LOGISTICS CHAIN STUDY FOR GRENADA

CARIBBEAN DEVELOPMENT BANK

LOGISTICS CHAIN STUDY FOR GRENADA

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ABBREVIATIONS

ABBREVIATION / TERM	FULL TERMINOLOGY / DEFINITION
24/7	24 hours a day, 7 days a week
3D	Three Dimensional
AGV	Autonomous Guided Vehicle
AI	Artificial Intelligence
AMR	Autonomous Mobile Robot
ANU	V. C. Bird International Airport (St. John's, Antigua)
AR	Augmented Reality
ASYCUDA	Automated System for Customs Data
ATA	Actual Time of Arrival
ATL	Hartsfield–Jackson Atlanta International Airport
B2B	Business to Business
B2C	Business to Consumer
BGI	Grantley Adams International Airport (Bridgetown, Barbados)
BQN	Rafael Hernández International Airport (Aguadilla, Puerto Rico)
CARICOM	Caribbean Community
CDB	Caribbean Development Bank
CET	Common External Tariff
CIF	Cost, insurance, and freight
CLT	Charlotte Douglas International Airport (Charlotte)
CO	Country of Origin Certificate
CO2	Carbon Dioxide
COVID-19	Coronavirus disease
CPI	Consumer Price Index
CRU	Lauriston Airport (Carriacou, Grenada)
DEIB	Diversity, Equity, Inclusion, Belonging
DOM	Douglas–Charles Airport (Dominican Republic)
DWT	Deadweight Ton
eCO	Electronic Country of Origin Certificate
EDI	Electronic Data Interchange
EIS	Terrance B. Lettsome International Airport (British Virgin Islands)
ERP	Enterprise Resource Planning
EWR	Newark Liberty International Airport
FCL	Full container load
FDF	Martinique Aimé Césaire International Airport (Fort-de-France)

ABBREVIATIONS

ABBREVIATION / TERM	FULL TERMINOLOGY / DEFINITION
FEU	Forty-foot Equivalent Unit Container
FMCG	Fast Moving Consumer Goods
FOB	Free On Board
FZMA	Free Zone Management Authority of Saint Lucia
GCNA	Grenada Cooperative Nutmeg Associa-tion
GDP	Good Distribution Practice
GND	Maurice Bishop International Airport (IATA Code)
GDP	Gross Domestic Product
GEO	Cheddi Jagan International Airport (Georgetown, Guyana)
GRT	Gross Registered Tonnage
GSP	Good Storage Practice
GT	Gross Tons
HACS	Hewanorra Air Cargo Services
Hb	Haemoglobin
HS Code	Harmonised System Code
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
ICT	Information and Communication Technology
IMF	International Monetary Fund
IoT	Internet of Things
ISO	International Organisation for Standardi-sation
IT	Information Technology
ITC	International Trade Centre
JFK	John F. Kennedy International Airport (New York, USA)
JIT	Just-In-Time
KPI	Key Performance Indicator
LCCAS	Port of Castries
LCCDS	Port of Cul De Sac
LCL	Less than container load
LCVIF	Port of Vieux Fort
LGW	Gatwick Airport (London, UK)
LIAT	Leeward Islands Air Transport Services
LOA	Length overall
LPG	Liquefied Petroleum Gas
LPI	Logistics Performance Index
LSCI	Liner Shipping Connecitivty Index

ABBREVIATIONS

ABBREVIATION / TERM	FULL TERMINOLOGY / DEFINITION
MIA	Miami International Airport
MOU	Memorandum of Understanding
MPA	Maritime and Port Authority of Singapore
MSc	Master of Science
NFC	Near-Field Communication
NSW	National Single Window
NTP	Networked Trade Platform
OCHA	United Nations Office for the Coordina-tion of Humanitarian Affairs
OECS	Organisation of Eastern Caribbean States
PCS	Port Community System
PLSCI	Port Liner Shipping Connecitivty Index
POS	Piarco International Airport (Port of Spain, Trinidad and Tobago)
PPP	Purchasing Power Parity
PTP	Pointe-à-Pitre International Airport (Gua-deloupe)
QR	Quick Response
R&D	Research and Development
RFP	Request For Proposal
RFID	Radio Frequency Identification
RoRo	Roll On-Roll Off
SEDB	Singapore Economic Development Board
SITC	Standard International Trade Classifica-tion
SJU	Luis Muñoz Marín International Airport (San Juan, Puerto Rico)
SKB	Robert L. Bradshaw Airport (Basseterre, St. Kitts and Nevis)
SLASPA	Saint Lucia Air and Sea Ports Authority
SLU	George F. L. Charles Airport (IATA Code)
SME	Small and Medium-sized Economies
SPS	Sanitary and Phyto-Sanitary
SRO	Statutory Rules and Order
SVD	Argyle International Airport (Kingstown, St. Vincent & the Grenadines)
SWOT	Strengths, Weaknesses, Opportunities and Threats
SXM	Princess Juliana International Airport (Sint Maarten)
TAB	A. N. R. Robinson International Airport (Scarborough, Tobago)
TEU	Twenty-foot Equivalent Unit Container
TMS	Transport Management System
TOS	Terminal Operating System

ABBREVIATIONS

ABBREVIATION / TERM	FULL TERMINOLOGY / DEFINITION
TPP	Port of Tanjung Pelepas (Malaysia)
TRS	Time Release Study
TTI	Time-Temperature Indicator
TVET	Technical and Vocational Education and Training
UAV	Unmanned Aerial Vehicle
UN	United Nations
USD	US Dollar
UVF	Hewanorra International Airport (IATA Code)
VAS	Value Added Services
VAT	Value-Added Tax
VLCC	Very Large Crude Carrier
VR	Virtual Reality
WMS	Warehouse Management System
WOG	Whole-of-Government
WTO	World Trade Organisation
XaaS	Everything as a Service or Anything as a Service
XCD	Eastern Caribbean Dollar
XR	Extended Reality
YYZ	Toronto Pearson Airport

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CHAPTER 1

EXECUTIVE SUMMARY

1.1 BACKGROUND

The International Trade Centre (ITC) in collaboration with the Caribbean Development Bank (CDB) to carry out a Logistics Chain Study for Grenada and Saint Lucia. The study is intended to identify challenges and analyse possible solutions to achieve logistics efficiency gains and elaborate a roadmap for each country. This report is focused on the country of Grenada.

1.2 OBJECTIVES OF THE STUDY

The objectives of this study are to:

i. Review the policy and regulatory framework in the transport and logistics sector;

ii. Identify ongoing initiatives aimed at improving logistics performance and their impact on trade and economic development in the region;

iii. Quantify and qualify transport costs in the three modes of transport (i.e., sea, air, road) for imports and exports, and establish the duration and costs involved for importing and exporting through the main port;

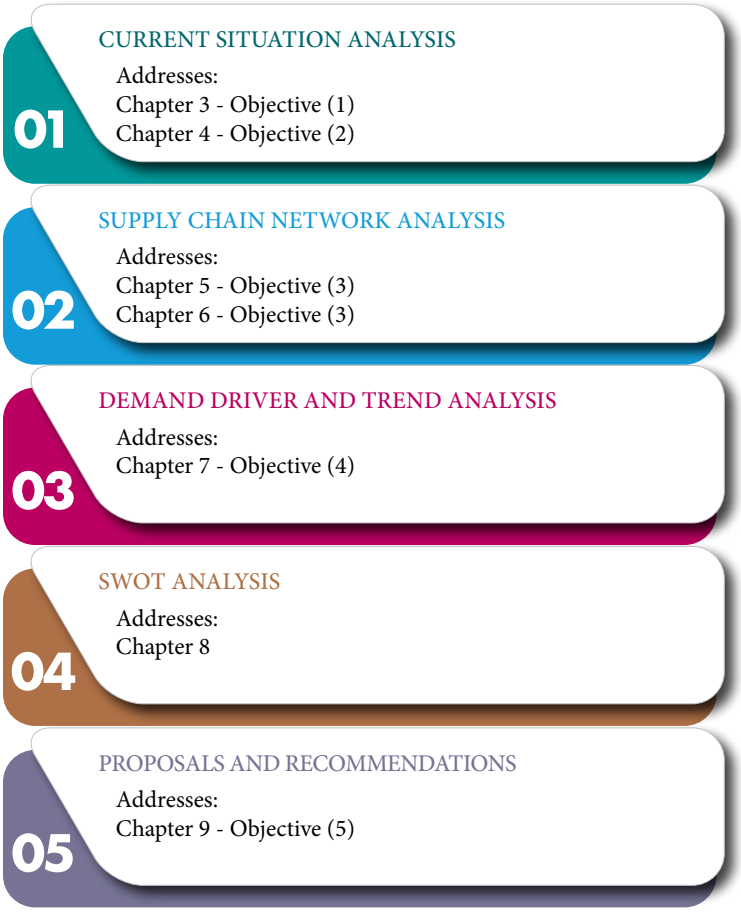
iv. Identify emerging trends and propose performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions; and

v. Propose and recommend concrete policy and institutional measures aimed at reducing costs and improve competitiveness in the transport and logistics sector, along with identifying the main cost drivers of the proposed measures (e.g., infrastructure, human resources, training, etc.)

1.3 APPROACH ADOPTED FOR THE STUDY

The approach adopted is presented by the framework shown in **Figure 1** (see **Chapter 2** for details on the methodology and approach). There are five points to address in relation to the objectives of the study. **Point 1** addresses **Objective 1** and **Objective 2** of the study. The aim is to assess the state of the transport and logistics sector in both countries. This component of the study shall also review the current performance of the transport and logistics sector and its impact on trade and economic development in Grenada. Content pertaining to this point in the framework is provided by **Chapter 3** and **Chapter 4** of the report.

Figure 1: Framework for Proposed Approach to the Study



Source: International Consultant.

For **Point (2)**, the aim is to establish the supply chain network for key products in the agriculture and manufacturing sectors. **Chapter 5** and **Chapter 6** of the report addresses this part of the study. In addition, this component will identify areas to address regarding supply chain inefficiencies, across different levels and sectors. Focus is to quantify and qualify transport and various logistics costs incurred for imports and exports in relation to the three modes of transport. **Objective 3** of the study shall be addressed in this component.

In **Point (3)**, critical demand drivers and emerging trends relevant for the transport and logistics sector in Grenada are presented. This is an important area to be investigated and addressed in **Objective 4** of the study. The component shall also propose performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions. This part of the study shall be addressed by **Chapter 7** of the report.

We shall perform Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis to assess prospects and potential transport and logistics development strategies for **Point (4)** of the study. The intention is to outline core competitive advantages and strengths that are possessed in serving as attractive logistics centres for international trade and market access. The analysis will also propose logistics positioning strategy based on the attributes of key transport and logistics infrastructures. **Chapter 8** addressed this part of the study.

Proposals for concrete policy and institutional measures are addressed by **Point (5)** of the study and **Chapter 9** of the report. The strategic road map for implementation will include recommendations to be implemented over the short term (1 to 2 years), medium term (3 to 5 years), and longer term (6 to 10 years). This component shall address the **Objective 5** of the study. **Chapter 10** concludes.

The deliverables of the study are aligned to the five points shown above in **Figure1**. They are:

- State of the transport and logistics sector, taking into account policy and regulatory frameworks and ongoing initiatives aimed at improving logistics performance (with reference to objectives 1 and 2, and Point 1 of the framework, and chapters 3 and 4 of the report);
- Supply chain networks for key products with emphasis on the agriculture and manufacturing sectors, including quantifying and qualifying transport costs for imports and exports (with reference to Objective 3, and Point 2 of the framework, and chapter 5 of the report);
- Critical demand drivers and emerging trends along with proposed performance indicators (with reference to Objective 4, and Point 3 of the framework, and chapter 6 of the report);
- Core competitive advantages and strengths required to serve as logistics centres for international trade and market access. Analysis will include food security aspects (with reference to Point 4 of the framework and chapter 7 of the report); and
- Proposals and recommendations along with main cost drivers. Also to include considerations and recommendations to strengthen food security and intra-regional trade (with reference to Objective 5, and Point 5 of the framework, and chapter 8 of the report).

