TRUMP TARIFFS AND THEIR IMPACT ON KERALA'S PRODUCTS

A Technical Note

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Executive Summary

1. Any trade agreements signed by the federal authority may have an impact on the **sub-federal governance**[1] (like states, provinces, or regions) even if they weren't directly involved in the negotiations. Mechanisms of Impact on Sub-Federal Governance:
    a. **Regulatory Spillover** (Modern trade agreements go beyond the border measures like tariffs — they often include rules on behind-the-border measures like services, procurement, investment, non-trade issues, and standards.);
    b. **Implementation Obligations** (Even if sub-federal units weren't part of the negotiation, they may be required to comply with treaty obligations); and
    c. **Loss of Policy Autonomy** (Trade agreements may constrain sub-federal governments from enacting policies that conflict with treaty provisions — e.g., local procurement preferences or environmental standards and matters related to non-trade issues, etc.).
2. There is an urgent need to activate the local panchayat systems, linking the same with state and central level, to improve data collection across all sectors, such as **Production** (farmers, input suppliers, FPOs, and Agri tech startups), **Processing** (primary processing, food processing, and SHGs and cooperatives), **Marketing & Sales** (Mandis (APMCs), direct-to-consumer platforms, exporters & aggregators, and retailers), **Supply Chain & Logistics** (cold chain operators, transporters, warehouses & collection centers, and digital traceability platforms), **Financing & Risk Management** (banks & NBFCs, insurance providers, Fintech and commodity exchanges), **Consumption points** (consumers, restaurants & QSRs, and institutional buyers), and finally **international trade** (exports and imports). Such data collections should be conducted based on the harmonised system nomenclature (HSN), preferably at the subheading level (6-digit) or at least at the heading level (4-digit). It becomes essential to strike a balance between free trade (tariff liberalisation) and fair trade. All trade remedial measures targeted at addressing deviations, such as circumventions, subsidisation, and anti-dumping practices by partner nations, can only be handled effectively with this information.
3. It can be concluded based on the differing levels of tariff application that the country-specific tariff would be in the range of 10% to 50%.
4. To address the negative impact of reciprocal tariff of 25% plus penalties (oil and defence purchases from Russia and the India's effort of weakening of dollar), Kerala government needs to activate departments working with Cooperative Boards (such as the Coconut Board, Spices Board, Coffee Board, and the NAFED) to address the unclear impacts of tariff escalation or increased tariffs. This highlights the need for close coordination between the Department of Commerce and the Ministry of Cooperation at the federal level.
5. There is a need to focus on establishing labs for testing agricultural products, which would assist in gaining export markets. Such testing should cover issues like contaminants, chemicals, biological, microbiological, and residue analysis. Most current labs adhere to ISO/IEC 17025:2017 and are NABL-accredited. The facilities

[1] The Indian constitution does provide some added responsibilities to the sub-federal governance bodies (for example, the state governments). Concurrent List in the Indian Constitution (List III of the Seventh Schedule) includes subjects on which both Parliament and State Legislatures can legislate.

offered by these labs are in line with the norms set by the Export Inspection Council (EIC) and FSSAI for international trade. These efforts would help diversify Kerala's agricultural products, particularly in light of the tariff hike.

6. Kerala's **coconut, seafood, spices, medical apparatus, and textiles would face** pressure and headwinds in the export market. However, the only silver lining is that most other countries would face a similar situation, except for the United Kingdom, which needs to be verified based on the 'Origin Rules' and 'transhipment provisions.

7. As of August 2025, the UK and the US have finalised a trade deal known as the Economic Prosperity Deal (EPD). It was officially agreed upon on May 8, 2025, and several provisions took effect on June 30, 2025. One of the strategic advantages of India-UK FTAs lies in how it can be leveraged for indirect market access. The UK–US FTA is almost signed; a new opportunity arises for Indian exporters to access the US market via the UK under specific conditions. This trade routing strategy hinges on the Rules of Origin (ROO) and transhipment provisions negotiated in these FTAs.

Specific Results based on the Kerala Study

(A). Empirical Analysis

8. In 2019, Kerala exported $768 million to the USA; however, there was a notable dip in 2020, with exports worth $720.25 million to the USA, likely due to the COVID-19 pandemic. Kerala's exports to the USA peaked in 2024 at $950.22 million. As of May 2025, Kerala had exported $409.96 million.

9. The USA's share in Kerala's exports to the world has generally increased from 7.5% in 2019 to around 19–20% in 2021 and 2025. The lowest share was in 2024 (11.49%).

10. HS Code 61112000 (Baby garments, etc., of cotton) leads exports with a value of $527.83 million to the USA. Other notable items include shrimps and prawns (HS 16052900) and turmeric oleoresins (HS 33019014), which have export values of $230 million, $217 million, and $188 million, respectively, to the USA. The combined value of these 15 items totals USD 2.675 billion, highlighting their importance as major export drivers. These products account for 50% of the total exports to the USA.

11. Kerala's top export categories to the USA include fish and fish products ($868.56 million), followed closely by coffee, tea, and spices ($811.07 million), and textiles ($788 million). Other major export items are clothing, electronics, machinery, and rubber products.

12. Kerala has low exports in sectors such as petroleum ($1.96 million), cotton, silk, and wool ($0.03 million), and dairy ($0.14 million), indicating limited engagement or demand in these areas.

13. An evaluation of export growth momentum using CAGR (2019–2023) further distinguishes between high-performing and declining sectors. Shrimp exports and machinery parts show strong growth (35% and 30.7%, respectively), indicating potential for future exports. Conversely, the decline in textiles and coir products suggests saturation or decreased competitiveness in key markets.

(B). Partial Equilibrium Analysis (TiNA): Overall India Assessment

14. The assessment based on TiNA provides an impact assessment for overall India – and Kerala-specific claims are drawn based on the section one assessment carried out, which is Kerala's exported products to the US and the World. Therefore, this assessment is not based on Kerala's exported products, which is a limitation of TiNA.

    a. To enhance the trade analysis, a simulation was conducted using the TiNA Partial Equilibrium model. It aimed to assess Kerala's export vulnerability under increasing U.S. tariff scenarios. The simulation analysed 1,347 HS 6-digit codes, representing approximately 89% of Kerala's export basket across four tariff shocks: +10%, +26%, +36%, and +500%. These reflect the U.S. tariff regime announced in May 2025, which imposed a 30% baseline tariff on all trading partners except China, Hong Kong, and Macao.

    b. The results reveal a non-linear response to tariff escalation. Under a modest +10% tariff, India experiences a **short-term gain of USD 7.75 billion**, primarily due to trade diversion, such as **U.S. buyers switching from Chinese** to Indian suppliers for products like spices. However, beyond the +26% threshold, losses accelerate dramatically, with India's exports **declining by USD 20.08 billion at +26%**, USD 32.52 billion at +36%, and a **peak loss of USD 63.10 billion at +500%, effectively wiping out the 2023 trade value** of the modelled product lines. For Kerala, this trajectory poses significant risks given its heavy concentration in tariff-sensitive products.

    c. The sectors most affected include seafood (HS 1605) and textiles (HS 6111), which together account for nearly **90% of the state's marine and garment exports. Under a +26% tariff,** these two sectors alone could face losses of approximately USD 160.6 million. By contrast, niche and **premium products, such as virgin coconut oil (HS 1513) and spice oleoresins (HS 3301), demonstrate greater resilience, buoyed by consistent global demand in the** wellness and organic segments.

    d. The study also evaluates **diversion potential** to other markets, identifying **Ecuador, Vietnam, Thailand, Mexico, and the EU** as key **absorptive destinations** for displaced Kerala exports.

    e. These findings have clear policy implications. In the short term, Kerala must diversify its seafood exports toward the **EU and Japan through MPEDA-certified processing** and improved cold chain infrastructure. Over the medium term, **strengthening GI tagging and sustainability branding** in spices and textiles will enhance export resilience. In the long run, investments in Techno park-based health-tech and Ayurveda-linked electronics can position Kerala as a niche exporter of tariff-insulated products.

    f. However, the simulation also carries limitations. It does not account for **non-tariff barriers such as U.S. FDA rejections**, which currently impact up to 30% of India's seafood shipments. Additionally, the model assumes static elasticities, which may potentially underestimate the adjustment frictions faced by Kerala's MSME-dominated export sectors.

    g. Overall, the simulation reinforces the urgency of strategic diversification and value chain repositioning. **Kerala** must leverage its unique strengths,

such as Ayurveda, coir, and organic agro-exports, while building institutional and policy buffers to withstand future tariff-induced trade shocks.

15. In comparative terms, India's exposure is nearly similar to or lower than that of China, Vietnam, and Thailand (depending on how export originating from China is treated), with China's export tariffs reaching USD 729.67 million in core products. This presents an opportunity for India and, by extension, Kerala to strengthen its competitive position in the U.S. market as rival countries withdraw.

Trade Policy Options

16. The **policy implications for Kerala:**

1. ***Cross-cutting:*** further increased focus on building testing labs and aligning with international quality norms; integrating sub-federal export monitoring systems for proactive trade response.
2. ***Diversify Export Markets:*** Reduce reliance on the US by expanding into Africa, the UK, Europe, ASEAN, and Latin America;
3. ***Headwinds for Exports:*** Shift focus to the domestic markets as nearly all the countries that have been imposed with the reciprocal tariffs by the US, would attempt a similar strategy – protection of the domestic market space from Imports from third countries;

Table 1: Sector-wise Domestic Market Size (2023–24)

S.N.	Sector	GVA (₹ Lakh Crore)	Share of Total GVA
A	**Services**	146.44	54.72%
A.1	Financial, Real Estate & Prof. Services	60.64	22.12%
A.2	Trade, Hotels, Transport, Communication	46.84	17.09%
A.3	Public Administration & Defence	38.95	14.21%
B	**Industry**	73.93	27.62%
B.1	Manufacturing	38.19	13.93%
B.2	Construction	23.84	8.70%
B.3	Electricity, Gas, Water Supply	6.63	2.42%
B.4	Mining & Quarrying	5.26	1.92%
C	**Agriculture & Allied**	47.25	17.66%
Total Market Size of India		267.62	100.00%

Source: India GDP sector-wise 2024 - StatisticsTimes.com

4. ***Short-term:*** Capitalise on trade diversion to the U.S. in sectors like spices and coir – the UK FTAs, the EU markets;
5. ***Medium-term***: Diversify seafood exports toward the EU and Japan; invest in MPEDA-certified processing and cold chain infrastructure;
6. ***Long-term:*** Focus on value-added innovation (e.g., Ayurveda-based electronics, GI-tagged textiles); develop resilience in less tariff-sensitive sectors; and
7. ***Contract Manufacturing in the US***: employing Indian origin US citizens and setting up or partnering with US-based manufacturing and food processing facilities to bypass import tariffs entirely.

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Section I: Introduction

The imposition of protectionist trade measures during the Trump administration, especially the increased tariffs on various foreign goods, marked a significant shift in global trade dynamics. In the initial phase, the "Trump Tariffs" mainly targeted strategic sectors and countries with high bilateral trade deficits; their ripple effects extended well beyond their original scope, impacting exporters worldwide, including those in India. On April 2, 2025, and subsequently, additional tariffs of 10% were applied, followed by an increase to 26%, which took effect in August.

The imposition of retaliatory tariffs by the United States under the Trump administration has reshaped global trade dynamics, presenting both challenges and strategic openings for Indian exporters. Kerala, with its diverse export portfolio spanning seafood, garments, coir, cashew, and IT services, finds itself at a critical juncture. While the 26% reciprocal tariff on Indian goods poses a threat to price competitiveness in the U.S. market, the uneven tariff landscape across countries creates sector-specific opportunities for Kerala's exporters.

Kerala, a coastal state with an export portfolio rooted in heritage and natural richness, experienced the ripple effects of these policy shifts in multiple ways. Globally recognised for its marine resources, aromatic spices, Ayurvedic ingredients, handlooms, and artisanal coir products, Kerala's exporters faced disruptions as pricing dynamics shifted and preference patterns changed in key markets, such as the United States, amidst growing uncertainties related to tariffs. Still, this turbulence brought unexpected opportunities. U.S. importers, seeking to avoid Chinese tariffs, turned to alternative suppliers, creating strategic entry points for Kerala producers capable of meeting stringent quality, compliance, and sustainability standards.

For instance, Kerala's shrimp industry, which is responsible for nearly 38% of India's shrimp exports to the U.S., faces acute pressure. The new tariff regime raises total duties to over 36%, making Indian shrimp significantly more expensive than Ecuadorian alternatives, which attract tariffs of only 13.78%. This price differential risks eroding

Kerala's market share and jeopardising the livelihoods of over 200,000 workers in the sector.[2]

The impact on Kerala is disproportionately severe, suggesting a considerable loss of livelihood. The facts are indicated in Table 1, as proposed, Kerala contributes only a small fraction of India's total shrimp output. India's production of Shrimp is nearly half that of Ecuador, and its exports are only 20%, indicating considerable consumption within India. Exports from Kerala are essentially from fishing zones like the Kollam Bank, wherein 80% of Kerala's deep-sea shrimp are caught. The primary challenges are the limited aquaculture infrastructure, reliance on trawl fishing, and sustainability concerns. Some recent developments by the WWF-India are supporting Kerala's shrimp fishery to meet MSC certification standards by 2025[3]. This suggests a shift away from tariffs (at the border) to trade policy measures, such as non-tariff measures (behind the border).

Table 1: Comparison of Shrimp Production, Exports and Key Markets

Region	2025 Production Capacity	Export Volume (2025)	Key Markets
Ecuador	>2 million MT	1.4–1.5 million MT	China (49%), the USA (19%), the EU and Japan
India	~0.93 million MT	~0.26 million MT (2023)	USA, China, EU
Kerala	<0.1 million MT (est.)	Niche exports	EU, USA (selective)

Source: Author based on various Sources.

Kerala's advantage lies not only in the uniqueness of its products but also in its growing alignment with international certifications, such as those under Codex Alimentarius, SPS Agreement protocols, and traceability norms for fisheries and organic produce. As the Indian government increasingly leverages diplomatic platforms and trade agreements to offset tariff impacts through WTO representations or bilateral negotiations, the state's export ecosystem has begun to reposition itself to benefit from the rerouting of trade flows.

Moreover, Kerala's ability to leverage ethical sourcing practices, especially in fisheries and spice plantations, enabled it to appeal to segments of the U.S. consumer base that prioritise transparency and sustainability. The disruptions during the Trump era thus created an opportunity for Kerala's exporters to rebrand themselves not merely as suppliers but as resilient contributors to a restructured global value chain.

While the tariffs mainly targeted Chinese imports, particularly steel, aluminium, electronics, and specific high-tech sectors, the ripple effects extended across Asia, prompting countries like India to modify their export strategies. For Kerala, a state on

[2] Refer to https://www.newindianexpress.com/states/kerala/2025/Apr/05/indian-seafood-sector-left-in-rough-waters-as-trumps-tariffs-kick-in.
[3] Refer to https://www.msc.org/what-we-are-doing/our-collective-impact/ocean-stewardship-fund/impact-projects/making-kerala-s-deep-sea-shrimp-fishing-sustainable-2021.

