FINAL REPORT

Policy Research on Fruits, Vegetables and Other High-Value Crop Sectors to Improve Value Chains of The Potential Crops for the Export Markets

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Executive Summary

The Agriculture Sector Modernization Project (ASMP) aims to modernize Sri Lanka's agricultural sector by enhancing productivity, improving market access, and increasing value addition for smallholder farmers and agribusinesses. This report focuses on policy research related to the fruits, vegetables, and high-value crop sectors to improve their value chains and expand export market potential.

Key Findings:

1. **Market Analysis**:
   - Sri Lanka's export share in key fruit and vegetable markets is minimal, with significant untapped potential.
   - Top export markets include the Middle East and parts of Europe, North America, and Asia-Pacific, but market diversification is required to reduce regional dependence.
2. **Challenges**:
   - Limited production volume, lack of adherence to international quality standards, and high logistical costs hinder global competitiveness.
   - Smallholder farmers face constraints in accessing export-quality inputs and infrastructure.
3. **Opportunities**:
   - Value addition, such as processing and organic certifications, offers pathways to access premium markets.
   - Emerging markets in Asia and Africa present growth opportunities for fruits and vegetables.
4. **Policy Gaps**:
   Sri Lanka faces significant policy gaps in aligning its agricultural exports with international standards, particularly in meeting quality and certification requirements like GlobalGAP and Fair Trade. Regulatory inconsistencies and inadequate enforcement of export-related standards hinder access to premium global markets. Limited institutional support, such as insufficient trade facilitation mechanisms and weak coordination among value chain actors, restricts the sector's competitiveness. Infrastructure deficits, including inadequate cold chain systems and post-harvest facilities, exacerbate quality losses and reduce marketability. There is a lack of targeted policies to promote product diversification and market expansion, leaving Sri Lanka reliant on a few regional markets. Additionally, insufficient adoption of digital platforms and poor information flow within the value chain limit opportunities for growth and innovation.

Recommendations:

1. Regulatory Enhancements

- Enforcement of Standards: Align domestic standards with international requirements like GlobalGAP, Fair Trade, and ISO 22000. Establish or strengthen certification bodies to streamline certification processes.
- Phytosanitary Compliance: Upgrade domestic regulations to meet standards of importing countries (e.g., EU, Japan).
- Export Licensing: Implement monitoring systems for compliance, ensuring that only high-quality exports enter global markets.

2. Economic Support Mechanisms

- Subsidies: Provide financial aid for certifications (GlobalGAP, Organic) and post-harvest infrastructure.
- Export Incentives: Offer tax rebates and reduced tariffs for exporters meeting quality benchmarks or exploring new markets.
- Financial Support: Extend soft loans and grants to smallholder farmers and cooperatives for export-oriented projects.

3. Institutional Strengthening

- Dedicated Export Divisions: Establish specialized units in institutions like the Export Development Board (EDB) to focus on fruits and vegetables.
- Trade Facilitation Centers: Create hubs for streamlined customs clearance, export documentation, and logistics.
- Farmer Cooperatives: Promote group farming and cooperatives to achieve economies of scale, improve marketing, and share infrastructure.

4. Infrastructure Development

- Cold Chain Systems: Invest in refrigerated transport and storage facilities to reduce post-harvest losses.
- Processing Zones: Set up zones equipped with grading, sorting, and packaging facilities near production areas.
- Digital Trade Systems: Develop platforms for integrated customs, quality control, and documentation processes.

5. Market Diversification and Promotion

- New Market Entry: Research and target emerging markets in Eastern Europe, Africa, and Asia-Pacific.
- Global Branding: Launch marketing campaigns emphasizing the unique qualities of Sri Lankan produce, like sustainability and organic methods.
- Trade Agreements: Negotiate tariff reductions and market access with key trading partners.

6. Capacity Building

- Training Programs: Educate farmers and exporters on sustainable farming practices, quality standards, and export protocols.
- Knowledge Hubs: Establish centers providing real-time market intelligence and regulatory updates.

7. Research and Development

- Crop Development: Fund research on export-grade crop varieties with improved quality and shelf life.
- Value Addition: Encourage innovations in product processing, like dried fruits and frozen produce.
- Climate Resilience: Support studies on sustainable practices to mitigate the impact of climate change on agriculture.

8. Digital and Technological Innovations

- E-commerce Platforms: Build systems connecting exporters with international buyers, supporting online transactions and logistics.
- Traceability Systems: Use blockchain or other technologies to enhance product traceability and compliance verification.

9. Sustainability Focus

- Environmental Certifications: Provide financial support for achieving sustainability certifications such as Rainforest Alliance.
- Resource Management: Implement policies encouraging water conservation, waste reduction, and renewable energy use in agriculture.

The findings underscore the need for comprehensive policy reforms, enhanced infrastructure, and market-oriented strategies to harness the export potential of Sri Lanka's fruits, vegetables, and high-value crops. Through targeted interventions, the country can position itself as a competitive player in global markets.

1. Introduction

- **Project Background**:

The Agriculture Sector Modernization Project (ASMP) in Sri Lanka aims to increase agriculture productivity, improve market access, and enhance value addition for smallholder farmers and agribusinesses. The project consists of three components: Agriculture Value Chain Development, which promotes commercial and export-oriented agriculture; Agriculture Technology Demonstration Parks (ATDPs), which ensure the selection, design, and continuity of crop clusters; Production and Market Infrastructure, which establishes cluster-specific infrastructures; and Analytical and Policy Advisory Support, which conducts policy studies, assessments, and evaluations. The project was initiated in 2017 with funding from the Ministry of Agriculture and co-financed by the European Union in 2021. The project focuses on farmer training, capacity building, and logistics requirements.

Agriculture contributes 7.3% to Sri Lanka's GDP, with Fruits & Vegetable exports accounting for 0.36% in 2012 and 0.46% in 2022. The fruit sector has a larger share than the vegetable sector. Sri Lanka's top three vegetable export markets are the Maldives, UK, and UAE, while UAE, Saudi Arabia, and Maldives are the top three for fresh fruit exports. The Export Development Board of Sri Lanka identifies processed food and fruits & vegetables as high-potential sectors due to increasing demand. However, Sri Lanka faces challenges such as quality constraints, poor technology, high seasonality, and lack of proper linkages among stakeholders. To enhance production, policy improvements, product diversification, and market diversification are needed.

With this background, it is important to enhance the production of fresh & value-added forms of fruits & vegetables for the export market. To achieve this target, it is necessary to analyze the existing policies and improvements required in the policy environment that support production enhancement, product diversification and market diversification to capture the underutilized export potential of the Fruit & Vegetable crop sectors. vegetables, and high-value crops to increase export potential.

2. Objectives and Scope

The objective of this assignment is to carry out in-depth policy research in the area of fruits, vegetables and other high-value crop exports, to identify knowledge gaps, policy, and regulatory inconsistencies that affect the quantity and quality of export of these crops from Sri Lanka, in fresh and value-added forms. The assignment aims at policy adjustments, reforms or new policies needed to support F&V and other high-value crops; production, development of value chains targeted for export markets and thereby making the agriculture sector more productive, competitive, responsive to the export markets, enabling the country to capture underutilized export potential in this sector.

This study covers fruits and vegetables supported under the Agricultural Sector Modernization project to improve their volume of production of fresh and value-added products for export markets. This assignment was carried out with following tasks:

- A detail analysis of existing local and export markets for Sri Lankan fruits, vegetables and other high value crops (both fresh & value-added products) in terms of production share, market share and export prices received for respective value chains of major products.

- Detail analysis of specific requirements of existing and potential export markets (quality standards and product specifications etc.), availability of support (Institutional, policy & regulatory) and limitations in Sri Lanka to meet those requirements.

- Critically review, awareness among local value chain actors (exporters', processors, collectors/sellers, and farmers/producers) on specific requirements of export markets including quality standards and export protocols for different products (fresh & value added) in potential markets with special reference to the crops promoted by the project.

- Review existing trade facilitation mechanisms in sea freight (transportation protocol) and air freight in order to support Sri Lankan farmers / exporters to get the benefit of the market demand.

- A detail assessment of the prevailing information flow and the communication methods along value chain actors especially with farmers, collectors, processors and exporters.

- Identify the degree of using e-business platforms and the facilitation required for improvements.

- Review local and international experience of farming as groups or farmer organizations and measures to empower them to enhance export market share / direct export.

- Review the evolution of technological improvement, transportation facilities, trading facilities, effective flow of information and other institutional support for export of fruits, vegetables and other high value crops prevail in neighboring countries (India, Pakistan, Bangladesh, Thailand and Malaysia) with a focus on policies, regulations and institutions in support of these success stories.

- Identify policy and regulatory changes or gaps need to be fulfilled, through which market share of Sri Lankan F & V products and other high value products in the global market can be expanded by enhancing the product diversification (product range) and market diversification (enter into new markets).

- Recommend appropriate policy instruments that the Government could be used to implement proposed policy changes to improve competitiveness and sustainability of fruit & vegetable exports in fresh and value-added forms and to capture unutilized export potential in the sector.

3. Methodology

The research will utilize a mixed-methods approach, combining qualitative and quantitative data collection and analysis. A two-pronged research approach was used to achieve the stated objectives:

1. **Desk Research:** This study will delve into existing reports and data from international trade organizations, national agencies, and industry sources to understand global markets, specific requirements, and Sri Lanka's current standing. This will include:
    a) A detailed analysis of existing local and export markets for Sri Lankan fruits, vegetables and other high-value crops (both fresh & value-added products) in terms of production share, market share and export prices received for respective value chains of major products using secondary sources such as the export development board [EDB], Sri Lanka customs International Trade Center [ITC] and the Food and Agricultural Organization [FAOSTAT].
    b) Detailed analysis of specific requirements of existing and potential export markets (quality standards and product specifications etc.), availability of support (Institutional, policy & regulatory) and limitations in Sri Lanka to meet those requirements. Sources include national regulatory bodies and industry association documents.
    c) A review of existing trade facilitation mechanisms in sea freight (transportation protocol) and air freight using extant literature and key informant interviews.
    d) Research existing trade facilitation mechanisms for Sri Lankan agricultural exports, including e-platforms, digital payment systems, and information dissemination channels. Sources include trade promotion agencies, logistics companies, and e-commerce platforms.
2. **Field Research:** key informant interviews and focus groups will be conducted to:

    a) Understand awareness among local value chain actors (exporters, processors, collectors/sellers, and farmers/producers) on specific requirements of export markets including quality standards and export protocols for different products (fresh & value-added) in potential markets with special reference to the crops promoted by the project.
    b) Assess the prevailing information flow and the communication methods along value chain actors especially with farmers, collectors, processors and exporters.
    c) Identify the degree of use of e-business platforms and the facilitation required for improvements.

4. Findings

4.1 Analysis of existing and potential markets for Sri Lankan fruits and vegetables

FRUITS

4.1.1 Banana

4.1.1.1 Global Export Landscape

The banana market, represented by HS code 0803 (bananas, including plantains: fresh or dried), continues to be a vital segment in global agricultural trade, with a total import value of approximately $14.7 billion in 2023. In 2023, the top 10 exporters dominated the market (Table 1), collectively contributing more than 75% of the total global banana exports. The leading exporter was the Philippines, with an export value of approximately $1.22 billion and a global market share of 13.76%. Following closely were Costa Rica (13.4%) and Guatemala (12.67%). These three countries are well known for their high production capacity, which makes them major suppliers to global markets.

Table 1: Market share of top 10 exporters of Banana [HS Code 0803] in the world

No	Exporter	2023 Value US$	Market Share
1	Philippines	$1,220,477,664.00	13.76%
2	Costa Rica	$1,189,143,623.00	13.40%
3	Guatemala	$1,124,216,104.00	12.67%
4	Netherlands	$926,326,770.00	10.44%
5	Colombia	$915,172,738.00	10.32%
6	United States	$527,097,919.00	5.94%
7	Germany	$314,402,599.00	3.54%
8	India	$251,516,011.00	2.84%
9	Mexico	$240,497,523.00	2.71%
10	France	$203,964,943.00	2.30%
37	**Sri Lanka***	**$17,658,766.00**	**0.20%**

Source: UN COMTRADE
Note: Sri Lanka occupies 37th position in terms of market share

The Netherlands and Colombia rank 4th and 5th, with export values of $926 million and $915 million respectively, reflecting their established presence in the European and Latin American trade routes. Interestingly, the Netherlands, despite being a non-producer of bananas, plays a significant role as a re-export hub, highlighting the importance of logistics and distribution centers in global trade.

Other prominent exporters include the United States (5.94%) and Germany (3.54%), with these developed economies serving as both producers and re-exporters in some cases. India, ranked 8th with a 2.84% market share, reflects its potential as an emerging player, while Mexico (2.71%) and France (2.30%) complete the top 10.

Sri Lanka, although a minor player in the global market, ranks 37th, contributing 0.20% of the total exports, valued at approximately $17.66 million. This suggests potential growth opportunities for the country, especially through value addition and niche market penetration.

4.1.1.2 Key Importers

The demand for bananas is largely concentrated in developed economies, with the United States being the largest importer, accounting for 21.4% of the global import value, or approximately $3.15 billion. This immense demand is driven by the country's large consumer base and the preference for bananas as a staple fruit in households. Germany (7.9%), China (7.4%), and Japan (6.5%) follow as major importers, reflecting the widespread global consumption of bananas. These markets present opportunities for exporters, especially as consumers in these regions demand consistent quality and supply throughout the year. European countries such as the Netherlands, France, and the United Kingdom are key importers due to their role in re-exporting bananas within the European Union. Italy, Canada, and Poland also represent significant markets, each contributing between 3.4% to 4.2% of global imports (Table 2).

Table 2: Top 10 importers [export destinations] of banana

No	Importer	2023	Share
1	United States	$3,147,860,429.00	21.4%
2	Germany	$1,156,966,511.00	7.9%
3	China	$1,082,372,010.00	7.4%
4	Japan	$958,729,116.00	6.5%
5	Netherlands	$911,398,093.00	6.2%
6	France	$869,769,559.00	5.9%
7	United Kingdom	$733,153,540.00	5.0%
8	Italy	$624,759,736.00	4.2%
9	Canada	$503,967,821.00	3.4%
10	Poland	$376,355,442.00	2.6%

Source: UNComtrade

4.1.1.3 Sri Lanka’s Position

Sri Lanka's current position in the global banana market ranks 37th with a total export value of **$17.66 million** in 2023, representing just **0.20%** of the global market. Despite this modest share, there is significant potential for Sri Lanka to expand its banana exports, particularly by targeting strategic markets and leveraging its existing trade relationships. By analyzing current export data and understanding the global demand, Sri Lanka can identify key opportunities to enhance its presence in the banana trade.

The major markets for Sri Lankan banana are given in

Table 3. Sri Lanka’s position in main global markets as given in Table 2 are related to the data in

Table 3 and analyzed below.

Table 3: Value of exports of Banana from Sri Lanka to various destinations in 2023

Importer	2023	Share of Total Exports from Sri Lanka
Saudi Arabia	$8,313,827.00	47.08%
United Arab Emirates	$4,886,121.00	27.67%
Qatar	$1,436,740.00	8.14%
Bahrain	$1,304,360.00	7.39%
United States	$414,458.00	2.35%
Netherlands	$269,807.00	1.53%
Germany	$253,044.00	1.43%
Maldives	$159,748.00	0.90%
United Kingdom	$116,843.00	0.66%
Lithuania	$114,954.00	0.65%
France	$63,168.00	0.36%
Switzerland	$56,490.00	0.32%
Kuwait	$53,411.00	0.30%
Turkiye	$37,295.00	0.21%
New Zealand	$35,269.00	0.20%
Japan	$32,310.00	0.18%
Oman	$30,031.00	0.17%
Russia	$24,414.00	0.14%
Australia	$22,088.00	0.13%
Bulgaria	$11,536.00	0.07%
South Korea	$6,835.00	0.04%
Italy	$6,694.00	0.04%
Canada	$5,692.00	0.03%
Finland	$1,933.00	0.01%
Philippines	$1,395.00	0.01%
Macedonia	$174.00	0.00%
Sweden	$80.00	0.00%
Seychelles	$38.00	0.00%
China	$11.00	0.00%
Spain	$2.00	0.00%
Total	**$17,658,768.00**	

Source: UN Comtrade

Saudi Arabia and the Middle East

Sri Lanka's Position: Saudi Arabia is the largest buyer of Sri Lankan bananas, accounting for **47.08%** of Sri Lanka's total banana exports. The **United Arab Emirates (27.67%)**, **Qatar (8.13%)**, and **Bahrain (7.39%)** are other significant buyers.

Comparison to Global Trends: While Sri Lanka has a strong foothold in these Middle Eastern markets, its position here primarily reflects demand for fresh fruit imports from tropical regions. Sri Lanka benefits from proximity and relatively lower logistical costs when exporting to the Middle East. However, in global terms, these markets are not the largest banana importers compared to the United States, Europe, and East Asia.

United States

Sri Lanka's Position: Exports to the United States represent **2.35%** of Sri Lanka's total banana exports, which is relatively small.

Comparison to Global Trends: The United States is the world's largest banana importer, with an import value of approximately **$3.15 billion** in 2023, or **21.4%** of global banana imports. Sri Lanka's presence here is minimal, indicating that it has yet to tap into one of the most lucrative markets for bananas. This gap is mainly due to stiff competition from large exporters like Guatemala and Costa Rica, as well as logistical challenges related to shipping.

European Union (Germany, Netherlands, France, UK)

Sri Lanka's Position: The combined export share to European markets such as Germany, Netherlands, United Kingdom, and France is quite small (under 2% of total exports). For example, Germany receives about 1.43% of Sri Lanka's bananas, and the Netherlands imports around 1.53%.

Comparison to Global Trends: Europe is a significant market for bananas, with countries like Germany, the Netherlands, and France among the top global importers. In 2023, Germany alone imported bananas worth $1.16 billion, accounting for 7.9% of global imports. Sri Lanka's exports to these countries are small, largely due to competition from well-established exporters in Latin America and Africa and the strict quality standards in the European market.

East Asia (China and Japan)

Sri Lanka's Position: Exports to East Asia are currently negligible, with Japan receiving less than 0.20% of Sri Lanka's total banana exports.

Comparison to Global Trends: China and Japan are major importers of bananas, with China importing around $1.08 billion worth in 2023 and Japan importing $958 million. These markets present significant opportunities for Sri Lanka, but it faces competition from countries like the Philippines and Ecuador, which dominate East Asian banana imports.

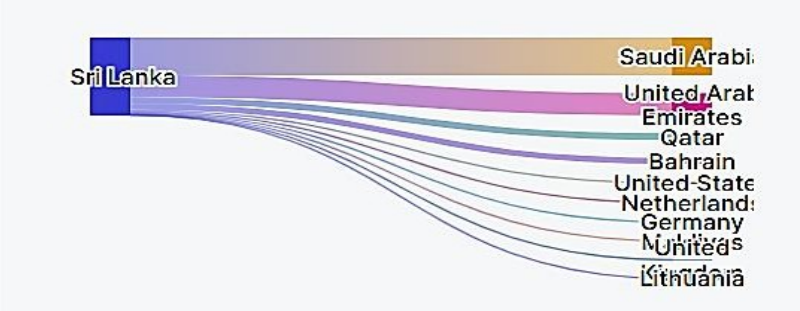

Figure 1: Top 10 exporting destinations of Banana

Source: https://www.tridge.com

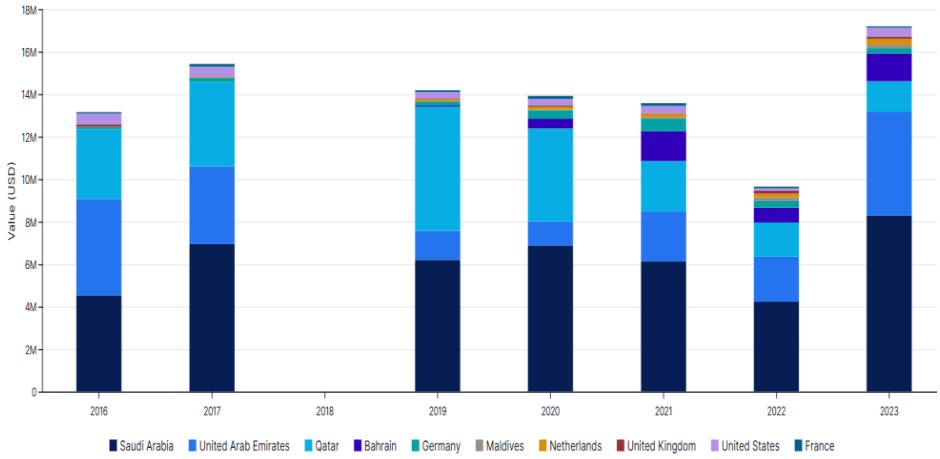

Figure 2: Share of exports to top importers of HS Code: 0803 from Sri Lanka by value [US$]

Source: https://www.tridge.com

4.1.1.4 Challenges for Sri Lanka in Major Markets

1. **Low Production Volume**: Compared to global banana giants like Costa Rica, the Philippines, and Ecuador, Sri Lanka's banana production is limited, which hinders its ability to compete in large-volume markets such as the United States and Europe.

2. **Quality Standards and Certification**: Major banana importers, particularly in Europe and North America, demand high quality and certifications such as Global GAP, Fair Trade, and organic labels. Many Sri Lankan banana producers have yet to obtain these certifications, which limits their access to premium markets.

3. **Logistical Barriers**: Long shipping distances to Europe and North America result in higher transportation costs for Sri Lankan exporters, reducing their competitiveness compared to exporters in Latin America or the Philippines, who have geographical advantages.

4.1.1.5 Strategies for Expansion

Despite these challenges, there are several key opportunities for Sri Lanka to expand its banana exports and compete more effectively in the global market:

1. **Regional Market Expansion**

   - **Middle East and Asia**: Sri Lanka already has a foothold in the Middle Eastern market, with significant exports to Saudi Arabia, the UAE, and Qatar. There is room to grow by further expanding into countries like Kuwait, Oman, and Turkey. These markets are heavily dependent on imports to meet their fruit consumption needs, and Sri Lanka's geographical proximity can be an advantage.

   - **Emerging Markets in Asia**: Sri Lanka can target emerging economies in Asia, such as China and Japan, which are increasing their imports of bananas. While China and Japan are competitive markets, they offer lucrative opportunities for high-quality and differentiated banana products.

2. **Targeting Niche Markets in Europe and North America**

   2.1. European countries like **Germany**, **Netherlands**, and **France**, as well as the **United States** and **Canada**, are highly competitive banana markets, with a strong focus on quality, certifications, and sustainability. Sri Lanka can differentiate itself by exporting organic, Fair Trade-certified bananas to cater to these premium segments.