For the purpose of the logistics chain study for Grenada, survey exercises, on-site interviews and workshops were conducted over the period of March and April 2023. The survey forms were sent out to 67 companies/organisations. Responses were received from 22 entities which yielded a response rate of 32.8%.

Interviews and site visits with stakeholders of the logistics community in Grenada lasted from 24-26 April 2023. The consultants met with 17 companies and organisations. Focus group workshops for Grenada were held from 27-28 April. The workshops were attended by 18 participants. Observations and findings from the field trip and workshops were reviewed and used to prepare the final report. Key observations pertaining to each point of the framework are presented in the following section of this chapter.

1.4 KEY OBSERVATIONS

Current Situation Analysis (Chapter 3)

The chapter sets the context for the study by providing the background for developments that affect the transport and logistics sector of Grenada. The chapter addresses the first objective which is to review the policy and regulatory framework in the transport and logistics sector. The chapter also addresses general economic and social conditions, as well as developments in trade performance.

Grenada is a member of the Caribbean Community (CARICOM) which comprises developing countries that are relatively small in terms of land size and population. The country is also founding member of the Organisation of Eastern Caribbean States (OECS). As a full member of the OECS, Grenada can enjoy free movement of people and goods within the Economic Union, including use of the common currency "Eastern Caribbean Dollar" (XCD).

The GDP for Grenada reached USD1.11 billion in 2021, measured at current prices. In the period since 2011, Grenada saw its economy emerge from the Global Financial Crisis and European Sovereign Debt Crisis with a positive real GDP growth of 2.4% in 2013. The pace of economic growth was sustained at an annual average rate of 4.8% to 2018. The COVID-19 pandemic severely affected growth in the country with GDP contracting by 13.8% in 2020. Going forward, Grenada is projected to see its economy grow at 2.8% to 4.1% from 2023 to 2028. The IMF projects Grenada's GDP per capita to reach USD14,300 by 2028.

The largest economic activities are education, and real estate, renting and business activities. Transport and storage activities, which accounted for 8.1% of GDP in 2019, form the third largest economic sector in the country. The share of GDP attributed to this sector generally fluctuated between 7.0-10.0%.

In terms of trade performance, there is a worrying trend of persistent trade deficits incurred by Grenada. Merchandise imports exceeded those of exports at an average 36.5% of GDP over the period of 1980 to 2021. Trade deficits appear to be worsening as we progress into the 2020s. Persistent trade deficits of such magnitudes put significant pressure on balance of payments and causes outflow of currency. This development may also point to underlying issues plaguing the competitiveness of the export sector.

Analysis of key commodities and products traded for Grenada showed exports to be skewed towards agricultural-related produce. Animal feed and fish are also major export items. In terms of trading partners, the bulk of international trade for Grenada is conducted with countries and territories in North America and South America. The US remains the largest trade partner with the country accounting for 34.6% of imports by Grenada and 29.9% of exports. The second largest trade partner is Trinidad and Tobago.

Turning to the policy and regulatory framework pertaining to the transport and logistics sector, we note that the country adopts a parliamentary democracy model, where the British monarch is head of state and is represented in the respective countries by the Governor General. Executive authority is vested in the Prime Minister of the country and the Cabinet. As for the judicial system, it is independent from other branches of government.

For Grenada, the customs and excise functions come under the Ministry of Finance. Customs procedures will see cargo being processed using four types of lanes. These are the green, yellow, blue and red lanes. The Grenada Customs and Excise Division shared that they are working on having an electronic payments system. The system is expected to be implemented in the first half of 2024. There are also intentions to have an e-stamp system and move away from using fixed stamps.

For tariff measures, Grenada is a member of CARICOM which adheres to the Common External Tariff (CET). The CET is a common tariff applied to goods imported into the CARICOM region from outside. The CET is designed to promote regional integration and provide a level playing field for member states.

On the aspect of security, poor security to cargo was not highlighted as a major weakness or threat during the face-to-face interviews and workshops conducted in Grenada. Nonetheless, participants at the workshops mentioned concerns regarding cybersecurity especially on training and awareness for fraud detection and prevention.

State and Performance of the Transport and Logistics Sector (Chapter 4)

The chapter reviews the current state and performance of the transport and logistics sectors in Grenada. The chapter also identifies ongoing initiatives aimed at improving logistics performance and their impact on trade and economic development in the region. The chapter deals specifically with the second objective of the study.

For the port sector in Grenada, majority of cargo-handling is performed at the multi- purpose terminal located in the inner harbour of the Port of St. George's. The Grenada Ports Authority is responsible for management, operation and regulatory functions of the port. The facility consists of a 335m single quay which serves as the main berth with depth alongside ranging up to 9.1m. Berth productivity for containers ranges from 9 to 12 Twenty-foot Equivalent Unit Containers (TEUs) per hour per gang worked for a vessel. Pilotage is compulsory on all vessels of 200 GRT and above. For tug service, larger vessels will have to arrange for tugs to come from neighbouring islands.

Turning to the air cargo sector, the main facility for handling

air cargo in Grenada is at Maurice Bishop International Airport. The airport is capable of handling the B747-400F. There is a cargo shed located approximately 400m to the east of the passenger terminal. As of now, handling of cargo is usually performed in the open air which offers more space. Cold storage is made possible by a Forty-foot Equivalent Unit Container (FEU) reefer container stationed outside the cargo shed. Maurice Bishop International Airport is managed and regulated by the Grenada Airports Authority (GAA). The GAA also manages Lauriston Airport at the neighbouring island of Carriacou.

Cargo consolidation and distribution is mainly done in the city of St. George's at the port area or in the surrounding vicinity. The road network consists mostly of two lane-carriageways. Given the hilly terrain in and around the capital city, roads can be narrow at certain stretches. Traffic can build up due to incidences such as random parking of vehicles at the side of the road or drivers coming in opposite directions making a quick stop for conversations.

For the Port of St. George's, throughput has been growing steadily over the years until the pre-COVID period. There was a sharp decline of 14.5% in total cargo volume handled in 2020. However, strong recovery in breakbulk cargo saw total cargo traffic rebound by 9.6% to reach 716,268 tonnes. For vessel arrivals, the port saw three consecutive years of decline, falling from 17.9 million Gross Tons (GT) in 2018 to 6.1 million GT in 2021. The massive decline in vessel throughput was attributed largely to the cruise trade which bore the brunt of disruptions caused by the COVID-19 pandemic.

In terms of air cargo handled in Grenada, Maurice Bishop International Airport saw its air cargo traffic fell by 22.3% in 2020 and further by 6.6% in 2021. This resulted in air cargo handled by the airport falling from 3,054 tonnes in 2019 to 2,217 tonnes in 2021. Volumes remain low in 2022 with the airport handling 2,170 tonnes of cargo.

According to data from The World Bank, volume of containers handled by Saint Lucia exceeded those of Grenada's by 1.6 times in 2021. However, the figure also showed that container traffic handled by Saint Lucia appears to be on a declining trend. This lies in contrast to the rising trend seen for Grenada.

Analysis of the list of initiatives implemented or are planned to improve logistics performance in Grenada saw projects covering a wide spectrum of aspects including customs clearance, road transport infrastructure, food security, intra-region trade, and infrastructure, operations and storage capacity at the seaport and airport. We note that the initiatives comprise those which have or are receiving funding from international sources and foreign governments, as well as projects that are driven largely by local efforts.

Supply Chain Network Analysis (Chapter 5)

The chapter analyses supply chain networks from the perspectives of shipping and air connectivities. The chapter further identifies areas to address regarding supply chain inefficiencies across the different levels and sectors. User requirements are determined in relation to developments for international trade logistics for Grenada.

The primary source of international connectivity is shipping networks that connect the island nation of Grenada to overseas exports markets and import sources. The analyses were made using data collected daily for cargo vessel arrivals over the month of April 2023 at the respective main cargo port of Grenada.

For the Port of St. George's, vessels transporting containerised and breakbulk cargoes made up 80.3% of vessel arrivals totalling 230,490 GT. In terms of shipping connectivity, the port was found to be highly connected to the East Caribbean. Containerships were a significant contribution to this development. The vessels sail from Florida to the East Caribbean region and turn around in Trinidad and Tobago.

We saw the Liner Shipping Connectivity Index (LSCI) for Grenada taking a significant dip during the period of the Global Financial Crisis before recovering to pre-crisis levels in 2012. The peak was reached in 2013 and the LSCI has been trending down ever since. At the port level, the Port Liner Shipping Connectivity Indices (PLSCI) of the Port of St. George's also appears to be trending down.

For issues concerning shipping connectivity and port operations, the first challenge is the limited shipping connectivity faced by Grenada. The issue is partly attributed to inadequate

capabilities of the mainports in handling large containerships as well as inefficiencies in port operations. This is the second area of concern. Inefficiencies with operations at the port can result in shipping lines skipping the port-call.

The third area of concern is expensive shipping and port charges facing the trade community in the country. Landing charges in the country are approximately USD1,200 per FEU, making it the second most expensive in the region. By comparison, landing charges in the Port of Castries are approximately USD480 per TEU.

The fourth concern is the seemingly archaic system of port tariffs currently in place. There are calls by the logistics and trade communities in Grenada to review the system of port tariffs. The fifth area of concern pertains to inefficiencies in port operations that occur at the berth and in the yard. There are calls by the logistics and trade communities in Grenada for the port to be operational 24 hours a day, seven days a week.

The sixth area of concern is related to customs operations where stakeholders in the country are calling for a fully electronic and paperless system to be implemented. The seventh concern relates to availability of empty containers and such equipment being in good shipping condition.

Regarding flight networks and air connectivity, the main aviation gateway of Grenada is connected to the cities of Miami and New York in the US, Toronto in Canada, the capital city of Georgetown in Guyana in South America, and six cities in the Caribbean region. The bulk of air cargo is accounted by Amerijet International. This was followed by American Airlines, Mountain Air Cargo, British Airways and Virgin Atlantic.

For issues concerning flight connectivity and airport operations, the first challenge is the issue of flight delays which can cascade through the network. The second concern relates to improvements needed for cargo-handling facilities at GND. Cargo is typically handled on a JIT basis, arriving at the airport ready to be loaded onto the aircraft. The third issue is the concern raised by the logistics communities on the need to have a dedicated facility with cold storage capabilities at the airport. The fourth issue relates to customs operations pertaining to air cargo. The time taken for inspection will depend on the competency of the customs officer.

As a whole, many companies interviewed in Grenada felt that there is potential to do more air cargo. Air cargo volumes have yet to recover from pre-COVID levels. However, the outlook is optimistic as demand returns and as flights resume to operating at pre-COVID levels.

Supply Chain Costs for Selected Products and Note on Food Security (Chapter 6)

The chapter presents the duration and costs involved for logistics activities through supply chain networks. The chapter makes reference to selected key products in the agriculture and manufacturing sectors. The chapter also discusses the aspect of food security in relation to its four pillars which are physical availability of food, economic and physical access to food, food utilisation, and stability over time of the aforementioned dimensions.

For the cocoa trade of Grenada, the product forms the fourth biggest source exports in 2021. Cocoa beans are collected at buying stations in Grand Bras and Tivoli, before being transported by trucks to the warehouse in St. George's. After which, the cocoa beans are transported to the port and shipped overseas. The most expensive component of the supply chain on a cost per kilogram basis is transportation from farms to the buying stations. This is attributed to the state of farm roads which can become difficult to use during the rainy season.