India's southwestern coast known for its unique biodiversity and artisanal economy, these shifts brought both challenges and new opportunities.

Kerala's export profile is based on rich traditions and competitive advantages. Its role in international trade encompasses a diverse range of valuable commodities, including black pepper, cardamom, and nutmeg, which enhance global culinary practices; coir and handloom products, reflecting a strong craft heritage; and marine products such as shrimp and tuna, which lead the premium seafood markets. During the Trump tariff period, these sectors faced challenges such as pricing pressures, compliance issues, and shifts in sourcing. U.S. buyers, limited by higher costs in China, began exploring alternative markets and adjusting their procurement strategies to regions such as South Asia, where Kerala emerged as a specialised yet reliable supplier.

Despite India's limited direct exposure to punitive tariffs, Kerala's export community experienced collateral impacts, including shifting buyer expectations and more rigorous due diligence processes. During this period, strategic adaptation was essential, as exporters adopted digital traceability, conducted sustainability audits, and obtained certifications aligned with Codex standards, USDA Organic, and Fair-Trade labels. Government-supported initiatives, such as the Marine Products Export Development Authority (MPEDA) and the Spices Board, have bolstered Kerala's compliance infrastructure, particularly in light of WTO negotiations that promote the trade interests of developing countries.

Kerala also demonstrated remarkable adaptability by framing its exports through narratives of resilience, ethics, and innovation. For instance, amid increasing scrutiny under U.S. laws such as the TVPRA and UFLPA, which discourage imports linked to forced labour or opacity in supply chains, Kerala's fisheries and spice sectors have adopted transparent sourcing practices. This positioned them favourably with retailers and distributors catering to socially conscious consumers. Furthermore, Kerala's development of integrated cold chains and compliance with EU-aligned sanitary standards facilitated a smoother transition for goods redirected from U.S.-China routes to India-U.S. pathways.

In a world transformed by tariff conflicts and protectionist sentiments, Kerala's response illustrates how regional economies can capitalise on heritage, sustainability, and policy adaptability to redefine their international trade profiles. While the Trump tariffs may have disrupted global standards, they also present opportunities for Kerala to enhance its stature, transitioning from merely a supplier of exotic commodities to a strategic trade partner within a diversified global economy.

The US Retaliatory Tariffs (Feb to July 2025)

The US has adopted one of the oldest trade policy instruments available. Retaliation through tariffs dates back centuries, often used to counteract protectionist measures by

trading partners. In the early 19th century, the U.S. imposed tariffs not just for revenue but also to protect domestic industries and respond to foreign trade restrictions. The Smoot-Hawley Tariff Act of 1930 is a classic example; though intended to protect U.S. agriculture, it triggered a wave of retaliatory tariffs from Canada, France, and others, deepening the Great Depression.

Few countries have announced retaliation; the exact status is unclear. China has increased tariffs on U.S. goods by up to 84%, including soybeans, chicken, wheat, and machinery. Followed by the European Union Tariffs on $23.2 billion worth of U.S. exports, including metals and consumer goods. Canada imposed a 25% import tax on U.S. vehicles and targeted counter-tariffs on fruits, motorcycles, and other goods. Mexico initially planned to impose tariffs but paused after receiving USMCA exemptions; it may resume after April. Brazil, South Korea, Japan, the Philippines, South Africa, and Sri Lanka have vowed retaliation, and others have lodged diplomatic protests.

The increase in tariffs started with Executive Orders under the IEEPA on February 4, 2025, targeting Canada, Mexico, and China. All Chinese goods faced a flat 10% tariff, while goods from Canada and Mexico were subject to a 25% tariff.[4] Additionally, a 10% tariff was levied on Canadian energy products. A temporary restoration of de minimis treatment for low-value Chinese shipments occurred on February 5, 2025.[5]

The US is indeed implementing sectoral targeting with increased tariffs on Chinese goods. Starting March 4th, 2025, tariffs on all products from China and Hong Kong will be raised to 20%.[6] Additionally, concerns exist regarding potential tariffs on auto parts, with an effective date of May 3rd, 2025. Furthermore, on March 6th, USMCA-compliant goods were exempt; however, potash and energy from Canada were taxed at a rate of 10%.[7] This led to further targeting on March 12th, with a 25% global tariff on steel and aluminium, including derivatives.[8] This may affect Kerala's steel-linked medical devices exports to the USA.

In the same month, on March 26th, it further imposed a 25% tariff on automobiles, effective from April 3rd, 2025. This may be delayed to address some domestic concerns about auto parts tariffs, effective from May 3, 2025.[9]

In April 2025, the Liberation Day tariffs announced on April 2nd resulted in a 10% baseline tariff on all imports.[10] Additional duties were imposed on more than 50 trading

[4] Refer to https://www.cbp.gov/trade/programs-administration/trade-remedies/IEEPA-FAQ.
[5] Refer to https://cassels.com/insights/effective-march-4-2025-the-trump-tariffs-are-here/.
[6] Refer to https://www.cbp.gov/newsroom/announcements/official-cbp-statement-tariffs.
[7] Refer to https://cassels.com/insights/another-temporary-reprieve-no-tariffs-on-usmca-compliant-goods-until-april-2-2025/.
[8] Refer to https://www.strtrade.com/trade-news-resources/str-trade-report/trade-report/march/usmca-compliant-goods-from-canada-and-mexico-exempted-from-new-tariffs.
[9] Refer to https://www.congress.gov/crs_external_products/IN/PDF/IN12545/IN12545.1.pdf.
[10] Refer to https://www.cbp.gov/newsroom/announcements/official-cbp-statement-liberation-day.

countries, with the US exceeding 10%. A ***de minimis*** exemption for China is set to expire on May 2, 2025. On April 5th, 2025, a 10% reciprocal tariff was applied to most countries.[11] On April 9, 2025, China's tariff increased to 84%, then to 125% on April 10. About 50 country-specific tariffs have been paused for 90 days. However, India was one of the countries affected, with a 26% tariff hike. The impact will depend on sector-specific elasticities and price sensitivity; it is expected to have a moderate to high impact on Kerala. Export potential depends on sector characteristics.[12] On April 29, 2025, another Executive Order clarifies tariff stacking rules to prevent excessive cumulative duties.[13]

At the temporary easing & legal pushback, which was provided on May 2nd, 2025, when the de minimis for China finally ended. On May 12, 2025, the US and China agreed to a 90-day truce, with tariffs reduced to 10% (from 125%) until August 12, 2025. On May 28, 2025, a three-judge panel of the U.S. Court of International Trade (CIT) issued a unanimous decision, holding that tariffs imposed by the Trump administration under the International Emergency Economic Powers Act of 1977 (IEEPA) were unlawful and invalid. There are, however, contrary views on how the Trump tariffs have been applied, which are being challenged.[14,15,16]

From June to July 2025, we can observe an Intensification and Retaliation by the US. On June 03, 2025, the tariffs on steel and aluminium imports into the US have doubled to 50% for all countries except the UK. The tariffs, which took effect on June 4, include derivative products that contain a proportion of those metals. On June 23, 2025, the US changed its trade policy by imposing a 50% tariff on steel derivatives, including refrigerators and washers.[17]

On July 7, 2025, a 90-day extension was granted for country-specific tariffs until August 1. The tariffs charged by the US for imports from Japan would be faced with 25% duty followed by Korea (25%); South Africa (30%); Kazakhstan (25%); Laos (40%); Malaysia (25%); Myanmar (40%); Tunisia (25%); Bosnia and Herzegovina (30%); Indonesia (32%);

[11] Refer to https://www.whitehouse.gov/fact-sheets/.
[12] Refer to https://www.whitehouse.gov/presidential-actions/2025/04/modifying-reciprocal-tariff-rates-to-reflect-trading-partner-retaliation-and-alignment/.
[13] Refer to https://www.whitehouse.gov/presidential-actions/2025/04/addressing-certain-tariffs-on-imported-articles/.
[14] Refer to https://www.dorsey.com/newsresources/publications/client-alerts/2025/5/global-tariff-strike-down.
[15] US Congressional Report, 2025, Presidential 2025 Tariff Actions: Timeline and Status, https://www.congress.gov/crs_external_products/R/PDF/R48549/R48549.1.pdf.
[16] Refer to https://www.congress.gov/crs_external_products/R/PDF/R48549/R48549.1.pdf.
[17] Refer to https://www.whitehouse.gov/fact-sheets/2025/06/fact-sheet-president-donald-j-trump-increases-section-232-tariffs-on-steel-and-aluminum/.

Bangladesh (35%); Serbia (35%); Cambodia (36%) and Thailand (36%).[18] On the same day, the duties on China's 10% rate are set to rise to 34% on Aug 12.

Therefore, we could conclude based on the differing levels of tariff application that the country-specific tariff would be in the range of 19 to 50 per cent. Hence, Kerala's coconut, seafood, spices, medical apparatus, and textiles would face pressure and headwinds in the export market. However, the only silver lining is that most other countries would face a similar situation, except for the United Kingdom.

Products of Kerala: In Comparison to India

For Kerala, a state renowned for its diverse economic activities, including agriculture, marine products, spices, and coir industries, the shifting landscape of U.S. trade policies presented both challenges and unique opportunities. The adoption of protectionist trade measures under the Trump administration marked a significant shift in global economic patterns, disrupting long-standing supply chains and causing volatility across trade routes. As global supply chains adapt and American importers seek alternative sourcing strategies, Kerala's reputation for quality and sustainable production can help ensure continued trade, resilience, and growth.

Spices

India is the world's largest producer of spices. It is also the largest consumer and exporter of spices. The production of various spices has been increasing rapidly over the past few years. The production of spices in FY24 was estimated at 12 million metric tonnes. The largest spice-producing states in India are Madhya Pradesh, Gujarat, Andhra Pradesh, Rajasthan, Telangana, Karnataka, Maharashtra, Odisha, Uttar Pradesh, Assam, West Bengal, Tamil Nadu, and Kerala.

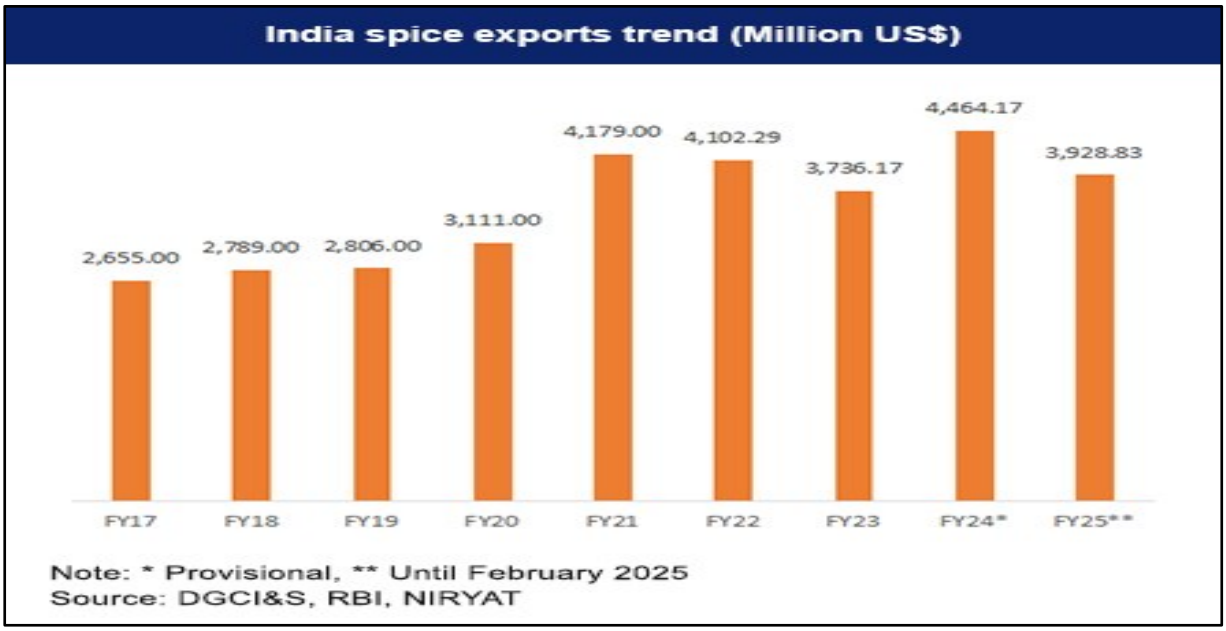
China is the largest importer of spices, valued at US$610.05 million, and the USA is the second-largest importer of spices, worth US$594.82 million, in 2025. The UAE imported goods worth US$320.36 million, and Bangladesh imported spices worth US$305.60 million from India (as of February 2025). India exports to Thailand, Malaysia, the UK, Saudi Arabia, Indonesia, and Germany and the top 10 destinations comprised more than 60% of the total export earnings.

India produces about 75 of the 109 varieties listed by the International Organization for Standardization (ISO). The most produced and exported spices are pepper, cardamom, chilli, ginger, turmeric, coriander, cumin, celery, fennel, fenugreek, garlic, nutmeg & mace, curry powder, spice oils and oleoresins. Out of 12 primary products, seven are grown in

[18] Refer to https://www.whitehouse.gov/fact-sheets/2025/07/fact-sheet-president-donald-j-trump-continues-enforcement-of-reciprocal-tariffs-and-announces-new-tariff-rates/.

Kerala: pepper, cardamom, ginger, turmeric, cinnamon, clove, and nutmeg. All three value-added products were produced and exported from the state of Kerala.

Figure 1: Trend in India's Spice Exports (USD Million)



Source: IBEF.

Kerala's spices often reach the US through cooperative societies, private exporters, and spice parks managed by the Spices Board of India. The Spices Park in Puttady (Idukki) specialises in cardamom and pepper processing, enhancing export quality. The US imports a wide range of Indian spices, including chilli, cumin, curry powder, fennel, fenugreek, garlic, and mint products, many of which are blended with Kerala-origin spices.[19] The post-COVID period has led to an increase in average export levels, with a clear upward trend observable in Figure 1.

India's spice export sector is booming, with Kerala contributing a distinct but smaller share. In FY 2023-24, India's spice export stood at a value of US$4.72 billion with a volume of 1.54 million metric tons. The top exporters are 1) **Everest Spices** – exports to 91 countries; dominant in blends, 2) **MDH Spices** – exports to 95-plus countries with strong in traditional masalas, 3) **Shri Sagas Connect Pvt Ltd, Nik May Exports LLP, VNS Food LLP** – major players in turmeric, cumin, and chili, and 4**) Synthite Industries Pvt Ltd** – Kerala-based; global leader in spice extracts and oleoresins.

Kerala's spices exports stood at a value of US$460 million and a volume of 100,076 metric tons. The top exporters from Kerala are **Synthite Industries Pvt Ltd** and the **Eastern Condiments** and **Spices Board of India** HQ (Kochi). These firms/boards used spices such as cardamom, pepper, ginger, turmeric, nutmeg, and spice oils.

