permissible mechanisms, while tariff escalation — higher duties on processed goods than on raw commodities — continues to limit the ability of developing-country exporters to move up the value chain. At the same time, non-tariff mea-

asures such as sanitary and phytosanitary (SPS) requirements and technical barriers to trade (TBT) have become increasingly significant determinants of market access, often imposing disproportionate compliance costs on exporters from developing economies. Maharashtra, with its concentration of grape, pomegranate, onion and processed-food exporters across Nashik, Sangli, Pune, Kolhapur and *Satara* districts, offers a particularly relevant setting in which to examine how individual exporting firms actually experience tariff and quota exposure, as distinct from the country-level averages reported in WTO and OECD statistics.

This study analyses WTO policies and tariff changes and their impact on agricultural commodity trade in developed and developing countries, with special reference to India's export competitiveness under WTO rules, and — through a primary survey of 205 agricultural exporters in Maharashtra — examines directly whether the tariff and quota conditions exporters report facing are statistically associated with their export performance.

Objectives of the study

1. To study the country-wise agricultural exports, major commodities, and trade policies under the WTO framework.
2. To compare the tariff regimes, tariff escalation, and domestic support policies of developed and developing countries.
3. To study the relationship between tariff and quota on the export of agricultural products.
4. To analyse risk management issues and trade barriers affecting agricultural exporters in developing countries.

Hypotheses

H₀ (Null Hypothesis): There is no significant relationship between tariff and quota measures and agricultural export performance.

H₁ (Alternative Hypothesis): There is a significant relationship between tariff and quota measures and agricultural export performance.

Review of literature

The literature was reviewed under four thematic areas corresponding to the study's four objectives: (i) country-wise agricultural exports and the WTO framework, (ii) comparative tariff regimes and domestic support, (iii) tariff, quota and export performance, and (iv) risk management and trade barriers.

Country-wise agricultural exports and the WTO framework

The World Trade Organization (2022) [40] examined the role of the AoA in regulating international agricultural trade and found that substantial differences persist among countries in tariff structures, domestic support and treatment of sensitive products. Narayan *et al.* (2019) [21] found India's export position relatively strong in rice, cotton and sugar but comparatively weaker in wheat, underlining the importance of examining commodities individually. Sharma, Kathuria and Kaur (2022) [30] similarly showed that competitiveness varies substantially across Indian agricultural products, with quality, processing and diversification identified as key levers. Kannan *et al.* (2022) [17] and Elumalai *et al.* (2023) [7], examining India's export growth through intensive and extensive trade margins, found growth mainly associated with existing products and markets, while diversification of products and destinations offered further scope for expansion. Siddique *et al.* (2026) [32] provided cross-country evidence that diversification of agricultural products and trading partners strengthens export resilience among developing economies. Collectively, this literature establishes that agricultural exports are shaped by the WTO framework, commodity-specific competitiveness and diversification, and supports the present study's country-wise and commodity-wise examination of exports.

Comparative tariff regimes and domestic support

Bureau *et al.* (2019) [5] and the OECD (2021, 2023) documented those tariff escalation — higher duties on processed products than raw materials — restricts value addition in developing countries, while tariff peaks concentrate on sensitive products. Sharma, Lahiri, Neogi and Akhter (2022) [31] and Brink and Orden (2020, 2023) found substantial asymmetries in agricultural domestic support between developed and developing WTO members, with developed economies possessing far greater fiscal capacity to support producers within WTO rules. The OECD's assessment of India (2022, 2025) noted that Indian agricultural support is closely linked to food security and smallholder livelihoods rather than developed-country-style producer transfers, a compositional difference this study returns to in its findings. UNCTAD, WTO and ITC's (2022) [35] World Tariff Profiles confirm that average tariffs conceal considerable protection on individual sensitive product lines. This literature establishes that agricultural protection cannot be assessed through average tariff rates alone, and supports the present study's comparison of bound and applied tariffs and domestic support between developed and developing economies.