Nutmegs form the biggest source of exports for Grenada. The commodity is collected at the buying station at Gouyave before sending to the warehouse in St. George's. They are then transported to the port and exported. The biggest cost component would be shipping charges. Addressing this will require developing shipping connectivity where alternative service providers are available.

On the import side, meat and edible offal constitutes the second biggest import item. A key source of import is the US. The largest cost component is ocean transportation. It takes about seven days to reach St. George's from Palm Beach in Florida USA. Interestingly, the vessel sails directly from Castries in Saint Lucia to Trinidad and Tobago before turning back to call at St. George's.

On the state of food security, the analysis is conducted with reference to the countries of Grenada and Saint Lucia. Saint Lucia seemed to have a higher dependency on imported food compared to Grenada. Nonetheless, Grenada saw food imports forming 24.0% of merchandise imports whereas the comparative figure is significantly lower at 10.4% for Saint Lucia. Saint Lucia also have more than five times in arable land compared to 3,000 hectares in Grenada.

For the pillar of economic and physical access to food, prevalence of moderate or severe food insecurity in the total population was almost the same at about 22% for Grenada and Saint Lucia. However, the pressure on food security is likely to be much higher in Grenada with 60% of monthly household expenditure spent on food. By comparison, monthly spending on food accounted for 30.3% of household expenditure in Saint Lucia. We also saw that annual income for farmers in Saint Lucia was considerably higher at 1.4 times the income of a farmer in Grenada.

For the pillar on food utilisation, Grenada has significantly higher levels of anaemia in children aged below five years, and women. Prevalence of underweight in adults aged 18 years and over was 2.4 times higher for females in Grenada compared to Saint Lucia. For infant and neonatal mortality rate, the indicators showed Saint Lucia to register higher rates compared to Grenada.

On the fourth pillar of stability, Grenada is entirely dependent on overseas imports for cereals. In terms of price inflation, we saw Saint Lucia to experience higher levels of price increase compared to Grenada. For the set of indicators measuring various risks that could impact on food security, both countries generally had medium to very low risk ratings. The only exception would be sovereign credit risk for Grenada which was given a high-risk rating.

Food staples form the cornerstone of food security. Corn imports by Grenada are almost entirely from the US. Turning to wheat, the US is a key supplier to Grenada. For wheat flour, Saint Vincent and the Grenadines is the biggest source of supply to Grenada. The exporter is a member of the CARICOM. Rice is also an important source of food in Grenada. Guyana, who is a member of the CARICOM, is a key supplier of rice to the country. Diversification of cereal imports could consider other major exporting countries and regions which include the EU and South America.

For soybeans, diversification of import sources may be difficult as the trade is dominated by Brazil and the Unitedd States. With the importance of corn, wheat, soybeans and rice, it may also be prudent for the government of Grenada to consider creating stockpiles of these commodities for emergency use.

The fertile soil and climate of Grenada makes the country suitable for growing crops such as yams, plantains, sweet potatoes, cassava, and breadfruit. In Grenada, the root crops are grown locally. Small quantities are imported from Saint Vincent and the Grenadines during shortages.

Demand Driver and Trend Analysis (Chapter 7)

The chapter presents critical demand drivers and emerging trends relevant for the transport and logistics sector in Grenada. This addresses the fourth objective of the study. Performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions are also proposed.

The chapter gave a recap of challenges faced by the transport and logistics sector in both countries. These were organised into those pertaining to shipping and port operations, flight network and airport operations, and land transportation. In addition to the issues mentioned, there were other concerns gathered from stakeholders. Firstly, there is the issue with port labour. Secondly, there are calls to improve conduct of businesses with the port through electronic means. Thirdly, there is a need to have a fundamental review of current port capacity in relation to the medium to long term needs in the country. The fourth issue relates to having a national single window system that allows for full electronic transactions. The fifth issue relates to training and education in logistics and supply chain management. The sixth issue relates to export promotion. Last but not least, stakeholders mentioned the importance of an unbroken cold chain for products.

For stakeholders in both the private and public sectors, there are two major sets of drivers and trends of concern. The first set of developments concern the macroeconomic environment which businesses operate within. Demand for logistics services is driven largely by the external sector with high dependence of the country on international trade. As such, economic performances of key trade partners become important. This will be other countries in the Organisation of Eastern Caribbean States (OECS), CARICOM and major economies in North America, South America and Europe.

The second set of developments relate to operational parameters which span the dimensions of market demand, technologies, work conditions, sustainability, environmental protection, and sourcing among other perspectives. Based on the Logistics Trend Radar 6.0 developed by DHL, developments likely to have a high impact on logistics within five years are digital marketplaces, omnichannel, stationary robotics, and indoor mobile robots. For trends or drivers that will take 5- 10 years to reach realisation, they include supply chain diversification, circularity, decarbonisation, alternative energy solutions, and outdoor autonomous vehicles.

Trends and drivers seen to have a moderate impact on the logistics industry include cybersecurity 2.0, smartification, big data analytics, smart labels, next- generation packaging, edge computing, blockchains, drones, computer vision, physical internet, and environmental stewardship. For the list of drivers and trends that are expected to have a mild impact on the logistics industry, it may be the case that they are already in advanced stages of development and/or beginning to see widespread adoption across the industry.

Notwithstanding the aforementioned drivers and trends, there are five important developments to watch in the near term. Firstly, inflation and tight budgets will impact logistics demand significantly. Secondly, personalisation is going to become the biggest logistics trend. Thirdly, use of AI logistics and supply chain management is expected to grow. Fourthly, Internet of Things (IoT) will see greater proliferation and adoption in supply chain management. Fifthly, data analytics is expected to further transform the logistics business.

The demand drivers and trends cover a wide spectrum of dimensions and issues. This is inevitable with the all-encompassing and cross-cutting nature of the logistics industry which transcend many aspects of society at the government, business, and individual levels.

Proposed logistics performance indicators (LPI) that are aligned to the aspects of time, cost and complexity of trade transactions makes reference to the LPI from The World Bank. Results for LPI 2023 showed Grenada ranked in the 97th position globally. In addition to the attributes analysed, the community was asked to rate the attributes in terms of their importance to the organisation or company, followed by their views on their performance for that country.

For Grenada, respondents view the supply chain attributes to be "very important" to their companies or organisations. However, scores received for logistics performances were mostly in the rating of "poor". The lowest scores were seen for infrastructure, international shipments, and timeliness. Results also revealed the

biggest gap in terms of importance to the company or organisation and performance for the country was seen for the attribute of infrastructure.

The logistics community in Grenada was also asked to rate the quality of service for the main seaport and airport of the country. Respondents rated overall quality of service by the port to be slightly below "adequate". Areas found lacking are information technology capability and reliability of service by the port operator. For Grenada, ratings were generally higher for the airport compared to the seaport. The only area found to be slightly below "adequate" is that of reliability of service by airlines.

Analysis of Strengths, Weaknesses, Opportunities and Threats (Chapter 8)

SWOT analysis is conducted to assess prospects and potential transport and logistics development strategies. Intention is to outline core competitive advantages and strengths that are possessed in serving as attractive logistics centres for international trade and market access.

Workshops held in the country were used to validate key observations regarding the transport and logistics sectors. Groups of interest are manufacturers, importers and exporters, logistics service providers, and government entities. The participants were asked to assess a set of aspects pertaining to strengths, weaknesses, opportunities, and threats facing the logistics sector in the country.

Consolidating views from all participants at the workshops for Grenada showed low cost of operations for businesses as a core strength. Competitive and high- quality airport sector and services, and competitive exports of food and beverages regime also received high scores from participants at the workshops. This was followed by having a stable currency and a competitive and high-quality freight forwarding sector and services.

For weaknesses, consolidated views from participants across the three groups in Grenada rated highly the lack of cold storage facilities, inadequate road network and poor road conditions, and insufficient capacity at the airport to serve logistics needs of users to be key weaknesses suffered by the logistics sector in Grenada. Other weaknesses which received high scores were inefficient labour practices at the port and ageing port infrastructure.

As for threats facing the logistics and transport sector in Grenada, the top concerns by participants were limited or lack of sufficient cold-chain handling capacity and facilities, insufficient cargo volumes to grow transport connectivity to overseas markets, and low rate of technology adoption. Consolidated views from workshop participants also

highlighted failure to develop an export-oriented economy and limited or lack of sufficient cargo-handling capacity and facilities for seaport sector.

Consolidated views from participants at the Grenada workshops ranked training and education to develop logistics and supply chain management skills, developing a National Single Window for customs and border processes, and adopting technology such as use of IoT devices for tracking and tracing shipments as top opportunities to work on. This was followed by improving logistics performance in the area of cost for greater competitiveness and galvanising the logistics community through regular dialogues and sharing sessions.

Participants at focus group workshops in Grenada were also asked to discuss possible actions or initiatives required to improve logistics chain efficiency as well as positioning strategies for the sector. Topics discussed include the areas of promoting and developing data processing and management, growing cargo volume, attracting investments, addressing customs and border processes, developing and growing e-commerce, training and education, improving transport infrastructure, promoting and growing research and development, promoting automation, facilitating financial transactions, and export promotion.

Recommendations for the Logistics Sector (Chapter 9)

Concrete initiatives and policy and institutional measures are proposed in this chapter. This forms the last component of the study and addressed the fifth objective. Implementation timeline of the proposed recommendations are provided and the strategic road map makes reference to implementation over the short term (1 to 2 years), medium term (3 to 5 years), and longer term (6 to 10 years).

Recommendation #1 calls for strengthening the consensus building mechanism between public and private sectors for trade facilitation reform. Areas of attention for the reform include legal, organisation, technology, processes and people. Time frame: 1 to 2 years.

Recommendation #2 calls for establishing a national logistics skills curriculum for the country. Time frame: 1 to 2 years.

Recommendation #3 calls for a thorough review of work processes involved in collecting cargo and customs inspection and clearance at the port. Areas of attention are yard operations, gate operations and customs processes. Time frame: 1 to 2 years.

Recommendation #4 calls for implementing 24 hours, 7 days a week work system for the port. The work system may exclude public holidays for the moment, until deemed necessary at a later time. Time frame: 1 to 2 years.

Recommendation #5 calls for a national single window system to facilitate trade and logistics processes. Time frame: 1 to 5 years. A case study of Singapore's National Single Window System was given.

Recommendation #6 calls for efforts to go fully paperless with customs declaration, payments and inspections. This will accelerate digitisation and digitalisation of customs processes and facilitate trade. Time frame: 1 to 2 years.

Recommendation #7 calls for installation of a terminal operating system (TOS) to enhance port productivity and efficiency in the seaport. Time frame: 1 to 2 years.

Recommendation #8 calls for setting up a port community system (PCS) to further enhance efficiency and productivity of port operations. The PCS is an extension of the TOS by incorporating other port service providers in the logistics and supply chain. Time frame: 1 to 2 years. A case study of the PCS in Singapore was given.

Recommendation #9 calls for a review of existing port tariff system. Time frame: 1 to 2 years. A case study comparing terminal handling charges for the Caribbean region was provided.

Recommendation #10 calls for a review of the import tariff system. Time frame: 1 to 2 years.

Recommendation #11 calls for technical assistance to be provided for equipment repair, maintenance and where necessary, replacement at mainport in Grenada. It may also be necessary to acquire additional new equipment to address deficiencies seen in port productivity levels. Time frame: 1 to 5 years.

Recommendation #12 calls for locating and setting aside land to establish a container depot to provide value added services for cargo operations. Time frame: 1 to 5 years.

Recommendation #13 calls for a review of courses pertaining to training and education for the logistics sector. Time frame: 1 to 5 years. A case study on logistics training and education in Singapore was given.

Recommendation #14 calls for fundamental review of current port capacity and its capability of meeting the needs over the long term in the country. Time frame: 6 to 10 years. A case of developing the Port of Kaohsiung in Taiwan China was given.