Table 2: Comparison Table of Shrimp Exports by India and Kerala

[19] See, IBEF, 2024, Spices Industry and Export in India, https://www.ibef.org/exports/spice-industry-india.

Metric	India	Kerala	Share of Kerala-%
Export Value (FY 2023–24)	₹39,994 crore	₹3,905 crore	9.8
Export Volume	1.54 million MT	~100,076 MT	6.5
Share of National Export	100%	~9.8% (by value)	
Dominant Exporters	Everest, MDH, Sagas, Nik May	Synthite, Eastern	
Top Spices	Chilli, cumin, turmeric	Cardamom, pepper	
Export Destinations	USA, China, UAE, EU	USA, Japan, and the Middle East	

Source: Authors from Various Sources.

Textiles and Clothing's[20]

Textiles

India's textile export sector is substantial, with Kerala contributing a smaller yet distinct share. The export value of India's textile sector was US$25.6 billion, with leading segments including Readymade Garments: ₹72,000 crore, Cotton Textiles: ₹59,000 crore, Man-made Textiles: ₹26,000 crore, and Silk, Wool, Jute, Carpets, and Handlooms together worth ₹56,000 crore. The top exporters from India included 1) Arvind Ltd – Cotton & denim fabrics, 2) Raymond Ltd – Garments & suiting, Welspun India – Home textiles, and other companies like Vardhman Textiles, Alok Industries, Shahi Exports, and Page Industries, demonstrating diverse portfolios across yarn, garments, and accessories.

Table 3: Comparison Table of Textiles Exports by India and Kerala

Metric	India	Kerala	Share of Kerala-%
Export Value (FY 2023–24)	₹2.13 lakh crore	₹1,200–₹1,500 crore	0.7
Export Volume	~1.5 million MT	~100,000 MT (est.)	6.7
Share of National Export	100%	~0.7% (by value)	
Dominant Segments	Garments, cotton, MMF	Handloom, coir, babywear	
Export Hubs	Tirupur, Surat, Ahmedabad	Kochi, Alappuzha, Kannur	
Global Reach	100+ countries	~15–20 countries	

Source: Authors from Various Sources.

The textile exports are valued at US$145–180 million.[21] The product segments are: 1) **Handloom fabrics**: Balaramapuram sarees, Kuthampully dhotis, 2) **Coir products**: Mats, geotextiles, ropes, 3) **Kasavu garments**: Traditional cotton babywear and ceremonial clothing. The exporters from Kerala include Kitex Childrenswear Ltd, which produces cotton baby garments; Synthite Industries, which specialises in spice–infused textile blends; and Eastern Condiments, which has diversified into textile accessories.

[20] Volza Global Grow, 2024, https://www.volza.com/p/baby-clothes/export/export-from-india/.
[21] Nisha Parveen, 2023, Legacy of Kerala: From spice haven to thriving export hub, November, https://www.indiabusinesstrade.in/blogs/legacy-of-kerala-from-spice-haven-to-thriving-export-hub/.

Kerala's textile exports are highly differentiated, rooted in tradition and sustainability, whereas India's leading exporters dominate the mass-market, fast-fashion, and technical textiles sectors. Kerala's strength lies in eco-friendly, artisanal, and culturally themed products that command premium prices but are sold in lower volumes.

Clothing's

India's clothing export sector is a global force, while Kerala plays a more niche but culturally rich role. India's clothing export landscape in the FY 2023–24, in terms of total export values, is US$15.9 billion. It is bifurcated into top product segments, including Readymade Garments (RMG): ₹72,000 crore, Cotton Garments: ₹59,000 crore, and Man-made & Speciality Fabrics: ₹26,000 crore. The leading exporters from India are **Shahi Exports** – ₹6,380 crore, **Orient Craft Ltd.** – ₹2,046 crore, **Pearl Global Industries** – ₹1,650 crore, **Eastman Exports** – ₹1,600 crore, **Arvind Ltd.** – ₹1,293 crore and **Gokaldas Exports** – ₹1,079 crore.

Kerala's clothing exports are valued at US$145–180 million. The top exporters in this category are **Kitex Childrenswear Ltd**, which exports cotton baby garments to the USA and Canada, followed by Stanwells Kids and BearBee Borns, which specialise in ethnic and handloom babywear. The primary products of focus are **Kasavu frocks**, **Onam-themed lehengas**, **handloom ceremonial wear, and Coir products, including coir-infused textiles** and **Ayurveda-themed apparel.**

Table 4: Comparison Table of Clothing Exports by India and Kerala

Metric	India	Kerala	Share of Kerala-%
Export Value (FY 2023–24)	₹1.32 lakh crore	₹1,200–₹1,500 crore	0.37
Leading Exporters	Shahi, Orient, Pearl, Eastman	Kitex, Stanwells, BearBee	
Product Focus	Mass-market RMG	Ethnic, babywear, handloom	
Export Reach	100+ countries	~15–20 countries	
Global Position	Top 5 globally	Niche, premium segment	

Source: Authors from Various Sources.

Kerala's exports are highly differentiated, rooted in tradition and sustainability, while India's leading exporters dominate the mass-market, fast-fashion, and technical apparel sectors. Kerala's strength lies in eco-friendly, artisanal, and culturally themed garments that command premium prices but are produced in smaller quantities.

Babywear Apparel

India's total global exports of babywear apparel amount to US$11.27 billion, with cotton garments constituting US$8.78 billion, approximately 78% of the total babywear exports. Knitted cotton babywear accounts for US$8.9 billion, establishing it as the dominant

segment, while woven cotton babywear is valued at US$2.37 billion. One of the leading exporters of cotton baby garments from Kerala to the United States is Kitex Childrenswear Ltd, located in Kizhakkambalam, Alwaye, Cochin. Kitex is known for its large-scale, vertically integrated operations, which include spinning, knitting, dyeing, and garment manufacturing—all managed within a single facility. The primary product category consists of cotton knitted baby garments and accessories (HS Code 611120). From 2021 to 2024, over 16,000 export shipments have been recorded. The leading export destination is the United States, followed by Canada and the Channel Islands. The major purchaser is The Children's Place Services Co., LLC, a prominent retailer based in the United States. Exports are primarily dispatched from Cochin Port to U.S. ports such as Savannah and Fort Payne.

Top exporters from India include 1) Tirupur-based firms like Eastman Exports and SCM Garments, 2) Gujarat clusters such as Ahmedabad and Surat, and 3) West Bengal (for woven infant wear). Their primary markets are the United States, Mexico, Australia, the United Kingdom, and Germany. **Kerala's baby cotton dress export snapshot is valued at an estimated US$14–21 million. The top exporters are 1) Stanwells Kids, 1) Picksparrow, and 3) BearBee Borns, mainly focusing on Kasavu frocks, Onam-themed lehengas, and handloom cotton wear. These are primarily exported to the UAE, the USA, and Australia, especially during the Onam/Vishu seasons**. There is a strong focus on the emigrant diaspora settled in these countries.

Table 5: Comparison Table of Babywear Apparel Exports by India and Kerala

Metric	India	Kerala	Share of Kerala-%
Export Value (FY 2024–25)	₹3,200–₹3,800 crore	₹120–₹180 crore	4.7
Export Shipments	~45,000+	~2,000–3,000	6.7
Dominant Exporters	Tirupur, Gujarat clusters	Kochi-based niche brands	
Product Focus	Knitwear, organic cotton sets	Traditional ethnic frocks	
Export Seasonality	Year-round	Peaks during Onam/Vishu	
Global Reach	80+ countries	10–15 countries	

Source: Authors from Various Sources.

Kerala's exports are highly differentiated, often handmade and culturally themed, commanding higher unit prices but lower volumes. In contrast, India's leading exporters focus on mass-market, fast-fashion babywear, optimised for scale and speed.

Shrimp and Prawns Exports

India's shrimp and prawn export sector is a heavyweight in the global seafood trade, but Kerala's contribution, while notable, is relatively modest in comparison. India's Shrimp & Prawn Export Landscape (2023–24): The value of exports stood at US$4.88 billion from

frozen shrimp alone, with a volume of 7,16,004 metric tons of frozen shrimp[22]. The top five exporters are Falcon Marine Exports Ltd, Anjaneya Sea Foods, Avanti Feeds, Coral Exports and Amart Fish World. These firms collectively shipped 83,763 frozen shrimp consignments between November 2023 and October 2024.

The state of Kerala contributed an export value of US$880 million in FY 2023–24 for all marine products, with frozen shrimp accounting for nearly 49%, at US$430 million. Kerala's export **Volume**: 197,000 metric tons of aquatic products, of which the share of sh**rimp is almost** 33% at 65,000 MT. The major **exporters** in Kochi and Alappuzha are facing challenges due to tariffs and an expected decline in demand, as the unit prices of consignment may increase. It has the potential to put pressure on the labour, and some companies may adopt mechanisation to cut prices to adjust for the increased tariffs.[23],[24],[25]

Table 6: Comparison Table of Shrimp Exports by India and Kerala

Metric	India	Kerala	Share of Kerala-%
Frozen Shrimp Export Value	₹40,013.54 crore	~₹3,543 crore	8.9
Frozen Shrimp Export Volume	716,004 MT	~65,000 MT	9.1
Share of National Export	100%	~8.8% (by value)	
Top Export Destinations	USA, China, EU	USA, Japan, China	
Tariff Challenges	Moderate	Severe (26% US duty hike)	

Source: Authors from Various Sources.

Kerala's exports are highly differentiated, often handmade and culturally themed, commanding higher unit prices but lower volumes. In contrast, India's leading exporters focus on mass-market, fast-fashion babywear, optimised for scale and speed.

Fruits and Nuts

India's exports of fruits are substantial, but Kerala's share, although rich in quality, is relatively modest in volume and value. India's nuts & fruits Export valued in 2023 stands at US$459.84 million. In the peak year, 2017, it was US$1.86 billion; hence, its exports have fallen by almost four times. The top products of exports are Cashew nuts (especially from Kerala, Goa, Maharashtra), Mangoes, bananas, grapes, pomegranates, Dry fruits like almonds, walnuts, and pistachios (mostly re-exported or processed). The top exporters

[22] Shrimp Export from India: Market Trends, Demand & Data 2025, 29-Apr-2025, https://www.eximpedia.app/blog/shrimp-export-from-india.

[23] Think Grain Feed Grain, 2024, Kerala's Shrimp Export Sector Faces Crisis as Japan Cuts Imports Following U.S. Ban, August 2, 2024, https://benisonmedia.com/keralas-shrimp-export-sector-faces-crisis-as-japan-cuts-imports-following-u-s-ban/.

[24] Ministry of Commerce & Industry, PIB, 2024, India's seafood exports reach an all-time high in volume in FY 2023-24. Major export items include frozen shrimp and frozen fish; US & China remain top export destinations, https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2026456.

[25] Dhanam, 2025, US tariff deadline: Shrimp exporters risk paying 500 crore extra; Kerala exporters worried, 03 Apr 2025, https://english.dhanamonline.com/news/shrimp-exporters-risk-paying-500-cr-extra-kerala-exporters-worried-9000716.

are Olam Agro India Pvt Ltd, Vijayalaxmi Cashew Company, Balaji Wafers Pvt Ltd, National Agricultural Cooperative Marketing Federation (NAFED), and Keventer Agro Ltd.

Table 7: Comparison Table of Fruits Export by India and Kerala

Metric	India	Kerala	Share of Kerala-%
Export Value (2024–25)	US$459.84 million	~ US$565 million (Agri total)	
Cashew Export Value	US$339.21 million	~ US$126 million	37.1
Fruit Export Value	US$120 million	~ US$100–150 million (est.)	
Dominant Exporters	Olam, Keventer, NAFED	Vijayalaxmi, CEPCI members	
Export Hubs	Maharashtra, Gujarat, TN	Kochi, Kollam, Alappuzha	

Source: Authors from Various Sources.

A snapshot of Kerala's fruits export stood at a value of US$565 million for all agricultural products, with cashew nuts alone accounting for a value of US$126 million, and Fruits, juices, and dry fruits estimated at ₹400–₹600 crore combined. The top exported items are Cashew nuts (premium quality), exported via Cochin Port, as well as Bananas, jackfruit, mango pulp, pineapple (often processed or value-added), and Dry fruits & coconut products, including desiccated coconut, copra, and coconut oil.[26] (Cocos Nucifera Oil and others). The destinations for these products are the UAE, the USA, Saudi Arabia, and Japan.[27]

Kerala's exports are high-value but low-volume, especially in cashews and processed fruits, while bulk shipments and a broader range of crops drive India's overall exports. Kerala's advantage lies in quality, sustainability, and heritage branding, giving it a premium edge despite smaller volumes. The journey of an agricultural crop from farm to fork involves a complex, multi-layered value chain that turns raw produce into food for consumption. The situation becomes even more complicated when destination markets impose increasing non-tariff measures (SPS, TBT, and import inspections).

Nuts Exports and leading Exporters'

India is a global leader in nut exports, especially in **cashew and groundnuts (peanuts)**, with Kerala playing a prominent role in **cashew exports**.

Top destinations for India are countries like Indonesia, Vietnam, the UAE, the USA, the Netherlands, and Japan. [28] The main export processing hubs in Kerala are located in

[26] See, https://coconutboard.gov.in/CoconutProducts.aspx and https://www.specialchem.com/cosmetics/inci-ingredients/cocos-nucifera-oil.

[27] Samakalikamalayalam, 2025, From rice to flowers; Kerala gains in agricultural products exports, Rs 4699.02 crore reached the state, https://www.samakalikamalayalam.com/news/kerala/kerala-achieved-growth-in-agricultural-exports.

[28] Refer to https://www.exportimportdata.in/blogs/peanut-export-from-india.aspx and https://www.ibef.org/exports/cashew-industry-india.

Kollam, Kochi, and Alappuzha, producing products such as premium cashew kernels, organic blends, and coconut-based nut oils. Kerala's strength lies in high-quality, value-added cashew exports, while groundnuts and bulk shipments drive India's broader nut export profile. Low volumes characterise Kerala's exports, but high margins are often achieved by targeting organic, fair-trade, and wellness markets. Kerala's farm-to-fork ecosystem usually emphasises sustainability, traceability, and value-added products, particularly in spices, coconuts, and bananas.

Table 8: Top Nut Exporters from India and Kerala: A Comparison

Nut Type	India Export Value	Kerala Export Value	Share of Kerala - %	India's Top Exporters	Kerala's Key Exporters
Cashew Nuts	US$339.21 million	US$126 million	37.2	Olam Agro India, Vijayalaxmi Cashew Co., CEPCI members2	Vijayalaxmi Cashew Co., CEPCI members, Synthite Industries2
Groundnuts	US$860.68 million	~ US$100–150 million	17.4	Agrocrops, Kinal Global Care, Skyz Intl, Dhaval Agri Exports LLP4	Includes coconut-based products, dry fruits, and nut blends
Other Nuts	~ US$200–300 million			Includes almonds, walnuts, pistachios (often re-exported or processed)	
Total Nuts Exports		~ US$250–280 million	24.1		Kerala contributes ~30–35% of India's cashew exports by value.