   2.2. By improving post-harvest processes, packaging, and meeting high food safety standards, Sri Lanka can make its bananas more appealing to Western consumers.

3. **Value Addition and Branding**

   3.1. Sri Lanka has the opportunity to export value-added banana products such as dried bananas, banana chips, and banana puree. These products could be targeted toward health-conscious consumers in developed markets.

   3.2. Country Branding: Promoting Sri Lankan bananas as a high-quality, sustainably grown product through country branding efforts could help differentiate them in competitive markets. Establishing a recognizable "Sri Lankan banana" brand associated with sustainability and quality could attract consumers in premium markets like Europe, Japan and North America.

4. **Improving Supply Chain and Market Access**

   - Strengthening logistics and transportation infrastructure is crucial for Sri Lanka to reduce costs and ensure consistent quality in long-distance markets. This can be particularly beneficial for exports to distant regions like Europe and North America. Investing in modern cold chain infrastructure, better packaging, and post-harvest technologies can help Sri Lankan bananas maintain quality during long-distance shipping. By reducing spoilage and improving the shelf life of exported bananas, Sri Lanka could become more competitive in distant markets.

   4.1. Sri Lanka can also explore trade agreements or partnerships that improve market access and reduce trade barriers, especially with countries where tariff or non-tariff barriers are an issue.

5. **Trade Agreements and Partnerships**

- **Leveraging Free Trade Agreements**: Sri Lanka can explore bilateral or regional trade agreements to improve market access for its banana exports. For example, negotiating reduced tariffs or trade barriers with countries like the European Union, the United States, or Japan could help Sri Lanka increase its competitiveness in these markets.

  Collaborative Ventures: Forming partnerships with international fruit companies or investing in co-exporting strategies could help Sri Lanka access new distribution networks. Collaborations with large importers or re-exporting hubs like the Netherlands could expand Sri Lankan bananas' market reach in Europe.

6. **Addressing Export Market Requirements**:
   - To boost its banana exports and access premium markets, Sri Lanka can pursue several key certifications that are highly valued by major importers, particularly in the United States, European Union, and other developed markets. These certifications focus on quality, sustainability, ethical production, and food safety, which are increasingly important to consumers and retailers globally.

6.1. Key Certifications to Boost Sri Lanka's Exports

1. GlobalGAP (Global Good Agricultural Practices)

- **Importance**: GlobalGAP is an internationally recognized standard for farm production processes. It covers food safety, sustainability, worker welfare, and environmental management.
- **Benefits**: Many European and North American retailers require GlobalGAP certification for fresh produce. Achieving this certification would make Sri Lanka's bananas more competitive, particularly in the European market, where consumer expectations regarding food safety and environmental responsibility are high. The adoption of GlobalGAP certification has been shown to positively impact exports to the EU, particularly for bananas, as it assures food safety and sustainability, making it essential for developed markets like the EU and North America (Masood & Brümmer, 2014). A study also found that GlobalGAP certification enhances trade in agrifood products, including bananas, to high-value markets such as the EU and OECD countries (Fiankor et al., 2019).
- **Market Impact**: This certification is crucial for penetrating major markets like the **EU** and **United States**, where food safety and traceability are priorities.

2. Fair Trade Certification

- **Importance**: Fair Trade certification ensures that farmers receive fair prices and work under safe conditions, with particular attention to social and environmental sustainability. It also guarantees that a portion of the profits goes back to local communities.

- **Benefits**: Fair Trade products often command a premium price in Western markets, particularly in the **European Union** and **North America**, where consumers are increasingly seeking ethically produced goods. Fair Trade certification offers farmers stable market access and better pricing, which improves their livelihoods and supports social development, particularly in export-oriented regions like Latin America (Waal, 2010). In St. Lucia, Fair Trade certification has helped farmers access better prices and contributed to local development, although some challenges remain (Moberg, 2005).
- **Market Impact**: This certification could boost Sri Lanka's exports to countries like **Germany**, **France**, and the **United Kingdom**, where there is strong demand for ethically produced bananas. Fair Trade products also enjoy prominent shelf space in supermarkets and specialized retailers.

3. Organic Certification

- **Importance**: Organic certification ensures that produce is grown without synthetic pesticides, fertilizers, or genetically modified organisms (GMOs). It also promotes biodiversity and sustainable farming practices. Organic banana farming has been shown to conserve biodiversity better than other certifications such as Rainforest Alliance, making it appealing to environmentally-conscious consumers in premium markets (Bellamy et al., 2016).
- **Benefits**: The demand for organic bananas is growing rapidly, particularly in **Europe**, **North America**, and parts of **East Asia**. Organic products fetch higher prices and appeal to health-conscious consumers who prioritize environmental sustainability.
- **Market Impact**: Securing organic certification can help Sri Lanka access niche premium markets, particularly in the **United States**, **Japan**, and **Germany**, where consumers are willing to pay more for organic fruits. Organic bananas are also a growing segment in high-end retail chains.

4. Rainforest Alliance Certification

- **Importance**: Rainforest Alliance certification focuses on environmental, social, and economic sustainability. It promotes biodiversity conservation, improved farm management, and worker welfare.
- **Benefits**: Like Fair Trade, this certification signals to consumers that the products were produced in a way that supports sustainable livelihoods and minimizes environmental impact. The logo is widely recognized in **Europe** and **North America**.
- **Market Impact**: This certification is particularly relevant in markets such as the **EU**, where consumers and retailers are increasingly focused on environmental impact. It can help Sri Lankan banana exporters stand out in competitive, sustainability-focused markets.

5. ISO 22000 (Food Safety Management System)

- **Importance**: ISO 22000 sets international standards for food safety management systems, ensuring that food products are consistently safe for consumption throughout the supply chain.
- **Benefits**: Compliance with ISO 22000 demonstrates a commitment to food safety, which is a critical factor for entering markets with stringent food safety regulations, like the **European Union**, **Japan**, and the **United States**.
- **Market Impact**: This certification is a valuable asset for securing partnerships with large retailers and distributors in markets with high regulatory standards.

6. HACCP (Hazard Analysis and Critical Control Points) Certification

- **Importance**: HACCP is a widely recognized standard for identifying and controlling potential hazards in food production processes. It ensures that products are safe from contamination or other risks.
- **Benefits**: Achieving HACCP certification is essential for gaining entry into highly regulated markets, such as the **European Union**, **United States**, and **Japan**, where food safety is non-negotiable. It also builds confidence with importers and consumers.
- **Market Impact**: This certification helps open doors to global retail chains and supermarket buyers who prioritize food safety compliance.

7. Sedex (Supplier Ethical Data Exchange) Certification

- **Importance**: Sedex focuses on improving working conditions, ethical business practices, and responsible sourcing throughout the supply chain.
- **Benefits**: Many international buyers, particularly in the **European Union** and **United Kingdom**, are increasingly looking to source from suppliers that can demonstrate ethical labor practices and environmental responsibility. Sedex helps businesses meet these buyer expectations.
- **Market Impact**: Sedex certification can improve access to markets with strict social compliance requirements, particularly in **Europe** and **North America**.

8. BRC (British Retail Consortium) Global Standards

- **Importance**: BRC certification ensures that food products meet high standards of safety, quality, and operational criteria set by retailers, particularly in the **United Kingdom**.
- **Benefits**: BRC certification is often a prerequisite for supplying major retailers, especially in the **UK**. It provides assurance to importers that Sri Lanka's bananas meet stringent safety and quality standards.
- **Market Impact**: This certification is crucial for accessing the **UK market**, where retailers require BRC compliance from their suppliers.

How These Certifications Can Boost Sri Lanka's Banana Exports

1. **Access to Premium Markets**: Certifications like Fair Trade, GlobalGAP, and organic can help Sri Lanka tap into premium market segments in the **European Union**, **United States**, and **East Asia**. These markets are willing to pay higher prices for certified, high-quality bananas, giving Sri Lanka a competitive advantage.
2. **Improved Market Entry**: Food safety certifications such as **ISO 22000** and **HACCP** are essential for gaining access to highly regulated markets like the **EU**, **Japan**, and **North America**. Without these certifications, it can be challenging to meet the import regulations of these markets.
3. **Better Pricing and Recognition**: Certifications like **Fair Trade** and **Rainforest Alliance** offer opportunities to command better pricing due to their association with ethical and sustainable production. These certifications also improve brand visibility and recognition in sustainability-focused markets.
4. **Increased Buyer Confidence**: Certifications like **GlobalGAP** and **ISO 22000** build trust with international buyers and retailers. This is particularly important when entering new markets or expanding relationships with large-scale retailers who have strict sourcing requirements.

By obtaining these certifications, Sri Lanka can significantly enhance its competitiveness in the global banana export market. The certifications not only ensure compliance with international standards but also provide access to high-value, niche markets, enabling Sri Lankan exporters to differentiate their products and achieve premium pricing. This strategic move could help Sri Lanka increase its share in major markets such as the United States, European Union, and Japan, while also expanding into new regions with strong demand for certified, sustainable products.

4.1.2 Guava and Mangoes

4.1.2.1 Global Export Landscape

The global market analysis is presented in terms of Mangoes, Guava and Mangosteen since all these are reported by a single HS code [080450] in international trade data. The total market was worth $3.1B in 2023 (UN Comtrade) its distribution from 2016-2023 is in Figure 3.

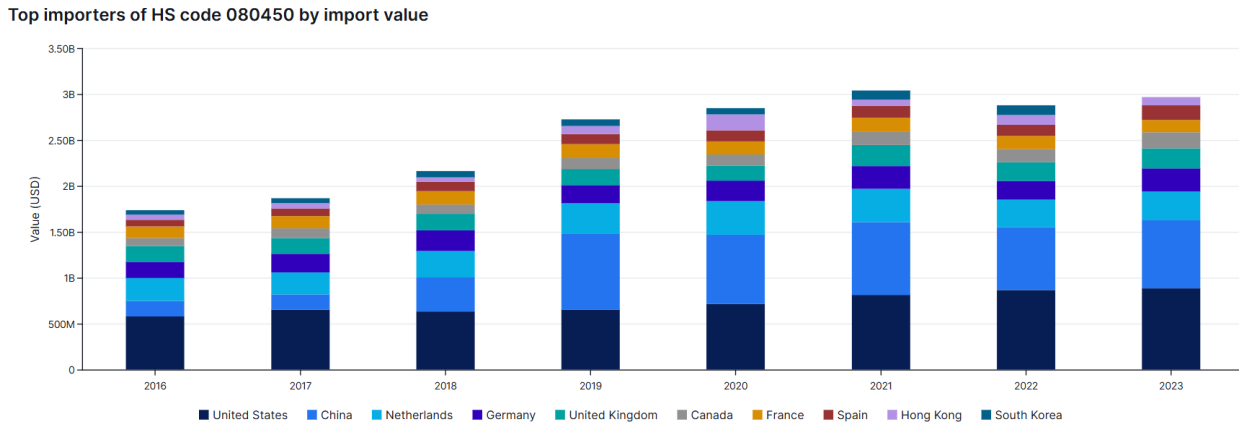

Figure 3: Top Importers of HS code:080450 by import value

The global export landscape for HS Code 080450, which covers guavas, mangoes, and mangosteens, has shown substantial growth and shifts over the past eight years, driven by key exporters and emerging players across continents. Here's an in-depth analysis using data from 2016 to 2023, highlighting trends, major exporters, and regional dynamics.

Dominant Exporters and Long-Term Trends

- **Mexico** has consistently been the top global exporter of guavas, mangoes, and mangosteens, showing steady growth over the years. Exports rose from **$378 million** in 2016 to a remarkable **$575 million** in 2023, with demand driven by North American and European markets. Mexico's extensive mango varieties and established supply chains have contributed to its dominance, meeting global demand with both quality and quantity.
- **Thailand** has also solidified its position as a leading exporter, with exports peaking at **$642 million** in 2023. Thailand experienced dramatic growth between 2016 and 2019, where exports surged from **$167 million** in 2016 to **$624 million** in 2019, benefiting from strong demand across Asia and the Middle East. Thailand's diverse fruit portfolio, including mangosteens, has enabled it to capture substantial market share in these regions.
- **Brazil** emerged as a significant exporter, consistently increasing its export volumes from **$180 million** in 2016 to over **$315 million** in 2023. This growth is attributed to favorable tropical climates and efficient farming practices, allowing Brazil to produce high-quality mangoes for international markets, particularly in Europe and North America.
- **India**, renowned for its diverse mango varieties, saw exports grow from **$202 million** in 2016 to **$154 million** in 2023. Although India remains a major player, its export volume fluctuated over the years, partly due to variable yields and competition from other exporters. Despite these challenges, India continues to be a strong presence in the global market, with its premium mango varieties, such as Alphonso and Kesar, enjoying popularity worldwide.
- **The Netherlands** plays a unique role as a re-export hub for Europe. With exports rising from **$291 million** in 2016 to **$381 million** in 2023, the Netherlands leverages its strategic location to distribute tropical fruits throughout Europe. This has made it a key transit point for mangoes and other tropical fruits entering the European market.

Emerging Exporters and Rapid Growth

- **Egypt** has shown remarkable growth in recent years, expanding exports from **$54 million** in 2016 to **$133 million** in 2023. Its geographical proximity to Europe and the Middle East has positioned Egypt as a competitive exporter, capable of delivering fresh produce quickly to high-demand regions.
- **Pakistan** has also grown significantly, with exports increasing from **$65 million** in 2016 to **$108 million** in 2023. Pakistan's strong reputation for flavorful mango varieties, including Chaunsa and Sindhri, has helped it secure a growing presence in markets across the Middle East, Asia, and Europe.
- **The Philippines** and **Colombia** have demonstrated growth in the export market, albeit with some fluctuations. The Philippines saw exports rise to **$54 million** in 2023, while Colombia reached **$14.7 million** in the same year. Both countries benefit from favorable climates for tropical fruit production, enabling them to tap into global markets with quality products.

African Exporters on the Rise

- **Burkina Faso** and **Ivory Coast** are notable African exporters that have strengthened their market positions over time. Burkina Faso's exports grew from **$14 million** in 2016 to **$27.6 million** in 2023, while Ivory Coast reached **$28.1 million** in 2023. The tropical climate and increasing investments in agriculture have allowed these countries to become reliable suppliers, mainly to Europe.
- **Ghana** experienced a surge in exports, with figures rising sharply from **$2.2 million** in 2016 to **$55.1 million** in 2023. Ghana's mango industry has been expanding due to favorable policies and growing interest in sustainable agriculture, allowing it to supply mangoes to European and Middle Eastern markets.

Re-Export Hubs and Strategic Transit Points

- **Hong Kong** and **The Netherlands** play unique roles as re-export hubs. Hong Kong's exports saw large fluctuations, reaching **$66 million** in 2023. The city's strategic location and efficient port infrastructure make it an ideal distribution point for tropical fruits entering East Asia, especially China.
- The Netherlands has maintained its role as a primary European distribution center, with exports consistently high over the years. This strategic role allows it to serve as a transit point for products from Latin America, Africa, and Asia, distributing them across Europe.

North American Market Dynamics

- The **United States** exports a notable number of tropical fruits, albeit primarily as a re-exporter. U.S. exports fluctuated over the years, reaching **$48 million** in 2023. While the U.S. is a major consumer market, it also re-exports significant volumes, particularly to Canada and nearby regions, leveraging its trade networks.

- **Canada** also plays a role in the re-export market, with exports varying from **$5.1 million** in 2016 to **$2.5 million** in 2023. Canada's import and re-export capabilities enable it to serve as a smaller distribution hub for tropical fruits, particularly within North America.

The global market for guavas, mangoes, and mangosteens (HS Code 080450) has seen considerable growth and diversification from 2016 to 2023. Major exporters like Mexico, Thailand, and Brazil continue to dominate, while emerging players from Africa, Latin America, and Asia are steadily expanding their footprints. With rising global demand for tropical fruits driven by health trends, the market is poised for further growth. However, exporters must navigate climate challenges, market access issues, and supply chain dynamics to maintain and expand their market positions. This diversified landscape ensures a steady supply to meet global demand for tropical fruits year-round. The future of this market looks promising, with technological advancements in farming and distribution likely to enhance the efficiency and sustainability of tropical fruit exports worldwide.

Table 4: Market Share of Top 10 Exporters of HS Code 080450 in 2022

Position	Country	Export Values [USD]	Market Share
1	Mexico	$547,480,648.00	16.27%
2	Thailand	$515,278,466.00	15.31%
3	Netherlands	$330,399,474.00	9.82%
4	Peru	$291,171,987.00	8.65%
5	India	$220,198,438.00	6.54%
6	Brazil	$206,853,191.00	6.15%
7	Spain	$115,920,972.00	3.44%
8	Pakistan	$111,123,952.00	3.30%
9	Egypt	$104,844,837.00	3.12%
10	Vietnam	$87,486,109.00	2.60%
42	**Sri Lanka**	**$2,240,347.00**	**0.07%**

Source: UN ComTrade

4.1.2.2 Key Importers of Guavas, Mangoes, and Mangosteens

The global trade in guavas, mangoes, and mangosteens shows significant activity, with several key markets leading in import value and trends (*Table 5*).

Top Importers (2023):

1. **United States**:
    - **Import Value**: $889.34M (22.20% share of global imports).
    - **5-Year Growth**: 39.55%.
    - **Trend**: The United States maintains its position as the largest importer, reflecting strong consumer demand for tropical fruits.
2. **China**:

- **Import Value**: $741.37M (18.50% share).
- **5-Year Growth**: 99.84%.
- **Trend**: Rapid growth in imports indicates increasing popularity of tropical fruits in China, driven by rising disposable incomes and demand for diversified diets.

3. **Netherlands**:
   - **Import Value**: $312.76M (7.81% share).
   - **5-Year Growth**: 8.75%.
   - **Trend**: The Netherlands acts as a major re-export hub for Europe, with steady growth.
4. **Germany**:
   - **Import Value**: $251.66M (6.28% share).
   - **5-Year Growth**: 11.84%.
   - **Trend**: Germany's consistent growth reflects strong demand for tropical fruits among European consumers.
5. **United Kingdom**:
   - **Import Value**: $218.32M (5.45% share).
   - **5-Year Growth**: 21.59%.
   - **Trend**: The UK shows robust growth, supported by high consumption of exotic fruits among diverse population groups.

Emerging Markets:

- **Canada**:
  - Import value of $175.26M with a significant 5-year growth of 72.10%, highlighting increasing consumer interest in tropical fruits.
- **South Korea**:
  - Import value of $116.15M and growth of 68.75%, showing growing demand in East Asia.
- **Hong Kong**:
  - Import value of $89.57M, with an impressive growth rate of 82.02%, driven by re-export activity to mainland China and local demand.

Declining Markets:

- **France**:
  - Import value of $133.96M with a negative growth rate of -7.93%, indicating a decline in demand or competition from local or alternative fruit markets.
- **Japan**:
  - Import value of $31.11M and g rowth of -11.56%, reflecting reduced interest in these fruits.

Notable Growth Trends:

- **Ghana**:
  - Experienced a staggering 5-year growth of 295,827.62%, albeit from a low base, showing an emerging demand for tropical fruits.
- **Jordan**:
  - Growth of 1,404.87%, suggesting new market potential in the Middle East.
- **Nigeria**:
  - Import growth of 10,488.43%, indicating significant but nascent market activity.

Table 5: World imports of guavas, mangoes and mangosteens

Rank	Trade Flow	Import Value 2023, USD	Share in Import Value 2023	5-Year Growth in Import Value 2018-2023
1	World to United States	$889.34M	22.20%	39.55%
2	World to China	$741.37M	18.50%	99.84%
3	World to Netherlands	$312.76M	7.81%	8.75%
4	World to Germany	$251.66M	6.28%	11.84%
5	World to United Kingdom	$218.32M	5.45%	21.59%
6	World to Canada	$175.26M	4.37%	72.10%
7	World to Spain	$159.41M	3.98%	58.48%
8	World to France	$133.96M	3.34%	-7.93%
9	World to South Korea	$116.15M	2.90%	68.75%
10	World to United Arab Emirates	$106.03M	2.65%	21.50%
11	World to Hong Kong	$89.57M	2.24%	82.02%
12	World to Portugal	$72.60M	1.81%	3.22%
13	World to Saudi Arabia	$62.45M	1.56%	48.31%
14	World to Switzerland	$48.75M	1.22%	5.06%
15	World to Oman	$48.51M	1.21%	45.18%
16	World to Italy	$45.87M	1.14%	43.28%
17	World to Belgium	$38.06M	0.95%	3.00%
18	World to Japan	$31.11M	0.78%	-11.56%
19	World to Ghana	$30.78M	0.77%	#########
20	World to Poland	$29.31M	0.73%	1.75%
21	World to Singapore	$28.86M	0.72%	-19.08%
22	World to Kuwait	$25.82M	0.64%	38.80%
23	World to Norway	$25.54M	0.64%	34.39%
24	World to Qatar	$22.24M	0.56%	41.92%
25	World to Malaysia	$20.97M	0.52%	-11.12%
26	World to Austria	$18.94M	0.47%	-14.38%
27	World to Czechia	$16.99M	0.42%	55.16%
28	World to Jordan	$16.61M	0.41%	1404.87%
29	World to Sweden	$13.25M	0.33%	-6.46%
30	World to New Zealand	$12.77M	0.32%	28.78%
31	World to Bahrain	$12.67M	0.32%	0.93%
32	World to Chile	$11.61M	0.29%	38.40%
33	World to Romania	$11.52M	0.29%	22.52%
34	World to Denmark	$11.47M	0.29%	18.76%
35	World to Morocco	$10.12M	0.25%	55.04%
36	World to Ireland	$9.95M	0.25%	90.37%
37	World to Maldives	$9.20M	0.23%	45.12%
38	World to Lithuania	$7.95M	0.20%	56.87%
39	World to Thailand	$7.77M	0.19%	-58.42%
40	World to Ukraine	$7.74M	0.19%	136.10%