Recommendation #15 calls for attracting and growing transhipment traffic with the purpose of transforming the port to become a major maritime hub in the Caribbean region. Time frame: 6 to 10 years. A case of development of Tanjung Pelepas in Malaysia as a transhipment hub.

Recommendation #16 calls for constructing a proper facility dedicated for cargo- handling at Maurice Bishop International Airport in Grenada. Time frame: 3 to 5 years.

Recommendation #17 calls for providing cold storage facilities at the airport. Time frame: 1 to 5 years.

Recommendation #18 calls for developing and growing the e-commerce sector in both countries. Time frame: 3 to 10 years.

Recommendation #19 calls for addressing logistics inefficiencies associated with land transport in the country. Time frame: 1 to 2 years.

Recommendation #20 calls for developing and growing the export sector in the country. Time frame: 3 to 10 years.

Recommendation #21 calls for designating a lead agency who will be given the authority and responsibility to drive development of the logistics sector. Time frame: 1 to 2 years.

Recommendation #22 calls for separation of regulatory and commercial responsibilities for the seaport. Time frame: 3 to 10 years.

Recommendation #23 calls for creation of strategic stockpile for essential food and food items to address concerns over food security. Time frame: 1 to 5 years.

Conclusion (Chapter 10)

Key actions or aspects and the implementation timeline for the list of recommendations are as shown:

Recommendation	Timeframe
Strengthen the consensus building mechanisms between public and private sectors for trade facilitation reform: • Identify lead agency to drive trade facilitation reform. • Determine the scope of reform, focusing on priority areas. • Engage relevant stakeholders from across key public and private sector organisations depending on specific area of reform. • Determine the desired outcomes and targets to be achieved. • Hold regular dialogues between the public and private sectors. • Conduct periodic reviews on the scope of reform.	**1-2 years**
Establish national logistics skills curricula: • Establish a working committee to develop a national logistics skills curriculum. • Identify specific skill sets required for the logistics industry. • Consultation with stakeholders in the logistics community. • Determine the desired outcomes and targets to be achieved. • Identify partners from the public and private sectors for collaboration. • Design and offer courses with certification to address skill sets demanded.	**1-2 years**
Review work processes for cargo collection and clearance at the port: • Clarity on cargo collection, inspection and clearance processes (to be made public). • Follow through on status given by risk assessment system. • Award green lane status, to be renewed annually. • Impose severe penalties for erroneous reporting. • Institute pre-clearance for cargo. • Set up one-stop location to handle all payments for port and trade matters. • Use electronic system to track and trace cargo (updated continuously). • Container assigned green lane status should be made ready for pick up at scheduled time. • Establish KPIs to port and customs processes with aim for progressive improvements to time and cost.	**1-2 years**
Review implementing 24/7 work system at the port: • Project cargo and vessel traffic for medium term. • Review benefits and costs to convert to 24/7 work system. • Work out implementation plan and timeline. • Secure buy in from stevedores, customs, regulatory authorities and other port service providers.	**1-2 years**
Accelerate efforts to go fully paperless with customs declaration, payments and inspections: • Identify lead agency to drive implementation. • Identify outstanding bottlenecks and concerns. • Determine specific action plans with implementation timelines and responsible agencies. • Provide regular updates on progress. • Redeploy staff made redundant to other roles. • Review customs procedures to identify other areas to go paperless.	**1-2 years**
Install TOS to enhance productivity and efficiency of seaport terminal operations: • Determine user requirements and KPIs to achieve. • Evaluate TOS available in the market. • Decide on the TOS based on suitability to local operations. • Follow through with implementation, training and post-implementation follow-up. • Conduct periodic reviews and benchmark performance with other ports in the region.	**1-2 years**
Designate lead agency to drive development initiatives of logistics sector: • Designated lead agency to drive logistics matters and development initiatives. • Initiatives can take the form of public-private partnership projects • Identify key private sector organisations to work with. • Identify supporting agencies to deliver the Whole-of-Government approach. • Leverage on public-private partnerships structures where applicable. • Regularly review composition of WOG team to ensure alignment to contemporary developments. • Initiate regular dialogues between stakeholders in the logistics community.	**1-2 years**

Recommendation	Timeframe
Review import tariffs to address high cost of imports: • Assess impact of high import tariffs on the country. • Review scheme of trade tariffs for opportunities to reduce the rates. • Initiate legislative process and consultation sessions. • Simplify tariff structure and make it easy to understand. • Make the tariff structure transparent. • Conduct benchmarking with other countries in the region to monitor competitiveness. • Conduct periodic reviews to ensure consistency with country's economic growth and development objectives	**1-2 years**
Address concerns raised towards state of land transport: • Close off certain sections of Port Highway during certain hours to facilitate port-related vehicle movements. • Work with cargo owners to make truck deliveries during before or after- hours. • Monitor conditions of vehicles above a certain age. • Make it illegal for vehicles to be parked at certain stretches of a road during specified timings of the day. • Authorities can perform random checks on truckers' licence validity. • Assess level and extensity of improvements needed for farm roads.	**1-2 years**
Review system of port tariffs: • Review intended purpose of port tariff system. • Modernise the tariff structure by aligning to container shipping era. • Communicate and engage relevant stakeholders for political support. • Initiate legislative procedures. • Simplify tariff structure and make it easy to understand. • Make the tariff transparent. • Benchmark with other ports. • Conduct periodic reviews to ensure competitiveness and consistency with country's development aims.	**1-2 years**
Implement NSW system for trade and logistics facilitation: • Identify sponsor and project lead. • Pay attention to technical and operational aspects for implementation. • Identify project risks and mitigation plan. • Training for all stakeholders. • User support essential. • Evaluation, user acceptance testing and handover. • System maintenance.	**1-5 years**

Recommendation	Timeframe
Set up the PCS: • Identify lead agency. • Determine objectives, scope of services and entities to include. • Consider legal frameworks to address. • Identify stakeholders for participation and consultation. • Use RFP to refine objectives and scope of PCS. • Follow through with implementation, training, and post-implementation follow-up. • Conduct periodic reviews to determine adequacy.	**1-5 years**
Provide technical assistance for equipment, repair, maintenance and replacement: Short term • Carry out technical assessment to determine repairs and replacements needed. • Deploy technical team to make quick repairs or replacement. • Determine schedule of replacement for port equipment where repairs are not possible. Short to medium term • Project port traffic volume for next decade. • Determine KPIs based on desired operation and asset utilisation levels. • Assess current level of equipment readiness and availability. • Identify infrastructure works required. • Work out schedule for repairs and replacements. • Train team of technicians.	**1-5 years**
Allocate land to be designated as container depot: Short term • Determine cargo traffic container depot should handle. • Identify suitable land area. • Develop arguments to support notion. • Engage stakeholders through consultations. • Establish schedule of implementation. Medium term • Forecast port traffic volume. • Develop port masterplan. • Determine operational, economic, environmental, social and traffic impact. • Engage stakeholders through consultations. • Establish schedule of implementation.	**1-5 years**

Recommendation	Timeframe
Training and education for logistics sector: • Identify training needs for the logistics sector. • Identify partner tertiary institution for collaboration. • Design and offer courses with flexible delivery modes. • Identify persons to be sent for training, with financial support provided. • Promote awareness, attractions and career opportunities in the logistics industry.	**1-5 years**
Construct cold storage facilities at the airport: • Assess the volume of cargo that requires cold storage at the airport. • Ascertain user requirements with respect to specific products anticipated to be handled. • Identify potential site to locate the building and conduct site assessment. • Engage stakeholders through consultations. • Establish schedule of implementation. • Explore interim solutions if the situation is deemed to be urgent	**1-5 years**
Create strategic stockpile for essential food and food items to bolster food security: • Identify lead agency. • Determine basket of essential items for food security. • Establish duration which stockpile is meant to last. • Determine the quantities required. • Decide on location and facilities required. • Decide on the administrative model.	**1-5 years**
Construct a proper dedicated cargo-handling facility at Maurice Bishop International Airport: • Ascertain user requirements and projected cargo volume. • Determine capacity required for the new cargo building. • Identify potential site to locate the building and conduct site assessment. • Engage stakeholders through consultations. • Establish schedule of implementation.	**3-5years**
Develop and growth the e-commerce sector: • Initiate discussions with prospective air cargo carriers or other airlines. • Determine the required capacity. • Identify potential sites to locate e-commerce hub. • Assess the benefits and costs of accommodating the airline's requirements. • Engage stakeholders through consultations. • Establish schedule of implementation.	**3-10 years**

Recommendation	Timeframe
Develop and grow the export sector: • Set up cooperatives for other targeted commodities. • Assess possibilities of subsidising agricultural and primary industry sectors in their research and development efforts. • For strategic commodities, establish national research and development institutes to drive R&D efforts. • Continuous engagement with investors, especially for export sector. • Initiate discussions with prospective key logistics companies for interest in using the country as a major logistics hub.	**3-10 years**
Separation of regulatory and commercial functions of the seaport: • Examine costs and benefits of current operating model. • Decide on governance model. • Identify functions to be commercialised. • Determine implementation timeline and milestones. • Engage relevant stakeholders. • Initiate legislative procedures.	**3-10 years**
Explore development of a new port: • Economic and social impact. • Environmental impact. • Site assessment. • Technological impact. • Legal and regulatory impact. • Financial impact. • Industry impact. • Traffic impact.	**6-10 years**
Attract and grow transhipment traffic: • Initiate discussions with prospective shipping lines or other entities. • Determine required capacity. • Identify potential sites. • Assess benefits and costs to accommodate requirements of prospect. • Engage stakeholders through consultations. • Establish schedule of implementation.	**6-10 years**

OBJECTIVES OF THE STUDY AND APPROACH

2.1 BACKGROUND

The International Trade Centre (ITC) in collaboration with the Caribbean Development Bank (CDB) to carry out a Logistics Chain Study for Grenada and Saint Lucia. The study is intended to identify challenges and analyse possible solutions to achieve logistics efficiency gains and elaborate a roadmap for each of the two countries. This report is focused on the country of Grenada.

The ITC is the joint agency of the World Trade Organisation (WTO) and the United Nations (UN). It is the only multilateral agency fully dedicated to supporting the internationalization of SMEs (Small and Medium-sized Economies). ITC's mission is to foster inclusive and sustainable growth and development through trade and international business development. ITC Headquarters is located in Geneva, Switzerland. ITC projects and programmes contribute to the global efforts to achieve UN Global Goals for Sustainable Development and the Aid for Trade agenda.

The report was prepared using information and data obtained from desktop research, returned survey forms, face-to-face interviews and workshops conducted on-site in Grenada.