Source: Authors from Various Sources.

Coconut Trade with the US

India's coconut exports to the USA are growing steadily, but Kerala's share, while high in quality, is relatively modest in volume. In 2021, India's coconut exports to the USA, in terms of value, were US$5.84 million. The top exported products from coconut are Desiccated coconut, Virgin coconut oil, coconut milk, and coconut water. There are some value-added products which is being exported. The leading exporters are AKM Traders, Arecanut Dealer, Gangai Exports, Phoenix Exports, and Nikosi Exports. Exports are primarily handled through the ports of Cochin, Tuticorin, and Chennai.

Kerala's exports of coconuts to the USA in value are approximately US$1.5–2.2 million, which is around 25–35% of India's total bilateral exports (see Table 7). Some of the key products are Virgin coconut oil (wet-processed from coconut milk), Desiccated coconut and Coconut milk powder. The top exporters from Kerala include Synthite Industries Pvt Ltd, which specialises in spice-infused coconut extracts; Vijayalaxmi Cashew Company, which has diversified into coconut products; and the Coconut Development Board (Cochin HQ), which supports value-added exports.

Table 9: Comparison Table of Coconut Export to the USA by India and Kerala

Metric	India	Kerala	Share of Kerala-%
Export Value to USA (FY 2021)	US$5.84 million	US$1.5–2.2 million (est.)	38.0
Dominant Products	Desiccated coconut, VCO	VCO, coconut milk powder	
Export Ports	Cochin, Tuticorin, Chennai	Cochin, Thiruvananthapuram	
Share of National Export	100%	~25–35%	

Source: Authors from Various Sources.

Kerala's exports are **characterised by high value and low volume**, often processed using **traditional wet milling or fermentation** methods that preserve aroma and purity. These products command premium prices in niche US markets, such as organic stores and Ayurvedic wellness brands.

Electronic Equipment Exports

India's electronics exports to the USA (2024–25) stood at a value of US$14.4 billion, up from US$13.2 billion in 2023, with an annual growth rate of 9.1. The top exported products are Smartphones (especially Apple iPhones manufactured under the 'made-in-India' label), Semiconductors and components, Consumer electronics (including TVs, wearables, and smart appliances), medical electronics, and solar cells. [29] Leading exporters from India are: Samsung India Electronics Pvt. Ltd., Foxconn Hon Hai Technology India Mega Development, Tata Electronics, Jabil Circuit India Pvt. Ltd., and Maxim Integrated Products India Pvt. Ltd. The USA accounted for 60.17% of India's electronics exports in Q1 FY25-26, making it the dominant destination.[30]

Table 10: Impact on Electronic and Electrical Equipment Export to the USA and Kerala

Metric	India	Kerala
Export Value (2024–25)	US$14.4 billion	US$120–180 million
Share of National Export	100%	~1.2%
Dominant Products	Smartphones, semiconductors	Medical & wellness electronics
Export Hubs	Tamil Nadu, UP, Karnataka	Kochi, Thiruvananthapuram
Growth Drivers	PLI scheme, Apple/Samsung	Ayurveda, niche innovation

Source: Authors from Various Sources.

In comparison, Kerala's electronics exports to the USA are estimated to be in the range of US$120–180 million in value terms. Some of the key products include spice-infused electronics (e.g., essential oil diffusers, Ayurvedic wellness devices), medical electronics (surgical instruments, diagnostic kits), and Consumer electronics (niche smart devices,

[29] IIFT Annual Report 2023-24, https://www.iift.ac.in/iift/docs/report/18.pdf.

[30] The Economic Times, 2025, US top destination for electronics, marine goods in Q1, https://economictimes.indiatimes.com/news/economy/foreign-trade/us-top-destination-for-electronics-marine-goods-in-q1/articleshow/122673169.cms?from=mdr.

coconut-based cosmetic electronics). The top exporters of these products are Synthite Industries Pvt. Ltd., which specialises in spice extracts and electronic aroma diffusers; Kitex Group, which diversified into smart babywear with embedded sensors; and Startups in Technopark & Infopark, exporting IoT and health-tech devices.

In the electronics and electrical products sector, the impact on Kerala would be approximately 1.2 per cent of the total effects on India. However, the table suggests that the export drivers for both India and Kerala are different, and the latter is not linked to the PLI Scheme. Additionally, Ayurveda-led niche innovations may behave differently because these are products dependent on the popularity of Indian medicines.

Table 11: Tariff Increase Impact on Medical Equipment Export to the USA

Subsector	Export Exposure	Tariff Sensitivity	Kerala's Strategic Leverage
Surgical Instruments & Consumables	Moderate (via Kochi, Kozhikode ports)	**High–price–sensitive**, low-margin items	Ayurveda-linked variants may find a niche in Japan/EU - Explore bonded warehousing to offset duties.
IoT Health Devices & Remote Diagnostics	Emerging (Technopark startups)	**Moderate** – hardware hit, software less affected	Pivot to **software-centric models** - Leverage India's lower tariff vs. China (34%)
Medical Electronics (e.g., monitors, sensors)	Low to moderate	**High–chip** imports + device tariffs compound costs	Duty drawback schemes - Explore ASEAN/EU markets with lower barriers
Ayurveda-Integrated Diagnostics	Niche, growing	**Low to moderate** – wellness tech often premium-priced	Position as a **luxury wellness exporter** - Tap into Japan's ageing population demand
Sterilisation & Packaging Services	Indirect (outsourced to other states)	**High** – cross-border services penalised	Localise sterilisation hubs - Use SEZs for tariff-neutral processing

Source: Authors from Various Sources.

Table 12: Summary of the Sectoral Impacts on Kerala: A comparison to India

Sector	Kerala Impact	India Impact	Notes
Seafood	**Severe**	High (diversified)	Kerala's shrimp sector is highly exposed
Textiles & Clothing	Moderate to High	Moderate	Kerala's niche babywear vs India's mass RMG (Diaspora driven demand)
Coconut Products	Moderate	Low to Moderate	Kerala leads in VCO, faces niche market pressure
Electronics	Low but strategic	Mixed	Kerala's wellness tech vs India's EMS giants
Spices & Agro	Moderate	Resilient	Kerala's premium spices vs India's bulk exports (Diaspora and Value Chain led)
Medical Electronics	Resilient	Moderate	

Source: Authors from Various Sources.

Table 13: Recommendation based on Literature on the Sectoral Impacts on Kerala (Challenges and Opportunities)

Sector/Product	Context	Challenges	Opportunities	Pain-points
Seafood (Shrimp)	Kerala contributes to seafood exports, mainly frozen shrimp	High US duties (34.26%) vs Ecuador (13.78%) destabilise price parity	Pivot to EU/Japan markets; invest in **processing & traceability**	Hatchery shutdowns, worker layoffs, reduced margins
Textiles (Babywear)	Focus on cotton baby garments, ceremonial wear (Kitex, major exporter)	US tariff pressure on mass-market babywear pricing	Leverage GOTS/Eco-cert to position Kerala as a sustainable textile exporter	Loss of price advantage vs Bangladesh, Vietnam
Coconut Products	Kerala leads in VCO, desiccated coconut, wellness ingredients	The niche Ayurvedic segment may not absorb cost hikes fully	Push Ayurveda-themed bundles to the Middle East, Europe	Small processors face scaling and export documentation issues
Spices (Pepper/Cardamom)	Premium organic blends, oils, and extracts are exported to niche US food/wellness markets.	Tariff shocks reduce competitiveness vs bulk spice origins (Vietnam, Guatemala)	Branding around GI tags, organic certification, and direct-to-consumer channels	Value-added units at risk; lower export volumes despite high quality
Medical Electronics	Technopark/Infopark firms export wellness and medical tech	Component sourcing costs rise; small firms lack buffer capacity	Collaborate with the AYUSH sector and leverage synergies in the health tech sectors of Korea and Sweden.	Supply chain fragility; limited international scale

Source: Author.

SWOT analysis of Kerala's export potential to the US market following the 25% reciprocal tariffs imposed on August 1st, 2025.

Strengths: Diverse Export Basket: Kerala exports a range of products, including seafood, spices, coir, garments, tea, and cashews, many of which have niche appeal in the US market. Diaspora Demand: The Malayali diaspora in the US drives seasonal demand, especially during Onam and New Year, for processed foods and cultural products. Established Port Infrastructure: Cochin Port handles ~1,500 TEUs/month to the US, indicating robust logistics and trade connectivity. Quality Reputation: Kerala's seafood and coir products are known for quality, with the US being the second-largest importer of Indian coir.	**Weaknesses** Low Export Share: Kerala's share in India's total exports has decreased to 1.09% in 2024–25, down from 1.87% previously. Shrinking Marine Exports: Marine export volume fell from 2.18 lakh MT to 1.96 lakh MT, and value dropped by ₹1,000 crore in one year. Limited Backwards Integration: Many exporters rely on third-party suppliers, making it harder to absorb cost shocks from tariffs. High Container Costs: Post-tariff, import cost per container to the US has risen to $62,000, squeezing margins.
Opportunities **Value-Added Products:** Kerala can pivot to premium, organic, or artisanal variants of spices, seafood, and coir to justify higher prices. **FTA Leverage:** India's ongoing trade negotiations (e.g., with UK, EU) may offer compensatory markets or tariff relief mechanisms. **Diversification:** Exploring Latin American and ASEAN markets could reduce overdependence on the US. **MSME Resilience:** Kerala's MSMEs in the food processing and textiles sectors can innovate with sustainable packaging and branding.	**Threats** **Price Undercutting by Rivals:** Ecuador (10% duty) and Vietnam offer cheaper seafood and cashew, threatening Kerala's competitiveness. **Festive Season Disruption:** Onam shipments already en route may face retroactive tariffs, risking losses. **IT Sector Uncertainty:** Reduced US orders in software exports could affect Kerala's tech employment. **Consumer Shift:** US buyers may switch to lower-cost alternatives from Mexico or Africa, especially for ready-to-eat foods.

Source: Author.

Section II: Methodology

This study explores the potential impact of increasing U.S. tariff barriers on Kerala's exports (indirectly, since the model is limited in its selection of exporters; in this case, we used India). It utilises the Trade Intelligence and Negotiation Adviser (TiNA) platform developed by UNESCAP. TiNA uses a Partial Equilibrium (PE) modelling framework, analysing each product market separately while keeping other factors constant. This approach allows detailed, product-level simulations of long-term trade adjustments, making it suitable for evaluating a region like Kerala, where exports are concentrated in a few agro-based and light manufacturing sectors.

The total exports from Kerala to the USA were recorded in 1,519 tariff lines at the eight-digit level, out of a total of 12,935 national tariff lines (HSN 8 digits) for India, which is nearly 12% of India's exported tariff lines. The simulations use the most recent trade data from 2023 available on the TiNA platform. This ensures that the results reflect current export volumes, partner dependencies, and tariff structures. The study includes 1,347 unique six-digit HS codes (89% of 1519 tariff lines) selected from Kerala's total of 1,519 export lines (65% of Kerala's total exports to the USA). These codes represent Kerala's main export strengths, including spices, seafood, garments, and textiles. They are further categorised into Multilateral Trade Negotiations (MTN), a classification used by the WTO and its subcategories to facilitate understanding of sector-level vulnerabilities and to analyse the dynamics of global value chain (GVC) possibilities.

Four tariff shock scenarios were simulated, reflecting different levels of protectionism from the United States: +10%, +26%, +36%, and +500%. These scenarios indicate potential trade policy directions following the tariff revision on May 12, 2025, which imposes a 30% tariff on all economies except China, Hong Kong, and Macao. Each shock was modelled in TiNA by applying the specific tariff increase to U.S. imports of the selected HS codes from India and Kerala.

In every scenario, TiNA assesses the impact on exports by modelling two sequential mechanisms: trade diversion (TD) and trade creation (TC). Trade diversion occurs when higher tariffs decrease the competitiveness of Kerala's products in the U.S. market. This causes importers to source from exempt countries, such as China and others with lower reciprocal tariffs, like the UK. While the total volume of U.S. imports remains the same, the source countries change. This step is modelled first. Trade creation is then analysed, capturing changes in overall demand levels. Typically, in scenarios with tariff increases, TC is negative or minimal, indicating a decline in total import demand due to higher prices, as few policies in the US market offset income level increases. TiNA adjusts its formulas to ensure the combined effect of TD and TC does not exceed the baseline trade value, focusing on TD effects when overall demand decreases.

The model's behavioural responses rely on elasticity estimates. For India's exports to the U.S., the export supply elasticity of India is set at 0.647, while the U.S. import substitution elasticity is fixed at 2.141. These figures are derived from the World Bank's trade elasticity report, with adjustments made to account for the price-sensitive nature of India's exports. A higher substitution elasticity means U.S. buyers are more likely to switch suppliers if relative prices change, putting India at risk in competitive sectors. The results from each tariff scenario at (+10%, +26%, +36%, and +500%) are then aggregated as total trade across products and summarised at the MTN sub-category level to pinpoint both the most vulnerable and the most resilient sectors. These findings contribute to Kerala's export risk profile and highlight potential strategic redirection opportunities in the event of future trade disruptions.

Similar tariff shock simulations were carried out for China, Thailand, Vietnam, and Sri Lanka, with export supply elasticities of 0.554, 0.490, 0.849, and 0.535, respectively. These tariff shocks were applied to the top 15 products at the 8-digit HS level, which account for 97% of Kerala's USD 2,758 million in exports to the US. This comparison helps identify how the markets of competitor countries respond to similar tariff shocks.

Limitations of the TiNA Simulation Model in the study

While the TiNA Partial Equilibrium (PE) model provides valuable policy-relevant insights into the long-term trade impacts of tariff escalation, several limitations must be acknowledged when interpreting the results.

First, the model does not account for short-term behavioural responses such as front-loading, where exporters accelerate shipments ahead of tariff implementation. These dynamics often result in temporary trade surges that are excluded from long-run equilibrium outcomes. Similarly, the model abstracts from rational expectations and firm-level adjustments, such as inventory smoothing, staggered contracts, and logistical realignments, all of which introduce short-term volatility not captured within the PE structure.

Second, the simulation assumes instantaneous market adjustment, thereby ignoring the time delays involved in real-world trade. In reality, structural changes such as contract renegotiation, re-sourcing inputs, and reconfiguring supply chains take time. This is especially important for Kerala's MSME sectors, where exporters may need six to twelve months to shift to new markets, like coir producers adapting to destinations such as Turkey. These delays are not captured in the simulated trade diversion results. This scenario would only be relevant if reciprocal tariffs were imposed on just one country. Therefore, the current model cannot represent this accurately, as most models are better suited to a single-country scenario in order for TD and TC to be more meaningful.