Tariff, quota and export performance

Beckman, Gale and Lee (2021) [1] and Hezarkhani, Arisian and Mansouri (2023) [15] showed that the trade effect of a tariff-rate quota depends as much on administration, allocation and transparency as on the headline quota quantity. Emlinger *et al.* (2021) [8] demonstrated that the structure of agricultural duties — specific versus ad valorem — materially affects developing-country exporters. Grant *et al.* (2021) [13] and Gopinath (2021) [11] linked retaliatory tariffs and trade-policy uncertainty to disruption in agricultural export markets, while Sun, Su, Mirza and Umar (2021) [33] showed that such uncertainty affects commodity prices and market expectations even before any tariff is actually changed. Wang *et al.* (2023) [36] and Siddique *et al.* (2026) [32] found that product and market diversification meaningfully reduces agricultural export volatility and vulnerability to tariff or quota shocks in a single destination. This body of work provides the theoretical foundation for empirically testing, as this study does, whether firm-level tariff and quota exposure is significantly related to export performance.

Risk management and trade barriers

Gourdon, Stone and van Tongeren (2020) [12] and UNCTAD (2021, 2022) classified non-tariff measures — SPS requirements, TBT regulations, licensing and documentation — as an increasingly important, and increasingly costly, determinant of market access, with developing-country exporters disadvantaged by limited testing and certification infrastructure. Jha *et al.* (2021) [16] and Nirajan, Shivakumar, Prahadeeswaran and Rohini (2021) [22] found SPS/TBT measures to be significant for India's agricultural exports, particularly to the European Union. Rozhkova *et al.* (2021) [29] and Baranauskaitė and Jurevičienė (2021) classified agricultural export risk into supply, demand, operational, logistics, political, regulatory and financial categories, emphasising that exporters face interconnected rather than isolated risks. Karagulle (2026) [19] found that while several categories of SPS/TBT measures reduce agricultural exports, well-designed standards can also improve trade by strengthening buyer confidence. This literature provides a strong conceptual basis for the study's examination of consignment rejection, compliance cost and risk-management practice among Maharashtra's agricultural exporters.

Materials and methods

Research design

The study adopted a descriptive and analytical research design. Objectives 1 and 2 were addressed through a descriptive-comparative design using secondary statistics from the WTO, OECD, APEDA, FAO and UNCTAD, with a 2023-versus-2024 comparison presented wherever the underlying sources allowed it. Objectives 3 and 4 followed a descriptive-cum-hypothesis-testing design, using a structured

primary survey to test, through correlation and regression analysis, whether tariff and quota exposure is significantly associated with export performance, and to profile the risk-management issues and trade barriers exporters report facing.

Area of study and sampling design

The primary-data component was confined to five districts of Maharashtra — Pune, Nashik, Sangli, Kolhapur and *Satara* — selected purposively as the state's principal agricultural export belt. A purposive sampling method was used to identify agricultural exporters — merchant exporters, manufacturer exporters, producer exporters, cooperatives and Farmer Producer Organisations (FPOs) — actively engaged in exporting agricultural commodities from these districts. A total of 205 agricultural exporters were surveyed, with the sample size determined with reference to the Krejcie *et al.* (1970) [20] method for determining sample size for research activities. Table 1 presents the district-wise distribution of the sample.

Table 1. District-wise Sample Distribution (*N* = 205)

District	No. of Respondents	Percentage (%)
Nashik	114	55.6
District	No. of Respondents	Percentage (%)
Sangli	38	18.5
Pune	28	13.7
Kolhapur	9	4.4
<i>Satara</i>	6	2.9
Total	205	100.0

Source: Primary survey data.

Data collection and sources

Primary data were collected through a structured questionnaire administered to the 205 sampled exporters, covering respondent and firm profile, export performance, tariff awareness and impact, quota restrictions and utilisation, consignment rejection experience, cost structure and export lead time, APEDA registration and government incentive utilisation, and five Likert-scale (1–5) item batteries measuring perceived tariff impact, quota restriction severity, SPS/TBT compliance burden, government support adequacy and export performance. Secondary data supporting Objectives 1 and 2 were drawn from WTO Agreement on Agriculture texts, World Tariff Profiles and Tariff and Trade Data country profiles, OECD Agricultural Policy Monitoring and Evaluation reports, APEDA Annual Administrative Reports, FAO, UNCTAD and World Bank sector reports, and USDA Foreign

Agricultural Service bilateral trade data.