41	World to Brunei	$7.45M	0.19%	176.54%
42	World to Lebanon	$5.90M	0.15%	-43.03%
43	World to Hungary	$5.52M	0.14%	106.85%
44	World to Slovakia	$5.37M	0.13%	37.45%
45	World to Australia	$4.96M	0.12%	37.88%
46	World to Turkiye	$4.91M	0.12%	454.05%
47	World to Greece	$4.83M	0.12%	104.28%
48	World to Finland	$4.82M	0.12%	6.02%
49	World to Macao	$3.53M	0.09%	60.73%
50	World to Luxembourg	$3.37M	0.08%	16.95%
51	World to Slovenia	$3.34M	0.08%	-3.63%
52	World to Croatia	$3.33M	0.08%	145.97%
53	World to Argentina	$3.09M	0.08%	31.56%
54	World to Kyrgyzstan	$3.01M	0.08%	40638.87%
55	World to Philippines	$2.93M	0.07%	69772.33%
56	World to South Africa	$2.27M	0.06%	111.53%
57	World to Djibouti	$2.26M	0.06%	-
58	World to Estonia	$2.26M	0.06%	52.64%
59	World to Serbia	$1.93M	0.05%	342.16%
60	World to Cyprus	$1.93M	0.05%	29.00%
61	World to Bulgaria	$1.85M	0.05%	131.04%
62	World to Iceland	$1.79M	0.04%	-17.08%
63	World to Kazakhstan	$1.46M	0.04%	249.64%
64	World to Mexico	$1.40M	0.03%	-5.42%
65	World to Botswana	$1.40M	0.03%	50.69%
66	World to Uganda	$1.19M	0.03%	-23.28%
67	World to Guatemala	$1.15M	0.03%	236.89%
68	World to Bahamas	$1.09M	0.03%	-6.12%
69	World to India	$1.07M	0.03%	-3.29%
70	World to Panama	$1.04M	0.03%	111.62%
71	World to Israel	$938.07K	0.02%	-12.66%
72	World to Moldova	$847.06K	0.02%	178.01%
73	World to Cambodia	$836.45K	0.02%	101.62%
74	World to Nigeria	$778.23K	0.02%	10488.43%
75	World to Uruguay	$759.24K	0.02%	238.31%
76	World to Georgia	$652.63K	0.02%	256.85%
77	World to Costa Rica	$538.31K	0.01%	323.79%
78	World to El Salvador	$515.34K	0.01%	48.10%
79	World to Mauritania	$513.22K	0.01%	-4.42%
80	World to Honduras	$507.28K	0.01%	-2.76%
81	World to Mauritius	$501.23K	0.01%	476.53%
82	World to Armenia	$498.12K	0.01%	456.03%
83	World to Malta	$487.84K	0.01%	54.91%
84	World to Namibia	$460.36K	0.01%	-25.67%

85	World to Azerbaijan	$422.32K	0.01%	403.86%
86	World to Aruba	$398.30K	0.01%	55.86%
87	World to Ivory Coast	$369.04K	0.01%	494.85%
88	World to Albania	$361.60K	0.01%	529.81%
89	World to Seychelles	$310.12K	0.01%	154.73%
90	World to Colombia	$309.27K	0.01%	-46.42%
91	World to Uzbekistan	$214.72K	0.01%	23837.34%
92	World to Barbados	$169.05K	0.00%	1.51%
93	World to Bosnia and Herzegovina	$148.12K	0.00%	-0.81%
94	World to Montenegro	$137.23K	0.00%	88.39%
95	World to Cape Verde	$115.49K	0.00%	-4.02%
96	World to Mozambique	$115K	0.00%	224.46%
97	World to Myanmar [Burma]	$107.02K	0.00%	63.60%
98	World to Tunisia	$102.63K	0.00%	450.64%
99	World to Lesotho	$87.30K	0.00%	-43.50%
100	World to Paraguay	$83.45K	0.00%	12.20%
101	World to Macedonia	$81.03K	0.00%	80.83%
102	World to Zambia	$54.05K	0.00%	-44.54%
103	World to Swaziland	$36.98K	0.00%	34.28%
104	World to Niger	$34.58K	0.00%	-81.00%
105	World to Fiji	$27.50K	0.00%	-15.59%
106	World to Gabon	$25.51K	0.00%	-70.06%
107	World to Ecuador	$24.45K	0.00%	1152.86%
108	World to Zimbabwe	$22.86K	0.00%	118.22%
109	World to Senegal	$12.63K	0.00%	4.46%
110	World to Burkina Faso	$11.67K	0.00%	188.27%
111	World to Kenya	$11.18K	0.00%	-98.56%
112	World to Angola	$10.96K	0.00%	-94.61%
113	World to Andorra	$7.99K	0.00%	978.73%
114	World to Togo	$7.65K	0.00%	-
115	World to Jamaica	$7.42K	0.00%	-41.14%
116	World to Antigua and Barbuda	$6.86K	0.00%	35.53%
117	World to Dominican Republic	$6.01K	0.00%	-87.38%
118	World to Malawi	$4.88K	0.00%	-50.27%
119	World to Grenada	$4.88K	0.00%	106.64%
120	World to Indonesia	$4.77K	0.00%	-5.67%
121	World to Peru	$4K	0.00%	201.85%
122	World to Nicaragua	$3.88K	0.00%	-89.79%
123	World to Benin	$3.44K	0.00%	-
124	World to Samoa	$2.25K	0.00%	-8.13%
125	World to Sri Lanka	$1.29K	0.00%	-
126	World to Tanzania	$1.27K	0.00%	-80.75%
127	World to Madagascar	$1.27K	0.00%	-63.19%
128	World to Liberia	$1.03K	0.00%	569.64%

129	World to Guyana	$418	0.00%	-
130	World to Belize	$284	0.00%	-
131	World to São Tomé and Príncipe	$256	0.00%	-74.69%
132	World to Saint Vincent and the Grenadines	$216	0.00%	425.89%

Source: Tridge.com

4.1.2.3 Sri Lanka's Position

The total export value of Sri Lanka stood at USD 2 million in 2023. The export trend shows fluctuations, with a peak in 2019 followed by a decline due to external challenges, especially the pandemic, and partial recovery thereafter. The current downward trend from 2022 to 2023 suggests that while Sri Lanka has potential in the mango, guava, and mangosteen export market, it faces challenges that may require strategic adjustments to maintain or grow its market presence.

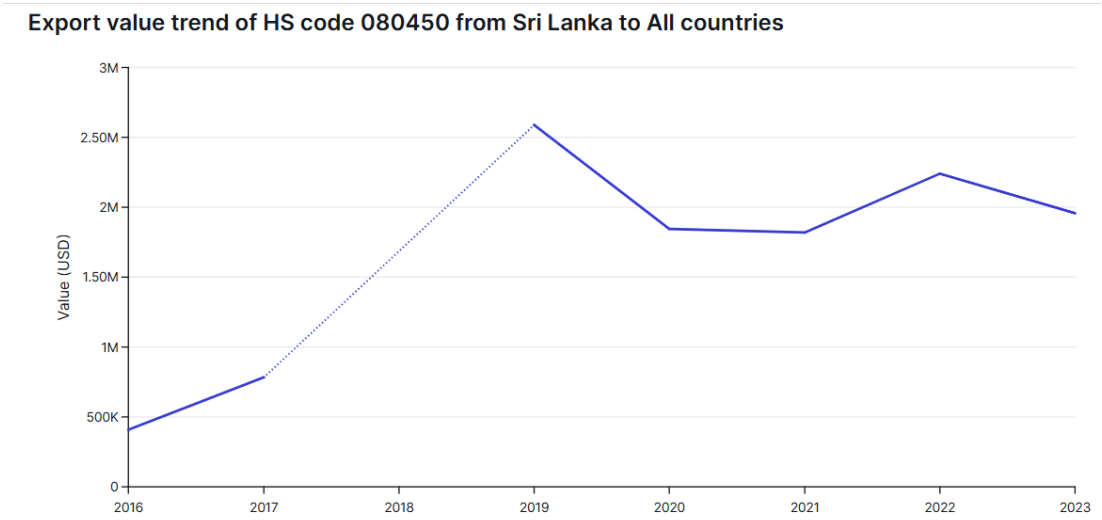

Figure 4:Export Value Trend of HS code 080450 from Sri Lanka to all Countries

1. **Middle East**:

- The Middle East has consistently been a top market for Sri Lankan mango and guava exports. Notably, **Qatar** and the **United Arab Emirates** are major destinations. In 2023, the UAE imported $450,765 worth of mangoes and guavas from Sri Lanka, while Qatar imported $356,704. Other significant importers in the region include **Saudi Arabia** ($183,163) and **Kuwait** ($205,209).
- These countries show steady demand, with the UAE and Qatar in particular showing high values across multiple years. The strong performance in the Middle East can be attributed to demand for fresh tropical fruits, driven by a large South Asian diaspora and favorable trade relationships.

2. **South Asia**:

- **Maldives** is a consistent importer, with 2023 imports valued at $112,672. This is a substantial increase from previous years, where imports ranged from around $4,800 to $46,520. The increase indicates a growing preference for Sri Lankan mangoes and guavas, likely due to proximity and established trade ties.

3. **Europe**:
   - **Germany** has been a stable market in Europe, with imports reaching $99,044 in 2023. Over the years, Germany's imports have been relatively high, averaging between $67,556 and $109,795, indicating sustained demand.
   - **Switzerland** and the **Netherlands** are also notable European markets. Switzerland's imports varied but were substantial in certain years (e.g., $276,792 in 2021), although it saw a decline in 2023 with $37,084. The Netherlands, while a re-export hub, imported $4,139 in 2023, showing fluctuating but ongoing interest.
   - There is some potential in other European countries like **France** and **Italy**, which have shown inconsistent imports in smaller quantities.
4. **North America**:
   - **Canada** imported $13,575 in 2023, showing a recent upward trend after importing $260,294 in 2022. The Canadian market's demand for Sri Lankan mangoes and guavas appears sporadic, but there is growth potential.
   - The **United States** showed peak imports in 2019 ($423,591) and 2022 ($164,783), but 2023 saw lower imports at $3,279. This drop could reflect market competition or logistical challenges.
5. **Asia-Pacific**:
   - The **Australian** market has seen a significant increase, with imports rising to $32,412 in 2023 from lower levels in previous years. **Japan** also represents a steady market, although imports were relatively low in 2023 ($7,671) compared to prior years. There may be growth opportunities with targeted promotions.
   - **Singapore** imported $42,013 in 2023, demonstrating stable demand, albeit with fluctuations across years.
6. **Emerging Markets**:
   - Newer and emerging markets include **Poland**, **Russia**, and **Lithuania**. While import volumes are relatively low, they show that Sri Lankan mango and guava exports are gradually entering more diverse markets.

Table 6: Exports of HS code: 080450 from Sri Lanka

Importer	Average Export Value from 2016-2023	Share of Total Exports
United Arab Emirates	339109.57	19%
Qatar	220061.29	12%
Oman	159705.43	9%
Saudi Arabia	146007.14	8%
Switzerland	142155.86	8%
United States	114205.71	6%
Kuwait	113918.17	6%
Germany	83068.00	5%
Bahrain	67559.83	4%

Canada	63564.86	4%
Italy	52568.75	3%
Maldives	39056.43	2%
Netherlands	35128.57	2%
Singapore	32716.43	2%
Bulgaria	27207.29	2%
Swaziland	22739.00	1%
United Kingdom	17498.29	1%
Australia	16242.00	1%
Russia	13117.60	1%
Ukraine	11378.00	1%
France	10225.67	1%
Finland	6895.00	<0%
Japan	6642.71	<0%
Norway	5062.75	<0%
Lithuania	3962.00	<0%
Poland	2651.00	<0%
Hungary	1741.00	<0%
Greece	1720.33	<0%
South Korea	1718.00	<0%
Czechia	769.00	<0%
Sweden	527.00	<0%
Hong Kong	513.50	<0%
Lebanon	408.00	<0%
Kenya	374.67	<0%
Turkiye	371.00	<0%
Azerbaijan	267.00	<0%
China	194.00	<0%
Austria	146.00	<0%
American Samoa	98.00	<0%
Cyprus	78.00	<0%
Croatia	20.00	<0%
Indonesia	10.00	<0%
Jordan	2.00	<0%
Malaysia	2.00	<0%
Bangladesh	1.00	<0%
Iran	1.00	<0%
Macao	1.00	<0%
Spain	1.00	<0%

Source: UN ComTrade

4.1.2.4 Challenges for Sri Lanka in Major Markets

1. **Market Concentration in the Middle East**

Sri Lanka's mango and guava exports are heavily concentrated in the Middle East, with Qatar, UAE, and Saudi Arabia accounting for a significant share. This dependency makes exports vulnerable to regional demand fluctuations, economic conditions, and trade policies.

2. **Fluctuating Demand in Europe and North America**
   European and North American markets, such as Germany, Canada, and the United States, show inconsistent import patterns. This instability highlights challenges in establishing a stable foothold, potentially due to competition from major exporters like Mexico, Thailand, and Brazil, and a lack of sustained marketing efforts.
3. **Small Export Volume and Market Share**
   Sri Lanka's global export value of $2 million in 2023 represents only 0.07% of the market share, ranking 42nd among exporters of HS Code 080450. This low market share is indicative of limited competitiveness, scale, and international visibility.
4. **Logistical and Quality Challenges**
   Competing with dominant exporters requires addressing logistical inefficiencies and maintaining consistent quality. Delays, inadequate cold chain infrastructure, and higher transport costs could hinder Sri Lanka’s ability to deliver fresh produce competitively.
5. **Lack of Diversification**
   Limited engagement with emerging markets in Asia, Eastern Europe, and Africa restricts opportunities for growth. While countries like Russia, Poland, and Lithuania show potential, Sri Lanka's penetration into these markets remains minimal.
6. **Compliance with International Standards**
   Exporters face challenges adhering to stringent quality and phytosanitary standards set by developed markets, especially in Europe and North America. This can lead to rejection of shipments or restricted access to lucrative markets.

4.1.2.5 Strategies for Expansion

1. **Diversify Export Markets**
   - Reduce reliance on Middle Eastern markets by expanding into emerging markets in Eastern Europe (e.g., Russia, Poland), Asia-Pacific (e.g., Australia, Singapore), and Africa. Targeted market studies and promotional campaigns can help tap into these regions effectively.
2. **Enhance Product Branding and Differentiation**
   - Develop a strong branding strategy emphasizing the unique qualities of Sri Lankan mangoes and guavas, such as flavor, organic certification, and sustainability. Position the produce as premium offerings in global markets.
3. **Strengthen Supply Chain and Logistics**
   - Invest in cold chain infrastructure, improve packaging standards, and streamline logistics to ensure fresh, high-quality deliveries. Collaborate with logistics providers to reduce costs and enhance reliability.
4. **Leverage Regional Trade Agreements**
   - Utilize existing trade agreements, such as with SAARC and ASEAN nations, to reduce tariffs and gain preferential access to regional markets. Focus on building relationships with nearby countries that demand tropical fruits.
5. **Focus on Niche Markets**

- Target niche consumer groups, such as health-conscious buyers or ethnic communities in Europe and North America, by promoting tropical fruits as exotic, nutritious, and culturally significant.

6. **Comply with International Standards**
   - Train exporters on global quality, food safety, and phytosanitary standards. Certification programs, such as GlobalG.A.P., can enhance credibility and market access, particularly in stringent European and North American markets.
7. **Market-Specific Strategies**
   - **Middle East:** Consolidate existing markets by building on strong trade relationships and addressing consumer preferences.
   - **Europe and North America:** Invest in digital marketing, in-store promotions, and collaborations with local distributors to establish a consistent presence.
   - **Asia-Pacific:** Strengthen regional trade ties and participate in food expos to showcase products in countries like Japan, Australia, and Singapore.
8. **Capacity Building for Farmers and Exporters**
   - Provide technical training to farmers on sustainable farming practices and quality improvement. Encourage exporters to adopt best practices in grading, sorting, and post-harvest management.
9. **Government Support and Policy Intervention**
   - Enhance export incentives, reduce taxes on export-related inputs, and provide financial support for certification and branding initiatives. Collaborate with trade promotion organizations to identify and pursue new market opportunities.
10. **Invest in Research and Development**
    - Develop mango and guava varieties suited for export markets in terms of size, taste, and shelf life. Use market intelligence to align production with global trends and preferences.

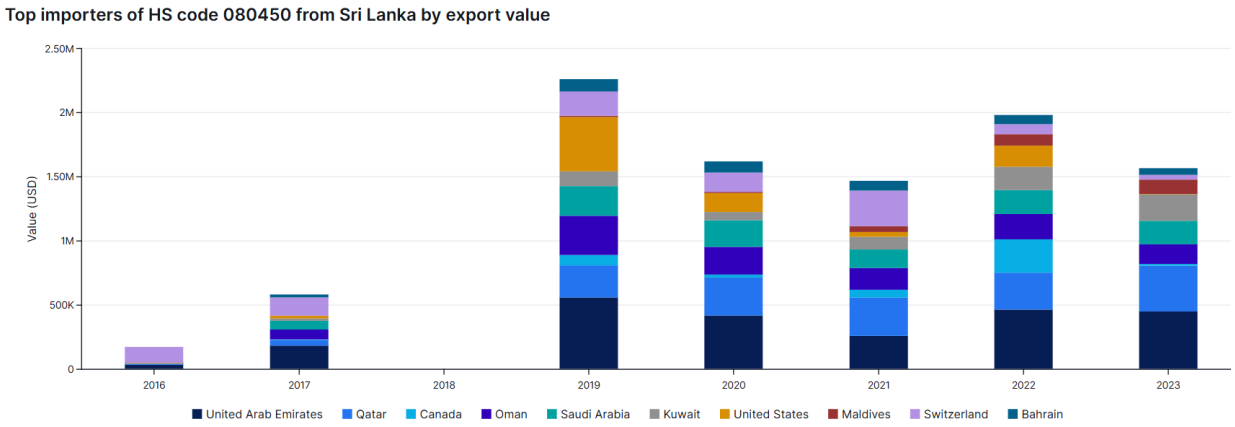

Figure 5: Top Importers of HS code 080450 from Sri Lanka by Export Value

Source: https://www.tridge.com

4.1.3 Passion Fruit

4.1.3.1 Global Export Landscape

The global passion fruit market has experienced consistent growth, with a total export value of $3.9 billion in 2023. The global passion fruit export market is concentrated among a few dominant players (Table 7). The top ten exporters account for a significant share of the market, led by Canada, Thailand, and Poland. Smaller players, such as Sri Lanka, currently contribute minimally (0.004%).

Table 7: Top 10 exporters of passionfruit in the world

Position	Exporter	Average Value (2016-2023)	Market Share
1	Canada	$379.5M	11%
2	Thailand	$305.7M	9%
3	Poland	$225.8M	7%
4	Chile	$207.1M	6%
5	Peru	$185.3M	6%
6	United States	$175.3M	5%
7	Netherlands	$133.4M	4%
8	Malaysia	$129.8M	4%
9	Serbia	$115.9M	3%
10	Vietnam	$110M	3%

Source: UNComtrade

4.1.3.2 Key Importers

The demand for passion fruit is concentrated in several high-income and emerging markets. The **United States** leads global imports, followed by **China** and **Germany** (Table 8).

Table 8: Top importers of Passionfruit

Position	Importer	Average Import Value	Share in World Imports
1	United States	$683.2M	19%
2	China	$471.3M	13%
3	Germany	$290.6M	8%

Position	Importer	Average Import Value	Share in World Imports
4	France	$201.5M	6%
5	Canada	$167.5M	5%
6	Japan	$158.6M	5%
7	Netherlands	$151.7M	4%
8	Australia	$125.9M	4%
9	Poland	$115M	3%
10	United Kingdom	$113.9M	3%

Source: UNComtrade

Key Import Insights:

- **United States:** The largest importer, with a 19% market share, driven by strong consumer demand for health-focused and exotic fruits.
- **China:** Represents 13% of global imports, with growing demand for passion fruit as a premium product.
- **Europe:** Collectively a significant market, with Germany, France, and the UK importing large quantities.

4.1.3.3 Sri Lanka's Position

Sri Lanka currently ranks **80th** in global passion fruit exports under HS code 081190, contributing only a small fraction of the global trade. Despite its modest position, the country has significant untapped potential to expand its presence in the international market. This potential lies in leveraging existing trade relationships, targeting high-value markets, and improving production and export strategies.

Sri Lanka's passion fruit exports are highly concentrated, with the **Maldives** accounting for **41.08%** of total exports, followed by the **United Arab Emirates (UAE)** (**11.00%**) and **Qatar** (**8.66%**). Other notable destinations include the **United Kingdom** (**8.22%**) and **Switzerland** (**4.59%**). These markets demonstrate a strong demand for Sri Lankan passion fruit, albeit on a small scale (Table 9).

Table 9: Export destinations of Passionfruit from Sri Lanka

Importer	Average Value (2016-2023)	Share
Maldives	$3,856,888.71	41.08%
United Arab Emirates	$1,033,081.57	11.00%
Qatar	$812,694.00	8.66%
United Kingdom	$771,949.43	8.22%
Switzerland	$430,755.71	4.59%
Canada	$370,225.29	3.94%
France	$323,159.00	3.44%
Germany	$313,765.86	3.34%
Saudi Arabia	$284,902.71	3.03%
Kuwait	$210,113.14	2.24%

Source: UNComtrade

4.1.3.4 Challenges for Sri Lanka in Major Markets

Sri Lanka's exports to **high-value markets** such as the **United States**, **Germany**, **France**, and **Canada** remain limited but show room for growth:

1. **United States**: Sri Lanka's exports to the U.S. account for only **1.64%** of its total passion fruit exports, despite the U.S. being the largest global importer of passion fruit with a market share of **19%**.
2. **Germany**: While Germany holds **8%** of global imports, Sri Lanka's share in this market is **3.34%**, suggesting further potential.
3. **United Kingdom**: This market accounts for **8.22%** of Sri Lanka's exports, the largest among high-value importers. However, the UK is still underutilized given its substantial import capacity.
4. **Canada and France**: These two markets collectively represent **7.38%** of Sri Lanka's exports, but their global significance indicates further opportunities.

4.1.3.5 Strategies for Expansion

1. **Market Diversification**
   Sri Lanka could reduce its dependence on nearby markets like the Maldives by diversifying into other regions, particularly **North America**, **Europe**, and **Asia-Pacific**.

2. **Value Addition**
   Exporting processed passion fruit products, such as juices, purees, and concentrates, could help Sri Lanka fetch higher value in markets like the **United States** and **Japan**, where demand for ready-to-consumer products is growing.

3. **Quality and Certification**
   Obtaining certifications such as **GlobalGAP**, **Fair Trade**, and **Organic** could enhance Sri Lanka's competitiveness, especially in environmentally and health-conscious markets like **Germany** and the **Netherlands**.

4. **Target Emerging Markets**
   Expanding into emerging markets such as **China** and **India** could also be strategic, given their rising middle-class populations and increasing demand for exotic fruits.

5. **Logistics and Cold Chain Improvements**
   Enhancing post-harvest handling, storage, and logistics can help maintain fruit quality for distant markets, ensuring better competitiveness in premium markets.

Sri Lanka's position in the global passion fruit market is modest, but with targeted strategies, the country can expand its export footprint. High-value markets like the **United States**, **Germany**, and **Canada** offer significant growth opportunities. By improving quality standards, diversifying products, and enhancing logistics, Sri Lanka can increase its share in the global passion fruit trade.