Third, while the model evaluates 1,347 HS codes out of 1,519, excluding 172 codes, even though they represent low trade values, it may overlook niche or emerging sectors that could respond differently under tariff stress, especially in the context of Kerala's diversified but *"low-volume and high-value"* export profile.

Fourth, the simulation does not include non-tariff barriers (NTBs), such as U.S. FDA import rejections or EU sanitary and phytosanitary (SPS) measures, which disproportionately affect Kerala's key exports. For example, over 30% of the state's marine shipments face FDA compliance issues, and value-added spices often encounter rejections due to documentation or residues. These regulatory hurdles frequently outweigh the trade cost effects of tariffs.

Finally, the model may overestimate domestic redirection capacity, especially in Kerala. The projected redirection of USD 602 million to local markets assumes sufficient local absorption; however, Kerala's small-scale industrial base lacks the necessary infrastructure and demand to handle diverted exports, particularly in sectors such as shrimp, textiles, and Ayurvedic formulations.

In summary, while the TiNA model effectively captures long-term, tariff-induced shifts in export composition, its structural assumptions, particularly regarding adjustment speed, behind-the-border measures such as NTMs, and subnational capacities, imply that the simulated impacts may underrepresent Kerala's near-term risks, especially in high-compliance and MSME-sensitive sectors.

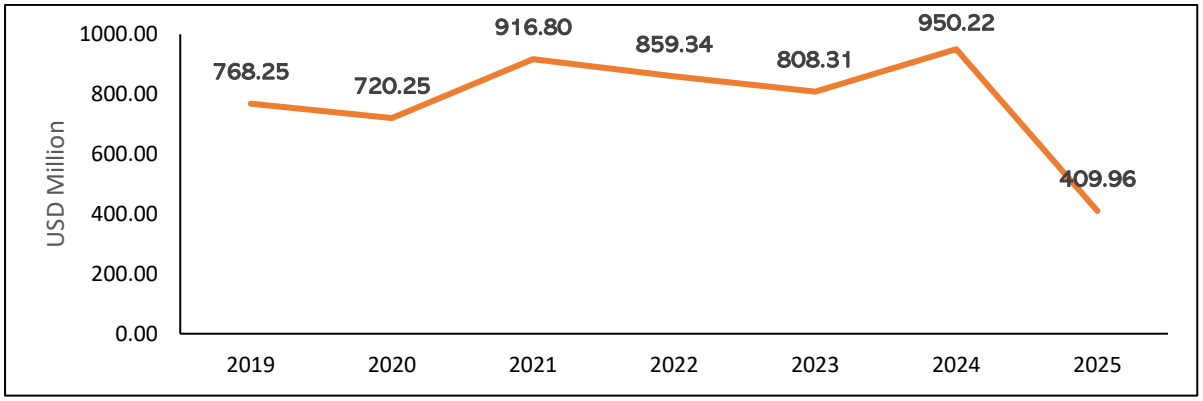
Section III: Empirical Assessment and TiNA Partial Equilibrium Modelling

This report is divided into two parts in Section Three. The first assessment presents a simple trend and shares analysis, comparing Kerala's exports to the World and the USA. The second part provides a partial equilibrium analysis of the reciprocal increase in tariffs by the USA based on four scenarios 10%, 26%, 36% and 500%.

Empirical Assessment of Trends (Trade Analysis)

As an introduction to understanding the impact of increased tariffs on Kerala, we have analysed Kerala's exports at the 1,519 8-digit level (HSN) by destination, focusing on the world and the US. A comparative approach helps assess the potential impact of the US's increased tariffs on Kerala's overall exports and its prospects for diversification. The top 15 products, which hold the most significant shares in exports to the US, are identified, and a comparison with global data is provided. This suggests a possible shift in market opportunities.

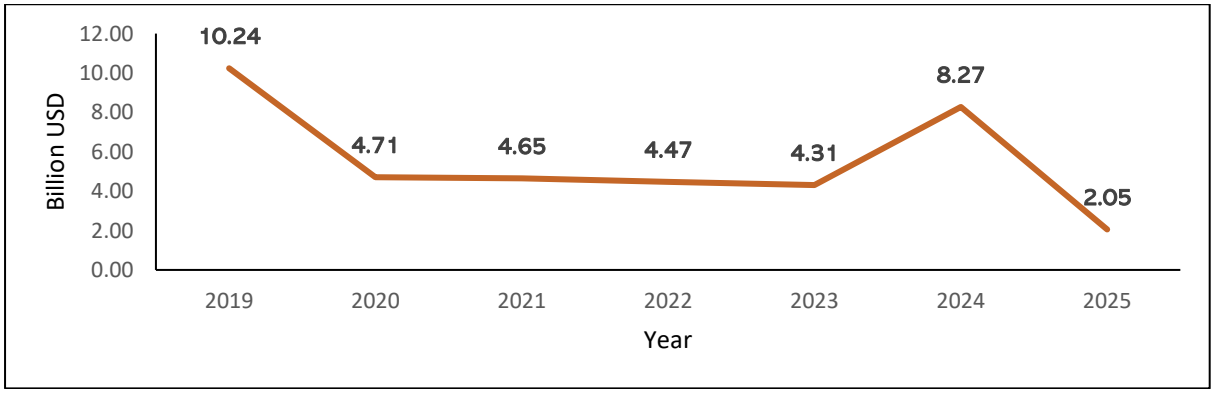
Figure 2: Kerala's Export to USA (USD Million).



Source: DGCIS

Figure 2 shows Kerala's exports to the United States from 2019 to May 2025. In 2019, it exported $768 million to the USA; however, there was a noticeable dip in 2020, with exports totalling $720.25 million to the USA, likely due to the COVID-19 pandemic. Kerala's exports to the USA peaked in 2024 at $950.22 million.

Figure 3: Kerala's Export to the World (USD Billion)



Source: DGCIS.

As of May 2025, Kerala had exported $409.96 million.

Figure 3 presents Kerala's global export figures over the same period. As shown, there was a sharp decline in 2020 ($4.71 billion) from $10.24 billion in 2019, likely reflecting the impact of COVID-19 disruptions. The highest exports were seen in 2024 ($8.27 billion). As of May 2025, only $2.05 billion has been exported.

Table 14: Share of the USA in Kerala's Total Export

Items/Year	2019	2020	2021	2022	2023	2024	2025
Share of Kerala's export to the USA in Kerala's export to the World	7.50	15.31	19.72	19.23	18.77	11.49	19.95

Source: DGCIS

Table 14 shows the percentage of Kerala's total exports that go to the US each year. The USA's share has generally increased from 7.5% in 2019 to around 19–20% in 2021 and 2025. The lowest share was in 2019, and a dip in 2024 (11.49%) suggests Kerala's exports grew more broadly that year beyond the USA.

Table 15: Top 15 Products Exported to the USA and the world

HS Code	Product Description	Exports in USD Million to the USA	Exports in USD Million to the World	% share	Impact in Comp. to India
1	2	3	4	5	6
61112000	Babies' Garments, etc. of Cotton	527.83	644.54	81.89	Sever
16052900	Other: Shrimps and Prawns	230.28	291.66	78.95	Sever
57039090	Carpets and other textile floor coverings, tufted, whether or not made up of other textile materials: Other	217.43	407.11	53.41	Moderate
33019014	Turmeric Oleoresins	188.31	310.33	60.68	Moderate
09042219	Crushed Or Ground; Other Fruits of the Genus Capsicum	185.89	317.73	58.51	Moderate
03061711	Accelerated Freeze Dried (Accelerated freeze drying)	154.49	241.56	63.96	Moderate
16052100	Not In an Airtight Container	148.19	215.95	68.62	Moderate
40169100	Floor Coverings and Mats	144.31	429.10	33.63	Low
85364100	Relays For a Voltage Not Exceeding 60 V	143.53	151.17	94.94	Sever
09041200	Crushed Or Ground Pepper	140.59	252.36	55.71	Moderate
33019029	Oleoresins of Spices N.E.S.,	138.5	370.69	37.36	Low
57039020	Carpets And Floor Coverings of Coir	125.81	203.92	61.69	Moderate
57050039	Other Carpets of Jute	116.57	233.31	49.96	Moderate
20081910	Cashew Nut, Roasted And/Or Salted	110.91	129.60	85.58	Sever
84679900	Parts Of Other Tools for Working with the Hand	102.88	111.22	92.51	
Sub Total		**2675.52**	**4310.27**		
% share		**97.30%**	**11.14**		
Others Exports		**2,307.01**	**34387.1**		
Max		**95.71**	**8177.94**		
Min		**0**	**0.00**		
Standard deviation		**6.29**	**104.63**		
Kerala's Total Exports to the USA		**5,433.02**	**38,697.3**		

Source: DGCIS

Table 15 above lists Kerala's top 15 HS code product categories exported to the US, along with their values in USD million. HS Code 61112000 (Baby garments, etc., of cotton) leads with exports worth $527.83 million. Other shrimps and prawns (16052900), others (57039090), and Turmeric oleoresins (33019014) also play a significant role, with exports of $230 million, $217 million, and $188 million, respectively, to the USA. The total of these 15 items amounts to USD 2.675 billion, indicating that these products are key drivers of exports. These products constitute 50% of the total exports to the USA.

In addition to these products, the remaining 2,307 products, which account for 50% of the total exports, generate $2,757.61 million in exports. Column 6 of Table 15 provides a detailed assessment of the number of products that may be severely impacted, as their share in Kerala's exports to the USA, compared to the world, is more than 70%. The number of severely affected products is only four, except for one electronic product; for all the others, the easiest solution would be to focus on the domestic market. Products moderately impacted are those with shares ranging from 40% to 70%. There are almost eight products across all these categories where ways and means of retaining exports to the USA or, alternatively, to other FTAs need to be explored. Those products that are minimally impacted have shares ranging from 0% to 40%, and only two products belong to this category.

Table 16: Yearly Export Data and Growth of Top 15 products exported to the USA

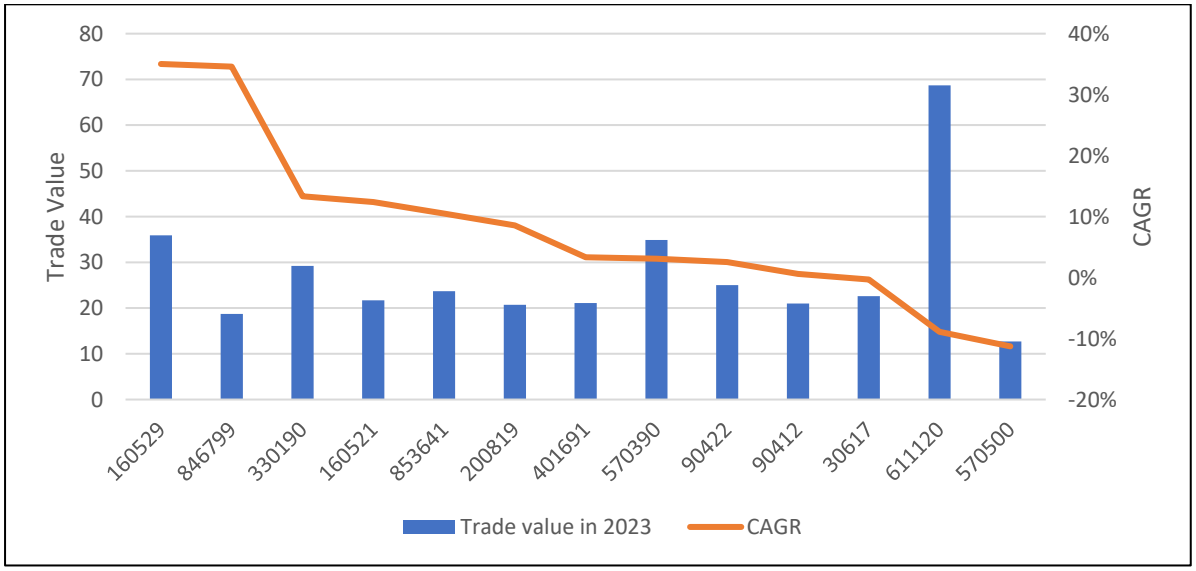
HS Code	Product Description	Exports in USD Million							Growth (%)
		2019	2020	2021	2022	2023	2024	2025	
61112000	Babies' Garments, etc. Of Cotton	99.8	60.1	79.0	97.7	68.7	90.9	31.6	-1.5
16052900	Other Shrimps and Prawns	10.8	35.7	57.0	59.6	35.9	22.6	8.6	13.2
57039090	Other	30.9	22.0	30.8	29.7	34.9	48.3	20.7	7.7
33019014	Turmeric Oleoresins	17.7	26.6	31.6	28.3	29.2	38.9	16.0	14.0
09042219	Crushed Or Ground; Other Fruits Of the Genus Capsicum	22.6	25.8	37.0	27.5	25.0	35.7	12.2	7.9
03061711	Accelerated Freeze Dried(Afd)	22.9	19.1	20.5	22.2	22.6	30.8	16.4	5.0
16052100	Not In an Airtight Container	13.6	20.8	22.3	22.9	21.7	31.4	15.5	14.9
40169100	Floor Coverings And Mats	18.5	17.0	25.7	21.3	21.1	27.7	13.0	6.9
85364100	Relays Fr A Vltg Nt Excdg 60 V	15.9	15.8	20.5	22.4	23.7	30.8	14.4	11.6
09041200	Crushed Or Ground Pepper	20.5	13.4	24.0	21.0	21.0	27.4	13.4	4.9
33019029	Oleoresines Of Spices N.E.S.,	22.2	21.5	24.4	18.6	19.2	22.1	10.4	-0.1
57039020	Carpets And Floor Coverings Of Coir	2.7	25.1	37.6	29.6	14.3	11.3	5.2	26.5
57050039	Other Carpets Of Jute	20.5	18.3	25.8	19.7	12.7	13.0	6.5	-7.2
20081910	Cashew Nut, Roasted And/Or Salted	14.9	15.5	19.3	17.6	20.7	17.6	5.3	2.9
84679900	Parts Of Other Tools For Working with the Hand	5.7	8.0	14.9	16.3	18.7	28.3	11.1	30.7

Source: DGCIS

Table 16 shows CAGR export growth (%) for the top 15 HS codes exported to the USA. Of these products, three display negative growth, while twelve demonstrate positive growth. HS Code 61112000 shows strong but volatile growth, with a sharp decline of 1.5% from 2019 to 2025. HS 57050039 and 33019029 also experience negative growth during this period, at 7.2% and 0.1%, respectively. HS Code 84679900 has the highest and most solid growth at 30.7%. This is followed by HS 57039020 with a 26.5% increase and HS 16052100 with a 14.9% increase.

A focused assessment of Compound Annual Growth Rates (CAGRs) for Kerala's top 13 export products (at the 6-digit HS level) from 2019 to 2023 reveals varied growth paths. Figure 4 shows that HS 160529 (Cooked Shrimps) has the highest CAGR of 35%, followed closely by HS 846799 (Machinery Parts) and HS 330190 (Spice Oleoresins), at 35.08% and 12.34% respectively.