2.2 OBJECTIVES OF THE STUDY

The objectives of this study are to:

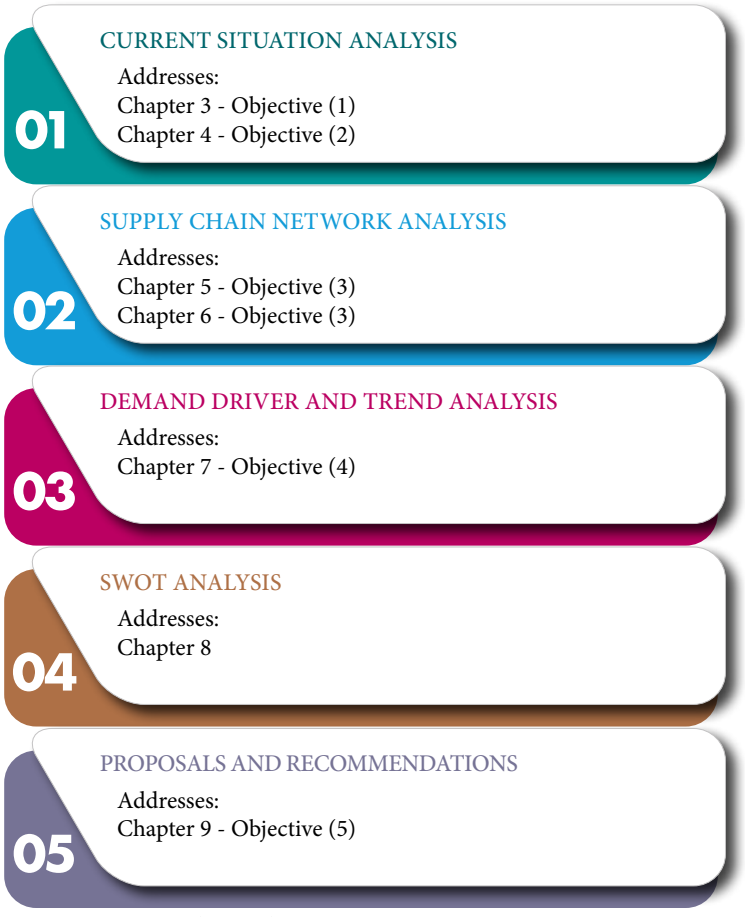
i. Review the policy and regulatory framework in the transport and logistics sector;
ii. Identify ongoing initiatives aimed at improving logistics performance and their impact on trade and economic development in the region;
iii. Quantify and qualify transport costs in the three modes of transport (i.e., sea, air, road) for imports and exports, and establish the duration and costs involved for importing and exporting through the main port;
iv. Identify emerging trends and propose performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions; and
v. Propose and recommend concrete policy and institutional measures aimed at reducing costs and improve competitiveness in the transport and logistics sector, along with identifying the main cost drivers of the proposed measures (e.g., infrastructure, human resources, training, etc.)

2.3 METHODOLOGY AND APPROACH

The delivery of the logistic chain study will be completed in the following the steps:

- Desk research and data collection conducted from February to May 2023;
- Survey exercise conducted from March to April 2023 (see section 2.5);
- First mission to Grenada with site visit and interviews conducted in April 2023 (see section 2.6);
- Draft report circulated to stakeholders and CDB for comments in June 2023;
- Presentation and validation workshops in June 2023; and
- Submit final revised report in July 2023.

Figure 2: Framework for Proposed Approach to the Study



Source: International Consultant.

There are five points to address in relation to the objectives of the study. The proposed approach for the study is presented by the framework shown in **Figure 2**. Details pertaining to each part of the study are described in the following paragraphs of this section.

Based on the above figure, the current situation analysis (i.e., **Point 1**), aims to assess the state of the transport and logistics sector in the country. This component of the study aims to review the current performance of the transport and logistics sector and its impact on trade and economic development in Grenada. This aspect of the study shall also investigate related developments pertaining to government policies, regulatory framework, customs procedures, tariff measures, security measures, and ongoing initiatives to improve logistics performance. Infrastructure plays a critical role in determining the efficiency and potential growth of the transport and logistics sector. As such, emphasis shall be on the connectivity and capacity perspectives of key highways, airports, ports, warehousing facilities, and distribution centres, and their integration with various transport modes. The current situation analysis shall address the first two objectives of the study. The aim is to take stock of the transport and logistics sector where the findings will serve as a basis and provide the context for subsequent investigations in the study. This component shall address the **first and second objectives of the study.**

For **Point (2)**, the aim is to establish the supply chain network for key products in the agriculture and manufacturing sectors. The analysis to be carried out will be a result of examination of ITC data. This will include identifying key customers, stakeholders and key cargo consolidation and distribution nodes in the logistics and supply chain as well as user requirements. The study will also identify areas to address regarding supply chain inefficiencies, across different levels and sectors. Product-specific challenges may arise but is not the main scope of the study. Focus is to quantify and qualify transport and various logistics costs incurred for imports and exports in relation to the three modes of transport. The component shall also establish the duration and costs involved for trade activities using the main port. Through the analysis, we aim to identify key concerns and priorities faced in providing for transport and logistics services for the selected products and commodities. The study will also ascertain user requirements in relation to the development of international trade logistics for the country. This component shall address the **third objective of the study.**

The third step is to determine critical demand drivers and emerging trends relevant for the transport and logistics sector in Grenada (i.e., **Point 3**). Similar to the previous point, the analysis will be carried out as a result of analysis of ITC data. Product-specific challenges may arise but this is not the main scope of the study. The analysis will also address pertinent issues from other perspectives including economic, trade, technological and other relevant developments. Increasing penetration of digitisation and digitalisation reinforces the impetus to develop integrated logistics systems and trade platforms that can facilitate information flows, track and trace capabilities, materials handling, and financial services especially in international trade. This is an important area to be investigated. The component shall also propose performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions. While no new index will be created, a set of indicators will be proposed for consideration when assessing the sector. Intention is to provide a comprehensive overview of major challenges and opportunities likely to be faced by the transport and logistics sector. This component shall address the **fourth objective of the study.**

In the fourth step, we shall perform SWOT analysis to assess prospects and potential transport and logistics development strategies for this component of the study (i.e., **Point 4**). The analysis shall draw on findings from points (1), (2) and (3) of the study. Through this exercise, intention is to outline core competitive advantages and strengths that are possessed in serving as attractive logistics centres for international trade and market access. The analysis will also propose logistics positioning strategy based on the attributes of key transport and logistics infrastructures. The analysis will consider the perspectives of manufacturers, traders, freight forwarders and policy makers.

In the fifth and final step, we shall propose concrete policy and institutional measures in this component of the study (i.e., **Point 5**). The aim is to reduce costs and improve competitiveness of the transport and logistics sector in Grenada and Saint Lucia. The recommendations shall draw on findings from points (1), (2), (3) and (4) of the study. Implementation timeline and main cost drivers of the proposed measures shall be provided. The strategic road map for implementation will include recommendations to be implemented over the short term (1 to 2 years), medium term (3 to 5 years), and longer term (6 to 10 years). This component shall address the f**ifth objective of the study.**

The study will employ relevant cases and examples of logistics development in emerging countries to illustrate and reinforce key messages, considering relevant sea transport routes for the analysis.

2.4 DELIVERABLES

The deliverables of the study are aligned to the five points proposed in **Figure 1**. Specifically, the deliverables of the study are:

- State of the transport and logistics sector, taking into account policy and regulatory frameworks and ongoing initiatives aimed at improving logistics performance (with reference to Point 1 presented in the framework for proposed approach to the study);
- Supply chain networks for key products with emphasis on the agriculture and manufacturing sectors, including quantifying and qualifying transport costs for imports and exports (with reference to Point 2 presented in the framework for proposed approach to the study);
- Critical demand drivers and emerging trends along with proposed performance indicators (with reference to Point 3 presented in the framework for proposed approach to the study);
- Core competitive advantages and strengths required to serve as logistics centres for international trade and market access. Analysis will include food security aspects (with reference to Point 4 presented in the framework for proposed approach to the study); and
- Proposals and recommendations along with main cost drivers. Also to include considerations and recommendations to strengthen food security and intra-regional trade (with reference to Point 5 presented in the framework for proposed approach to the study).

2.5 NOTE ON SURVEY EXERCISE CONDUCTED IN GRENADA

For the purpose of the logistics chain study for Grenada, survey exercises were conducted over the period of March and April 2023. The surveys were conducted using both emails and through face-to-face interviews. The main survey exercise lasted from 14 March to 26 April for Grenada.

The survey exercise sought to obtain views from stakeholders of the logistics communities with respect to the state of logistics performance, transport infrastructure, critical demand drivers, and emerging trends relevant for the transport and logistics communities in the region. The survey also aims to identify likely strengths, weaknesses, threats and opportunities that are faced by the transport and logistics sectors in Grenada. Survey forms were sent out to 67 companies/organisations. Responses were received from 22 entities which yielded a response rate of 32.8% (see **Table 1)**.

Table 1: Responses to Survey Exercise by Stakeholders in Saint Lucia

Logistics-related segment	No. of entities surveyed	No. of responses received	Response rate
Manufacturers	15	3	20.0%
Importers/exporters	21	6	28.6%
Freight forwarders	17	3	17.6%
Shipping lines	1	1	100.0%
Air cargo sector	2	1	50.0%
Trucking companies	2	1	50.0%
Government sector	7	6	85.7%
Seaport/airport authority	2	2	100.0%
Total	**67**	**22**	**32.8%**

Source: International Consultant.

Responses obtained from the survey were used to develop and prepare for the series of workshops that were held in April 2023.

2.6 NOTE ON FIELD TRIP AND ACCOMPANYING WORKSHOPS CONDUCTED IN GRENADA

The field trip and accompanying workshops were conducted for Grenada to obtain a good sensing of the challenges and opportunities facing the logistics and supply chain community.

Interviews with stakeholders of the logistics community in Grenada lasted from 24- 26 April 2023. The consultants met with 17 companies and organisations. In addition to the interviews and visitations, route assessments for cargo transport and traffic conditions between the airport, seaport and various industrial estates were conducted from 22 to 29 April. Site visits to observe cargo operations at the Maurice Bishop International Airport was made on 24 April while similar observations for the Port of St. George's was made on 28 April.

Focus group workshops for Grenada were held from 27-28 April. The workshops were attended by 18 participants. The workshops lasted for 1.5 days and were held on-site at the Kirani James Athletic Stadium in St. George's. Purpose is also to validate key observations made during the interviews and information obtained through background research.

Observations and findings from the field trip and workshops were reviewed and used to prepare the final report.

2.7 NOTE ON VALIDATION WORKSHOP CONDUCTED IN GRENADA

The draft final report was circulated to stakeholders of the logistics community in Grenada in June 2023. Findings and recommendations of the study were subsequently validated through the validation workshop held at the Radisson Grenada Beach Resort on 29 June 2023. Please see **Annex 5** for list of participants at the validation workshop for Grenada.

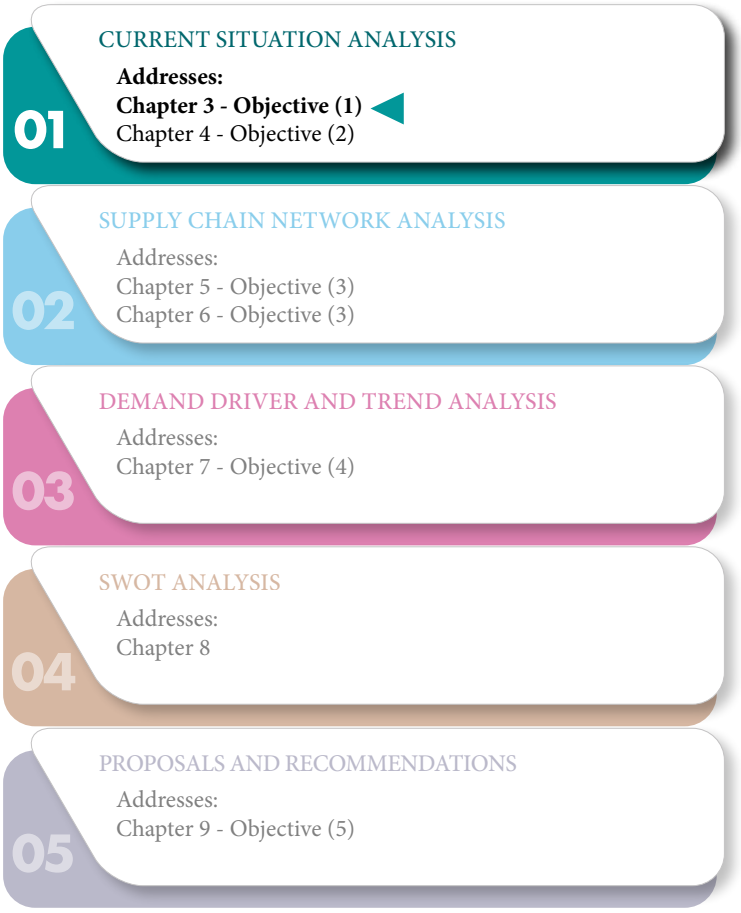
National flower of Grenada - Bougainvillea

CHAPTER 3

CURRENT SITUATION ANALYSIS

The current situation analysis sets the context for the study by providing the background for developments that affect the transport and logistics sector of Saint Lucia. For this purpose, discussion of the current situation analysis will be presented over two chapters. **Chapter 3** of the report presents developments concerning the state of trade and economic affairs in Saint Lucia. The chapter shall also investigate related developments pertaining to government policies, regulatory framework, customs procedures, tariff measures and security measures. Specifically, this chapter of the report shall address the first objective which is to review the policy and regulatory framework in the transport and logistics sector (see **Figure 3**). By extension, the chapter shall also address general economic and social conditions, as well as developments in trade performance for the country. Matters and issues concerning the performance of the transport and logistics sector including ongoing initiatives to improve logistics performance shall be presented in the next chapter.