VEGETABLES

4.1.4 Beans [HS code 070820]

4.1.4.1 Global Export Landscape

Beans remain a vital agricultural commodity, with a total global export value of $1.1 billion. Key producing countries continue to dominate the market due to favorable climatic conditions and established trade networks. The market is driven by growing demand for legumes, fueled by their nutritional benefits and rising interest in plant-based diets globally.

Figure 6 showcases the leading trade flows of beans across the globe. The prominent exporters include Morocco, Netherlands, and China, with major flows directed to European, Asian, and North American destinations.

- Morocco emerges as the global leader in beans export, maintaining a 26% market share.
- Other key exporters include Netherlands (9%), China (9%), Guatemala (8%), and Mexico (8%).

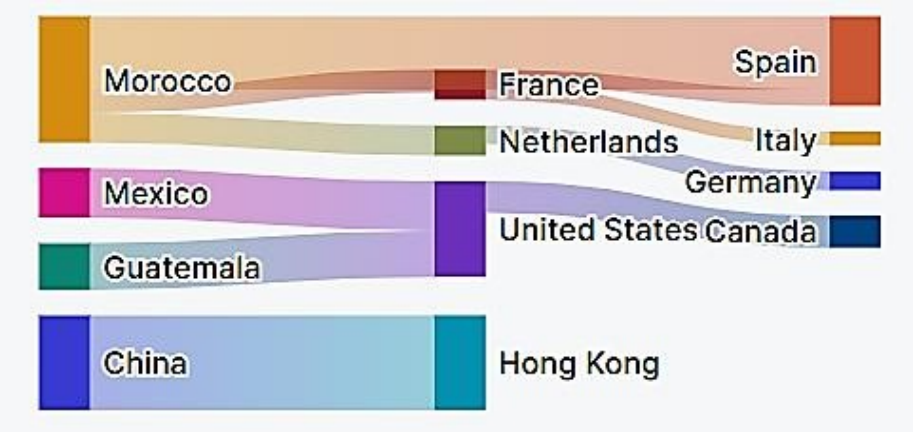

Figure 6: Top 10 trade flows of Beans in the world

Table 10 highlights the Top 10 Beans Exporters globally, their average export values (2016–2023), and market shares.

Table 10: Top 10 Exporters of Beans and their market share in the world

Rank	Exporter	Average (2016-2023)	Percentage
1	Morocco	$240,711,769.13	26%
2	Netherlands	$83,634,335.75	9%
3	China	$81,802,804.88	9%
4	Guatemala	$74,096,134.88	8%
5	Mexico	$72,688,744.13	8%
6	France	$71,210,068.88	8%

7	United States	$67,772,120.88	7%
8	Spain	$46,942,006.38	5%
9	Kenya	$41,175,999.13	4%
10	Egypt	$34,481,331.88	4%

Morocco dominates global bean exports, with exports worth over $240 million annually. Netherlands and China**,** both key European and Asian players, each hold 9% of the market.

4.1.4.2 Key Importers

The bean market has several dominant players contributing a substantial share of global imports. Below are the **top five importers**:

Table 11: Top 5 Importers of Beans

Country	Import Value (USD)	Percentage Share
United States	$186,244,178.50	18%
Spain	$170,445,707.25	16%
France	$126,032,173.50	12%
United Kingdom	$118,287,524.63	11%
Netherlands	$113,387,084.88	11%

- **United States** leads the market with 18% of total world imports, reflecting a high domestic demand for beans, driven by dietary preferences and usage across food industries.
- **Spain** and **France** have substantial shares, driven by their culinary cultures where beans are staple ingredients.
- **United Kingdom** and **Netherlands** round out the top 5, accounting for strong demand in Europe and significant food processing industries.

The next tier of importers, holding smaller but significant shares, includes:

Table 12: Secondary Importers of Bean

Country	Import Value (USD)	Percentage Share
Canada	$69,965,077.00	7%

Country	Import Value (USD)	Percentage Share
Germany	$60,080,307.00	6%
Belgium	$46,922,517.13	5%
Italy	$30,415,786.63	3%
Singapore	$14,418,817.38	1.39%

- **Canada**'s position highlights its role in both domestic consumption and processing for international markets.
- **Germany**, **Belgium**, and **Italy** contribute to steady demand within the European Union.
- **Singapore** acts as a hub for re-exporting beans in the Asian market.

The remainder of the market is highly fragmented with many countries contributing shares below **1%**:

Table 13: Emerging Markets for Beans

Key Emerging Importers	Import Value (USD)	Percentage Share
Japan	$3,864,356.38	0.37%
United Arab Emirates	$6,020,524.75	0.58%
Saudi Arabia	$1,963,983.17	0.19%
Malaysia	$1,590,423.88	0.15%
South Africa	$1,272,255.13	0.12%

- These markets indicate rising demand in **Asia, the Middle East, and Africa**, likely driven by population growth, urbanization, and changing dietary patterns.

Regional Insights

- **North America** dominates with the United States and Canada being the largest importers.
- **Europe** collectively accounts for a major share, led by Spain, France, the United Kingdom, Netherlands, and Germany.

- **Asia and the Middle East** are emerging markets, with countries like Japan, UAE, and Singapore showing moderate demand.
- **Africa** and **Latin America** remain minor players with limited imports but potential for growth.

Accordingly, the United States is the largest global importer, highlighting strong demand. Europe collectively holds a dominant share, with Spain and France leading. Emerging markets such as Japan, UAE, and Singapore present opportunities for future growth. Fragmented markets indicate niche opportunities for exporters looking to expand into smaller economies.

4.1.4.3 Sri Lanka's Position

Sri Lanka's bean exports are currently underdeveloped with small-scale trade to limited markets. Over the past five years, key export destinations and average export values include are included in Table 14.

Table 14: Past five-year average of top importers from Sri Lanka

Importer	Average Export Value (USD)
Saudi Arabia	$34,909.83
United Arab Emirates	$41,453.00
Qatar	$28,642.00
Bahrain	$20,252.00
Canada	$19,921.00
Oman	$11,814.00

Source: Tridge.com

- United Arab Emirates (UAE) and Saudi Arabia lead among destinations, indicating a growing market in the Middle East.
- Trade volumes to Canada and Europe (France, Switzerland, Sweden) remain low but show potential for niche markets.

4.1.4.4 Challenges for Sri Lanka

1. **Targeting the Middle East Market**
    - The Middle East, particularly countries like the UAE, Saudi Arabia, and Qatar, demonstrates rising demand for beans.
    - As these nations heavily rely on imports, Sri Lanka can leverage its proximity and trade agreements to expand exports.

2. **Expanding into Emerging Asian Markets**
    - Countries like Japan, Malaysia, and Singapore have increasing demand for legumes due to urbanization and changing dietary patterns.
    - Sri Lanka can position itself as a competitive supplier to these markets by emphasizing quality and sustainability.
3. **Niche European Markets**
    - While Europe is dominated by Spain, France, and the Netherlands, there is scope for specialty and organic beans exports.
    - Targeting countries like Switzerland and Sweden, where demand for high-quality and organic food products is growing, could be profitable.
4. **Value-Addition and Certifications**
    - Sri Lanka can capitalize on value-added bean products (e.g., processed or packaged beans) to enhance competitiveness.
    - Certifications such as organic farming or fair-trade labels can help Sri Lanka access premium markets in Europe and North America.
5. **Strengthening Regional Trade**
    - Expanding exports to neighboring countries such as Maldives and India offer logistical advantages due to proximity.
    - Australia and Southeast Asia can serve as growth markets for bulk and specialty bean products.

4.1.4.5 Strategies for Expansion

- **Improving Agricultural Productivity:** Increase yields through better cultivation practices and investment in research and development.
- **Market Diversification:** Focus on emerging markets in Asia and the Middle East while strengthening trade ties in Europe.
- **Quality Standards**: Adopt global food safety and organic certification standards to enhance market appeal.
- **Value Chain Development**: Invest in post-harvest infrastructure, including packaging, processing, and cold storage, to improve competitiveness.
- **Trade Partnerships**: Leverage bilateral trade agreements and participate in international trade fairs to create demand for Sri Lankan beans.

Sri Lanka has untapped potential to expand bean exports, particularly to the Middle East, Asia, and niche European markets. By enhancing productivity, targeting premium segments, and

emphasizing quality and value-addition, Sri Lanka can position itself as a competitive player in the global beans market.

4.1.5 Capsicum [HS code 090421]

4.1.5.1 Global Export Landscape

The global capsicum[1] export market which had a total value of $1.6B in 2023, is primarily dominated by a few key players with India, China, and Mexico leading the market. These top exporters collectively account for 87.9% of the total export share in 2023. The remaining export contributions come from other countries, exhibiting a fragmented market with moderate growth opportunities for emerging exporters.

Top Exporters:

The capsicum export market is dominated by a few key players with significant global shares (Table 15).

Table 15: Five major exporters of Capsicum in the world

Rank	Country	Export Value	Share in Export	5-Year Growth
1	India	$1.06B	68.23%	96.88%
2	China	$234.12M	15.07%	51.58%
3	Mexico	$71.54M	4.60%	73.46%
4	Myanmar (Burma)	$30.49M	1.96%	142.58%
5	Germany	$28.62M	1.84%	16.67%

Key Insights:

- India leads the global export market with a 68.23% share, demonstrating steady growth over the last 5 years.
- China and Mexico follow, showing robust growth trends but are far behind India's dominant share.
- Myanmar (Burma) has shown exceptional growth at 142.58% over 5 years, indicating its potential as an emerging player.

High-Growth Export Markets:

Certain countries exhibit exceptional growth in capsicum exports over the past 5 years, presenting significant opportunities for exporters and partnerships (Table 16).

Table 16: High-growth exporters in 2018-2023

Country	5-Year Growth	Export Value	Share in Export
Egypt	2099.94%	$664.69K	0.04%
Philippines	10,089.09%	$16.81K	0.00%
Romania	1293.03%	$1.79M	0.12%

[1] HS code 090421: Spices; fruits of the genus Capsicum or Pimenta dried neither crushed nor ground

Country	5-Year Growth	Export Value	Share in Export
Bahrain	3421.49%	$117.20K	0.01%
Ghana	2065.73%	$210	0.00%

Key Insight:

- Emerging exporters such as Egypt, Philippines, and Romania have shown exponential growth, though their absolute market share remains small.
- Bahrain and Ghana also present noteworthy growth rates that could drive regional capsicum trade.

Stable Exporters:

These countries have consistent export volumes with steady long-term growth (Table 17).

Table 17: Stable exporters in 2018-2023

Country	5-Year Growth	Export Value	Share in Export
India	96.88%	$1.06B	68.23%
China	51.58%	$234.12M	15.07%
Mexico	73.46%	$71.54M	4.60%
Germany	16.67%	$28.62M	1.84%
United States	-5.18%	$4.99M	0.32%

Key Insight:

- While countries like **India**, **China**, and **Mexico** dominate, smaller exporters like **Germany** and **United States** maintain consistent demand due to market stability.

Declining Export Markets:

Some exporters are experiencing sharp declines in export value, signaling challenges or market risks (Table 18).

Table 18: Exporting countries that showed a decline in exports in 2018-2023

Country	5-Year Growth	Export Value	Decline Factors
Spain	-36.82%	$6.36M	Market competition
Netherlands	-31.07%	$11.76M	Oversupply or reduced demand
Hong Kong	-60.68%	$226.12K	Trade disruptions
Morocco	-88.96%	$188.10K	Domestic production challenges

Key Insight:

- Spain, Netherlands, and Hong Kong face significant market share declines, possibly due to oversupply or stronger competition from leading exporters.

4.1.5.2 Key Importers

Top Importers:
The leading countries for capsicum imports are dominated by consistent large buyers with strong market shares and growth potential (Table 19).

Table 19: Top importers of capsicum in the world

Rank	Country	Import Value [2023]	Share in Import [2023]	5-Year Growth
1	China	$394.72M	25.17%	263.12%
2	United States	$247.32M	15.77%	54.47%
3	Thailand	$215.61M	13.75%	56.93%
4	Malaysia	$145.74M	9.29%	119.61%
5	Mexico	$126.46M	8.06%	38.20%

Key Insights:
- China is the largest importer of capsicum globally, showing exceptional 5-year growth of 263.12%, signaling strong and increasing demand.
- United States and Thailand demonstrate consistent demand for capsicum with steady growth over the past 5 years.
- Malaysia has witnessed impressive growth (119.61%) fueled by demand for processed and fresh capsicum.

High-Growth Import Markets:

Several emerging importers show extraordinary growth trends, making them strong opportunities for exporters (Table 20)

Table 20: High-Growth import markets of Capsicum

Country	5-Year Growth	Import Value [2023]	Share in Import
Uzbekistan	26,951.21%	$415.24K	0.03%
Pakistan	1,171.44%	$919.37K	0.06%
Namibia	856.36%	$294.91K	0.02%
Armenia	2,648.00%	$191.17K	0.01%
Bahamas	2,553.80%	$82.37K	0.01%

Key Insight:
- Uzbekistan and Armenia experienced exponential import growth, indicating potential as new capsicum markets.

- Pakistan and Namibia also signal strong demand growth, particularly for affordable and bulk imports.

Stable Import Markets:
These countries have consistent demand and long-term stability, making them reliable markets (Table 21)

Table 21: Stable import markets of Capsicum

Country	5-Year Growth	Import Value [2023]	Share in Import
United States	54.47%	$247.32M	15.77%
Thailand	56.93%	$215.61M	13.75%
Malaysia	119.61%	$145.74M	9.29%
United Arab Emirates	203.28%	$14.15M	0.90%

Key Insight:
- These countries have shown reliable long-term demand growth, making them secure targets for exporters.

Declining Import Markets:
Some countries show a significant decline in import value, signaling market risks (Table 22).

Table 22: Countries with declining imports of Capsicum

Country	5-Year Growth	Import Value
Brazil	-76.15%	$394.95K
Belgium	-44.97%	$1.51M
Kazakhstan	-37.46%	$526.38K
Philippines	-27.38%	$419.18K

Key Insight:
- Countries like Brazil and Belgium face shrinking demand, possibly due to self-sufficiency or economic pressures.

4.1.5.3 Sri Lanka's Position

Sri Lanka's top export destinations for capsicum highlight a mix of established and emerging markets (

Table *23*).

Table 23: Top export destinations of Sri Lanka's Capsicum (2020-2023)

Rank	Country	Export Value (2023)	Share in Export	3-Year Growth
1	India	$148.91K	25.40%	595.74%
2	Australia	$77.22K	13.17%	561.94%
3	Pakistan	$52.30K	8.92%	-
4	Maldives	$48.62K	8.29%	95.64%
5	United Arab Emirates	$45.99K	7.84%	180.55%
6	United States	$44.75K	7.63%	352.07%
7	Spain	$39.94K	6.81%	-60.29%
8	Germany	$29.90K	5.10%	-27.77%
9	Canada	$24.84K	4.24%	-59.43%
10	France	$19.71K	3.36%	465.17%

1. **High-Growth Markets**:
    - India: Leading importer with a 25.4% share and extraordinary growth of 595.74% over 3 years. India is Sri Lanka's most reliable and growing export destination.
    - Australia: Second-largest importer with a 561.94% growth rate, indicating potential for sustained demand.
    - United Arab Emirates (UAE): Significant growth of 180.55%, supported by its position as a regional trade hub.
    - United States: Strong growth at 352.07%, highlighting opportunities in the North American market.
2. **Declining Markets**:
    - Spain (-60.29%), Germany (-27.77%), and Canada (-59.43%) show declining trends, potentially due to competition or demand saturation.
    - United Kingdom (-62.88%) and Switzerland (-71.60%) also reflect notable declines.
3. **Emerging Markets**:
    - Japan: Although small in volume ($536), its 5194.39% growth signals potential for further expansion.
    - Maldives: Steady growth of 95.64%, supported by proximity and cultural ties.

4.1.5.4 Challenges for Sri Lanka

1. **High-Growth Partners**:
    - India and Australia are key opportunities due to their high growth rates and geographical proximity.
    - United States offers long-term potential in the premium capsicum market.
    - UAE acts as a gateway to Middle Eastern markets and can be leveraged for regional expansion.
2. **Focus on Value-Added Exports**:

- Export processed or packaged capsicum products to markets like United States, UAE, and France, which demand premium goods.

3. **Expanding to Emerging Markets**:
   - Target Japan and Maldives, which exhibit exceptional growth trends.
   - Explore untapped markets in Pakistan, which has shown potential despite limited current volume.

4.1.5.5 Strategies for Expansion

A. Market Diversification

- Reduce reliance on top markets like India by expanding to countries like Japan, UAE, and United States.
- Develop strategies to recapture declining markets, particularly Germany and Canada, by addressing quality or pricing challenges.

B. Focus on High-Growth Niches

- Promote organic and sustainably grown capsicum, especially in premium markets like United States and France.
- Offer ready-to-use and processed capsicum products to tap into the convenience food trend.

C. Strengthen Trade Partnerships

- Negotiate preferential trade agreements or partnerships with India, UAE, and Australia to ensure steady demand.
- Participate in food trade exhibitions and marketing campaigns targeting emerging markets like Japan and Maldives.

D. Address Declining Market Challenges

- Analyze reasons for the decline in Spain, Germany, and Canada (e.g., competition, logistical barriers).
- Reposition capsicum products in these markets with tailored marketing strategies.

4.1.6 Tomatoes [HS code 0702]

4.1.6.1 Global Export Landscape

The total global export value for tomatoes is $11.5 billion in 2023, with a diverse set of players contributing across continents. Dominated by Mexico, with a 26.59% share, followed by Netherlands, Spain, and Morocco, who collectively account for nearly half of global exports (Table 24).

Table 24: Market share and growth trends of key exporters

Rank	Country	Export Value (USD)	Share in Export	5-Year Growth
1	Mexico	$3.05B	26.59%	**36.80%**
2	Netherlands	$1.92B	16.80%	**-0.01%**
3	Spain	$1.18B	10.30%	**7.54%**

Rank	Country	Export Value (USD)	Share in Export	5-Year Growth
4	Morocco	$1.14B	9.95%	**68.14%**
5	France	$782.78M	6.83%	**113.26%**

Key Insights:

- Mexico leads the global tomato export market with a dominant 26.59% share, fueled by exports primarily to the United States.
- Netherlands and Spain retain strong positions in Europe, though Netherlands shows stagnation (-0.01% growth).
- Morocco exhibits remarkable growth (68.14%), becoming a significant exporter to Europe.
- France is a rising star with exceptional 113.26% growth in the last five years.

High-Growth Exporters of Tomato

Table 25: Highly growing exporters of Tomatoes in the world (2018-2023)

Country	5-Year Growth	Export Value (USD)	Share in Export
Hungary	382.98%	$29.18M	0.25%
Romania	749.43%	$5.49M	0.05%
Kenya	7,190.54%	$4.17M	0.04%
Ethiopia	132.02%	$8.03M	0.07%
Namibia	169.37%	$4.16M	0.04%

Key Insights:

- Hungary and Romania are emerging European exporters with exponential growth, despite their small market shares.
- Kenya's exports surged by over 7,190%, likely reflecting new trade flows or investments in production.
- Namibia and Ethiopia also show rapid growth, offering opportunities for further development in Africa.

Declining Exporters

Table 26: Countries with declining exports of Tomato (2018-2023)

Country	5-Year Growth	Export Value (USD)	Share in Export
United Kingdom	-70.66%	$3.35M	0.03%
South Africa	-52.60%	$4.75M	0.04%
Lithuania	-49.87%	$5.94M	0.05%
Saudi Arabia	-85.93%	$541.17K	0.00%
Ukraine	-83.52%	$1.71M	0.01%

Key Insights:

- Countries like United Kingdom, South Africa, and Ukraine face severe declines, likely due to reduced production or shifting trade dynamics.
- Saudi Arabia's exports fell drastically (-85.93%), signaling challenges in sustaining production or competitiveness (Table 26).

Regional Insights
Europe:

- Dominated by Netherlands, Spain, and France, but smaller players like Hungary and Romania are gaining traction.
- Italy and Portugal are maintaining moderate growth with 43.85% and 96.07% respectively.

North America:

- Mexico dominates the region, exporting primarily to United States, which accounts for the largest share of its exports.
- Canada is also a strong exporter, with 25.57% growth over five years.

Africa:

- Morocco leads African exporters with strong growth (68.14%), followed by emerging players like Namibia, Ethiopia, and Kenya.

Asia:

- Turkey shows substantial growth (84.81%), becoming a major exporter in the Middle East.
- Emerging players like Kazakhstan and India show promise, though growth rates are mixed.

4.1.6.2 Key Importers

United States leads with nearly 30% of global imports, driven by strong demand for fresh tomatoes from countries like Mexico and Canada. Germany holds the second position with a significant 15.7% share, sourcing mainly from European exporters like the Netherlands and Spain. France has shown impressive growth (61.34%) over the past 5 years, reflecting increased domestic demand. Poland emerges as a high-growth market with an astounding 93.88% growth rate (Table 27).

Table 27: Key importers and their market share

Rank	Country	Import Value (USD)	Share in Imports - 2023	5-Year Growth
1	United States	$3.28B	29.53%	**31.91%**
2	Germany	$1.74B	15.70%	**18.31%**
3	France	$1.13B	10.21%	**61.34%**
4	United Kingdom	$743.25M	6.69%	**6.15%**
5	Poland	$469.69M	4.23%	**93.88%**

Emerging Importers:

- Ukraine experienced a massive 214.38% growth, likely due to increased reliance on imports amid domestic agricultural challenges.
- Serbia, Croatia, and Moldova also show rapid growth, highlighting increased demand in Eastern Europe.
- South Africa and Lebanon are seeing exponential growth rates (464.52% and 4973.19%, respectively).

High-Growth Importers

The importers that have grown rapidly in the past five years are given in *Table 28*.

Table 28: High growth importers of Tomatoes in the world

Country	5-Year Growth	Import Value (USD)	Share in Imports
Ukraine	214.38%	$116.80M	1.05%
Mauritania	932,295.30%	$5.53M	0.05%
South Africa	464.52%	$8.69M	0.08%
Lebanon	4973.19%	$8.79M	0.08%
Poland	93.88%	$469.69M	4.23%

Insights:

- Poland and France are becoming significant players in the global tomato trade, with strong growth in imports.
- Emerging markets in Africa and the Middle East, like South Africa, Lebanon, and Mauritania, provide opportunities for exporters.

Declining Importers

The importers that have shown a decline in their import in the past five years are given in Table 29.