Figure 4: CAGR-Based Export Momentum of Kerala's Core Products (2019–2023)



Source: Based on the author's calculation using DGCIS

These figures highlight the strong export potential of the marine and machinery sectors, positioning them as key drivers of export growth. Similarly, HS 611120 (Cotton Garments) and HS 570500 (Textile Floor Coverings) recorded negative CAGR values of -8.72% and -11.10%, indicating a declining demand trend or loss of competitiveness in global markets. A negative CAGR in textiles emphasizes the need for GI tagging for Kerala's Balaramapuram sarees. These patterns suggest a need for strategic rebranding, innovation, or market realignment in traditional labour-intensive sectors.

Analysing CAGR trends provides a directional view of product-level momentum, aiding in prioritizing export promotion and resilience strategies. Products with consistently rising export values over time deserve special attention under targeted trade facilitation programs, while those with negative CAGR may need support to regain competitiveness or shift to nearby markets.

Table 17: MTN Category-wise Exports of Kerala to the USA

S.No.	MTN Category	USD Million
1	Fish and fish products	868.56
2	Coffee, tea, cocoa and spices	811.07
3	Textiles	788.00
4	Other agricultural products	741.75
5	Clothing	587.66
6	Electrical machinery and electronic equipment	444.96
7	Fruits and vegetables	254.77
8	Mechanical, office and computing machinery	208.31
9	Rubber, leather and footwear	203.26
10	Other manufactures	135.66
11	Chemicals	120.38
12	Cereals and cereal preparations	119.71
13	Minerals and metals	104.48
14	Wood, paper, furniture	30.49
15	Transport equipment	5.72
16	Oilseeds, fats and oils	4.86
17	Petroleum	1.96
18	Sugars and sugar confectionery	1.09
19	Beverages and tobacco	0.26
20	Dairy products	0.14
21	Cotton, silk and wool	0.03
22	Live animals and meat	0.00
MTN Product Group		5,433.12
Share %		***1.06%***
Total Exports of India		508,275.3

Source: DGCIS

Table 17 shows Kerala's top export categories to the United States. Fish and fish products ($868.56 million) rank first, followed by Coffee, Tea, and Spices ($811.07 million) and Textiles ($788 million). Other important export categories include clothing, electronics, machinery, and rubber products.

Kerala has low exports in categories such as petroleum ($1.96 million), cotton, silk, and wool ($0.03 million), and dairy ($0.14 million), indicating limited engagement or demand in these sectors. Its share in India's total exports is only 1.06%. Therefore, there is a high likelihood of shifting to the domestic market or diversifying into other markets besides the USA, as shown in Table 17.

Table 18: Number of Tariff Lines under MTN Categories

SOP/MTN	Tariff Lines	% share
Capital goods	**2**	**13.3**
Electrical machinery and electronic equipment	*1*	*50.0*
Mechanical, office and computing machinery	*1*	*50.0*
Consumer goods	**10**	**66.7**
Clothing	*1*	*10.0*
Coffee, tea, cocoa and spices	*2*	*20.0*
Fish and fish products	*2*	*20.0*
Fruits and vegetables	*1*	*10.0*
Rubber, leather and footwear	*1*	*10.0*

Textiles	*3*	*30.0*
Intermediate goods	**3**	**20.0**
Fish and fish products	*1*	*33.3*
Other agricultural products	*2*	*66.7*
Grand Total	15	**100.0**

Source: Author's Calculation

Since nearly 67% of the top 15 products exported to the USA face increased pressure due to Trump's tariffs, and as our initial assessment indicated, we understand that the preferences of migrant Indians influence many imports. Therefore, manufacturers of these products need to implement price rationalisation by adopting technological solutions in marketing and sales. There is also a need to re-evaluate the profit margins for these products.

TINA Simulation-Based Assessment:

As a second step, we undertake a partial equilibrium assessment on the evaluated 1,347 HS codes out of 1,519, excluding 172 codes. Although these codes represent low trade values, overlooking them might miss niche or emerging sectors that could respond differently under tariff stress, especially in the context of Kerala's diversified but "low-volume and high-value" export profile.

Kerala's Export Vulnerability to U.S. Tariff Escalation

While the trade analysis in the preceding section highlights Kerala's most exposed export sectors and products through empirical trends, this approach remains static. It describes observed patterns but does not predict how Kerala's export composition might change under future trade policy shocks.

To address this limitation and provide a future-focused assessment, this study uses a simulation-based approach with the Trade Intelligence and Negotiation Advisor (TiNA) platform. The aim is to estimate the impact of rising U.S. tariffs on Kerala-linked exports and to identify product-level vulnerabilities and potential redirection opportunities.

Aggregate Trade Loss Estimates under Simulated Tariff Shocks

The TiNA model performs simulations on India's overall export basket to assess the effects of possible tariff escalations imposed by the United States. Although the simulation is conducted at the national level, this analysis focuses specifically on Kerala's key export products, considering their strategic economic importance to the state.

Table 19: Aggregate Export Impact of U.S. Tariff Scenarios on Kerala-Relevant HS Codes

Tariff Scenario	Potential Estimated Trade Gain/Loss (USD Billion)	Kerala's Estimated Share[31] (USD Billion)	Total export of India to the USA in 2023 (USD Billion)
Total Trade (+10%)	7.75 (short-term gain)	0.062	63.10
Total Trade (+26%)	-20.08	-0.161	
Total Trade (+36%)	-32.52	-0.260	
Total Trade (+500%)	-63.10 (total export value)	-0.505	

Source: TiNA ESCAP.

Table 19 shows that under a +10% tariff scenario, the model projects a positive export gain of USD 7.75 billion, indicating short-term trade advantages due to price substitution effects and the reallocation of global demand away from suppliers more heavily affected by the tariff. This initial gain aligns with Kerala's surge in spice exports as U.S. buyers shift away from China.

With further tariff escalation, the model shows a sharply worsening trade trajectory. At +26%, the simulation estimates a trade decline of USD 20.08 billion, which increases to USD 32.52 billion under the +36% scenario, and peaks at a USD 63.10 billion loss when tariffs hypothetically rise to +500%, a figure that nearly matches the total 2023 export earnings from these Kerala-linked product categories.

Table 19 also shows Kerala's proportional losses under rising U.S. tariffs, estimated by applying the state's 2023 export share (0.8% of India's total) to TiNA's simulated national losses. At a +26% tariff, Kerala faces $160.6 million in trade losses, mainly from seafood (HS 1605) and textiles (HS 6111). This matches MPEDA's 2024 risk assessment, which recommends diversification into EU markets with ESG-certified processing.

The progression emphasizes the nonlinear sensitivity of trade flows to protectionist shocks and shows how moderate tariffs might initially generate diversionary benefits but quickly turn harmful when exceeded beyond a certain point.

This pattern has particular policy importance in the context of expected tariff threats under a potential second Trump administration. The analysis emphasizes Kerala's vulnerability to external tariff-related disruptions, especially due to its reliance on labor-intensive, MSME-linked, and agro-industrial export products. Therefore, Kerala's trade preparedness should include both contingency plans for severe trade shocks and strategies to take advantage of short-term diversionary trade opportunities whenever possible.

Sectoral Vulnerability and Resilience under Simulated Tariff Shocks

[31] Kerala's losses estimated by applying state-level export shares (DGCI&S 2023) to TiNA's simulated India-wide losses, adjusted for sectoral elasticities. Values are adjusted for Kerala's higher sectoral elasticity (e.g., spices, seafood)

The MTN sub-sectoral results of the TiNA simulation under four tariff scenarios reveal the top five most and least affected MTN sub-categories within the MTN Category across India's export profile, offering a proxy for Kerala's vulnerability and resilience based on its sectoral presence.

It highlights both the severity of export contraction and the corresponding trade value in 2023, providing insights into which sectors are most vulnerable to tariff-induced shocks and which show resilience. This distinction is crucial for Kerala's strategic planning, as many of its niche exports, such as spice oleoresins, coconut-based oils, and wellness-linked electronics, may have lower volumes but high sensitivity.

Table 20: Most Affected MTN Sub-Categories under Simulated U.S. Tariff Scenarios within the MTN Category

	Total (values in USD Billions)	-9.95	-25.65	-35.32	-46.15	46.15
S.N.	**The top affected MTN subcategory within the MTN category.**	**Total Trade_10%**	**Total Trade_26%**	**Total Trade_36%**	**Total Trade_500%**	**Trade value in 2023**
1	**Electrical machinery and electronic equipment**					
	Audio-visual devices	-0.01	-0.03	-0.05	-0.05	0.05
	Domestic appliances	-0.01	-0.04	-0.05	-0.05	0.05
	Electrical machinery	-0.69	-1.80	-2.49	-2.91	2.91
	Electronic components	-0.02	-0.06	-0.08	-0.09	0.09
	Semiconductors	-0.49	-1.26	-1.74	-1.98	1.98
	Telecommunication equipment	-1.71	-4.42	-6.10	-6.63	6.63
2	**Minerals and metals**					
	Iron and steel	-0.42	-1.10	-1.51	-2.03	2.03
	Jewellery and related products	-1.83	-4.66	-6.37	-10.71	10.71
	Metal products	-0.10	-0.27	-0.38	-0.47	0.47
	Non-ferrous metals	-0.11	-0.29	-0.40	-0.49	0.49
	Non-metallic mineral products	-0.24	-0.62	-0.85	-1.08	1.08
	Other minerals	0.00	0.00	-0.01	-0.01	0.01
3	**Chemicals**					
	Inorganic chemicals	-0.01	-0.04	-0.05	-0.06	0.06
	Organic chemicals	-0.18	-0.45	-0.63	-0.79	0.79
	Other chemical products	-0.12	-0.31	-0.43	-0.55	0.55
	Pharmaceuticals	-2.03	-5.22	-7.19	-9.51	9.51
	Plastics	-0.20	-0.52	-0.71	-0.82	0.82
4	**Mechanical, office and computing machinery**					
	Computers and office machinery	-0.09	-0.23	-0.32	-0.37	0.37
	General industrial machinery	-0.54	-1.40	-1.94	-2.34	2.34
	Machinery for specialised industries	-0.20	-0.53	-0.73	-0.80	0.80
	Power-generating machinery	-0.13	-0.34	-0.47	-0.52	0.52
5	**Clothing**					
	Clothing	-0.80	-2.06	-2.84	-3.90	3.90

Source: TiNA ESCAP.

Table 20 highlights that among the MTN sub-categories, telecommunication equipment, jewellery and related products, pharmaceuticals, electrical machinery, and semiconductors emerge as the most severely impacted under a 26% tariff scenario. Notably, telecommunication equipment alone is projected to face a USD 4.42 billion export loss.

Kerala's Ayurvedic diagnostics (e.g., Prakruti sensors) may pivot to Japan's ageing population, followed closely by jewellery at USD 4.66 billion and pharmaceuticals at USD 5.22 billion. These sectors are high-value, technologically intensive, and sensitive to price distortions, making them particularly vulnerable to tariff escalation. Electrical machinery (USD 1.80 billion loss) and semiconductors (USD 1.26 billion) round out the list, reflecting the deep interconnectedness of global electronics supply chains. While Kerala may not be a dominant exporter in these categories at present, the rising share of niche medical electronics, Ayurveda-integrated wellness devices, and aroma-based electronic products suggests that even indirect exposure through input or assembly chains could lead to cascading impacts on local startups and exporters. These results reinforce the need for Kerala to monitor trade-sensitive innovation sectors while continuing to build value-added resilience in less volatile product groups.

Table 21: Least Affected MTN Sub-Categories under Simulated U.S. Tariff Scenarios within the MTN Category

	Total (values in USD Billions)	**-0.045**	**-0.117**	**-0.161**	**-0.292**	**0.292**
Sl.no	**Top 5 least affected MTN Sub subcategory within the MTN category**	**TT_10**	**TT_26**	**TT_36**	**TT_500**	**Trade value in 2023**
1	**Beverages and tobacco**					
	Non-alcoholic beverages, including juices	-0.001	-0.002	-0.003	-0.004	0.004
2	**Cotton, silk and wool**					
	Cotton	-0.001	-0.003	-0.005	-0.008	0.008
3	**Dairy products**					
	Dairy products	-0.003	-0.008	-0.012	-0.013	0.013
4	**Sugars and sugar confectionery**					
	Sugars and sugar confectionery	-0.010	-0.026	-0.036	-0.041	0.041
5	**Oilseeds, fats and oils**					
	Oilseeds	-0.011	-0.027	-0.037	-0.064	0.064
	Vegetable fats and oils	-0.019	-0.050	-0.069	-0.162	0.162

Source: TiNA ESCAP.

In contrast to the high-risk sectors, the TiNA simulation identifies a group of least affected MTN sub-categories, as in Table 21, which remain largely insulated from the adverse effects of tariff escalation even at the 26% level. These include non-alcoholic beverages (such as juices), cotton, dairy products, sugar and sugar confectionery, and oils, fats, and vegetable oils. The projected export losses for these sub-categories are minimal, ranging from just USD 2 million for beverages to USD 50 million for vegetable oils. The relatively low sensitivity is due to a combination of factors, including a low U.S. import share in these lines, inelastic demand, smaller export volumes, or niche consumption segments.

For Kerala, this group offers pockets of strategic resilience, especially in the context of coconut oil, virgin coconut-based products, and certain Ayurveda-linked dietary exports that fall under the oils and fats category. These are high-value, low-volume goods often targeting wellness and organic markets, which are less price-sensitive and more brand-driven. Hence, while these sectors may not register significant numerical losses, they offer stable export potential and may serve as anchor categories during tariff-induced trade disruptions.

Redirecting Risk: Trade Diversion Destinations for Kerala's Top Export Products under a 26% Tariff Shock

The imposition of a 26% tariff on India's exports to the United States triggers a significant redirection of Kerala's top 15 export products toward alternate global markets.

Table 22: Alternate Global Markets for Kerala's Top 15 Exported Products under a 26% U.S. Tariff Scenario

S. no	Country	Potential Diversion Value (USD Billions)
1	Ecuador (ECU)	0.167
2	Indonesia (IDN)	0.138
3	Mexico (MEX)	0.126
4	Vietnam (VNM)	0.098
5	Thailand (THA)	0.041
6	European Union (EU)	0.038
7	Canada (CAN)	0.036
8	Argentina (ARG)	0.020
9	Bangladesh (BGD)	0.016
10	India (domestic redirection)	-0.602(excluding from the target list)

Source: TiNA ESCAP.

Based on the simulation outputs in Table 22, the diversion potential is highest towards Ecuador, with a total of $ 167 million, followed by substantial absorption potential in Vietnam, Thailand, Indonesia, and Mexico. There is also a smaller yet meaningful redirection to Canada, the European Union, and Bangladesh. These markets demonstrate a combination of absorptive capacity, supply chain proximity, and product alignment for commodities.