Figure 3: Framework for Proposed Approach to the Study- Current Situation Analysis



Source: International Consultant.

3.1 GENERAL ECONOMIC AND SOCIAL CONDITIONS

Grenada is part of the group of Windward Islands and located in the eastern Caribbean. Grenada is a member of the CARICOM which comprises developing countries that are relatively small in terms of land size and population[1]. Grenada is also founding member of the OECS[2]. The OECS was formed in 1981 and is dedicated to regional integration in the region of the eastern Caribbean. As a full member of the OECS, Grenada can enjoy free movement of people and goods within the Economic Union, including use of the common currency XCD.

[1]Caribbean Community Secretariat (2023) Member States and Associate Members [Online]. Available at: https://caricom.org/member-states-and-associate-members/ (Accessed 4 May 2023).
[2]The Organisation of Eastern Caribbean States (2023) Member States [Online]. Available at: https://www.oecs.org/en/who-we-are/member-states (Accessed 13 April 2023).

Figure 4: Geographical Location of Grenada and Saint Lucia

Source: International Consultant, including using map data from Google Maps.

Grenada is located about 130 km north of Trinidad and Tobago and approximately 100 km south of the main island of St. Vincent and the Grenadines. The country has an estimated population of 114,299 as of 2023[3]. An estimated 36.7% of the population lives in urban areas with the largest being the capital city of St. George's. The main island Grenada has a land area of 344km^2. Approximately one-third of the land is used for agricultural purposes with 50% of the island being forested. Other main islands of Grenada are Carriacou and Petite Martinique. The climate is tropical with the rainy season lasting from June to November.

Key macroeconomic and social indicators of Grenada is presented in **Table 2**. We would like to highlight the key indicators of GDP growth and GDP per capita are presented. These are core indicators of economic performance and commonly used for comparison across countries. According to data from the International Monetary Fund (IMF), Grenada has GDP reaching 1.11 billion in 2021, measured at current prices.

[3]The World Factbook (2023a) 'Saint Lucia' US Central Intelligence Agency [Online]. Available at: https://www.cia.gov/the-world-factbook/countries/saint-lucia/ (Accessed 18 April 2023).

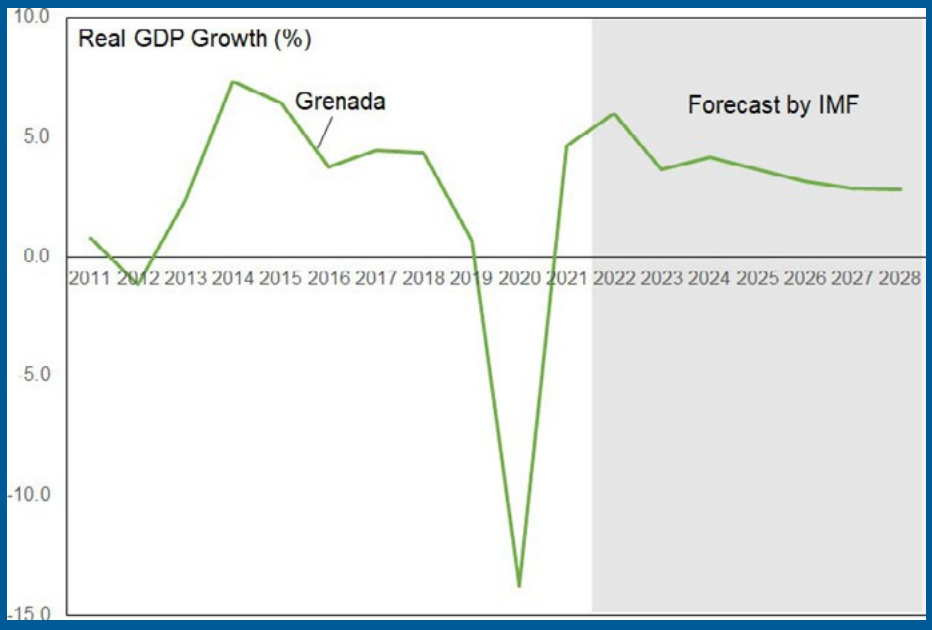
Table 2: Key Macroeconomic and Social Indicators of Grenada

Grenada	2017	2018	2019	2020	2021
GDP (current prices, USD billion)	1.13	1.17	1.21	1.04	1.11
Real GDP growth (%)	4.44	4.36	0.68	-13.76	4.66
GDP per capita (current prices, XCD)	27,413	28,260	29,253	25,038	26,375
Inflation (%)	0.91	0.81	0.60	-0.74	1.22
Population (million)	0.111	0.111	0.112	0.113	0.113
Urban population (% of total pop)	36.2	36.3	36.4	36.5	36.7
Government budget balance (% GDP)	3.02	4.59	4.97	1.21	0.33
Government gross debt (% of GDP)	70.4	64.0	58.5	71.4	71.0
Current account balance (% of GDP)	-14.4	-16.1	-14.6	-21.0	-24.2
Merchandise exports (USD million)	30.0	31.0	31.0	22.0	29.0
Merchandise imports (USD million)	420.0	467.0	475.0	393.0	450.0
FDI (net inflows, % of GDP)	13.8	15.8	16.4	14.3	12.8

Sources: International Consultant, using data from International Monetary Fund (2023)[4] and The World Bank (2023a)[5].

Figure 5 shows the economic performance for GDP of the country measured in constant prices. In the period since 2011, Grenada saw its economy emerge from the Global Financial Crisis and European Sovereign Debt Crisis with a positive real GDP growth of 2.4% in 2013. The pace of economic growth was sustained at an annual average rate of 4.8% until 2018. The COVID-19 pandemic severely affected growth in the country with GDP contracting by 13.8% in 2020. Going forward, the IMF has projected Grenada to see its economy grow at 2.8% to 4.1% from 2023 to 2028. In terms of the GDP per capita, the number for Grenada for 2011 was USD7,292 (see **Figure 6**). GDP per capita is a proxy to gauge the level of economic development as well as economic well-being. While GDP per capita fell during the period of COVID-19 pandemic, the IMF forecasted sustained growth should see the indicator reaching USD14,300 by 2028.

Figure 5: Economic Performance for Grenada



Source: International Consultant, using data from International Monetary Fund (2023)[6] .

[4]International Monetary Fund (2023) World Economic Outlook Database [Online]. Available at: https://www.imf.org/en/Publications/WEO/weo-database/2023/April (Accessed 2 May 2023).

[5]The World Bank (2023a) World Development Indicators [Online]. Available at: https://data-topics.worldbank.org/world-development-indicators/ (Accessed 3 May 2023).

[6] International Monetary Fund (2023) World Economic Outlook Database [Online]. Available at: https://www.imf.org/en/Publications/WEO/weo-database/2023/April (Accessed 2 May 2023).

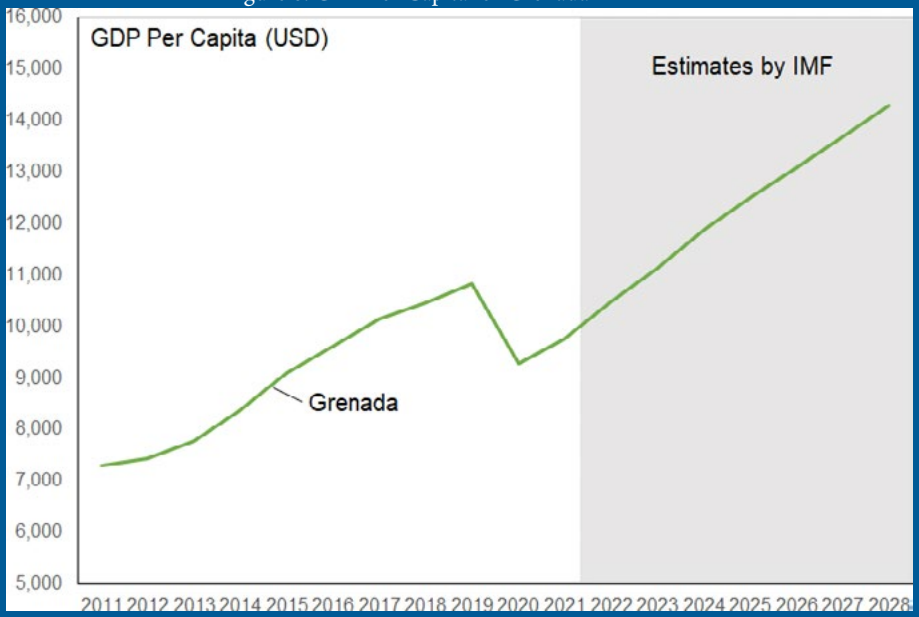
Looking at the composition of the economy, the largest economic activities are education, and real estate, renting and business activities (see **Figure 7**). The figure shows composition of various economic activities measured in terms of current prices. For education, the economic sector accounted for 19.2% of Grenada's economic output in 2019. The education sector has been the largest economic activity since 2007. Growth of the education sector was attributed to the rapid expansion of private education. The share of GDP accounted by private education in Grenada almost quadrupled from 4.3% in 2001 to reach 16.1% in 2019. In fact, the sector saw its share of GDP reach a peak of 16.8% in 2017 before tapering off. By comparison, public education activities saw its share of GDP fluctuating largely between 3.0-4.0% from 2001 to 2019. Before education activities became the largest economic sector, the economy in Grenada was previously dominated by the real estate, renting and business activities sector.

Activities constituting the sector included those of real estate activities, renting of machinery and equipment, computer and related activities, business services, and owner-occupied dwellings. In 2001, the sector accounted for 12.4% of GDP ranking it the largest economic activity in the country. However, the share for this economic activity fell to 9.0% of GDP by 2019.

Transport and storage activities which accounted for 8.1% of GDP in 2019, form the third largest economic sector in Grenada. These activities are directly related to the logistics sector. Our period of observation which covered 2001 to 2019 saw the share of GDP attributed to this sector fluctuating largely between 7.0-10.0%. Within the sector, road transport took the biggest GDP share and accounted for about two-thirds of economic contribution by the transport and storage sector. Sea transport activities accounted for about one-tenth of economic contribution coming from the sector while the remaining GDP contribution came largely from supporting and auxiliary transport activities. The contribution from air transport activities remains small at less than 3.0% of GDP coming the transport and storage sector.

The other major economic activities in Grenada are construction (7.2% of GDP in 2019), wholesale and retail trade (6.6% of GDP) and hotels and restaurants (6.4% of GDP). These are respectively the fourth, fifth and sixth largest economic sectors in the country. Grenada has a sizeable agriculture, livestock and forestry industry with economic activities from the sector accounting for 3.8% of GDP in 2019, ranking it in the ninth position in the country. The manufacturing sector was ranked in the tenth position with its activities accounting for 3.4% of Grenada's GDP in 2019. It is also worth noting that Grenada has a sizeable fishing industry which contributed to about 1.0-1.5% of GDP.