Table 29: Importers of Tomato who show a declining trend

Country	5-Year Growth	Import Value (USD)	Share in Imports
United Arab Emirates	-47.30%	$53.05M	0.48%
Japan	-39.12%	$20.78M	0.19%
Argentina	-85.60%	$299.05K	0.00%
Mexico	-21.50%	$962.37K	0.01%
Kenya	-99.94%	$2.31K	0.00%

Insights:

- Import declines in **UAE** and **Japan** may reflect reduced demand or shifts in local production.
- **Argentina** and **Mexico** show sharp declines, potentially due to self-sufficiency or economic challenges.

Regional Overview of Demand for Tomatoes

North America:

- Dominated by United States and Canada.
- The U.S. imports primarily from Mexico and Canada, accounting for over 85% of its total imports.

Europe:

- Europe represents a large and diversified import market, with countries like Germany, France, and Poland leading.
- Eastern Europe, including Ukraine, Serbia, and Moldova, is emerging as a growth region for imports.

Middle East and Africa:

- Rapid growth in Lebanon and South Africa reflects shifting trade dynamics and increasing demand.
- Import growth in countries like Mauritania (932,295.30%) and Tunisia (8450.09%) is exceptional but may reflect anomalies or significant changes in trade patterns.

4.1.6.3 Sri Lanka's Position

Sri Lanka exports very little of Tomatoes and in recent years the exports have declined (Figure 7).

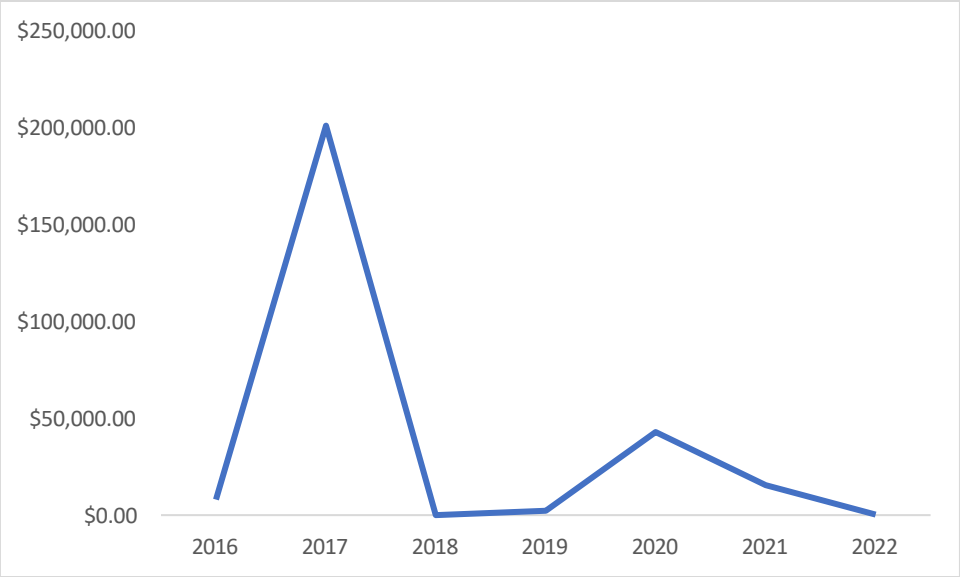

Figure 7: Exports of Tomato from Sri Lanka

There are only a few destinations of exports of Tomato from Sri Lanka, the Maldives being the continuous buyer (Table 30).

Table 30: Tomato export destinations from Sri Lanka

Importer	2016	2017	2018	2019	2020	2021	2022
Australia	-	-	-	-	-	-	$72
Bahrain	-	$235	-	$79	-	-	-
Germany	$8,088	-	-	-	-	-	-
Kuwait	-	$78	-	-	-	-	-
Maldives	-	$7,488	-	$1,588	$42,270	$15,538	$191
Oman	-	$235	-	$95	-	-	-
Qatar	-	$118	-	-	-	-	-
Saudi Arabia	-	$466	-	$264	-	-	-
Seychelles	-	$191,996	-	-	-	-	-
United Arab Emirates	-	$235	-	$192	$623	-	-

Source: Tridge.com

4.1.6.4 Strategies for Expansion

Focus on Emerging Markets:

- Target high-growth regions like Poland, Ukraine, South Africa, and Lebanon. Poland's import growth of 93.88% and Lebanon's 4973.19% increase in demand offer lucrative opportunities.
- Explore smaller but rapidly expanding markets in Africa and the Middle East, such as Mauritania and Tunisia, which show extraordinary growth rates.

Build Stronger Connections with Maldives:

- Strengthen relationships with the Maldives, Sri Lanka's most consistent buyer, and expand offerings with fresh and value-added tomato products.

Invest in Organic and Sustainable Tomatoes:

- Tap into the rising global demand for organic and environmentally friendly tomatoes, particularly in high-value markets like Germany, France, and the United States.

Improve Consistency in Quality:

- Adopt advanced agricultural practices and certifications (e.g., GlobalG.A.P.) to ensure consistent quality and compliance with international standards.

Focus on Value-Added Products:

- Develop products such as sun-dried tomatoes, tomato paste, or organic tomato juice to appeal to premium markets.

Expand in Regional Markets:

- Leverage geographic proximity to the Middle East and South Asia by targeting countries like Oman, Qatar, and Saudi Arabia where Sri Lanka already has a foothold.

Tap into Europe's Smaller Emerging Markets:

- Markets like Hungary, Romania, and Moldova are showing rapid growth in tomato imports and may offer entry points for Sri Lankan tomatoes.

4.2 Specific requirements of existing and potential export markets availability of support (Institutional, policy & regulatory) and limitations in Sri Lanka to meet those requirements.

4.2.1 International Quality Standards for Exports of Fruit and Vegetables:

Global fruit exports must meet rigorous quality standards to ensure the products are safe, fresh, and suitable for international markets. Below is key quality standards required for global fruit exports:

1. Food Safety Standards

- **Global Food Safety Initiative (GFSI) Benchmarks**:
- Certifications under GFSI include (SaiGlobal, 2024):
  - **BRC Global Standards (British Retail Consortium)**: Focuses on food safety, legality, and quality.
  - **IFS (International Featured Standards)**: Similar to BRC, tailored for retailers. IFS is widely recognized by **European retailers and distributors**, particularly in countries like **Germany, France, and Italy**. IFS aligns with regulatory requirements such as: **EU Food Safety Regulations** and **FDA standards** (for exports to the US).
    Examples:
    Thai Longan Exporters: In Thailand, Longan exporters have adopted IFS certification to meet stringent international food safety standards. This certification has enabled them to access European markets, where compliance with recognized standards is crucial. The adoption of IFS has also led to improved post-harvest handling and quality control, reducing losses and increasing profitability (Kubo, K., 2019).
  - **Food Safety System Certification (FSSC) 22000**: Combines ISO 22000 with specific prerequisite programs. It is based on the **ISO 22000 standard** for food safety management systems. Includes additional requirements specific to food safety management (e.g., PRPs based on ISO/TS 22002)
    Examples:
    Sahyadri Farms (India): Sahyadri Farms, a prominent fruit exporter, transitioned from ISO 22000 to FSSC 22000 to meet global customer demands. This shift led to a comprehensive cultural change within the organization, with every employee taking ownership of food safety and quality. The certification enabled Sahyadri Farms to operate on a global scale, securing long-term growth potential (*Sahyadri Farms case study*. (n.d.))
    Baron Foods (Caribbean): Baron Foods, a food processing company in the Caribbean, achieved FSSC 22000:2010 compliance for over 165 products, including exotic fruit beverages. This certification facilitated exports to the USA, Canada, Europe, Guyana, and the Caribbean, demonstrating how adherence to international standards can expand market reach (Baron Foods. (n.d.))
  - **SQF (Safe Quality Food)**: is a globally recognized food safety and quality program that provides independent validation that a product, process, or service complies with international, regulatory, and other specified standards. It enables food producers to assure consumers that their products have been produced, prepared, and handled according to the highest possible standards.
  - **Hazard Analysis and Critical Control Points (HACCP)**:
    A systematic approach to identify, evaluate, and control hazards during food production.

Examples:

1. The Fruit Republic (Vietnam): The Fruit Republic operates a 4,000 m² HACCP-certified packing facility in Can Tho, Mekong Delta, surrounded by over 350,000 hectares of tropical fruits and vegetables. This facility includes washing, sorting, grading, and packaging lines, enabling the handling of large volumes of produce with precise calibration for size and color. Additionally, a 750 m² high-care fresh-cut room employs 75 well-trained staff to prepare a wide range of fresh-cut fruits, supplying supermarkets, food service companies, international airlines, and multinational corporations in Vietnam (*The Fruit Republic at a glance*. (n.d.))

2. Greenex (Chile): Greenex, a Chilean fruit exporter, maintains HACCP certification for its packing house, ensuring that all handling processes are monitored for product safety. Their orchards are also certified under GLOBALGAP, guaranteeing safety and quality. Greenex offers a diverse portfolio of products, providing customers with year-round fresh fruit (*Greenex,* (n.d.)).

3. Fresh World Exporters (Sri Lanka): Fresh World Exporters is committed to the highest food quality and safety standards, holding HACCP certification. They supply high-quality and fresh products, including conventional and organic vegetables, fruits, herbs, spices, and various hotel requirements (*Fresh World Exporters,* (n.d.))

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2. Good Agricultural Practices (GAP)

- **GLOBALG.A.P. Certification**:
  Recognized internationally, it ensures that fruits are produced sustainably with minimal environmental impact and attention to worker welfare and food safety. Studies have highlighted that while GLOBALG.A.P. certification is crucial for accessing high-value markets, its adoption is uneven globally, influenced by factors such as economic development, export orientation, and institutional support (Flachsbarth, et al., 2020).

  Sanitary and Phytosanitary (SPS) Measures:
  Standards established by the World Trade Organization (WTO) to protect human, animal, and plant health. Stringent SPS measures in high-income countries can act as non-tariff barriers, disproportionately affecting exporters from lower-income countries by increasing compliance costs and limiting market access (Murina, 2017).

3. Pesticide Residue Compliance

- **Maximum Residue Levels (MRLs)**:
  Exporting countries must ensure that fruits comply with the MRLs set by the importing country or region (e.g., European Union, United States). Different countries have varying MRL standards. For instance, the European Union (EU) has stringent MRLs, often requiring testing for up to 480 chemical substances .

4. Traceability Standards

- Systems must be in place to trace products throughout the supply chain, from the farm to the final consumer. This includes accurate documentation of production, processing, and distribution stages. Some of the available standards in the world are:

GlobalG.A.P. Chain of Custody (CoC) Standard

- Ensures that products labeled as GlobalG.A.P. certified can be traced throughout the supply chain, from the farm to the consumer. Focuses on handling, processing, and trading certified products. Kenyan exporters adopted the GlobalG.A.P. CoC standard to ensure traceability of avocados to the EU, boosting market confidence.

GS1 Standards

- A set of global standards for supply chain visibility, including barcoding, electronic product codes (EPC), and global location numbers (GLN). Facilitates traceability through scanning and digital records. Australian grape exporters use GS1 barcodes to track shipments to Asia and Europe, ensuring transparency and efficient recall if needed.

Blockchain Technology in Traceability

- Provides a decentralized and immutable ledger for tracking products along the supply chain. Thailand's exporters use blockchain to provide traceability for durians, satisfying Chinese requirements for transparent and verifiable supply chain data.

Produce Traceability Initiative (PTI)

- A voluntary standard in the U.S. designed to enhance traceability of fresh produce through standardized case labels. PTI is widely used by apple exporters to ensure compliance with FDA's Food Safety Modernization Act (FSMA), facilitating traceability in case of a food safety incident.

EU's General Food Law (Regulation (EC) No 178/2002)

- Requires one step forward, one step back traceability, ensuring that food businesses can trace their products along the supply chain. Spanish citrus producers comply with the EU regulation by maintaining robust traceability systems to export to EU countries.

Codex Alimentarius Traceability Guidelines

- Provides general principles for food traceability systems to support food safety and market access. Chilean exporters adhere to Codex traceability guidelines to meet the standards of importing countries like the U.S. and Japan.

Japan's JAS (Japanese Agricultural Standard) Traceability

- Focuses on transparency and food safety for imported and exported agricultural products. Vietnamese exporters implement JAS-compliant traceability systems for dragon fruit to access the Japanese market.

FDA's Food Safety Modernization Act (FSMA) Rule on Traceability

- Mandates record-keeping for high-risk foods to ensure traceability in case of contamination. Mexican exporters comply with FSMA requirements by implementing digital traceability systems to export tomatoes to the U.S.

CanadaGAP Traceability System

- Part of CanadaGAP (Good Agricultural Practices), it includes specific requirements for tracking the movement of produce. Greenhouse vegetable exporters use the CanadaGAP system to meet requirements for exports to the **U.S.** and **Europe**.

5. Quality and Grading Standards

- **Codex Alimentarius Standards**:
  Set by the FAO and WHO, these guidelines define minimum quality requirements for various fruits.
  Bananas: The *Codex Standard for Bananas (CODEX STAN 205-1997)* applies to commercial varieties of bananas grown from *Musa spp. (AAA)* of the Musaceae family, intended for fresh consumption. This standard specifies quality requirements, including criteria for classification, sizing, and presentation.
  Mangoes: The *Codex Standard for Mangoes (CODEX STAN 184-1993)* covers commercial varieties of mangoes (*Mangifera indica L.*) supplied fresh to consumers. It outlines provisions concerning quality, including minimum requirements, classification, sizing, and presentation.
  Guavas: While there isn't a specific Codex standard exclusively for fresh guavas, guava products like juices and nectars are covered under the *Codex General Standard for Fruit Juices and Nectars (CODEX STAN 247-2005)*. This standard defines quality criteria for fruit juices and nectars, including those derived from guavas.
  Passion Fruits: The *Codex Standard for Passion Fruit (CODEX STAN 316-2014)* applies to commercial varieties of passion fruit from species such as golden passion fruit/sweet granadilla (*Passiflora ligularis Juss*), purple passion fruit (*Passiflora edulis Sims forma edulis*), and yellow passion fruit (*Passiflora edulis Sims forma flavicarpa*). This standard specifies quality requirements, including classification, sizing, and presentation (*Standards | CODEXALIMENTARIUS FAO-WHO*, n.d.)

6. Packaging and Labeling Standards

- **Packaging**:
  Fruits must be packed in materials that prevent contamination and preserve freshness. The packaging must also meet importers' weight, size, and durability requirements.
- **Labeling**:
  Labels must include information such as product name, country of origin, grower identification, batch number, and certifications.

7. Organic Standards (If Applicable)

- For organic exports, certifications such as USDA Organic, EU Organic, or JAS (Japan Agricultural Standards) are required. These standards ensure that no synthetic pesticides, fertilizers, or genetically modified organisms (GMOs) are used.

8. Sustainability and Ethical Standards

- Many importers, especially in Europe and North America, now require adherence to sustainability certifications, such as:
  - Rainforest Alliance
  - Fair Trade Certification
  - Environmental and Social Responsibility Standards

9. Cold Chain Requirements

- Maintaining an unbroken cold chain is crucial for preserving fruit quality. Compliance with international protocols for cold storage and transportation is often required.

10. Phytosanitary Certificates

- Issued by the National Plant Protection Organization (NPPO) of the exporting country, these certificates confirm that the fruit shipments are free from specific pests and diseases.

Key Challenges in Meeting Standards

- **Cost of Certification**: Obtaining certifications like GLOBALG.A.P. or organic labels can be expensive, especially for small-scale farmers.
- **Compliance with Varying Standards**: Different countries have different regulations, which complicates the process for exporters targeting multiple markets.
- **Infrastructure and Technology**: Maintaining the required quality often demands advanced infrastructure for cold storage, processing, and transportation.

Meeting these quality standards is essential for gaining access to competitive global markets and ensuring consumer safety and satisfaction.

4.2.2 Quality Standards of Key Importing Countries in the World and Sri Lanka's Situation

Exporting fruits like bananas, mangoes, guavas, and passion fruits to major international markets requires adherence to specific standards and regulations set by each importing country. Below is an overview of the standards for key markets and Sri Lanka's position in meeting these requirements.

1. United States

- **Standards**: The U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA) regulate fruit imports. Key requirements include compliance with the Food Safety Modernization Act (FSMA), adherence to Good Agricultural Practices (GAP), and meeting Maximum Residue Limits (MRLs) for pesticides (*Agricultural Marketing Service*, n.d.).
- **Sri Lanka's Position**: Sri Lanka exports a limited quantity of fruits to the U.S. To expand in this market, Sri Lankan exporters must ensure compliance with FSMA and obtain necessary certifications.

2. European Union

- **Standards**: The EU enforces stringent regulations through the European Food Safety Authority (EFSA). Requirements include compliance with MRLs, traceability, and adherence to sanitary and phytosanitary (SPS) measures. The EU also emphasizes certifications like GlobalG.A.P. (*CBI*, 2023).
- **Sri Lanka's Position**: Sri Lanka has been adjusting to EU standards, with some exporters obtaining GlobalG.A.P. certification. However, the volume of fruit exports to the EU remains modest, indicating room for growth.

3. China

- **Standards**: The General Administration of Customs China (GACC) oversees fruit imports, requiring pest risk assessments and adherence to specific import protocols. Only fruits from approved countries and regions are permitted (*Market Access List*, n.d.).
- **Sri Lanka's Position**: As of the latest available information, Sri Lanka is approved to export bananas to China. Expanding exports of other fruits would necessitate bilateral agreements and compliance with Chinese import protocols.

4. Japan

- **Standards**: Japan's Ministry of Agriculture, Forestry and Fisheries (MAFF) sets strict standards, including MRLs, pest control measures, and quarantine requirements (Riker, 2018).
- **Sri Lanka's Position**: Sri Lanka exports a minimal number of fruits to Japan. To increase market share, exporters need to meet Japan's stringent quality and safety standards.

5. Middle East

- **Standards**: Countries like the UAE and Saudi Arabia have varying standards, generally focusing on MRLs, labeling, and packaging requirements (Export Development Board, 2022).
- **Sri Lanka's Position**: The Middle East is a significant market for Sri Lankan fruits, with a substantial portion of exports directed there. Compliance with regional standards has facilitated this trade.

6. Australia:

- **Biosecurity Measures:** Australia enforces stringent biosecurity standards to prevent the introduction of pests and diseases. Imported fruits are subject to risk assessments and may require treatments such as irradiation or fumigation (Department of Agriculture Fisheries and Forestry.
- **Import Conditions:** The Department of Agriculture, Fisheries and Forestry provides detailed import conditions for various fruits, including permissible countries of origin and required certifications.

4.2.3 Sri Lanka’s Strengths and Weaknesses in terms of Meeting Quality Requirements

Sri Lanka has made several strides in aligning its fruit export standards with global benchmarks to enhance competitiveness in international markets. Below is an overview of how Sri Lankan standards correspond with key global requirements:

1. Food Safety Standards

- **Hazard Analysis and Critical Control Points (HACCP):** Sri Lankan processing facilities adhere to HACCP principles, ensuring systematic identification and control of food safety hazards. This alignment with international food safety protocols is crucial for maintaining product integrity (Export Development Board, n.d.).
- **ISO 22000 Series:** The country has adopted the ISO 22000 series standards, which integrate quality management systems with food safety management, reflecting a commitment to international food safety norms (Sri Lanka Export Development Board, 2019).

2. Good Agricultural Practices (GAP)

- **GLOBALG.A.P. Certification:** Some Sri Lankan farms have achieved GLOBALG.A.P. certification, demonstrating adherence to internationally recognized agricultural practices. However, the coverage is not yet comprehensive, indicating room for broader implementation (Sri Lanka Export Development Board, 2019).

3. Pesticide Residue Compliance

- **Maximum Residue Levels (MRLs):** Sri Lanka monitors pesticide residues to comply with the MRLs set by importing countries. Continuous efforts are made to educate farmers on the judicious use of agrochemicals to meet these standards.

4. Traceability Standards

- In Sri Lanka, the implementation of traceability standards has been limited, with several challenges hindering widespread adoption. The fruit and vegetable supply chain in Sri Lanka is complex, with minimal traceability measures in place, especially for produce

destined for the local market. A study focusing on supply chains linked to Thambuththegama and Keppetipola Dedicated Economic Centers revealed that wholesalers exhibited poor feasibility for traceability improvements, while farmers and retailers showed fair feasibility.

- However, some exporters take this seriously. Example: "Traceability is crucial in our value chain as it ensures product accountability, quality assurance, and the ability to address issues quickly if they arise. To achieve this, we implement a farmer-specific packaging process. Each farmer's bananas are packed separately, and after packing, we assign a unique code to each box. This code includes a reference to the farmer's individual code, which is generated by the Public Unlisted Company (PUC) using the GRN (Goods Received Note) system. This allows us to trace each box back to the specific farmer, providing transparency and quality control across the supply chain" (Steve Slemmermen, Ceylon Fresh Fields (pvt) LTD).

5. Quality and Grading Standards

- Sri Lanka follows quality grading standards that align with international benchmarks, ensuring that exported fruits meet the size, color, and texture requirements of global markets.

6. Packaging and Labeling Standards

- Exported fruits are packaged and labeled according to international standards, providing necessary information such as product name, country of origin, and certifications, thereby meeting global market requirements.

7. Organic Standards

- For organic produce, Sri Lanka complies with international organic certification standards, ensuring that products meet the criteria set by importing countries.

8. Sustainability and Ethical Standards

- The country is increasingly adopting sustainability practices and ethical standards, including certifications like Fair Trade, to meet the growing global demand for responsibly sourced products. For example, these standards are obtained by exporters of Banana and Guava (Key Informant Interview). Projects like the one initiated by the International Trade Centre (ITC) and the Ceylon Chamber of Commerce (CCC) aim to help Sri Lankan fruits and vegetables meet international quality and food safety requirements. This includes training for farmers and stakeholders on good agricultural practices and international standards (ITC, n.d).

9. Cold Chain Requirements

- The availability of cold chain infrastructure in Sri Lanka for fruits and vegetables has been limited, contributing to significant post-harvest losses.

10. Phytosanitary Certificates

- The National Plant Protection Organization (NPPO) of Sri Lanka issues phytosanitary certificates, confirming that fruit shipments are free from specific pests and diseases, as required by importing countries.

Identified Gaps

Despite these alignments, certain gaps persist:

- **Certification Coverage:** While some farms have obtained GLOBALG.A.P. certification, expanding this to more producers is essential to meet international buyer requirements.

- **Pesticide Residue Monitoring:** Ensuring consistent compliance with MRLs requires ongoing monitoring and farmer education on safe agrochemical use.
- **Post-Harvest Handling:** Improving post-harvest practices, including proper handling, storage, and transportation, is crucial to maintain fruit quality and reduce losses.
- **Traceability Systems:** Establishing more robust traceability systems is necessary to meet international standards and consumer expectations. Most fruit and vegetable supply chains in Sri Lanka lack effective traceability systems, making it difficult to identify where and when damages occur, leading to significant postharvest losses (Samarasinghe et al., 2021).