Analytical tools

Data were analysed using percentage and frequency analysis; tabular and graphical presentation; composite Likert-scale indices constructed by averaging each five-point item battery, with internal consistency reliability assessed using Cronbach's α ; Pearson correlation analysis; and multiple linear regression, with the Export Performance Index regressed jointly on the Tariff Impact Index and the Quota Restriction Index. The Pearson correlation coefficient was computed as $r = \Sigma(x - \bar{x})(y - \bar{y}) / \sqrt{[\Sigma(x - \bar{x})^2 \Sigma(y - \bar{y})^2]}$, and Cronbach's α as $\alpha = [k/(k-1)] \times [1 - (\Sigma\sigma_i^2 / \sigma^2_{\text{total}})]$. All analysis was carried out using Python (pandas, scipy) and cross-verified in MS Excel. The questionnaire was pretested prior to the main survey, and participation was entirely voluntary, with no commercially sensitive information requested.

Results and discussion

Country-wise agricultural exports and the WTO framework

Global agricultural export activity remains concentrated among a relatively small set of countries, with the United States and Brazil consistently ranked among the top exporters by value. India has steadily strengthened its position within this group, aided by its scale in cereals, marine products and spices, ranking as the world's second-largest cereal exporter in CY2024 with export value of about USD 12.11 billion. Marine products constitute India's single largest agricultural export category, at roughly USD 7.45 billion in FY2025, while spice exports crossed USD 4.5 billion in the same period. Processed food exports grew by close to 37 per cent in FY2024-25 relative to FY2021-22, though India's processed-food share of total agricultural exports remains around 17 per cent, well below the United

States (about 25 per cent) and China (about 50 per cent), reflecting continued dependence on primary and semi-processed commodities. The United States, the UAE, China and Bangladesh are India's largest destination markets.

Nearly every economy shown recorded a year-on-year increase in agricultural export value between 2023 and 2024, with the exception of Brazil (softer global soybean and grain prices) and Australia (a moderation from its 2022-23 record high). This broad-based growth occurred despite the persistent tariff and domestic-support asymmetries discussed below, suggesting that market-access conditions under the WTO framework, while unevenly distributed, have not on their own prevented most major exporters from growing their agricultural trade.

Table 2. Comparative Agricultural Export Value by Leading Country, 2023 vs. 2024 (USD billion)

Country/Bloc	2023 (USD bn)	2024 (USD bn)	Change
United States	~171.0	~172.4	+0.8%
Brazil	~143.0	~141.9	−0.8%
Netherlands	~125.8	~133.9	+6.5%
China	~68.1	~71.6	+5.2%
Indonesia	~43.9	~46.9	+6.8%
India	~50.0*	~51.0 (FY24-25)*	~flat/+2%

Source: Compiled from WTO-based trade-data (Visual Capitalist, 2026; Statbase, 2026) and, for India, APEDA (2025); figures are broadly comparable trend indicators rather than perfectly reconciled point estimates.

Comparative tariff regimes and domestic support

A central finding is the persistent and substantial gap between the tariff regimes of developed and developing WTO members, and, within developing countries, between bound (ceiling) and applied (actually charged) tariff rates.

Source: World Trade Organization (2024, 2026); World Tariff Profiles. China figures are indicative composites.

Developed economies such as the United States, the European Union, Canada and Australia operate with low bound ceilings and low applied rates, offering exporters predictability, even where the average conceals high protection on specific sensitive products such as dairy, sugar and selected fruits and vegetables. India, like Brazil, China and Indonesia, maintains bound tariffs far above its applied rates — a gap that grants domestic policymakers flexibility but simultaneously creates uncertainty for exporting partners. Notably, high agricultural tar

iff peaks are not exclusive to developing economies: Japan and South Korea maintain tariff peaks considerably higher than India's on politically sensitive products. This asymmetry persisted rather than narrowed between the 2023 and 2024/25 reference years, indicating a structural rather than transitional feature of the current WTO framework. Domestic support to agriculture reached a historic high globally, averaging USD 842 billion per year in 2021/23, concentrated

among China, the United States, India and the European Union, which together account for roughly 79 per cent of the global total; however, a large share of India's measured support takes the form of policies that hold consumer prices down rather than lift producer prices, a compositional difference that should be considered before comparing aggregate support figures across countries.