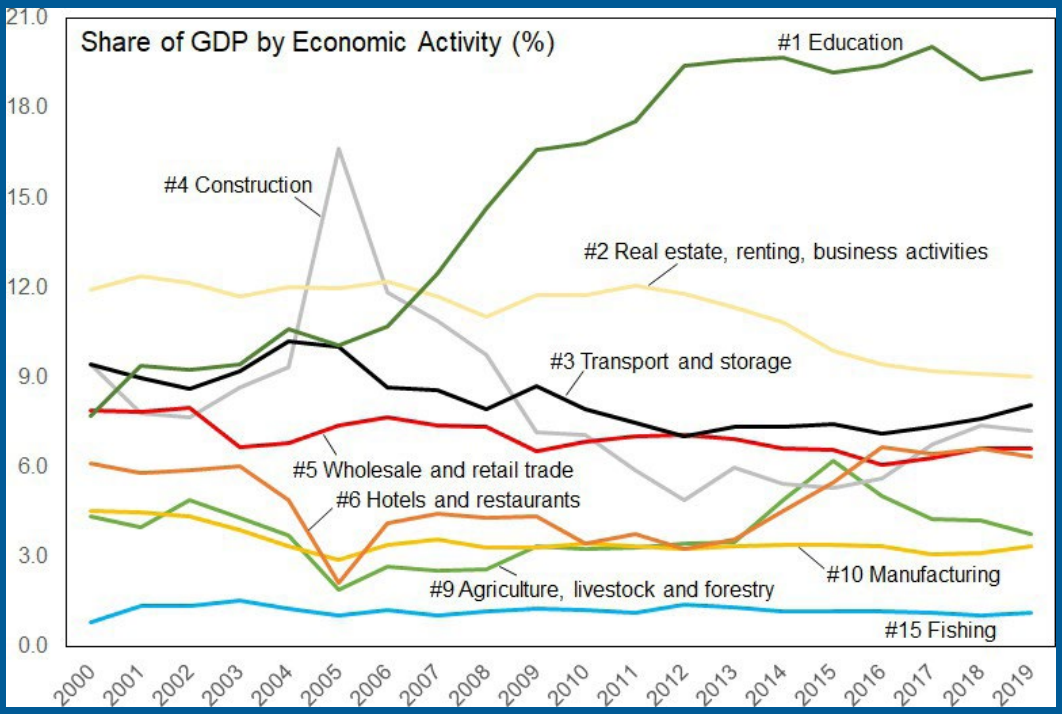
Figure 6: GDP Per Capita for Grenada



Source: International Consultant, using data from International Monetary Fund (2023)[7] .

[7]IBID

Figure 7: Composition of GDP by Economic Activity for Grenada

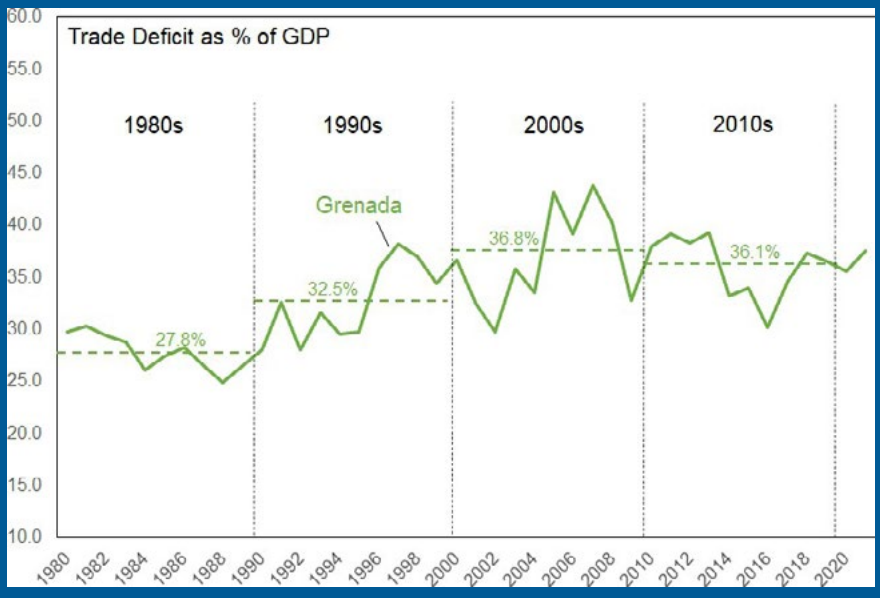


Source: International Consultant, using data from Central Statistical Office Grenada (2023)[8] .

3.2 TRADE PERFORMANCE

In terms of trade performance, **Figure 8** shows a worrying trend of persistent trade deficits incurred by Grenada. The figures present the deficit in merchandise trade as a percentage of GDP. Merchandise imports exceeded those of exports at an average 36.5% of GDP over the period of 1980 to 2021. There are three developments to be concerned with. Firstly, persistent trade deficits of such magnitudes inadvertently put significant pressure on the country's balance of payments and causes outflow of currency. This development may also point to underlying issues plaguing the competitiveness of the export sector.

Figure 8: Trade Deficit for Grenada

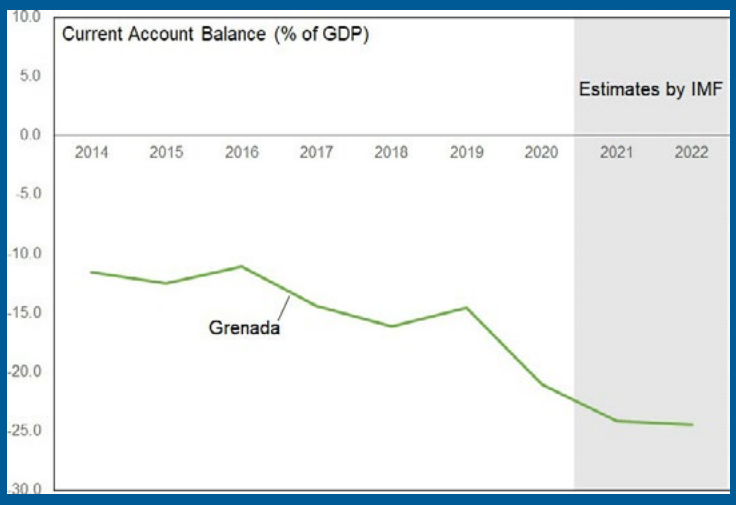


Source: International Consultant, using data from The World Bank (2023a)[9].

[8]Central Statistical Office of Saint Lucia (2023) Data [Online]. Available at: https://stats.gov.lc/data/data-tables/ (Accessed 4 May 2023).
[9]The World Bank (2023a) World Development Indicators [Online]. Available at: https://datatopics.worldbank.org/world-development-indicators/ (Accessed 3 May 2023).

For the second concern, we note that trade deficit appears to be worsening as we progress into the 2020s. The year 2021 saw merchandise imports reaching USD450 million over exports of USD29 million. This results in a trade deficit of USD421 million or 37.5% of GDP experienced by the country. The figure is higher than the average level of trade deficits experienced for the country. For the third concern, trade deficit appears to be on a rising trend for Grenada over the past four decades. With reference to the same figure, we saw trade deficits which averaged 27.8% of GDP in the 1980s for Grenada increasing to 36.8% of GDP in the 2000s. Trade deficits for the country remain at an elevated level averaging 36.1% of GDP in the 2010s. The higher levels of trade deficits for Grenada were reflected by worsening current account balance for the country as shown by **Figure 9**. The figure showed current account deficit for Grenada grew from 11.6% of GDP in 2014 to reach a new record of 21.0% of GDP by 2020. Estimates provided by the IMF showed the situation to worsen for the country with current account deficit reaching 24.5% of GDP in 2022. This development suggests export competitiveness could have deteriorated for the country over the course of the past forty years.

Figure 9: Current Account Balance for Grenada



Source: International Consultant, using data from the International Monetary Fund (2023) [10].

Analysis of key commodities and products traded for Grenada showed exports to be skewed towards agricultural-related produce such as nutmeg, mace, cocoa beans and berries (see above **Table 3**). Animal feed and fish are also major export items with these ranked in the third and sixth positions respectively. Other key exports of Grenada include wheat, water, toilet paper, paints and varnishes. As for imports, petroleum oils and oils obtained from bituminous minerals (excluding crude) alone accounted for 13.7% of total imports by the country. Other key imports included motor vehicles for transport of goods or persons (3.5%), meat and edible offal of fowls (2.7%), cement and clinkers (2.0%), food preparations (1.8%), automatic data-processing machines (1.7%), medicaments (1.6%), telephone sets (1.4%), and bread and pastry items (1.2%).

Table 3: Key Exports and Imports for Grenada (2021)

Key Exports	HS Code	Description	Value (USD '000)	% Share
1	0908	Nutmeg, mace and cardamoms	5,578	15.9
2	1101	Wheat or meslin flour	3,769	10.7
3	2309	Preparations of a kind used in animal feeding	2,787	7.9
4	1801	Cocoa beans	2,607	7.4
5	8479	Machines and mechanical appliances having individual functions	2,516	7.2
6	0302	Fish, fresh or chilled	2,270	6.5
7	0810	Fresh strawberries, raspberries, black-berries etc.	2,122	6.0
8	2202	Waters, including mineral waters and aerated waters	2,068	5.9
9	4818	Toilet paper and similar paper	1,554	4.4
10	3209	Paints and varnishes	1,182	3.4
		Total	**35,163**	**100.0**

[10]International Monetary Fund (2023) World Economic Outlook Database [Online]. Available at: https://www.imf.org/en/Publications/WEO/weo-database/2023/April (Accessed 2 May 2023).

Table 3: Key Exports and Imports for Grenada (2021) cont'd

Key Exports	HS Code	Description	Value (USD '000)	% Share
1	2710	Petroleum oils and oils obtained from bituminous minerals (excluding crude)	61,083	13.7
2	0207	Meat and edible offal of fowls	12,109	2.7
3	8703	Motor cars and other motor vehicles designed for the transport of persons	9,024	2.0
4	2523	Cement, including cement clinkers	8,999	2.0
5	2106	Food preparations	8,139	1.8
6	8471	Automatic data-processing machines	7,755	1.7
7	3004	Medicaments consisting of mixed or unmixed products for therapeutic uses	7,182	1.6
8	8704	Motor vehicles for the transport of goods	6,666	1.5
9	8517	Telephone sets	6,475	1.4
10	1905	Bread, pastry, cakes, biscuits and other bakers' wares	5,488	1.2
	Total		**446,676**	**100.0**

Source: International Consultant, using data from International Trade Centre (2023)[11].

In terms of trading partners, the bulk of international trade for Grenada is conducted with countries and territories in North America and South America. The US remains the largest trade partner for Grenada (see **Table 4)**. The country accounted for 34.6% of imports by Grenada and 29.9% of exports. Value of trade with the US reached USD168.9 million in 2021. The second largest trade partner is Trinidad and Tobago. In 2021, the country Trinidad and Tobago was ranked as the second biggest source of imports and fifth largest export destination for Grenada. Combined value of exports and imports with Trinidad and Tobago reached USD78.5 million or 16.0% of total trade.

Other important trade partners of Grenada include Cayman Islands, Barbados, Jamaica, Saint Vincent and the Grenadines and Dominican Republic in the Caribbean region. Important trade partners from the Americas also include Canada, Brazil, Panama, Guyana and Argentina. As for Europe, key trade partners are the United Kingdom, Netherlands, France and Germany. Major trade partners from Asia are China and Japan which accounted for 4.7% and 1.5% of exports respectively. As a whole, the top fifteen export destinations for Grenada totalled USD25.1 million in 2021 or 83.8% of exports. For imports, the top fifteen import sources accounted for 84.5% of imports or USD390.7 million.