Addressing these gaps through targeted interventions and continuous improvement will further enhance Sri Lanka's alignment with global fruit export standards.

4.2.4 Analysis of Policy and Regulatory Frameworks Related to Exports of Fruits and Vegetables

4.2.5 Current Policy Environment:

Sri Lanka's current policy environment for agricultural exports focuses on revitalizing the sector through strategic initiatives aimed at enhancing productivity, ensuring quality, and expanding market access. Key components of this policy framework include:

1. Trade Liberalization and Export Incentives:
    - Removal of Export Duties: Export duties on minor agricultural products were abolished in 1988, and on major exports in 1992, to encourage export activities.
    - Incentives for Non-Traditional Exports: The government, through the Export Development Board (EDB), offers incentives such as a 3% subsidy on the FOB value during the first year of operations, customs duty waivers on imported intermediate inputs, and income tax exemptions on export earnings to promote non-traditional agricultural exports like vegetables and fruits.
2. Quality Control and Standards
    - Import Restrictions for Quality Maintenance: To preserve the quality of Sri Lankan exports, restrictions are imposed on the import of certain commodities, such as tea and spices, to prevent the re-export of inferior products.
3. Support for Key Export Crops
    - Tea Industry Support: Initiatives include ensuring an adequate supply of fertilizers, providing subsidies to reduce costs for tea growers, and supporting tea replanting and new cultivation with significant financial allocations.
    - Coconut Industry Development: Despite challenges like the whitefly disease affecting coconut production, effective regulatory and control measures have been implemented to sustain and increase export earnings. The government has also launched loan schemes, such as the "Kapruka Jaya Isura," to support coconut-related producers in enhancing product quality and quantity.
4. Market Expansion and Trade Agreements
    - Indo-Sri Lanka Free Trade Agreement: This agreement facilitates trade between Sri Lanka and India, providing opportunities for agricultural exports to access a larger market.
5. Domestic Support Measures

- Subsidies and Financial Assistance: The government provides production subsidies and financial assistance for the development of post-harvest facilities and equipment for exporting agricultural crops (*Dept. of Export Agriculture*, n.d.).
- Research and Development: The Department of Export Agriculture focuses on research and development to improve productivity, production, and quality of export agricultural crops such as cinnamon, pepper, and cardamom.

6. Recent Policy Initiatives
   - Agricultural Export Revitalization Plan: In November 2023, President Ranil Wickremesinghe unveiled a comprehensive plan to revitalize Sri Lanka's agricultural sector for export, acknowledging past challenges and missed opportunities. The initiative emphasizes modernizing agricultural practices, enhancing research capabilities, and restructuring existing agricultural research institutes.

These policies reflect Sri Lanka's commitment to strengthening its agricultural export sector by enhancing competitiveness, ensuring quality, and expanding into new markets.

4.2.6 Regulatory Gaps:

Sri Lanka introduced the Promotion of Export Agriculture Act, No. 46 in 1992, which is a legislative measure enacted by the Parliament of Sri Lanka to enhance and regulate the country's export agriculture sector. This Act redefined the Department of Minor Export Crops as the Department of Export Agriculture (DEA), assigning it specific responsibilities to boost the cultivation, processing, and export of designated agricultural commodities. In 2023, it was amended to Updating the legislative framework to reflect contemporary agricultural practices and international trade standards, implement measures to improve the global competitiveness of Sri Lanka's export agricultural products, and promote sustainable agricultural practices to ensure long-term viability of export crops. Although the Act empowers the Minister to declare certain crops as "notified agricultural crops" through a Gazette notification, thereby bringing them under the purview of this legislation, fruits and vegetables have thus far not been included to be promoted under the Department of Export Agriculture or under this act. The exports of fruits and vegetables from Sri Lanka are governed by multiple policies and institutional frameworks. While fruits and vegetables are not specifically under the Promotion of Export Agriculture Act, No. 46 of 1992, they fall under the purview of broader export and agricultural promotion mechanisms. These include Sri Lanka Export Development Board Act, No. 40 of 1979, National Agriculture Policy, Food Act, No. 26 of 1980, Plant Protection Act, No. 35 of 1999, and the Customs Ordinance. In addition, Sri Lanka's fruit and vegetable export sector faces several regulatory challenges that hinder its growth and competitiveness in international markets. Key regulatory gaps include:

1. Issues on Compliance with International Standards

- Exporters often struggle to meet the stringent SPS requirements of importing countries due to inadequate local testing facilities and limited awareness of international standards. This results in increased costs and delays, as testing is frequently conducted abroad (Ghizzoni et al., n.d.).
- The absence of robust quality assurance systems leads to inconsistencies in product quality, affecting the reliability of Sri Lankan exports (Vidanapathirana, et al., 2018).

2. Domestic Trade Barriers Faced

- Exporters are subject to inspections by multiple agencies, including the National Plant Quarantine Service, Sri Lanka Customs, and Sri Lankan Cargo. Additionally, security checks by the Sri Lankan Air Force at airport entrances create redundancies and inefficiencies in the export process (Vidanapathirana et al., 2018).
- Variations in regulations across different regions and agencies lead to confusion and increased compliance costs for exporters, especially in the context of fruits and vegetables falling under many institutions as described previously.

3. Problems with Institutional Coordination

   Limited collaboration among government institutions, exporters, and farmers hampers the development of cohesive strategies to address export challenges. In addition, delays and inconsistencies in implementing export-friendly policies deter potential exporters and investors (Ghizzoni et al., n.d.).

4.2.7 Institutional support available in SL for agricultural exports:

Sri Lanka offers a notable support system for agricultural exports, particularly in the fruits and vegetables sector. Key institutions and initiatives include:

1. Department of Export Agriculture (DEA): Operating under the Ministry of Plantation Industries, the DEA focuses on research and development to enhance productivity and quality of export agricultural crops. It provides assistance for new planting, replanting, and post-harvest facilities, benefiting farmers and large-scale growers (Dept. Of Export Agriculture, n.d.)

2. Sri Lanka Export Development Board (EDB): As the apex body for promoting exports, the EDB offers resources and guidance to exporters of fresh and processed fruits and vegetables. It provides industry capability reports, market insights, and support for international trade fairs, aiding exporters in accessing global markets (Export Development Board, 2022).

Key Support areas provided by EDB

1. Capacity Building

   The EDB offers training programs and seminars to enhance the skills of exporters, particularly focusing on small and medium-sized enterprises (SMEs) and women entrepreneurs. Initiatives like the New Exporter Development Programme (NEDP) assist entrepreneurs in entering international markets (EDB, 2023).

2. Market Access and Promotion

   Through trade fairs, business matchmaking, and market research, the EDB facilitates access to global markets. It also provides market intelligence to help exporters make informed decisions (*Sri Lanka Export Development Board*, n.d.)

3. Product Development and Certification

   The EDB assists exporters in meeting international standards and regulations, ensuring product quality and competitiveness. For instance, it played a pivotal role in obtaining Geographical Indication (GI) certification for Ceylon Cinnamon in the European Union (EDB, 2023)

4. Policy Advocacy and Strategic Planning

   As a policy advisor, the EDB contributes to the formulation of national export strategies, such as the National Export Strategy (NES) 2018-2022, aiming to diversify and increase Sri Lanka's export portfolio (*National Export Strategy (NES) - Sri Lanka Export Development Board*, n.d.).

5. Trade Facilitation

   The EDB addresses operational challenges in the export value chain by establishing task forces to enhance export efficiency and resolve issues faced by exporters (*Economynext*, 2024)

6. Digital Initiatives

- E-services for exporters, including online registration and market data access.
- EDB Market Place: A digital platform connecting buyers and sellers (*EDB eMARKETPLACE - Buy Products Online from Sri Lanka*, n.d.).

In addition, the Export Development Board, have other initiatives to support exporters in terms of **National Organic Control Unit (NOCU)** which Established under the EDB in 2014, NOCU ensures the credibility of organic agricultural products traded within Sri Lanka and exported internationally, **Ceylon Spices Trademark:** Implemented in 2020, this initiative licenses the 'Ceylon Spices' trademark to qualifying producers, processors, and exporters, strengthening quality and preserving originality (EDB, 2023)

4. Lanka Fruit & Vegetable Producers, Processors and Exporters Association (LFVPPEA):

   Established in 1986, LFVPPEA serves as a platform for stakeholders in the fruit and vegetable supply chain. It advocates favorable policies, facilitates linkages between producers and buyers, and conducts capacity-building programs to enhance industry standards (Lanka Fruit & Vegetable Producers, Processors and Exporters Association (LFVPPEA), n.d.).

Its contributions are outlined below:

a) Unified Platform: Established in 1986, LFVPPEA provides a cohesive platform for stakeholders across the fruit and vegetable supply chain, facilitating collaboration and addressing common challenges.

b) Advocacy and Policy Influence: The association actively engages with government bodies to advocate for favorable policies, such as the enactment of the Plant Varieties Protection Bill, aiming to enhance the competitiveness of Sri Lankan produce in global markets.
c) Capacity Building: LFVPPEA conducts training programs and workshops to improve industry standards, focusing on Good Agricultural Practices (GAP) and value addition, thereby enhancing product quality and marketability.
d) Market Development: The association facilitates international market access by organizing trade missions and establishing partnerships with foreign entities, exemplified by the Memorandum of Understanding with Italy's Noberasco to boost exports (Export Development Board, n, d.).

Setbacks:

i. **Resource Constraints:** Despite its initiatives, LFVPPEA faces limitations in resources and funding, which can impede the implementation of large-scale projects and sustained support for its members.
ii. **Regulatory Challenges:** Members often encounter domestic non-tariff barriers, such as complex regulations and administrative procedures, which can hinder export efficiency and competitiveness (Anon, 2018).
iii. **Market Diversification Issues:** While efforts are made to explore new markets, the association's members sometimes struggle with limited diversification, making them vulnerable to market fluctuations and demand shifts.
iv. **Adoption of Advanced Practices:** Encouraging widespread adoption of modern agricultural practices and technologies among smallholder farmers remains a challenge, affecting overall productivity and quality standards.

4. Ministry of Agriculture:

The Ministry formulates and implements national policies to modernize agriculture.

5. Ceylon Chamber of Commerce:

Plays a supportive role in linking exporters with international buyers and providing information on regulatory requirements.

6. International Collaborations:

Projects like the Agriculture Sector Modernization Project, supported by the World Bank and the European Union, aim to increase productivity and market access for smallholder farmers and agribusinesses. These initiatives focus on agricultural diversification and technological improvements (World Bank, 2021)

These institutions collectively provide a robust framework to support and enhance Sri Lanka's agricultural exports, particularly in the fruits and vegetables sector.

Despite the institutional support for Sri Lanka's agricultural exports, particularly in the fruits and vegetables sector, several gaps hinder optimal performance:

Gaps in Institutional Support

1. Limited Market Diversification: Sri Lanka's agricultural exports are concentrated in a few products and markets, making the sector vulnerable to external shocks. Expanding into new markets and diversifying the product range are essential to mitigate risks and enhance export resilience (*Institute of Policy Studies of Sri Lanka*, 2021)

2. Inadequate Infrastructure: Post-harvest losses are significant due to insufficient storage, transportation, and processing facilities. Improving infrastructure is crucial to maintain product quality and competitiveness in international markets (Vidanapathirana, et al., 2018)

3. Compliance with International Standards: Many exporters face challenges in meeting stringent international quality and safety standards, which can limit market access. Strengthening quality control measures and providing training on global standards are necessary to overcome these barriers (Anon, 2018).

4. Limited Access to Finance: Small and medium-sized enterprises (SMEs) often struggle to secure financing for expansion and modernization. Enhancing access to credit and financial services is vital to support growth and innovation in the sector (Dissanayaka, and Thibbotuwana, (2021)

5. Research and Development Deficiencies: There is a need for more focused research on high-yielding, pest-resistant crop varieties and advanced farming techniques. Investing in research and development can lead to increased productivity and sustainability (Jayatilaka, et. Al., n.d.).

6. Policy and Regulatory Challenges: Inconsistent policies and bureaucratic hurdles can impede export activities. Streamlining regulations and ensuring policy coherence are essential to create a conducive environment for exporters (Anon, 2018).

Addressing these gaps requires coordinated efforts among government agencies, private sector stakeholders, and international partners to enhance the competitiveness and sustainability of Sri Lanka's agricultural export sector.

4.3 Awareness among local value chain actors on specific requirements of export markets including quality standards and export protocols for different products in potential markets with special reference to the crops promoted by the project.

4.3.1 Awareness of Export Market Requirements

Farmers

Farmers shared mixed experiences with exporting. Farmers growing banana and mango reported sporadic success with local exporters but faced challenges in meeting international standards. Vegetable farmers highlighted the lack of direct export opportunities due to perishability and inadequate logistics. They highlighted following challenges:

- Limited knowledge of export protocols, insufficient access to cold chain facilities, and high costs of production.
- Lack of modern farming techniques and inputs
- Difficulty connecting with exporters and understanding buyer requirements.

Farmers use traditional farming methods, with minimal mechanization or automation. Most rely on manual grading and packaging. However, some of the precision agricultural techniques such as drip irrigation has been practiced. It appears that most farmers were not involved in certification management since they were not aware of the internal control systems and third-party certification bodies. Finding enough fruits that satisfy export quality criteria is a problem for exporters. Farmers rely on informal networks, local traders, and occasional extension officer visits for market and export information. Farmers criticized the lack of sufficient subsidies for their cultivations.

A study conducted among organic farmers in Sri Lanka highlighted that they are unaware of the adopted organic standard although the farmers are organized into farmer organizations. The majority were unaware of the third-party certification body, and the internal control system (Karalliyadda and Kazunari, 2018).

Most farmer groups under the project reported that they lack awareness or capability to directly find export markets without an intermediary. Although, farmer companies has been formed, they still do not yield the require production capacity to venture directly into exports.

Traders:

- Moderate understanding of general quality standards but limited capacity to implement them due to lack of technical knowledge and equipment for proper post-harvest handling and packaging.

Exporters:

- High awareness of specific requirements, such as GLOBALG.A.P. certification, traceability systems, and phytosanitary regulations. However, they identified challenges in sourcing consistently high-quality produce from local farmers. However, some exporters still used the Sri Lankan GAP in their production process. Some Banana exporters exporting to Middle East countries stated that they do not have any maximum residue limit [MRL] on pesticides when exporting to these countries. Exporters who cater to high end markets such as Europe are aware of the requirements of these markets such as GlobalGAP, and organic certification. Some of these exporters have got these certifications for their products.

4.3.2 Awareness of Export Protocols

Farmers and Traders:

- Limited understanding of mandatory certifications and phytosanitary requirements.
- Documentation processes, including residue testing and traceability, perceived as overly complex and burdensome.

Exporters:

- Familiar with protocols but expressed concerns over regulatory inefficiencies, delays in obtaining certifications, and lack of coordination among regulatory bodies.

4.3.3 Gaps Challenges

- Exporters highlighted high cost of production and complicated customs procedure is setback for their business.
- There is a limited availability in rural areas leading to high post-harvest losses.
- Many actors lack knowledge and equipment for proper processing, reducing competitiveness in international markets.
- Lack of proper logistics systems, especially for perishables, affects quality during transit.
- Exporters highlighted challenges in high transactions cost of exporting, lack of reliable shipping options, delay in shipping, which is very sensitive to perishable items such as fruits and difficulties in customs procedures.
- There is a significant impact of NTMs on the export of fruits like mangoes from Sri Lanka. The complexity and diversity of NTMs, such as Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT), pose substantial challenges. Understanding and aligning with these measures is crucial for improving export performance (Wickrama et al., 2024).
- The fruit and vegetable industry in Sri Lanka relies on various procurement channels, including spot markets and contract farming. However, there is a lack of proper organizational models to effectively integrate small farmers into the supply chain, which increases costs and complicates logistics (Esham and Usami, 2006).
- The supply chain is heavily controlled by intermediaries, whose malpractices contribute to post-harvest losses. Issues such as improper packaging, careless handling, and unsuitable

harvesting practices are prevalent. The lack of coordination among intermediaries further exacerbates these problems, leading to inefficiencies (Gunarathna and Bandara, 2020).

- The supply chain involves multiple stakeholders, each adding costs at different stages. Key cost factors include production, labor, packaging, transportation, and post-harvest losses. These costs significantly increase consumer prices while offering low returns to farmers (Kumari, et al., 2021).

4.4 Existing trade facilitation mechanisms in sea and air freight to support Sri Lankan farmers / exporters to get the benefit of the market demand

4.4.1 Trade Facilitation Mechanisms in Sea Freight

1. **Port Infrastructure and Capabilities**
   Sri Lanka possess several port infrastructures to support exporters such as:
   - **Port of Colombo**: This hub is South Asia's leading transshipment port, equipped with world-class terminals like the Colombo International Container Terminal (CICT) and South Asia Gateway Terminals (SAGT). These facilities boast modern handling equipment, ensuring quick processing of agricultural products. Dedicated reefer container facilities provide temperature-controlled environments for perishable goods such as fresh produce and spices.
   - **Regional Ports**: Ports like Hambantota and Trincomalee complement Colombo by handling niche exports, reducing congestion, and offering direct access for exporters in specific regions.
   - **Cold Chain Logistics at Ports**: Specialized cold storage units ensure the integrity of fresh produce and other temperature-sensitive exports, mitigating spoilage risks during transit (*Sri Lanka Ports Authority*, n.d.).
2. **Customs Modernization and Simplification**
   - **Electronic Documentation Systems**: Sri Lanka Customs has integrated systems like ASYCUDA World, which allows exporters to submit documentation electronically, streamlining clearance procedures. This reduces processing times and minimizes errors associated with manual documentation.
   - **Green Channel Services**: A risk-based customs inspection approach prioritizes compliant exporters, particularly for non-sensitive agricultural goods, facilitating faster cargo movement.
   - **Pre-Export Clearance**: Pre-clearance mechanisms enable exporters to process documentation and obtain approvals well before their cargo reaches the port, expediting shipments (*Sri Lanka Customs*. n.d.)
3. **Support Through Trade Agreements**
   - Sri Lankan agricultural exporters benefit significantly from tariff concessions and preferential access to major global markets through agreements like:
     - **India-Sri Lanka Free Trade Agreement (ISFTA)**: Tariff-free access to a vast Indian consumer base.
     - **Generalized System of Preferences (GSP) with the EU**: Favorable conditions for products like tea, cinnamon, and fruits.
       These agreements reduce cost barriers and enhance competitiveness in international markets (*Department of Commerce*. n.d.).
4. **Private Sector Support and Logistics Networks**
   - Sri Lanka has a well-developed network of freight forwarding companies offering services tailored to agricultural exporters, including Full Container Load (FCL) and Less than Container Load (LCL) options.
   - Partnerships with private logistics providers ensure value-added services like packaging, labeling, and compliance with international standards, allowing exporters to deliver products that meet global expectations (*FAPAA*, 2017)

4.4.2 Trade Facilitation Mechanisms in Air Freight

1. **Strategic Air Cargo Infrastructure**
   Although not as much developed in other countries, Sri Lanka has strategic air cargo infrastructure in place which assists exporters of fresh produce.
   - **Bandaranaike International Airport (BIA)**: A key gateway for air exports, BIA is equipped with advanced cargo terminals, including temperature-controlled warehouses crucial for preserving the freshness of agricultural exports like vegetables, flowers, and spices.
   - **Dedicated Air Cargo Services**: Leading international airlines operating from BIA provide regular cargo flights to high-demand markets, ensuring timely delivery of goods.
2. **Support for Cargo Handling**
   - **Air Cargo Export Office**: A dedicated export processing hub is set up to ensure quick customs clearance for air freight shipments, catering especially to time-sensitive perishables.
   - **Pre-Clearance Options**: Similar to sea freight, air cargo benefits from electronic documentation systems, reducing delays in cargo processing and facilitating a seamless export experience (*Sri Lanka Customs*. n.d.).
3. **Connectivity to Global Markets**
   Sri Lanka's geographic location at the crossroads of major international trade routes provides a significant advantage for its exporters. Strategic flight routes connecting Colombo (Bandaranaike International Airport - BIA) directly to key global markets play a critical role in reducing transit times and maintaining the quality of agricultural exports, particularly perishable goods.
   - **Middle East**: Direct flights to cities such as Dubai, Doha, and Riyadh serve as vital connections to the Middle Eastern market. This region's high demand for tropical fruits, vegetables, and spices aligns well with Sri Lanka's agricultural offerings. The short transit times, often less than 6 hours, ensure freshness and minimize spoilage.
   - **Europe**: Exporters benefit from direct cargo flights to hubs like London, Frankfurt, and Paris. Europe is a lucrative market for Sri Lanka's premium products, including Ceylon tea, cinnamon, and organic produce. The connectivity ensures quick delivery, which is critical for meeting stringent European Union standards for fresh produce.
   - **East Asia**: Key markets such as China, Japan, and South Korea are served by direct air freight routes. These connections facilitate the export of high-value agricultural goods like coconuts, spices, and seafood. The proximity and direct flights reduce logistics costs, enhancing competitiveness in these price-sensitive markets.
   - Strategic flight routes not only provide speed and reliability but also strengthen Sri Lanka's position as a trusted supplier in global supply chains.
4. **Cold Chain and Quality Assurance**
   - **Temperature-Controlled Logistics**: Seamlessly integrated cold chain systems at airports ensure products remain fresh and safe during transit.

- **Phytosanitary Inspections**: Conducted at air freight terminals to comply with the agricultural health and safety standards of importing countries, ensuring the smooth acceptance of goods in foreign markets (*NPQS,* n.d.).

4.4.3 Institutional Support

Several institutional facilities are available to support exporters.

1. **National Trade Facilitation Committee (NTFC)**
   - In alignment with the World Trade Organization's Trade Facilitation Agreement (WTO-TFA), the NTFC established in 2014 coordinates efforts to simplify and harmonize export procedures. Initiatives include reducing non-tariff barriers and improving inter-agency collaboration for exporters. The NTFC serves as a collaborative platform for both public and private sector stakeholders involved in cross-border trade, aiming to streamline procedures, enhance transparency, and improve the efficiency of international trade operations ((National Committee on Trade Facilitation, 2016)
2. **Sri Lanka Export Development Board (EDB)**
   - **Capacity Building**: The EDB offers training programs for farmers and exporters to understand international trade requirements and market trends.
   - **Market Intelligence**: Exporters receive insights on demand patterns, pricing, and competition, enabling better decision-making.
   - **Financial Support**: Initiatives like co-financing for certification processes (e.g., Global GAP) ensure small and medium-sized agricultural exporters can meet international quality standards.
3. **Certification and Compliance**
   - **Phytosanitary Certificates**: Required for plant-based products, these certificates are issued to ensure exports meet importing countries' safety standards.
   - **Global GAP Certification**: Assists exporters in meeting stringent quality and sustainability requirements, especially for European markets.