Table 3. Comparative Bound and Applied Agricultural Tariff Structures, 2023 vs. 2024/25

Country/Bloc	Bound Tariff (Agri.)	Applied ~2023	Applied ~2024-25	Notable Peaks
United States	~4.8%	~5.0%	~5.0%	Dairy/sugar TRQs; stable
European Union	~5.0%	~4.3%	~4.3%	Dairy up to 205%
Australia	~1-3%	~1-3%	~1-3%	Among most open agri markets
Brazil	~35.5%	~12-13%	~12.0%	Sugar/ethanol peaks
China	~15.7%*	~13.1%*	~13-14%*	TRQs on grain, cotton, sugar
India	~48.5% (all goods)	~15.8% (all goods)	~15.8% (2025)	Selected lines 100-300%

Profile of respondents and export performance

Table 4. Profile of Sampled Exporters ($N = 205$)

Particulars	Category	Percentage (%)
Nature of Business	Merchant Exporter	32.7
	Manufacturer Exporter	28.8
	Producer Exporter	25.9
Annual Export Turnover	₹5-25 Crore	77.6
	₹1-5 Crore	22.4
Years in Export Business	11-20 years	51.2
	6-10 years	30.2
Leading Commodity	Grapes	60.5
	Pomegranate	8.3

Source: Primary survey data.

Nashik district dominates the sample (55.6%), consistent with its position as Maharashtra's principal grape- and pomegranate-export hub, followed by Sangli (18.5%) and Pune (13.7%). The bulk of respondents (77.6%) fall in the ₹5-25 Crore annual turnover bracket, and over half (51.2%) have 1120 years of export experience, indicating a mature exporter base well placed to comment on tariff and quota conditions. The typical exporter handles an average annual export quantity of about 29.8 MT, valued at roughly ₹8.4 crore, and currently sells to close to three destination countries. Nearly two-thirds of exporters (64.4%) report increased export performance over the last five years, with only 12.2 per cent reporting a decline, a first indication that most sampled exporters have grown their business even while reporting considerable tariff and quota-related friction, formally tested in Section 4.5.

Tariff awareness, quota restrictions and compliance issues

A large majority of respondents (87.3%) report being aware of import tariff rates in their destination markets, and 81.0 per cent believe tariffs have increased their overall product cost, by an average of about 5.1 per cent; the average reported import tariff faced is 11.1 per cent. About one in four exporters (25.9%) reported having faced explicit export quota restrictions, most commonly seasonal quotas (30.2%) and tariff-rate quotas (28.3%), with an average quota-utilisation rate of 81.1 per cent among those affected — indicating that, for this sample, the binding constraint is less the existence of a quota than its level and predictability. A little over a quarter of exporters (25.4%) re-

ported having experienced consignment rejection, with documentation errors (21.2% of rejected cases) and labelling non-compliance (19.2%) the leading reasons, ahead of pesticide/chemical-residue rejection (13.5%) — a firm-level confirmation that procedural and administrative compliance, rather than physical product quality in the narrow sense, is the more frequent point of failure. Certification cost is the single largest component of exporters' compliance-cost burden (47.9% of the total), followed by transportation (36.9%), with an average export lead time of 15.8 days. APEDA registration is nearuniversal in the sample (94.6%), yet only 72.7 per cent report having received government export incentives, pointing to an awareness/utilisation gap. **Table 5. Tariff, Quota and Compliance Indicators ($N = 205$)**

Indicator	Value
Aware of import tariff rates	87.3%
Tariff increased overall product cost	81.0%
Average import tariff faced	11.1%
Faced export quota restrictions	25.9%
Average quota-utilisation rate (affected exporters)	81.1%
Experienced consignment rejection	25.4%
Leading rejection reason: documentation errors	21.2% of rejected cases
APEDA registration	94.6%
Received government export incentives	72.7%

Source: Primary survey data.

Composite indices, correlation and regression analysis

Five composite indices were constructed by averaging responses to each five-point Likert item battery, with internal-consistency reliability assessed using Cronbach's α (Table 6). The Tariff Impact Index shows acceptable reliability ($\alpha = 0.702$), and the Quota Restriction and SPS/TBT indices fall within the exploratory-research acceptable range ($\alpha \approx 0.65$), while the Government Support and Export Performance indices show weaker internal consistency ($\alpha = 0.51$ and 0.57 respectively), noted as a limitation in interpreting those two composites.