Table 23: Trade Diversion Matrix for Kerala's Top Five HS Codes under a 26% Tariff

S. No	HS Code	Top Diversion Market	Diversion Value (USD million)
1	611120 (Women's cotton garments)	Vietnam (VNM)	22.82
2	90422 (Spices incl. Pepper)	Mexico (MEX)	15.57
3	570390 (Coir mats/carpets)	Turkey (TUR)	7.28
4	160529 (Shrimp/Prawns)	Indonesia (IDN)	3.93
5	330190 (Essential oils)	Mexico (MEX)	2.77

Source: TiNA ESCAP.

A disaggregated analysis at the HS-code level, as shown in Table 23, confirms that trade diversion under a 26% tariff scenario is not only geographically varied but also highly product-specific. The top export product from Kerala, such as women's cotton garments (HS 611120), shows maximum diversion potential to Vietnam (USD 22.8 million),

indicating the regional textile clusters' capacity to absorb Kerala's displaced apparel exports and suggesting that Kerala's Kitex should explore joint ventures to bypass tariffs. Similarly, spices and pepper (HS 90422) find redirection to Mexico, a market with increasing demand for value-added culinary inputs and wellness-linked spice blends, which also aligns with Kerala's value-added blends.

In the marine segment, shrimp and prawn exports (HS 160529) are strongly diverted to Indonesia, another aquaculture-intensive economy, potentially reflecting re-processing trade dynamics. Meanwhile, essential oils (HS 330190) and coir-based floor coverings (HS 570390) primarily redirect toward Mexico and Turkey, respectively—two economies that combine strong consumer markets with competitive manufacturing ecosystems, making them suitable for integrating intermediate goods.

These flows highlight how tariff-induced pressure in the US can lead to a strategic reshuffling of Kerala's exports into Southeast Asian and Latin American regions, where shared climatic profiles, processing linkages, and preferential access align with the state's niche product strengths. Institutional mechanisms such as market-specific branding, regulatory harmonisation, and non-tariff readiness will be key to converting these diversions into sustained trade corridors.

Comparative Analysis of Kerala's Core Export Basket to the US: Product-Level Competition across Key Asian Economies

To deepen the assessment of Kerala's export vulnerability to tariff escalation, a product-level analysis has been conducted for the top 15 products exported from Kerala to the United States, initially identified at the HS-8-digit level. These consolidate into 13 unique HS-6-digit product categories, spanning key sectors such as fish and fish products, tea and spices, textiles, garments, fruits, and electrical machinery and electronic equipment.

The analysis compares India's (Kerala's) export performance in these categories against four competing Asian economies — Sri Lanka, China, Thailand, and Vietnam — to evaluate relative exposure and resilience under four escalating tariff scenarios: +10%, +26%, +36%, and +500%. Each country's performance is assessed using TiNA simulation estimates, which capture both the absolute trade impact and product-wise sensitivity. This structured comparison helps identify where Kerala may gain from trade diversion, where it remains exposed, and how its positioning differs from regional competitors in the US market across these critical product lines.

Table 24: Impact of U.S. Tariffs on India's Exports in Kerala-Linked Key Product Categories

HS codes	MTN	Sum of Total Trade at +10%	Sum of Total Trade at +26%	Sum of Total Trade at +36%	Sum of Total Trade at +500%	Trade Value in 2023
30617	Fish and fish products	0.088	-0.590	-0.890	-1.923	1.923
90412	Coffee, tea, cocoa and spices	0.003	-0.008	-0.013	-0.025	0.025

90422	Coffee, tea, cocoa and spices	0.008	-0.019	-0.032	-0.087	0.087
160521	Fish and fish products	0.083	-0.151	-0.232	-0.446	0.446
160529	Fish and fish products	0.008	-0.015	-0.023	-0.053	0.053
200819	Fruits and vegetables	0.003	-0.012	-0.018	-0.028	0.028
330190	Other agricultural products	-0.001	-0.019	-0.028	-0.077	0.077
401691	Rubber, leather and footwear	0.002	-0.014	-0.021	-0.034	0.034
570390	Textiles	0.000	-0.023	-0.035	-0.101	0.101
570500	Textiles	0.016	-0.012	-0.028	-0.106	0.106
611120	Clothing	0.052	-0.080	-0.132	-0.256	0.256
846799	Mechanical, office and computing machinery	0.001	-0.003	-0.004	-0.007	0.007
853641	Electrical machinery and electronic equipment	0.003	-0.007	-0.012	-0.019	0.019
Total in USD Millions		0.266	-0.954	-1.469	-3.163	3.163

Source: TiNA ESCAP.

For India, as shown in Table 24, the tariff simulation results across the 13 key product categories indicate a fragile and uneven exposure. While the total trade impact shows a marginal gain of USD 0.27 million at the +10% tariff level, this quickly reverses into a loss of USD 0.95 million at +26%, USD 1.47 million at +36%, and ultimately a complete wipe-out of USD 3.16 million under the +500% tariff scenario matching India's total 2023 export value in these lines. The most prominent category is fish and fish products, particularly HS 30617 and HS 160521, which collectively account for over USD 2.3 million in trade and exhibit steep declines as tariffs increase. Other Agro-linked exports, such as coffee, tea, and spices (HS 90412 and 90422), fruits and vegetables (HS 200819), and other agricultural products (HS 330190), although smaller in absolute value, also exhibit high sensitivity. Textile products (HS 570390 and 570500) and clothing (HS 611120), the mainstays of Kerala's MSME and coir sector, face steady erosion under all scenarios. Meanwhile, light engineering products, such as mechanical machinery (HS 846799) and electrical equipment (HS 853641), display limited trade volume but remain vulnerable. Overall, India's profile reveals narrow short-term gains but sharp, nonlinear trade contraction beyond a modest tariff rise, reinforcing the urgency for Kerala to diversify and build resilience across its export sectors.

Table 25: Impact of U.S. Tariffs on China's Exports in Kerala-Linked Key Product Categories

HS codes	MTN	Sum of Total Trade at +10%	Sum of Total Trade at +26%	Sum of Total Trade at +36%	Sum of Total Trade at +500%	Trade Value in 2023
90412	Coffee, tea, cocoa and spices	-0.07	-1.01	-1.59	2.57	-2.57
90422	Coffee, tea, cocoa and spices	-2.28	-17.84	-27.36	54.81	-54.81
160521	Fish and fish products	-0.93	-9.56	-14.95	22.60	-22.60
160529	Fish and fish products	0.00	-0.05	-0.07	0.11	-0.11
200819	Fruits and vegetables	-1.34	-7.87	-11.94	17.87	-17.87
330190	Other agricultural products	-0.22	-1.72	-2.65	3.97	-3.97
401691	Rubber, leather and footwear	-3.92	-15.96	-23.36	35.14	-35.14
570390	Textiles	-0.78	-6.54	-10.10	15.96	-15.96
570500	Textiles	-4.74	-31.85	-48.14	117.82	-117.82
611120	Clothing	-11.58	-88.63	-135.99	239.14	-239.14

846799	Mechanical, office and computing machinery	-6.75	-33.08	-49.13	83.42	-83.42
853641	Electrical machinery and electronic equipment	-10.56	-52.93	-78.82	136.26	-136.26
Total in USD Millions		-43.18	-267.02	-404.10	729.67	-729.67

Source: TiNA ESCAP.

China's exports to the US, as shown in Table 25, exhibit substantial vulnerability, with total trade values declining progressively as tariffs rise. At a 10% tariff increase, the overall reduction stands at USD 43.18 million, which steeply rises to USD 267.02 million at 26%, USD 404.10 million at 36%, and a stark USD 729.67 million under the extreme 500% tariff. The worst-hit sectors are clothing (HS 611120) and electrical machinery (HS 853641), both showing massive trade contractions of over USD 200 million and USD 130 million, respectively, under the 500% tariff. Other high-impact sectors include textiles, mechanical equipment, and rubber products, indicating China's reliance on these categories for exports to the US. In contrast, minimal impacts are observed in fish products (HS 160529) and cocoa-based products (HS 330190) under lower tariff scenarios, although even these register significant declines at the highest escalation. The data underlines the high concentration of China's export exposure in labour-intensive and manufacturing sectors, making them sensitive to tariff hikes.

In comparison, India's overall export losses under similar tariff escalation scenarios are considerably lower in magnitude, both in absolute terms and across most product lines. Notably, for key sectors such as textiles and rubber products, China's trade loss at higher tariff levels far exceeds that of India, indicating a heavier dependency on the US market for these categories. India's relative insulation in categories such as mechanical equipment and electrical machinery could suggest a more diversified export destination base or less exposure to high-risk tariff sectors. This comparison highlights potential opportunities for India to enhance its market positioning in the US, particularly if China's share contracts significantly decline under increased tariff pressure.

Table 26: Impact of U.S. Tariffs on Thailand's Exports in Kerala-Linked Key Product Categories

HS codes	MTN	Sum of Total Trade at +10%	Sum of Total Trade at +26%	Sum of Total Trade at +36%	Sum of Total Trade at +500%	Trade Value in 2023
30617	Fish and fish products	-4.75	-46.77	-72.97	-112.61	112.61
90412	Coffee, tea, cocoa and spices	0.00	-0.02	-0.03	-0.05	0.05
90422	Coffee, tea, cocoa and spices	0.03	-0.29	-0.50	-0.95	0.95
160521	Fish and fish products	-6.98	-79.33	-123.94	-215.68	215.68
160529	Fish and fish products	-0.65	-6.15	-9.55	-16.48	16.48
200819	Fruits and vegetables	-5.64	-35.07	-53.20	-91.35	91.35
330190	Other agricultural products	0.00	-0.01	-0.02	-0.03	0.03
401691	Rubber, leather and footwear	-0.35	-3.85	-6.03	-9.31	9.31
570390	Textiles	-0.01	-0.44	-0.71	-1.12	1.12
570500	Textiles	0.25	-0.39	-0.79	-1.75	1.75
611120	Clothing	0.97	-10.98	-18.43	-33.05	33.05
846799	Mechanical, office and computing machinery	0.36	-3.20	-5.41	-9.23	9.23
853641	Electrical machinery and electronic equipment	0.11	-1.57	-2.62	-4.42	4.42
Total in USD Millions		-16.67	-188.08	-294.19	-496.03	496.03

Source: TiNA ESCAP.

Table 26 shows that for Thailand, the results of the tariff escalation simulation point towards pronounced vulnerabilities in its key export sectors to the US, with total trade losses estimated at USD 496 million under a 500% tariff hike. The most severely impacted products include fish and fish preparations (HS 160521 and 160529), textiles and clothing (HS 611120, 570390, 570500), fruits and vegetables (HS 200819), and electronic and mechanical machinery (HS 853641 and 846799). The fish sector alone accounts for nearly USD 215 million in losses due to high tariffs, highlighting the sensitivity of Thailand's marine exports to tariff changes similar to those observed in India. Likewise, losses in textiles and garments, amounting to over USD 35 million, emphasise the shared exposure of labour-intensive sectors in developing economies to tariff shocks. Interestingly, some product lines, such as coffee and spices (HS 90412, 90422), show only a marginal impact, suggesting that their lower trade volumes or price inelastic demand. Overall, Thailand's experience under rising tariff scenarios reflects structural parallels with India's export profile, especially in fisheries, textiles, and electronics, underscoring the need for resilience-building through product diversification and targeted trade diplomacy.

Table 27: Impact of U.S. Tariffs on Vietnam's Exports in Kerala-Linked Key Product Categories

HS codes	MTN	Sum of Total Trade at +10%	Sum of Total Trade at +26%	Sum of Total Trade at +36%	Sum of Total Trade at +500%	Trade Value in 2023
30617	Fish and fish products	-15.90	-191.68	-124.31	-282.66	282.66
90412	Coffee, tea, cocoa and spices	-2.27	-23.65	-15.69	-86.03	86.03
90422	Coffee, tea, cocoa and spices	0.01	-0.12	-0.07	-0.23	0.23
160521	Fish and fish products	-17.99	-214.64	-139.97	-372.00	372.00
160529	Fish and fish products	-0.58	-6.97	-4.53	-10.46	10.46
200819	Fruits and vegetables	-17.16	-117.37	-79.53	-226.69	226.69
330190	Other agricultural products	0.00	-0.06	-0.04	-0.08	0.08
401691	Rubber, leather and footwear	-0.29	-3.51	-2.28	-4.68	4.68
570500	Textiles	0.78	-3.13	-1.63	-6.28	6.28
611120	Clothing	-0.32	-104.58	-64.74	-170.90	170.90
846799	Mechanical, office and computing machinery	0.05	-5.68	-3.48	-8.02	8.02
853641	Electrical machinery and electronic equipment	0.02	-6.90	-4.24	-10.28	10.28
Total in USD Millions		-53.67	-678.29	-440.51	-1178.32	1178.32

Source: TiNA ESCAP.

Table 27 shows that Vietnam's exports to the US demonstrate a broad product base, with fish and fish products, fruits and vegetables, and clothing among the dominant sectors. The HS codes most impacted by tariff escalation scenarios include 30617 (Fish products), 160521, and 160529, which together account for a significant share of the overall trade reduction under all simulated tariff increases. At the 10% tariff level, Vietnam's exports decline moderately by USD 53.67 million; however, the impact intensifies sharply, with declines of USD 678.29 million at 26%, USD 440.51 million at 36%, and USD 1,178.32 million under the 500% tariff hike scenario. Sector-wise, fish and fish products alone make up over USD 650 million of the loss at the highest tariff level, indicating the sector's extreme vulnerability to tariff changes. Fruits and vegetables (HS 200819) and clothing (HS 611120) also register substantial declines of USD 226.69

million and USD 170.90 million, respectively, under the 500% increase, reflecting the importance of these sectors in Vietnam's export profile. In contrast, items such as textiles (HS 570500) and electrical machinery (HS 853641) exhibit minimal sensitivity, with losses under USD 11 million, indicating greater resilience or lower dependence on these HS lines. Overall, the results underline Vietnam's intense exposure in select agricultural and labour-intensive sectors, and any tariff escalation would disproportionately hurt these categories.

Table 28: Impact of U.S. Tariffs on Sri Lanka's Exports in Kerala-Linked Key Product Categories

HS codes	MTN	Sum of Total Trade at +10%	Sum of Total Trade at +26%	Sum of Total Trade at +36%	Sum of Total Trade at +500%	Trade Value in 2023
30617	Fish and fish products	-0.18	-1.71	-2.67	-3.99	3.99
90412	Coffee, tea, cocoa and spices	-0.02	-0.31	-0.49	-0.80	0.80
90422	Coffee, tea, cocoa and spices	0.00	0.00	0.00	-0.01	0.01
160521	Fish and fish products	0.00	-0.05	-0.08	-0.12	0.12
200819	Fruits and vegetables	-0.55	-3.72	-5.71	-8.60	8.60
330190	Other agricultural products	-0.08	-0.73	-1.14	-1.72	1.72
401691	Rubber, leather and footwear	-0.08	-0.87	-1.36	-2.00	2.00
570390	Textiles	0.00	-0.02	-0.03	-0.05	0.05
570500	Textiles	0.04	-0.07	-0.14	-0.31	0.31
611120	Clothing	1.16	-15.47	-25.83	-45.57	45.57
Total in USD Millions		**0.29**	**-22.96**	**-37.45**	**-63.16**	**63.16**

Source: TiNA ESCAP.