4.4.4 Challenges and Recommendations

1. **Challenges**
   - **High Costs of Logistics**: Freight costs for agricultural products, especially via air, are high, limiting the competitiveness of small-scale exporters.
   - **Inadequate Cold Chain Facilities**: While infrastructure exists, it is insufficient to meet the growing demand for fresh produce exports.
   - **Complex Documentation Processes**: Despite digital advancements, exporters still face delays due to regulatory complexities and inter-agency coordination issues.
2. **Recommendations**
   - **Expand Cold Chain Infrastructure**: Invest in additional refrigerated storage facilities at ports and airports.
   - **Subsidized Freight Programs**: Increase government support for small-scale exporters to cover logistics costs.
   - **Simplify Documentation**: Fully integrate and automate trade facilitation systems to minimize manual intervention and delays.

- **Strengthen Bilateral Trade Relations**: Negotiate better terms for agricultural exports in emerging markets to expand market access.

4.5 Assessment of Information Flow and Communication Methods in the Sri Lankan Fruit Value Chain

The fruit and vegetable value chains in Sri Lanka, encompassing farmers, collectors, processors, and exporters, is characterized by diverse communication methods and information flow patterns. Several studies highlight challenges and opportunities in enhancing these interactions for better efficiency and economic benefits.

1. **Fragmentation in Communication and Information Gaps:**
    - Farmers and other grassroots actors face significant challenges due to limited access to real-time market information, technical advice, and advanced technologies. This restricts their ability to make informed decisions and optimize production (Jayalath & Perera, 2021).
    - The lack of effective platforms for communication among value chain actors leads to inefficiencies and post-harvest losses of 30–40% in fruits (Rajapaksha et al., 2021).
2. **Role of ICT in Addressing Information Gaps:**
    - ICT solutions, such as mobile-based applications, are emerging as tools to provide actionable and context-specific information. These interventions can help farmers access details on weather, crop management, and market dynamics (Mohamed et al., 2019).
    - However, the adoption of ICT among smallholder farmers remains limited due to gaps in education and infrastructure (De Silva & Ratnadiwakara, 2008).
3. **Procurement and Contract Farming Models:**
    - Contract farming is positively perceived by processors and exporters as a reliable procurement method. However, the absence of robust organizational models to support small-scale farmers results in high linkage costs and inefficiencies (Esham & Usami, 2006).
4. **Supermarkets and Modern Supply Chain Management:**
    - The rise of supermarkets in Sri Lanka has transformed traditional production and marketing channels. These entities demand higher quality and streamlined processes, encouraging shorter and more effective supply chains (Abeysekera, 2007).
5. **Post-Harvest Handling and Value Addition:**

- Inadequate knowledge and poor practices in post-harvest handling at the farmer level exacerbate losses. Efforts to establish economic centers with regulated storage and cold chain practices can mitigate these issues (Rajapaksha et al., 2021).

6. **Collaborative Efforts and Cooperatives:**
    - Community cooperatives play a critical role in enabling efficient information flow and fostering trust among farmers. These networks enhance bargaining power, reduce transaction costs, and facilitate access to high-value markets (Galappaththi et al., 2016).

Improving communication and information flow among value chain actors in Sri Lanka's fruit industry requires integrating ICT tools, enhancing organizational models for small farmers, and investing in capacity building. Stakeholders can achieve significant gains by fostering collaboration, adopting modern supply chain practices, and addressing infrastructure gaps. These measures will not only reduce inefficiencies but also enhance competitiveness in local and global markets.

4.6 Degree of using e-business platforms and the facilitation required for improvements.

The use of e-business platforms by Sri Lankan exporters is a developing area with significant potential. Below is a review of the current state of adoption, challenges, and required improvements based on recent studies:

4.6.1 Current Adoption and Challenges:

1. **Digital Transformation for Exporters**:
    - Digital platforms have been instrumental for the Sri Lanka Export Development Board (EDB) in addressing challenges, especially during crises like COVID-19. However, implementation challenges and the need for strategic digital initiatives persist (Kumuduni et al., 2024).
2. **SMEs and Technology**:
    - SMEs face barriers like lack of information retrieval systems, inefficient global market identification, and outdated practices. Modern e-business platforms, integrating AI and machine learning, have been proposed as solutions (Pathirathna et al., 2023).
3. **Constraints in Adoption**:
    - Factors such as organizational and environmental dynamics significantly influence SMEs' adoption of technology. Challenges include low awareness, financial constraints, and a need for updated infrastructure (Yazeer & Sachithra, 2024).
4. **E-Commerce** (Electronic commerce) **and M-Commerce (Mobile Commerce)**:
    - Security concerns, legal frameworks, and integration issues in e-commerce platforms hinder adoption in Sri Lanka (Dissanayake, 2015).

4.6.2 Facilitation and Improvements:

1. **Digital Ecosystem Development**:
    - Improving digital literacy among exporters and providing user-friendly interfaces could bridge gaps in technology adoption (Yazeer & Sachithra, 2024).
2. **Integrated Platforms**:
    - Creating centralized e-business platforms to manage certifications, market analysis, and product listings can significantly ease exporters' operations (Pathirathna et al., 2023).
3. **Legal and Security Enhancements**:
    - Strengthening ICT laws to safeguard transactions on e-commerce platforms will boost trust and encourage wider adoption (Dissanayake, 2015).
4. **Customized Training and Support**:
    - Exporters would benefit from targeted training programs to better utilize e-business tools. Enhanced support systems, including financial incentives for technology investments, can foster growth (Kumuduni et al., 2024).

While there is progress in adopting e-business platforms among Sri Lankan exporters, challenges like lack of infrastructure, legal barriers, and low adoption of modern technologies persist. Efforts to integrate robust platforms, enhance digital literacy, and strengthen the legal framework will facilitate broader adoption and improved export performance.

In the case of agricultural exports, Sri Lanka has implemented several trade facilitation mechanisms to enhance agricultural exports, focusing on e-platforms, digital payment systems, and information dissemination channels. Key initiatives include:

1. E-Platforms

- **e-Certificate of Origin (e-CoO) System**: Launched by the Department of Commerce, this digital platform streamlines the issuance of Certificates of Origin, reducing processing time by 93% to just 30 minutes. This efficiency minimizes costs and environmental impact by eliminating the need for multiple physical document submissions (*Daily FT*., 2023)
- **Online Trade Information Portal**: Managed by the Sri Lanka Export Development Board (SLEDB), this platform offers comprehensive trade data, including export and import statistics, market trends, and regulatory information. It serves as a valuable resource for market research and selection (*Sri Lanka Export Development Board*, 2024).

2. Digital Payment Systems

- **Electronic Payment Gateway at National Plant Quarantine Service (NPQS)**: Introduced by the Ministry of Agriculture, this system facilitates online payments for quarantine services, expediting the export process for agricultural products (*Daily FT*., 2023).

3. Information Dissemination Channels

- **Govi Mithuru**: A bilingual mobile-based platform launched by Dialog Axiata PLC in collaboration with the Ministry of Agriculture and the Centre for Agriculture and Biosciences International (CABI). It provides farmers with timely information on best practices, weather forecasts, and market prices, enhancing decision-making and productivity (Dissanayeke, et al., 2020).
- **Smart Extension and Efficient Decision-making (S.E.E.D) Hub**: Developed by the Food and Agriculture Organization (FAO), this e-extension platform delivers integrated services, including climate and crop management advice, market prices, and advisory flows. It aims to reduce farmers' vulnerability to various shocks and support productivity-enhancing management choices (FAO., 2023).
- **Sri Lanka E-Agriculture Strategy**: Guided by the Ministry of Agriculture, this strategy focuses on increasing the availability and accuracy of agricultural information by creating, updating, analyzing, and linking critical databases. It also emphasizes developing accessible, affordable, and secure ICT platforms to enhance information dissemination (Sri Lanka E-agriculture Strategy, 2016).

These mechanisms collectively contribute to a more efficient and transparent trade environment for Sri Lankan agricultural exports, leveraging technology to streamline processes and enhance access to vital information.

4.7 Local and international experience of farming as groups or farmer organizations and measures to empower them to enhance export market share / direct export

4.7.1 Group Farming: Enhancing Collective Efficiency

Group farming involves organizing small-scale farmers into cooperatives or associations to pool resources, knowledge, and market access. This model has shown significant advantages in terms of improving production efficiency, quality standards, and access to export markets.

4.7.1.1 Benefits of Farmer Groups Collective Action Initiatives

1. Income and Market Access Improvement: Farmer groups can lead to positive income effects for active members by facilitating better market access and commercialization opportunities. For instance, in Kenya, participation in collective action initiatives has been shown to significantly increase household incomes and market participation (Fischer, and Qaim, 2012; Kirui, 2013). Contract farming ensures a stable market for farmers by connecting them directly with exporters. In Sri Lanka, contracts with supermarket chains and exporters have improved the reliability of the supply chain for fruits and vegetables (Esham & Usami, 2006).
2. Catalyst for Innovation and Information Flow: These groups serve as important catalysts for innovation adoption by promoting efficient information flows among members. This can lead to improved agricultural practices and productivity (Fischer, and Qaim, 2012).
3. Enhanced Bargaining Power and Reduced Intermediaries: Collective action helps farmers improve their bargaining power and reduce the number of intermediaries, thereby capturing more value from the agrifood value chain. This is particularly evident in the case of rice farmers in Indonesia (Ahmad, 2017).

4. Improved Technical Efficiency: In Ghana, female farmers who are part of farmer-based organizations (FBOs) have shown improved technical efficiency, producing a higher percentage of their potential yield compared to their male counterparts (Missiame, et al., 2023).
5. Professionalization and Agri-environmental Management: In the Netherlands, farmer collectives have been professionalized to effectively manage agri-environmental schemes, demonstrating the potential for organized groups to meet environmental and agricultural goals (Dik, et al., 2023)
6. Economies of Scale: Group farming allows members to share resources such as machinery, fertilizers, and irrigation systems, reducing individual costs and improving productivity. For example, Sri Lanka's Kandyan Gardens system supports diversified cropping, enhancing economic viability through shared management (Jacob & Alles, 1987).
7. Quality Assurance: Contracts often include provisions for training farmers in good agricultural practices (GAP), ensuring compliance with international export standards. For example, GlobalGAP certification in Thailand has improved the exportability of fruits and vegetables by enabling farmers to meet stringent European market requirements (Kersting & Wollni, 2012).

4.7.1.2 Demerits of Farmer Groups Collective Action Initiatives

1. Limited Price Advantages: Despite the potential for improved income, the price advantages of collective marketing can be small, and high-value market potentials are often not fully tapped (Fischer, and Qaim, 2012).
2. Exclusion of the Destitute: In some cases, the poorest community members may be excluded from farmer groups due to their inability to contribute financially, which can limit the inclusivity and overall impact of these initiatives (Ochieng, et al., 2018).
3. Free-riding and Participation Challenges: The success of collective action can be threatened by low participation rates and free-riding, where some members benefit without contributing equally. This is influenced by structural and institutional conditions such as group size and payment timing (Fischer and Qaim, 2014).
4. Dependence on Strong Internal Structures: The effectiveness of farmer groups often depends on mature groups with strong internal structures and stable external links. Without these, the groups may struggle to improve their market performance (Ochieng, et al., 2018).
5. Challenges in Heterogeneous Groups: In groups with diverse backgrounds, achieving cohesion can be challenging. Effective management and leadership are crucial to maintaining group engagement and reducing potential conflicts (Ahmad, 2017).
6. Coordination Issues: Weak organizational structures and limited leadership skills often reduce the efficiency of group farming. For example, Sri Lankan farmer organizations face challenges in sustaining group interactions for production and marketing activities (Abeyrathne & Jayawardena, 2014).

In summary, while farmer groups' collective action initiatives offer significant benefits such as improved income, market access, and innovation adoption, they also face challenges like limited price advantages, exclusion of the poorest members, and issues with participation and group cohesion. Addressing these challenges requires supportive policies, strong internal structures, and effective management to maximize the benefits of collective action.

4.7.2 International Examples and Lessons

Thailand: Group Certification and Market Access
Thailand's success in organizing smallholder farmers into certification groups for export purposes provides a valuable model for other countries. Under GlobalGAP certification, Thai farmers were organized into groups managed by donors, exporters, or farmer-led Quality Management Systems (QMS). This model enabled them to meet stringent European market standards for fruits and vegetables. Institutional support from public-private partnerships (PPPs) played a crucial role in training farmers, subsidizing certification costs, and facilitating market linkages. This approach demonstrates the importance of shared responsibility between stakeholders in achieving export readiness (Kersting & Wollni, 2012).

Khao Kitchakood Agriculture Cooperative Ltd. – Thailand
The Khao Kitchakood Agriculture Cooperative in Thailand is recognized for its self-reliant model in the fruit and vegetable sector. By focusing on member education, efficient management, and government support, the cooperative has successfully marketed various fruits and vegetables, benefiting its members economically (FFTC Agricultural Policy Platform, 2015).

Bangladesh: Contract Farming for Export Competitiveness
Bangladesh's experience with contract farming in organic vegetables highlights how structured agreements between farmers and exporters can improve market outcomes. Solidaridad, an international NGO, partnered with the Bangladeshi government to develop frameworks for organic farming and export. Farmers received technical and financial support to comply with international standards, which reduced inefficiencies in the supply chain and ensured consistent quality for exports. The integration of contract farming models also mitigated risks associated with price volatility and facilitated market access for small-scale producers (Azad, 2022).

Jashore Region Vegetable Farmers – Bangladesh
In Bangladesh's Jashore region, a collaborative approach involving 42 farmers led to the production of approximately 994 metric tons of export-quality vegetables. These were exported to the Middle East and European markets, generating over USD 4 million in revenue. The success was due to adherence to quality standards, effective collaboration, and access to international markets (USAID Learning Lab, (2023).

India: Horticultural Supply Chains
India has adopted innovative models combining group farming and contract farming to enhance its horticultural exports. Organized farmer producer organizations (FPOs) work collaboratively with large exporters and government schemes like eNAM (National Agricultural Market). These FPOs provide aggregated supply, reducing transaction costs and enabling compliance with international standards. Additionally, initiatives like the introduction of cold-chain logistics and food safety certification processes have helped Indian farmers reach high-value markets for fruits like mangoes and pomegranates. This model highlights the need for infrastructure investments and coordinated supply chains (Narrod et al., 2009).

Vietnam: Cooperatives and Export Growth

Vietnam's agricultural cooperatives have played a pivotal role in transforming its fruit and vegetable sector. These cooperatives provide members with access to training, inputs, and export markets. For example, dragon fruit farmers in the Bình Thuận province have benefited from collective action and export partnerships, which have facilitated access to markets in Europe and Asia (Hoat, et al., 2018). Additionally, Vietnam's government has incentivized group farming through subsidies for certification and cold storage facilities, enabling farmers to meet international food safety standards. This approach underscores the role of government support in fostering export-oriented cooperatives.

Philippines: Contract Farming for Pineapple Exports

The Philippines has successfully integrated contract farming into its pineapple industry. Multinational corporations like Dole and Del Monte engage smallholder farmers under contracts that specify production standards and guarantee market access. These contracts reduce the risks for both farmers and exporters by ensuring stable prices and quality control. However, challenges such as power imbalances in contract negotiations persist, necessitating government intervention to ensure fair practices. The Philippines' model highlights the potential of integrating smallholders into global supply chains through well-structured contracts.

Kenya: Public-Private Partnerships (PPPs)

In Kenya, PPPs have enabled small-scale farmers to meet food safety standards for European markets by providing technical assistance, improving traceability, and reducing transaction costs (Narrod et al., 2009).

National Agricultural Cooperative Federation (NACF) – South Korea

NACF, known as NongHyup, is a prominent federation of agricultural cooperatives in South Korea. It offers a wide range of services, including banking, insurance, and distribution of agricultural products. NACF's success is attributed to its comprehensive support system for farmers, integration of services, and strong government backing (World Cooperative Monitor 2023).

Japan Agricultural Cooperatives (JA Group) – Japan

JA Group is a national organization encompassing numerous regional cooperatives that provide services such as supplying production inputs, marketing agricultural products, and offering financial services. Its success stems from a well-structured network, diversified services, and a strong emphasis on community development (*ZEN-NOH*, n.d.).

Meiyu Cooperative – China

The Meiyu Cooperative in China has effectively integrated the vegetable supply chain through a "trinity" model encompassing production, supply and sales, and credit cooperation. This comprehensive approach has improved vegetable quality and safety, streamlined operations, and increased farmers' incomes. The cooperative's success is attributed to close coordination among stakeholders and efficient supply chain integration (Wang and 2021).

Trang Ti Garden Fruit Production Cooperative – Vietnam

Located in Can Tho city, the Trang Ti Garden Fruit Production Cooperative manages 70 hectares of longan orchards. By adhering to stringent standards required by markets in the U.S. and

Australia, the cooperative has enhanced the quality of its produce, facilitating access to high-end international markets. This focus on quality assurance and market-oriented production has been key to its success (FreshPlaza, 2024).

4.7.3 Key Factors Contributing to Success:

- Supply Chain Integration: Cooperatives that manage multiple stages of the supply chain—from production to marketing—achieve greater efficiency and product quality.
- Adherence to Quality Standards: Meeting international quality and safety standards enables access to lucrative export markets.
- Collaborative Approaches: Pooling resources and knowledge among farmers enhances productivity and market reach.
- Government Support and Training: Access to training, funding, and policy support from governments bolsters cooperative development and sustainability.

4.8 Evolution of technological improvement, transportation facilities, trading facilities, effective flow of information and other institutional support for export of fruits, vegetables and other high value crops prevail in neighboring countries with a focus on policies, regulations and institutions in support of these success stories.

4.8.1 India

India has made concerted efforts to expand its market share in the export of fruits and vegetables through various strategies, policies, and technological advancements.

1. Policy Interventions and Trade Agreements

- **Agriculture Export Policy (2018)** (Department of Commerce, Ministry of Commerce and Industry, & Government of India, 2019)
  - **Stable Trade Policy Regime**:
    - Aims to reduce ad-hoc trade measures like export bans and restrictions.
    - Ensures a predictable environment for exporters by minimizing policy fluctuations.
  - **Infrastructure and Logistics**:
    - Development of dedicated infrastructure like packhouses, cold storage facilities, and perishable cargo centers.
    - Improved port, rail, and airport connectivity for efficient handling of agricultural exports.
  - **Cluster Development**:
    - Promotes the establishment of export-oriented clusters for specific products (e.g., mangoes, bananas, grapes).
    - Focuses on aggregating smallholder produce to meet export volume and quality requirements.
  - **Value-Added Exports**:
    - Emphasis on processing and value addition of raw agricultural products to increase export revenue.
    - Special focus on organic and ethnic products.

- **Ease of Doing Business**:
  - Digitization of land records and farmer registrations to ensure traceability.
  - Simplified export procedures through single-window clearance systems.
- **Promotion of Brand India**:
  - Marketing campaigns for specific products like Indian mangoes and bananas.
  - Branding efforts to highlight the unique qualities of Indian agricultural products.
- **Sanitary and Phytosanitary (SPS) Standards**:
  - Establishing robust mechanisms to meet international SPS and Technical Barriers to Trade (TBT) standards.
  - Efforts to achieve mutual recognition of conformity assessment procedures.
- **Involvement of State Governments**:
  - Encourages states to include agricultural exports in their policies and develop infrastructure specific to local agro-climatic conditions.
  - Integration of state-level export strategies with national objectives.
- **Research and Development**:
  - Investment in R&D for export-oriented varieties and value-added products.
  - Collaboration with industry and research institutions to enhance export competitiveness.
- **Market Diversification**:
  - Expansion into new markets beyond traditional destinations.
  - Strengthening trade relationships with regions like ASEAN, GCC, and Europe.

- **APEDA Initiative:**
  - The Agricultural and Processed Food Products Export Development Authority (APEDA) facilitates market access, quality enhancement, and infrastructure development for horticultural exports.
  - It organizes international trade fairs, buyer-seller meets, and branding campaigns for Indian fruits and vegetables (Apeda, n.d.).
- **Regional Trade Agreements:**
  - Participation in bilateral and multilateral trade agreements to secure reduced tariffs and better market access for Indian produce in global markets.

2. Technological Innovations and Quality Enhancement

- **Use of Advanced Farming Techniques:**
  - Promotion of precision farming to enhance productivity and reduce input costs.
  - Use of high-yielding and disease-resistant crop varieties.
- **Post-Harvest Technology and Cold Chains:**
  - Establishment of modern packhouses, grading units, and ripening chambers.
  - Development of an integrated cold chain infrastructure to reduce post-harvest losses and maintain the quality of perishable produce.
- **Certification and Standards Compliance:**
  - Implementation of Good Agricultural Practices (GAP) and Hazard Analysis Critical Control Points (HACCP) for food safety.
  - Certification programs like GlobalGAP to ensure adherence to international standards.

3. Focus on Export-Oriented Clusters

- **Horticulture Clusters:**
  - Identification and development of export-oriented clusters for fruits like mangoes (Alphonso and Kesar), grapes, bananas, and pomegranates.
  - Support for vegetable clusters specializing in onions, potatoes, and green chilies (National Horticulture Board of India, 2022).
- **Integrated Horticulture Development:**
  - The National Horticulture Mission (NHM) promotes the production and quality of export-focused crops, providing financial incentives and subsidies for infrastructure, research, and marketing. The Government of India contributes 85%, while 15% is contributed by state governments.
  - Financial incentives and subsidies are provided for infrastructure, research, and marketing.

4. Diversification of Export Markets

According to the Agri Export Policy of India following strategies are carried out (Department of Commerce, Ministry of Commerce and Industry, & Government of India, 2019)

- **Market Targeting:**
  - Diversifying export destinations to include Europe, the Middle East, and Southeast Asia.
  - Strong presence in Gulf Cooperation Council (GCC) countries for vegetables like onions and fruits like mangoes.
- **Product Branding:**
  - Branding of Geographical Indication (GI) tagged fruits such as Alphonso mangoes, Nagpur oranges, and Mahabaleshwar strawberries to gain premium market value.
- **Digital Marketing and E-Commerce:**
  - Leveraging online platforms for direct marketing of fruits and vegetables to international buyers.

5. Financial and Institutional Support

- **Export Subsidies and Incentives:**
  - Subsidies under schemes like Transport and Marketing Assistance (TMA) to reduce freight costs.
  - Financial assistance for the adoption of export-oriented practices.
- **Export Facilitation Centers:**
  - Establishment of Export Facilitation Centers by APEDA to support exporters with documentation, certification, and compliance.
- **Research and Development:**
  - Research institutions like ICAR and state agricultural universities focus on R&D for export-quality horticultural crops.