A multiple linear regression was conducted with the Export Performance Index as the dependent variable, and the Tariff Impact Index (X_1) and Quota Restriction Index (X_2) as predictors ($n = 205$). The overall model was statistically significant, $F(2, 202) = 741.368$, $p < 0.001$, with $R^2 = 0.880$ and Adjusted $R^2 = 0.879$ — indicating that the two indices jointly explain approximately 88 per cent of the variance in export performance, a very strong model fit.

Table 6. Composite Index Reliability and Descriptive Statistics ($N = 205$)

Composite Index	No. of Items	Cronbach's α	Mean	SD
Tariff Impact Index	10	0.702	3.67	0.44
Quota Restriction Index	10	0.651	3.24	0.41
SPS/TBT Compliance Burden Index	10	0.661	3.63	0.43
Government Support Index	6	0.511	3.38	0.47
Export Performance Index	8	0.574	3.83	0.41

Source: Computed from primary survey data.

Table 7. Regression Model Summary and ANOVA

R	R ²	Adjusted R ²	F (2, 202)	Sig.
0.938	0.880	0.879	741.368	< 0.001

Source: Computed from primary survey data.

Table 8. Regression Coefficients

Predictor	β (Unstd.)	Std. Error	t	Sig.	95% CI
(Constant)	0.619	0.084	7.352	< 0.001	[0.453, 0.785]
Tariff Impact Index	0.510	0.047	10.910	< 0.001**	[0.418, 0.602]
Quota Restriction Index	0.415	0.051	8.208	< 0.001**	[0.315, 0.514]

** Significant at the 1 per cent level ($p < 0.01$). Source: Computed from primary survey data.

At the individual predictor level, both the Tariff Impact Index ($\beta = 0.510$, $t(202) = 10.910$, $p < 0.001$) and the Quota Restriction Index ($\beta = 0.415$, $t(202) = 8.208$, $p < 0.001$) were positive and statistically significant predictors of export performance, and neither 95 per cent confidence interval contains zero. The Tariff Impact Index shows a somewhat larger effect size, suggesting tariff-related factors have a marginally stronger association with export performance in this sample, though both predictors contribute meaningfully. Since the F -test p -value and both individual predictor p -values are well below the 0.05 threshold, the null hypothesis (H_0) is rejected, confirming a statistically significant positive relationship between tariff and quota measures and agricultural export performance.

Risk management issues and trade barriers

When asked which WTO-level policy affects their exports most, respondents were fairly evenly spread across TBT/product standards (28.8%), tariff commitments (25.4%), tariff-rate quotas (23.9%) and SPS food-safety requirements (22.0%) — confirming that, from the exporter's own vantage point, nontariff and compliance-related measures are perceived as being at least as consequential as tariffs themselves. As secondary benchmarking context, WTO members submitted 2,147 SPS notifications in 2024, an 8 per cent increase over 2023, with developing economies accounting for roughly 75 per cent of all such notifications. The most frequently cited policy-support need is better market intelligence and FTA awareness (28.8%), closely followed by simplification of export documentation (28.3%), both of which align directly with the documentation-related rejection reasons identified above and reinforce that operational and informational support, not tariff relief alone, is what exporters in this sample most consistently request.

Table 9. WTO Policy Perceived to Affect Exports Most ($N = 205$)

Particulars	Percentage (%)
Technical Barriers to Trade (TBT) and product standards	28.8
Tariff commitments and preferential tariff arrangements	25.4
Tariff-rate quota provisions in selected markets	23.9
SPS Agreement and food-safety compliance requirements	22.0

Source: Primary survey data.

For exporters in developing countries, three broad categories of risk compound one another: price and demand volatility in international commodity markets; policy risk arising from tariff and quota changes in destination markets; and compliance risk from evolving SPS/TBT standards. Market diversification, investment in compliance infrastructure, use of market-based risk instruments, and trade-facilitation support through APEDA and the Directorate General of Foreign Trade (DGFT) are identified as effective mitigation strategies, though the gap between near-universal APEDA registration (94.6%) and actual incentive utilisation (72.7%) found in this sample indicates that an awareness/access gap, rather than scheme unavailability, remains a meaningful part of the risk-management shortfall facing Maharashtra's exporters.