The simulation presented in Table 28 indicates that Sri Lanka's export performance to the U.S. is highly vulnerable to tariff escalation, particularly beyond moderate tariff hikes. At a 10% increase, the trade impact remains negligible (USD +0.29 million). Still, the situation sharply deteriorates with higher tariffs: USD -22.96 million at a 26% increase, -37.45 million at a 36% increase, and a complete trade erosion of -63.16 million under a 500% tariff hike. The steepest losses are concentrated in HS 611120 (Clothing) with a 2023 trade value of USD 45.57 million, followed by fruits and vegetables (HS 200819) and fish products (HS 30617). These are largely labour-intensive and price-sensitive sectors, and their sharp decline under higher tariff rates indicates limited buffer capacity to absorb cost shocks. The trajectory highlights a high risk of concentration and underscores the urgency for export diversification and enhanced tariff-free access through preferential channels.

The results reveal that while India faces significant risks in labour-intensive sectors like clothing, textiles, and fish products, several competitors experience even larger absolute losses due to their higher export volumes and deeper market penetration. China, in particular, shows the most significant exposure, highlighting India's opportunity to strengthen its market share if tariff pressures disrupt its rivals. Thailand and Vietnam exhibit similar sectoral sensitivities, especially in fisheries and apparel, aligning with

India's export profile but at varying scales. Sri Lanka, with a smaller trade base, remains highly vulnerable due to limited product diversification. Overall, the comparative insights emphasise the importance for India to enhance competitiveness, diversify exports, and leverage tariff shocks faced by competitors to improve its foothold in the US market.

Section IV: Conclusion

The study evaluates the impact of U.S. tariff shocks on Kerala's exports using a Partial Equilibrium (PE) model via the TiNA platform. The PE model is designed to simulate long-run trade adjustments under ceteris paribus conditions with elasticity-based demand and supply responses.

The TiNA model conducts simulations on India's aggregate export basket to estimate the impact of potential tariff escalations imposed by the United States. While the simulation is run at the national level, this analysis isolates and interprets the implications specifically for Kerala's significant export products, given their strategic economic relevance to the state.

The finding demonstrates that moderate tariffs may initially produce diversionary benefits, but rapidly become destructive when scaled beyond a certain threshold.

Under a +10% tariff scenario, the model projects a positive export gain of USD 7.75 billion, indicating short-term trade advantages resulting from price substitution effects and the reallocation of global demand away from suppliers that are more heavily affected. This initial gain aligns with Kerala's surge in spice exports as U.S. buyers shift away from China.

With further tariff escalation, the model reveals a sharply deteriorating trade trajectory. At +26%, the simulation estimates a trade contraction of USD 20.08 billion, intensifying to USD 32.52 billion under the +36% scenario, and peaking at a USD 63.10 billion loss when tariffs hypothetically rise to +500%, a value that nearly equals the total 2023 export earnings from these Kerala-linked product categories.

The analysis also shows Kerala's proportional losses under escalating U.S. tariffs, estimated by applying the state's 2023 export share (0.8% of India's total) to TiNA's simulated national losses. At +26% tariffs, Kerala faces $ 160.6 million in trade losses, primarily from seafood (HS 1605) and textiles (HS 6111).

Forward-looking trade preparedness for Kerala must, therefore, integrate both contingency planning for severe trade shocks and strategies to capture short-term diversionary trade gains, where feasible.

Among the MTN sub-categories, telecommunication equipment, jewellery and related products, pharmaceuticals, electrical machinery, and semiconductors emerge as the most severely impacted under a 26% tariff scenario. Notably, telecommunication equipment alone is projected to face a USD 4.42 billion export loss. These sectors are high-value, technologically intensive, and sensitive to price distortions, making them particularly vulnerable to tariff escalation.

While Kerala may not be a dominant exporter in these categories at present, the rising share of niche medical electronics, Ayurveda-integrated wellness devices, and aroma-based electronic products suggests that even indirect exposure through input or assembly chains could lead to cascading impacts on local startups and exporters. These results reinforce the need for Kerala to monitor trade-sensitive innovation sectors while continuing to build value-added resilience in less volatile product groups.

On the contrary, non-alcoholic beverages (including juices), cotton, dairy products, sugar, and sugar confectionery, as well as oilseeds, fats, and vegetable oils, are least affected. The projected export losses for these sub-categories are minimal, ranging from just USD 2 million for beverages to USD 50 million for vegetable oils.

The relatively low sensitivity is due to a combination of factors, including a low U.S. import share in these lines, inelastic demand, smaller export volumes, or niche consumption segments. For Kerala, this group offers pockets of strategic resilience, especially in the context of coconut oil, virgin coconut-based products, and certain Ayurveda-linked dietary exports that fall under the oils and fats category. These are high-value, low-volume goods often targeting wellness and organic markets, which are less price-sensitive and more brand-driven. Hence, while these sectors may not register significant numerical losses, they offer stable export potential and may serve as anchor categories during tariff-induced trade disruptions.

The diversion potential is highest towards Ecuador, with a total of $ 167 million, followed by substantial absorption potential in Vietnam, Thailand, Indonesia, and Mexico. A smaller yet meaningful redirection is also observed towards Canada, the European Union, and Bangladesh. These markets demonstrate a combination of absorptive capacity, supply chain proximity, and product alignment for commodities.

The tariff simulation results across the 13 key product categories (at the 6-digit HS level) indicate a fragile and uneven exposure for India. While the total trade impact shows a marginal gain of USD 0.27 million for India at the +10% tariff level, this quickly reverses into a loss of USD 0.95 million at +26%, USD 1.47 million at +36%, and ultimately a complete wipe-out of USD 3.16 million under the +500% tariff scenario matching India's total 2023 export value in these lines.

The most prominent category is fish and fish products, particularly HS 30617 and HS 160521, which collectively account for over USD 2.3 million in trade and exhibit steep declines as tariffs increase. Other Agro-linked exports, such as coffee, tea, and spices (HS 90412 and 90422), fruits and vegetables (HS 200819), and other agricultural products (HS 330190), although smaller in absolute value, also exhibit high sensitivity. Textile products (HS 570390 and 570500) and clothing (HS 611120), the mainstays of Kerala's MSME and coir sector, face steady erosion under all scenarios.

China’s exports to the US across the 13 key product categories exhibit substantial vulnerability, with total trade values declining progressively as tariffs rise. At a 10% tariff increase, the overall reduction stands at USD 43.18 million, which steeply rises to USD 267.02 million at 26%, USD 404.10 million at 36%, and a stark USD 729.67 million under the extreme 500% tariff. The worst-hit sectors are clothing (HS 611120) and electrical machinery (HS 853641), both showing massive trade contractions of over USD 200 million and USD 130 million, respectively, under the 500% tariff. In comparison, India’s overall export losses under similar tariff escalation scenarios are considerably lower in magnitude, both in absolute terms and across most product lines. Notably, for key sectors such as textiles and rubber products, China’s trade loss at higher tariff levels far exceeds that of India, indicating a heavier dependency on the US market for these categories. India’s relative insulation in categories such as mechanical equipment and electrical machinery could suggest a more diversified export destination base or less exposure to high-risk tariff sectors. This comparison highlights potential opportunities for India to enhance its market positioning in the US, particularly if China's share contracts significantly decline under increased tariff pressure. The results reveal that while India faces significant risks in labour-intensive sectors like clothing, textiles, and fish products, several competitors experience even larger absolute losses due to their higher export volumes and deeper market penetration.

For Thailand, the results of the tariff escalation across the 13 key product categories point towards pronounced vulnerabilities in its key export sectors to the US, with total trade losses estimated at USD 496 million under a 500% tariff hike. The most severely impacted products include fish and fish preparations (HS 160521 and 160529), textiles and clothing (HS 611120, 570390, 570500), fruits and vegetables (HS 200819), and electronic and mechanical machinery (HS 853641 and 846799). Overall, Thailand’s experience under rising tariff scenarios reflects structural parallels with India’s export profile, especially in fisheries, textiles, and electronics, underscoring the need for resilience-building through product diversification and targeted trade diplomacy.

Vietnam’s exports across the 13 key product categories to the US demonstrate a broad product base, with fish and fish products, fruits and vegetables, and clothing among the dominant sectors. The HS codes most impacted by tariff escalation scenarios include 30617 (Fish products), 160521, and 160529, which together account for a significant share of the overall trade reduction under all simulated tariff increases. At the 10% tariff level, Vietnam’s exports decline moderately by USD 53.67 million; however, the impact intensifies sharply, with a USD 678.29 million decline at 26%, USD 440.51 million at 36%, and USD 1,178.32 million under the 500% tariff hike scenario. Overall, the results underline Vietnam's strong exposure in select agricultural and labour-intensive sectors, and any tariff escalation would disproportionately hurt these categories.

Sri Lanka's export performance across the 13 key product categories to the U.S. is highly vulnerable to tariff escalation, especially beyond moderate tariff hikes. At a 10% increase, the trade impact remains negligible (USD +0.29 million), but the situation sharply deteriorates with higher tariffs: USD -22.96 million at a 26% increase, -37.45 million at a 36% increase, and a complete trade erosion of -63.16 million under a 500% tariff hike. The steepest losses are concentrated in HS 611120 (Clothing) with a 2023 trade value of USD 45.57 million, followed by fruits and vegetables (HS 200819) and fish products (HS 30617).

Overall, the comparative insights emphasise the importance for India to enhance competitiveness, diversify exports, and leverage tariff shocks faced by competitors to improve its foothold in the US market.

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Annexure: U.S.–UK Economic Prosperity Deal

Kerala can explore commercial opportunities through the US-UK economic prosperity deal by establishing Indian-led investments in the UK and adding value to agricultural and fisheries sector products. It can lead to investment in manufacturing facilities that create value chains for intermediate or final products using imports from Kerala and other nations, thereby enhancing the viability of operations. This would help mitigate some of the mid- to long-term concerns related to livelihood losses in Kerala.

The **U.S.-UK Economic Prosperity Deal**, signed in mid-2025, includes a transhipment clause aimed at curbing **the illegal rerouting of goods through third countries to evade tariffs or trade remedies, such as** antidumping and countervailing duties.

The coverage pertains explicitly to goods rerouted through third countries (e.g., China or Vietnam) that are subject to U.S. trade remedies. It also proposes **monitoring and enforcement mechanisms** to detect and prevent such practices. Additionally, it includes provisions for **Cooperation on customs data sharing** and supply chain transparency.

The U.S. is increasingly concerned about **circumvention of Section 232 tariffs**, especially on steel, aluminium, and autos. The clause helps ensure that UK exports are genuinely of UK origin and not disguised transhipments from restricted sources. It aligns with broader U.S. efforts to **secure supply chains** and reduce dependency on adversarial economies.

The UK must demonstrate **compliance with origin rules** and limit Chinese inputs in sensitive sectors, such as steel and pharmaceuticals. Failure to comply could trigger **retaliatory tariffs**—up to 50% on steel and aluminium from the UK. This clause also sets a precedent for similar provisions in future U.S. trade deals, especially with allies.

Transhipment Rules – US-UK Trade Understanding

The **Transhipment Rules** under the **U.S.–UK Economic Prosperity Deal**, formalised via **Executive Order 14309 in June 2025**, aim to regulate and streamline trade flows while safeguarding national security and preventing tariff circumvention.

Table 29: Core Transhipment Provisions

Provision	Details
Quota-Based Access	UK automotive exports to the U.S. are capped at **100,000 vehicles/year** at a **10% tariff** (7.5% + 2.5% MFN). Beyond this, Section 232 tariffs of **25%** apply.
Automotive Parts	UK-origin parts used in UK vehicles also face a **10% total tariff**, streamlining supply chain classification.
Steel & Aluminium Quotas	The U.S. will establish **tariff-rate quotas** for UK steel and aluminium products, contingent on UK compliance with **supply chain security standards**.

Pharmaceuticals	Preferential treatment for UK pharmaceutical products and ingredients is contingent upon the outcomes of the Section 232 investigation and the UK's adherence to **supply chain transparency**.
Aerospace Exemptions	Certain UK aerospace products are **exempt from tariffs**, reinforcing bilateral cooperation in aircraft manufacturing

Source: Fact Sheet: Implementing the General Terms of the U.S.-UK Economic Prosperity Deal – The White House.

Transhipment Safeguards

Origin Verification: Goods routed through third countries must retain their UK origin status, accompanied by documented proof, to avoid reclassification.

Minimal Processing Clause: Products undergoing only minor changes in intermediary countries are not eligible for UK-origin benefits.

Anti-Circumvention Measures: The deal includes monitoring protocols to prevent tariff evasion via transhipment hubs like Malaysia or Vietnam

Origin Rules

The **2025 U.S.-UK Free Trade Agreement (FTA)** introduced a structured set of **rules of origin** to ensure that only genuinely U.S. or UK-made goods benefit from preferential tariff treatment. Here's how they work:

Core Origin Criteria: To qualify as "originating," a product must meet **one or more** of the following: **Wholly obtained or produced** in the U.S. or UK (e.g. minerals, crops, livestock); **Substantial transformation**: Non-originating materials must undergo significant processing that changes their tariff classification; and **Regional value content (RVC)**: A minimum percentage of the product's value must be added within the U.S. or UK—typically **40% or more**, depending on the sector.

Certification & Compliance: Self-certification: Exporters can declare origin without third-party verification; **Importer's knowledge**: U.S. importers may rely on documentation or supply chain data to confirm origin; and **Verification protocols**: Customs authorities can request records or conduct audits to prevent transhipment or circumvention.

Anti-Circumvention Measures: Goods routed through third countries (e.g. China or Vietnam) must not falsely claim UK or U.S. origin. Inputs from non-participating countries must be limited in sensitive sectors, such as steel, automobiles**, and pharmaceuticals**. Violations may trigger retaliatory tariffs or the suspension of FTA benefits.

Some industries have established origin rules, as shown in the table below.

Table 30: Sector-Specific Origin Requirement

Sector	Key Origin Requirement

Pharmaceuticals	Must meet U.S. supply chain security protocols
Automotive	40–45% RVC + tariff shift for key components
Steel & Aluminium	Origin + ownership transparency of facilities
Aerospace	Substantial transformation + certified inputs

Source: Based on Various Sources

One of the strategic advantages of India-UK FTAs lies in how it can be leveraged for indirect market access – it is used to the trade deal between the UK and the US for the advantage of India's primary producers (Farmers and fishermen). The UK–US FTA is almost signed; a new opportunity arises for Indian exporters to access the US market via the UK under specific conditions. This trade routing strategy hinges on the Rules of Origin (ROO) and transhipment provisions negotiated in these FTAs.