Key Success Stories

- **Mangoes:** India dominates the global mango market with varieties like Alphonso and Kesar, exporting to regions like the Middle East, Europe, and the US.
- **Bananas:** Development of Cavendish varieties and cold-chain facilities has boosted banana exports to the Gulf and Southeast Asia.

- **Grapes:** The export of table grapes, especially from Maharashtra, has grown due to adherence to strict European standards.

India's multi-pronged strategy has positioned it as a significant player in the global fruits and vegetables market, with further potential for growth.

4.8.2 Thailand

Enhancing Competitiveness and Quality

Thailand has recognized the need to enhance the competitiveness of its fruit exports, particularly in markets like China. The National Research Council of Thailand has initiated programs to strengthen the competitive position of Thai fruit exports by addressing issues such as product quality, bargaining power, and brand recognition (Pongpanich and Phitya-Isarakul, 2008). The Thai government has also focused on research and development to improve the quality and economic efficiency of its fruit production, which includes major tropical fruits like durian, longan, and lychee (Chomchalow et al., 2008). The Department of Agriculture promotes GAP protocols, encouraging farmers to register and certify their farms to meet international standards.

Adoption of Standards and Institutional Support

The adoption of international standards such as GlobalGAP has been crucial for Thai fruit and vegetable farmers to access high-value markets, especially in Europe. This has led to the formation of new institutional arrangements involving farmers, exporters, and donors, which are essential for small-scale farmers to adopt these standards. Support from donors, exporters, and public-private partnerships has been identified as vital for enabling this adoption4. Additionally, the adoption of Good Agricultural Practices (GAP) is influenced by factors such as income and location, with suggestions that GAP certification could be made compulsory to increase adoption rates (Laosutsan and Shivakoti, 2019).

Marketing Strategies and Export Performance

Thai exporters have been encouraged to tailor their international marketing strategies to local market conditions to achieve superior performance. This involves adapting strategies to meet the demands of competitive markets in advanced economies, despite challenges such as limited resources and information asymmetry. For specific fruits like durian, strategies such as enhancing labor productivity and employing lower price strategies have been suggested to increase export income (Rangkakulnuwat, 2024).

Government Policies and Export Focus

The Thai government has implemented national policies focusing on the marketing and trade of major tropical fruits. These policies aim to address both domestic and export markets, highlighting the strengths and weaknesses of the Thai fruit industry5. The strategic focus on specific fruits and vegetables, along with the support for standard adoption and marketing strategies, underscores Thailand's efforts to expand its market share in the global fruit and vegetable export sector.

Market Diversification and Expansion:

Targeting New Markets: Beyond traditional markets like China, Thailand has expanded exports to Japan, the United States, and Europe, increasing global demand for Thai fruits (Thai Fruit Market, 2024a).

Infrastructure and Supply Chain Development: Initiatives like the development of integrated quality chains for the export market have been analyzed to improve efficiency (Buurma, and Saranark, 2006)

Government Support and Policy Implementation:
Export Growth Targets: The Commerce Ministry projects a 4% increase in fresh and processed fruit exports, aiming for 4.19 million tonnes worth 300 billion baht.

Strategic Plans: Plans include fast-tracking GAP certifications, promoting processing of key fruits, and developing contracts for large quantities to stabilize prices and ensure quality (Morgan, 2024).

Technological Adoption and Innovation:
Advanced Farming Techniques: Use of modern technology in production processes has improved fruit quality and increased yield.

E-commerce and Digital Marketing: Leveraging online platforms for direct marketing to international buyers has expanded reach and accessibility (Thai Fruit Market, 2024b).

Branding and Promotion:
Highlighting Unique Fruits: Promotion of exotic fruits like mangosteen, durian, and rambutan through targeted marketing campaigns has created niche markets in competitive regions (Thai Fruit Market, 2024b).

4.8.3 Bangladesh

Contract Farming as a Solution
Bangladesh has explored contract farming as a strategy to enhance its vegetable export market. This approach aims to address the challenges in the traditional supply chain by ensuring quality and reliability in exports. Contract farming has been identified as a feasible solution to increase vegetable exports, as it helps in maintaining export quality and overcoming supply chain issues. The government is encouraged to provide financial, legal, and technical support to farmers to make this supply chain more effective (Azad, 2022).

Aggregation Schemes and Market Connectivity
To improve market connectivity for smallholder farmers, Bangladesh has implemented aggregation schemes. These schemes collect and transport fruits and vegetables on behalf of multiple farmers, primarily targeting wholesale and urban markets. The 'Loop' aggregation service in Jashore, Bangladesh, has been studied for its potential to enhance distribution to smaller markets while benefiting farmers. The findings suggest that combining aggregation with market-oriented interventions can increase demand without compromising farmer benefits, promoting inclusive food systems (Choudhury et al., 2024).
Market Integration and Export Destinations
The integration of vegetable markets in Bangladesh involves various types of agricultural markets, including rural and urban markets. Despite the challenges in the marketing system, Bangladesh exports fresh fruits and vegetables to about 38 destinations, with key buyers in the United Kingdom

and the Middle East. The export of processed and frozen vegetables has also begun on a limited scale. However, the marketing system remains unorganized, with issues such as adulteration and contract violations increasing costs (Hossain at al., 2020). Bangladesh has negotiated trade agreements and sought to establish direct access to high-value markets, such as the European Union, the Middle East, and Southeast Asia. Notable agreements include preferential trade facilities under the EU's Everything but Arms (EBA) initiative (European Commission, 2023) and bilateral agreements with Gulf Cooperation Council (GCC) countries. Special emphasis has been placed on reducing tariff and non-tariff barriers. For instance, the country has worked to obtain certifications such as GlobalGAP and Hazard Analysis and Critical Control Points (HACCP), which are essential for entering premium markets.

Value Addition and Export Profitability

Bangladesh has significant potential for exporting high-quality vegetables, but several constraints limit this potential. Studies have shown that value addition in vegetable production and export is crucial for profitability. For instance, bitter gourd cultivation has been identified as highly profitable, with the UK market being particularly lucrative for exports. The study highlights the importance of addressing cost factors, such as airfreight charges, to enhance export profitability (Hoq et al., 2012).

Diversification of Export Products

Bangladesh has made efforts to diversify the range of fruits and vegetables it exports. Traditionally reliant on staples such as potatoes and green vegetables, the country has begun emphasizing tropical fruits like mangoes, jackfruits, and pineapples. This diversification aligns with global demand trends and allows Bangladesh to penetrate niche markets that value exotic and organic produce.

Compliance with Quality Standards

One of the significant steps taken by Bangladesh is the improvement of quality and safety standards. The government, in collaboration with exporters, has invested in modern packhouses and cold chain infrastructure through initiatives like the "National Agricultural Technology Project" (NATP) (NATP, 2023) and support from the "Bangladesh Agro-Processing Association" (BAPA) (BAPA, 2023). These facilities ensure that products maintain their freshness and meet the stringent quality requirements of international markets. Training programs for farmers on Good Agricultural Practices (GAP) have also been introduced, helping them produce export-quality crops.

4.9 Policy and regulatory changes or gaps need to be fulfilled, through which market share of Sri Lankan Fruit & Vegetable products in the global market can be expanded by enhancing the product diversification (product range) and market diversification (enter into new markets)

1. Aligning Domestic Quality Standards with Global Standards

Gap Identified:

Sri Lanka's fruit and vegetable exports often fail to meet the stringent quality and safety standards required by major importing countries such as those in the EU, North America, and Japan. Certifications like GlobalGAP, Fair Trade, Organic, HACCP, and ISO 22000 are increasingly prerequisites for market access in these regions. Many Sri Lankan producers lack the capacity, knowledge, or resources to comply with these standards.

Challenges:

- Lack of affordable certification processes for small-scale farmers.
- Limited laboratory facilities for pesticide residue testing, microbiological analysis, and other quality assessments.
- Insufficient training for farmers and exporters on maintaining quality and complying with international standards.

Recommendations:

- **Policy Support for Certifications:** Introduce government-subsidized programs to facilitate access to essential certifications. For instance, support smallholder farmers in obtaining GlobalGAP or organic certification to target high-value markets.
- **Infrastructure Investments:** Establish well-equipped, accredited laboratories for testing and certification, ensuring that results are internationally recognized.
- **Capacity Building:** Conduct regular training programs for farmers, processors, and exporters on global quality requirements, packaging standards, and sanitary protocols. Collaborate with international trade bodies for knowledge transfer.
- **Incentives for Compliance:** Provide tax rebates or financial grants to exporters and farmer cooperatives that adopt certifications and demonstrate compliance with international standards.

2. Inadequate Value Chain Support

Gap Identified:

The lack of robust post-harvest infrastructure—such as cold chains, processing facilities, and transportation systems—leads to high post-harvest losses, diminished quality, and limited market reach. This particularly affects Sri Lanka's ability to compete in markets that require long transit times, such as the EU and North America.

Challenges:

- Limited access to cold storage and refrigerated transport facilities.
- Poor post-harvest handling practices result in spoilage and reduced export quality.
- High logistical costs make Sri Lanka's produce less competitive in distant markets.

Recommendations:

- **Investment in Infrastructure:** Develop modern cold chain logistics, including cold storage facilities and refrigerated transport, especially in key agricultural zones. Public-private partnerships (PPPs) can accelerate these investments.
- **Post-Harvest Technology Adoption:** Promote the adoption of advanced post-harvest technologies like controlled atmosphere packaging and vacuum cooling. These can extend shelf life and improve the quality of exported products.
- **Specialized Export Zones:** Establish export-oriented agricultural processing zones equipped with facilities for grading, sorting, and packaging.

3. Regulatory Gaps in Trade Facilitation

Gap Identified:

The process of exporting agricultural products in Sri Lanka is often hampered by complex trade regulations, delays in customs clearance, and inadequate digital trade facilitation systems. These inefficiencies increase transaction costs and reduce competitiveness.

Challenges:

- Lengthy customs procedures and unclear regulatory requirements.
- Lack of integrated systems for documentation and trade approvals.
- Limited use of digital platforms for trade facilitation.

Recommendations:

- **Digitization of Trade Processes:** Develop a centralized digital platform that integrates customs, quality inspections, and export approvals. This will reduce paperwork and streamline export procedures.
- **Trade Facilitation Hubs:** Establish one-stop export facilitation centers in key agricultural regions to provide exporters with guidance, resources, and expedited services.
- **Regulatory Reform:** Simplify export regulations and align them with global best practices. Engage stakeholders, including exporters and farmer groups, in reform discussions.

4. Market Concentration and Diversification

Gap Identified:

Sri Lanka's exports are predominantly focused on Middle Eastern markets, leaving significant untapped potential in high-value regions like the EU, North America, and East Asia. Over-reliance on a few markets makes exports vulnerable to regional economic fluctuations and geopolitical risks.

Challenges:

- Minimal penetration into emerging and high-growth markets like China, Japan, and Eastern Europe.
- Lack of market intelligence and targeted marketing efforts for new regions.

Recommendations:

- **Market Research and Entry Strategies:** Conduct detailed market studies to identify opportunities in untapped regions, such as Eastern Europe, Africa, and Latin America.
- **Trade Agreements:** Actively negotiate bilateral trade agreements or leverage existing agreements like GSP+ to reduce tariffs and expand market access.
- **Product Positioning:** Develop niche products (e.g., organic or Fair Trade-certified) tailored to premium markets in the EU and North America.
- **Export Promotion Campaigns:** Increase participation in international trade fairs and expos to showcase Sri Lankan produce. Collaborate with embassies to conduct market-specific promotions.

5. Lack of Awareness and Training Among Value Chain Actors

Gap Identified:

Many farmers, processors, and exporters lack awareness of export market requirements, including specific product certifications, phytosanitary protocols, and quality standards.

Challenges:

- Low adoption of modern farming and post-harvest techniques.
- Insufficient knowledge of export market trends and buyer preferences.

Recommendations:

- **Farmer Training Programs:** Develop targeted training modules focusing on modern agricultural practices, export standards, and compliance requirements.
- **Knowledge Hubs:** Establish local knowledge hubs or resource centers where farmers and exporters can access information on global trends, standards, and protocols.

6. Limited Product Range and Innovation

Gap Identified:

Sri Lanka's export portfolio is heavily reliant on a limited number of fruits and vegetables. There is untapped potential in diversifying into high-demand, high-margin products such as processed fruits, exotic vegetables, and organic produce.

Challenges:

- Limited research and development (R&D) to create export-friendly product varieties.
- Inadequate support for processing and value addition.

Recommendations:

- **R&D Support:** Fund research institutions to develop export-grade varieties of crops with improved shelf life, flavor, and disease resistance.
- **Value Addition:** Encourage investments in processing facilities to produce products like dried fruits, purees, and frozen vegetables. Offer tax incentives to processors.

7. Lack of Branding and Country Image

Gap Identified:

Sri Lanka lacks a strong, recognizable brand for its fruits and vegetables in international markets, which limits its ability to compete in premium segments.

Challenges:

- Poor consumer awareness of Sri Lankan products in target markets.
- Limited marketing campaigns to promote Sri Lankan products globally.

Recommendations:

- **Country Branding:** Launch a global branding initiative emphasizing the unique attributes of Sri Lankan produce, such as flavor, organic cultivation, and sustainability.
- **Collaborative Marketing:** Work with exporters, industry associations, and trade promotion agencies to co-brand Sri Lankan products under a unified banner.

8. Trade Agreements and Tariff Reduction

Gap Identified:

Sri Lanka has not fully leveraged trade agreements to secure preferential market access for its agricultural products.

Challenges:

- High tariffs in key markets reduce the competitiveness of Sri Lankan exports.
- Limited negotiation power in trade agreements.

Recommendations:

- **Strategic Trade Negotiations:** Focus on securing lower tariffs and reduced non-tariff barriers for agricultural products in markets like the EU, China, and ASEAN.
- **Regional Collaboration:** Build partnerships with regional trade blocs to improve market access.

9. Institutional Support Deficiencies

Gap Identified:

Fragmented and underfunded institutions fail to provide adequate support to farmers and exporters.

Recommendations:

- **Integrated Framework:** Establish a unified institutional body to oversee all aspects of agricultural exports, from production to market access.
- **Financial Support Programs:** Provide loans and subsidies for export-oriented projects, especially those involving smallholder farmers.

10. Sustainability and Climate Resilience

Gap Identified:

Climate change poses risks to crop yields, quality, and consistency.

Recommendations:

- **Climate-Smart Practices:** Promote the adoption of resilient agricultural practices, including water management and organic farming.
- **Insurance Schemes:** Develop crop insurance schemes to protect farmers against climate-induced losses.

By addressing these challenges with targeted policies and regulatory improvements, Sri Lanka can position itself as a competitive exporter of fruits, vegetables, and high-value products in the global market. These measures will not only enhance market access and diversify export destinations but also ensure long-term sustainability and resilience for the agricultural sector.

4.10 Recommendation of appropriate policy instruments that the Government could use to implement proposed policy changes:

To implement the changes required for expanding Sri Lanka's global market share in fruits, vegetables, and other high-value agricultural products, the government can deploy a range of policy instruments. These instruments are described below under six: regulator, economic, institutional, supportive, trade and market access, and research and development:

1. Regulatory Instruments

These policies establish rules and standards that exporters, producers, and other stakeholders must follow to enhance quality, compliance, and competitiveness. However, these should be implemented with care such that it does not create bottle necks in the export process.

- **Introduction and Enforcement of Quality Standards:**
- Introduce mandatory compliance with international certifications like GlobalGAP, HACCP, Fair Trade, and ISO 22000 for exporters targeting high-value markets.
    - Create a certification body or strengthen existing agencies like the Sri Lanka Standards Institution (SLSI) to expedite certification processes.
- **Phytosanitary and Food Safety Regulations:**
- Align domestic regulations with international standards such as those of the World Trade Organization (WTO) and Codex Alimentarius for food safety and sanitary measures.
- **Export Licensing and Compliance Monitoring:**
- Implement export licensing systems that ensure compliance with quality and safety standards before products are shipped to high-demand markets.

2. Economic Instruments

These tools provide financial incentives or disincentives to encourage desired behaviors and investments in the agricultural sector.

- **Subsidies and Financial Support:**
    - Provide subsidies for farmers and exporters to cover certification costs for GlobalGAP, Organic, and HACCP standards.
    - Offer grants or soft loans for investments in post-harvest infrastructure, cold chain systems, and processing facilities.
- **Export Incentives:**
    - Establish tax rebates, duty-free import schemes for agricultural machinery, and reduced export taxes for certified high-quality products.
    - Introduce financial rewards for exporters achieving specific milestones, such as entering new markets or increasing export volumes.
- **Pricing Policies and Minimum Support Prices:**
- Ensure price stability for export-oriented farmers by setting minimum support prices to protect them from market volatility.
- **Public-Private Partnership (PPP) Funding:**

- Attract private sector investment in agricultural technology, infrastructure, and R&D through government co-funding or risk-sharing mechanisms.

3. Institutional Instruments

Strengthening and coordinating institutions to support exporters, farmers, and the entire value chain is critical.

- **Export Development Institutions:**
  - Strengthen the Sri Lanka Export Development Board (EDB) to focus on capacity-building programs for exporters, market research, and promotional campaigns.
  - Establish a dedicated division within the EDB for Fruits and Vegetable exports.
- **Trade Facilitation and Logistics Centers:**
  - Create trade facilitation hubs to streamline customs clearance, trade documentation, and logistics for exporters.
  - Introduce a "single-window" system for trade processes to reduce bureaucratic hurdles.
- **Farmer and Exporter Cooperatives:**

  Promote group farming and cooperatives to enable smallholder farmers to achieve economies of scale and share resources like storage and logistics facilities.

- **Specialized Export Councils:**

  Establish export councils for specific high-value crops like mangoes, guavas, or capsicums to guide production, marketing, and export strategies. Specialized Export Councils (SECs) are focused institutions or bodies dedicated to supporting the export activities of specific products or product categories. These councils act as a bridge between the government, exporters, producers, and other stakeholders in the value chain, ensuring cohesive strategies for enhancing exports. Functions of these councils could be policy advocacy, market research, capacity building, infrastructure development support, quality and compliance, branding and promotion, and facilitation of coordination among stakeholders.

4. Supportive Instruments

These policies foster an enabling environment for agricultural export growth.

- **Market Intelligence and Promotion:**
  - Develop a centralized database for exporters to access market research, global trends, and buyer requirements. These can be done through the export proposed export councils or the EDB
  - Conduct overseas promotional campaigns, participate in international trade fairs, and showcase Sri Lankan produce under a national brand.
- **Capacity Building and Training Programs:**
  - Train farmers, processors, and exporters on quality standards, sustainable farming practices, and value-added production.

  - Collaborate with international organizations like FAO or ITC to provide technical assistance and training.
- **Public Awareness Campaigns:**
  Increase awareness among local stakeholders about the economic and social benefits of export-oriented agriculture and international certifications.

5. Trade and Market Access Instruments

Facilitate international trade agreements and partnerships to open up new markets for Sri Lankan products.

- **Bilateral and Multilateral Trade Agreements:**
  - Leverage existing agreements like GSP+ with the EU to increase tariff-free exports of fruits and vegetables.
  - Negotiate new trade agreements with high-demand regions such as ASEAN, the Middle East, and East Asia.
- **Export Quotas and Tariff Reduction Agreements:**
  Advocate for preferential quotas and reduced tariffs in key markets to make Sri Lankan products more competitive.

- **Collaborations with Multinational Corporations:**

  Partner with international food companies and retail chains to co-brand Sri Lankan produce and expand its market reach. Collaborating with multinational corporations offers a powerful strategy for Sri Lanka to integrate into global agricultural value chains, increase export competitiveness, and drive economic growth. However, for this to happen, large volumes of production may be needed. A collaboration of several Farmer Companies under ASMP project might be an option rather than each individual Farmer Company trying to maximize individual profits.

6. Research and Development (R&D) Policies

Invest in agricultural research to enhance product diversification, innovation, and climate resilience.

- **Crop Improvement Programs:**

  Develop high-yield, disease-resistant varieties of fruits and vegetables tailored to international market preferences.

- **Value Addition and Innovation:**
  Fund research into processing techniques, packaging innovations, and new product development (e.g., fruit purees, frozen produce).

- **Climate Resilience Programs:**

Support R&D on sustainable farming practices and climate-resilient crops to safeguard production against climate change impacts.

7. Digital and Technological Instruments

Adopt modern technologies to enhance efficiency and market connectivity.

- **E-Commerce Platforms:**
  Develop or support platforms where exporters can directly connect with international buyers, reducing dependency on intermediaries.

  A Sri Lankan e-commerce platform for agricultural exports may need the following features:

  - **Product Listings:** Detailed descriptions of available products (e.g., mangoes, guavas, organic vegetables) with high-quality images, certifications, and origin details.
  - **Buyer-Seller Matching:** Tools to connect Sri Lankan exporters with buyers from different countries, including those in high-demand markets like Europe, the Middle East, and East Asia.
  - **Digital Payment Integration:** Secure payment gateways that support international transactions in multiple currencies.
  - **Logistics Support:** Integration with logistics providers to facilitate seamless shipping, tracking, and delivery.
  - **Compliance Assistance:** Guidance on export protocols, documentation, and certifications required by specific markets.
  - **Language and Localization Options:** Interfaces in multiple languages to cater to diverse international buyers.

  However, there can be challenges such as low digital literacy among farmers, limited internet access in some rural areas, trust issues, lack of awareness among international buyers etc.

- **Digital Certification Systems:**
  Use blockchain or digital platforms for traceability, ensuring compliance with international quality and safety standards.

- **Farmer Connectivity Programs:**
  Use mobile apps and SMS-based systems to provide farmers with timely updates on export requirements, market prices, and quality standards.

8. Environmental and Sustainability Instruments

Promote environmentally sustainable practices to enhance product appeal in eco-conscious markets.

- **Sustainability Certifications:**

Subsidize certifications like Rainforest Alliance and Organic for environmentally sustainable farming practices.

- **Environmental Impact Policies:**
  Encourage waste reduction, water conservation, and the use of renewable energy in the agricultural sector.

For these instruments to succeed, a coordinated approach involving government agencies, private sector stakeholders, and international partners is critical. The government should establish a cross-sectoral task force with representatives from:

- Ministry of Agriculture
- Export Development Board
- Sri Lanka Standards Institution
- Private sector export bodies
- Farmer cooperatives and associations
- International trade partners

By leveraging these policy instruments effectively, the Sri Lankan government can enhance the competitiveness of its agricultural exports, ensuring sustainable growth and diversification into high-value global markets.

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