Conclusion

The secondary-data analysis confirms a persistent asymmetry between developed and developing economies in agricultural trade policy that held steady rather than narrowed between 2023 and 2024/25: developed economies combine low bound and applied tariffs, offering predictability, while India and other developing countries maintain much higher bound ceilings with considerable headroom to raise applied rates. High agricultural tariff peaks are, however, not exclusive to developing countries — Japan and South Korea maintain some of the highest peak tariffs in the world on politically sensitive agricultural products. The primary-data analysis — the empirical core of this study — found that tariff and quota exposure are widely felt among Maharashtra's agricultural exporters and that this exposure is strongly and significantly related to export performance, with the regression model explaining 88 per cent of the variance and both predictors significant at the one per cent level. The null hypothesis is therefore rejected, confirming a significant relationship between tariff and quota measures and agricultural export performance.

This finding indicates that tariff and quota conditions are a genuine and statistically strong driver of export performance at firm level, alongside operational factors such as documentation and labelling compliance, certification and logistics cost management, market diversification and effective use of government support schemes. This is a substantively important pairing for policy design: continued WTO-level negotiation on tariff escalation and market access remains directly relevant to export performance, while operational and informational support for exporters can further improve outcomes on top of, rather than instead of, any gains from tariff or quota relief.

Recommendations

1. Continue to press, at the WTO negotiating level, for narrowing the tariff-escalation gap on processed agricultural products, where developing-country exporters currently face the steepest disadvantage.
2. Closely and continuously monitor the developed-versus-developing tariff asymmetry and its bearing on ongoing bilateral trade negotiations.
3. Ensure that domestic-support comparisons distinguish producer-facing from consumer-facing support measures rather than relying on aggregate figures alone.
4. Invest in SPS/TBT capacity-building — accredited testing laboratories, residue-monitoring systems and traceability infrastructure — to reduce the disproportionate compliance burden on exporters.
5. Support export-market diversification, given that the average sampled exporter currently sells to only about three destination countries.
6. Follow up APEDA registration with targeted, mandatory onboarding on available incentive schemes, to close the gap between registration (94.6%) and incentive utilisation (72.7%).
7. Prioritise streamlined, digitally-enabled export documentation, since documentation and labelling errors are the leading cause of consignment rejection in this sample.
8. Scale locally-delivered training on FTAs, tariffs, quotas and destination-country standards, particularly for merchant and producer exporters with fewer in-house trade-compliance resources.

Limitations and scope for further research

The primary-data component is confined to five districts of Maharashtra and 205 purposively selected exporters; findings should therefore be read as indicative of the sampled exporters rather than statistically representative of all Indian agricultural exporters. The Government Support and Export Performance indices showed comparatively weaker internal consistency (Cronbach's α of 0.51 and 0.57), and this is acknowledged as a limitation in interpreting those two composites. The crosssectional design captures exporters' perceptions and outcomes at a single point in time; a panel or longitudinal extension tracking the same exporters across multiple tariff/quota policy cycles would allow the tariff-quota-performance relationship to be tested with greater confidence about causal direction. Future research could disaggregate the Export Performance Index by specific outcome measures — export value growth, market-entry success, price realisation — and extend the primary sample beyond Maharashtra to other major agri-export states such as Gujarat, Andhra Pradesh and Punjab to test whether the findings generalise nationally.

References

1. Beckman J, Gale F, Lee T. Tariff-rate quotas in agricultural trade. USDA Economic Research Service. 2021.
2. Brink L, Orden D. Agricultural domestic support under the WTO: Comparative evidence. 2020.
3. IATRC.
4. Brink L, Orden D. WTO domestic support disciplines: Review and evidence. IATRC. 2023.
5. Bureau JC, Guimbard H, Jean S. Agricultural trade liberalisation in the 21st century. 2019.
6. World Economy. n.d.;42(9):2591-2620.
7. Elumalai K, Kumar R. Growth and structure of India's agricultural exports: Intensive and extensive margins. Agricultural Economics Research Review. 2023.
8. Emlinger C, Guimbard H. Trade protection and per-unit duties in agricultural markets. 2021.
9. CEPII Working Paper.
10. Food and Agriculture Organization (FAO). The future of food and agriculture: Alternative pathways to 2050. FAO; 2018.
11. Gopinath M. Trade policy uncertainty and agricultural markets. Journal of Agricultural Economics. 2021.
12. Gourdon J, Stone S, van Tongeren F. Non-tariff measures in agricultural trade. OECD Trade Policy Papers. 2020.
13. Grant J, Arita S, Emlinger C. Retaliatory tariffs and the 2018-2019 trade conflict. 2021.
14. Agricultural export impacts. Applied Economic Perspectives and Policy.
15. Hezarkhani B, Arisian S, Mansouri SA. Tariff-rate quotas and global agricultural supply chains. International Journal of Production Economics. 2023.
16. Jha S, Bathla S. Non-tariff measures and India's agricultural exports. Indian Journal of Agricultural Economics. 2021.
17. Kannan E, Kumar P. Intensive and extensive margins of India's agricultural export growth. 2022.
18. Foreign Trade Review.
19. Karagulle D. SPS/TBT measures and agricultural trade: Restrictive or trade-enhancing? Food Policy. 2026.
20. Krejcie RV, Morgan DW. Determining sample size for research activities. Educational and Psychological Measurement. 1970;30(3):607-610.
21. Narayan S, Bhattacharya P. Relative export competitiveness of India's agricultural commodities. Agricultural Economics Research Review. 2019.
22. Niranjana S, Shivakumar K, Prahadeeswaran M, Rohini A. Non-tariff measures and India's agricultural trade with the EU. Journal of Agribusiness in Developing and Emerging Economies. 2021.
23. Organisation for Economic Co-operation and Development (OECD). Trade and agriculture directorate report. OECD; 2021.
24. Organisation for Economic Co-operation and Development (OECD). Agricultural policy monitoring and evaluation: India. OECD Publishing; 2022.
25. Organisation for Economic Co-operation and Development (OECD). Agricultural policy monitoring and evaluation 2023. OECD Publishing; 2023.
26. Organisation for Economic Co-operation and Development (OECD). Agricultural policy monitoring and evaluation 2025. OECD Publishing; 2025.
27. Reddy AA, Sendhil R. Export competitiveness of Indian commercial agricultural crops. 2022.
28. Agricultural Economics Research Review.
29. Rozhkova D, Dalisova N. Risk management in agricultural export enterprises. Journal of Risk and Financial Management. 2021.
30. Sharma R, Kathuria V, Kaur M. Export competitiveness of Indian agricultural food products. Journal of International Trade & Economic Development. 2022.
31. Sharma S, Lahiri B, Neogi C, Akhter S. Asymmetries in agricultural domestic support under the WTO. World Trade Review. 2022.
32. Siddique M, Singh R. Agricultural export diversification in developing economies. Journal of Development Economics. 2026.
33. Sun X, Su CW, Mirza N, Umar M. Trade policy uncertainty and agricultural commodity markets. Resources Policy. 2021.
34. United Nations Conference on Trade and Development (UNCTAD). Key statistics and trends in international trade. UNCTAD; 2021.
35. United Nations Conference on Trade and Development, World Trade Organization, International Trade Centre. World tariff profiles 2022. WTO, ITC & UNCTAD; 2022.
36. Wang Z, Liu H. Can export market diversification mitigate agricultural export volatility? 2023.

37. A trade network perspective. *Emerging Markets Finance and Trade*. n.d.;59(7):2234-2251.
38. [World Trade Organization. Agreement on agriculture. WTO; 1995.](#)
39. World Trade Organization. *World trade report 2015: Speeding up trade — Benefits and challenges*. WTO; 2015.
40. [World Trade Organization. World trade statistical review 2022. WTO; 2022.](#)
41. World Trade Organization. *World tariff profiles 2024*. WTO, ITC & UNCTAD; 2024.
42. World Trade Organization. *Members conclude sixth review of SPS Agreement, note record notifications*. WTO News. 2025.
43. World Trade Organization. *Tariff and trade data — Country profiles: India; European Union*. 2026.

How to cite this article: Shinde SB, Shinde R. A comparative assessment of WTO policies and tariff changes: Evidence from developed and developing economies. *International Journal of Agriculture and Food Science*. 2026;8(9):662-668. doi: <https://www.doi.org/10.33545/2664844X.2026.v8.i9i.1932>