Table 4: Major Trading Partners of Grenada

No.	Exports			Imports		
	Country	Value (mil)	% Share	Country	Value (mil)	% Share
1	USA	8.95	29.9	USA	211,875	39.8
2	St. Vincent & the Grenadines	3.48	11.6	Trinidad & Tobago	75,140	14.1
3	France	2.08	7.0	Cayman Islands	33,938	6.4
4	Germany	1.61	5.4	China	31,991	6.0
5	Trinidad & Tobago	1.59	5.3	UK	15,162	2.8
6	Netherlands	1.09	3.6	Brazil	11,661	2.2
7	Canada	0.94	3.1	Barbados	11,243	2.1
8	St. Lucia	0.81	2.7	Canada	11,072	2.1
9	Barbados	0.78	2.6	Netherlands	7,906	1.5
10	Panama	0.75	2.5	Japan	7,285	1.4
11	Argentina	0.75	2.5	Dominican Rep	6,807	1.3
12	India	0.74	2.5	Jamaica	6,219	1.2
13	Guyana	0.62	2.1	Panama	6,048	1.1
14	Antigua & Barbuda	0.48	1.6	Finland	5,046	0.9
15	UK	0.40	1.3	Guyana	4,766	0.9
	Top 15	**25.08**	**83.8**	**Top 15**	**390.73**	**84.5**

Source: International Consultant, using data from International Trade Centre (2023)[12] .

[11]International Trade Centre (2023) Trade Map [Online]. Available at: https://www.trademap.org/Index.aspx (Accessed 3 May 2023).
[12] International Trade Centre (2023) Trade Map [Online]. Available at: https://www.trademap.org/Index.aspx (Accessed 3 May 2023).

3.3 POLICY AND REGULATORY FRAMEWORK

This section analyses developments pertaining to the policy and regulatory framework in the transport and logistics sector in Grenada. The country adopts a parliamentary democracy modelled closely on the Westminster system. The British monarch is the head of state and is represented in Grenada by the Governor General. Executive authority is vested in the Prime Minister of the country and the Cabinet. The Prime Minister commands the majority of support from the House of Representatives. The legislative branch comprises the Senate and House of Representatives. Members of the House of Representatives are elected for a five-year term by simple majority or first-past-the-post system. The Senate or House of Representatives may amend or initiate legislation. As for the judicial system, it is independent from other branches of government.

The main agencies dealing with transport and logistics activities in Grenada are summarised in **Table 5**. There is no overarching government agency or department taking charge of issues concerning the logistics sector. Stakeholders are required to approach the relevant agencies depending on the concern. For example, a foreign investor interested to establish a fish processing plant in Grenada may have to approach different agencies depending on the matter at hand. Notwithstanding the challenges involved, key government agencies which the foreign investor will likely deal with will include the Grenada Investment Development Corporation and Ministry of Finance.

Table 5: Main Agencies Dealing with Transport and Logistics Activities in Grenada

Government and Related Agency	Mandate
Ministry of Finance	Economic planning, fiscal and economic policy formulation and implementation, tax administration, customs and excise revenue, central statistics office, investment policy, financial sector supervision
Ministry of National Security, Home Af-fairs, Public Administration, Infor-mation and Disaster Management	Public order and security, national security, disaster management
Ministry of Foreign Affairs, Trade and Export Development	Trade policy formulation and implementation, trade negotiations, export promotion, import and export licensing
Ministry of Economic Development, Planning, Tourism, ICT, Creative Economy, Agriculture and Lands, Fisheries and Cooperatives	Economic development, industrial development, agriculture and fishing sectors, information and communication technology network, research and development
Ministry of Infrastructure and Physical Development, Public Utilities, Civil	Rural development, food security, agriculture and fishery sector
Aviation and Transportation	Transport infrastructure network and development (seaport, airport, road network),
international transport connectivity, utilities	Industry development, industry competitiveness, investment attraction
Ministry of Mobilisation, Implementa-tion and Transformation	Resource mobilisation, whole-of-government approach
Ministry of Climate Resilience, The Environment and Renewable Energy	Climate change challenges, sustainable and renewable energy policy
Ministry of Education, Youth, Sports and Culture	Training and education of logistics and supply chain management professionals
Ministry of Legal Affairs, Labour and Consumer Affairs	Employment, registration of companies
Customs and Excise Division	Border protection, revenue collection, trade facilitation
Grenada Investment Development Corporation	Investment attraction, commercial leasing,
industry development, business support, grant assistance	Investment attraction, business support
Grenada Ports Authority	Statuary body responsible for regulation of private ports and operation of Government owned ports
Grenada Airport Authority	Statutory body responsible for the management, control, supervision of the operation of the two airports in Grenada which are Maurice Bishop International Airport and Lauris-ton Airport

Source: International Consultant, using data from the Government of Saint Lucia (2023)[13].

[13] Government of Saint Lucia (2023) Our Government [Online]. Available at: https://www.govt.lc/ (Accessed 5 May 2023).

3.4 CUSTOMS PROCEDURES, TARIFF AND SECURITY MEASURES

For Saint Lucia, the Customs and Excise Department comes under the Ministry of Finance. Customs procedures will see cargo being processed using four types of lanes. These are[14]:

- Green lane: no checks required;
- Yellow lane: document checks are conducted;
- Blue lane: post-verification checks for documents are conducted; or
- Red lane: complete check is done; both physical and document checks.

Import procedures in Grenada are regulated by the Customs Act No. 35 of 1960, its various amendments and Statutory Rules and Order (SRO) No. 37 of 1999. The import documents required by Customs are the customs declaration (CARICOM Single Administrative Document), a commercial invoice, and the bill of lading/airway or shipping bill. Other documents such as an import licence or permit, a certificate of origin, or a concession letter may be required if applicable.

For the case of exports, physical checks are performed on about 5-10% of the cargo. There is a schedule of penalties for false declaration where the fine is either five times the value of the goods or XCD100,000 whichever is higher. The Grenada Customs and Excise Division shared that they are working on having an electronic payments system. The system is expected to be implemented in the first half of 2024. There are also intentions to have an e-stamp system and move away from using fixed stamps. The Division also shared that there are considerations to implement a de minimis system. Evaluation is being made regarding the impact on revenue.

It is possible for customs officers to conduct inspection at the premise of the importer. Otherwise, inspections are conducted at the port. Site visits to Grenada further observed that it is possible to have customs officers being stationed at premises outside of the general port area.

For tariff measures, Grenada is a member of CARICOM which adheres to the Common External Tariff (CET). The CET is a common tariff applied to goods imported into the CARICOM region from outside. The CET is designed to promote regional integration and provide a level playing field for member states. Examples of other trade agreements where the CARICOM members are signatories include:

- CARICOM-Venezuela Agreement on Trade and Investment (entry into force: 1993)
- CARICOM-Colombia Trade, Economic and Technical Co-operation Agreement (1995)
- CARICOM-Dominican Republic Free Trade Agreement (2001)
- CARICOM-Costa Rica Free Trade Agreement (2006)
- EU-CARIFORUM Economic Partnership Agreement (2008)
- CARICOM-US Trade and Investment Framework Agreement (2013)
- CARIFORUM-UK Economic Partnership Agreement (2021)

On the aspect of security, poor security to cargo was not highlighted as a major weakness or threat during the face-to-face interviews and workshops conducted in Grenada. Nonetheless, participants at the workshops mentioned concerns regarding cybersecurity especially on training and awareness for fraud detection and prevention.

3.5 CHAPTER SUMMARY

Grenada is a member of the CARICOM which comprises developing countries that are relatively small in terms of land size and population. The country is also a founding member of the OECS.

The GDP for Grenada reached USD1.11 billion in 2021, measured at current prices. Going forward, Grenada is projected to see its economy grow at 2.8% to 4.1% from 2023 to 2028. The IMF projects Grenada's GDP per capita to reach USD14,300 by 2028.

[14]Information provided by Grenada Customs and Excise Division during face-to-face meeting held on 26 April 2023 at the organisation's office at The Carenage in St. George's.

The largest economic activities are education, and real estate, renting and business activities. Transport and storage activities which accounted for 8.1% of GDP in 2019, form the third largest economic sector in the country. The share of GDP attributed to this sector generally fluctuated between 7.0-10.0%.

In terms of trade performance, there is a worrying trend of persistent trade deficits incurred by Grenada. Persistent trade deficits put significant pressure on balance of payments and causes outflow of currency. This development may also point to underlying issues plaguing the competitiveness of the export sector.

Exports of Grenada are skewed towards agricultural-related produce. Animal feed and fish are also major export items. In terms of trading partners, the US remains the largest trade partner with the country with the second largest being Trinidad and Tobago.

Turning to the policy and regulatory framework pertaining to the transport and logistics sector, we note that the country adopts a parliamentary democracy model, where the British monarch is head of state and is represented in the respective countries by the Governor General. Executive Authority is vested in the Prime Minister of the country and the Cabinet. As for the judicial system, it is independent from other branches of government.

The customs and excise functions come under the Ministry of Finance. Customs procedures will see cargo being processed using four types of lanes. These are the green, yellow, blue and red lanes. The Grenada Customs and Excise Division shared that they are working on having an electronic payments system. The system is expected to be implemented in the first half of 2024. There are also intentions to have an e-stamp system and move away from using fixed stamps.

On the aspect of security, poor security to cargo was not highlighted as a major weakness or threat during the face-to-face interviews and workshops conducted in Grenada. Nonetheless, participants at the workshops mentioned concerns regarding cybersecurity especially on training and awareness for fraud detection and prevention.

CHAPTER 4

STATE AND PERFORMANCE OF THE TRANSPORT AND LOGISTICS SECTOR

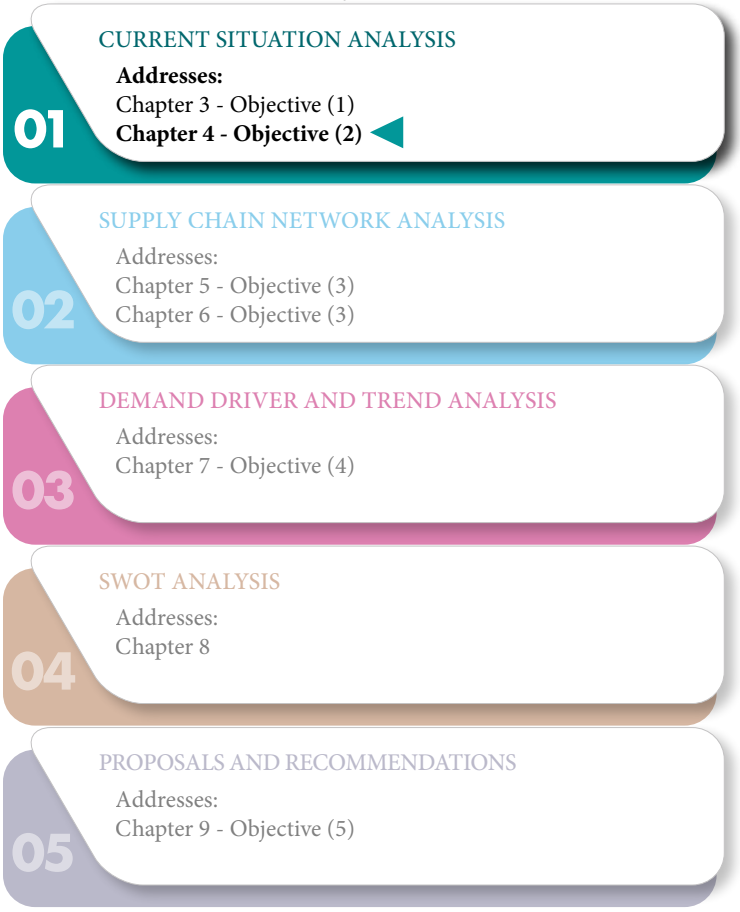
The chapter reviews the current state and performance of the transport and logistics sectors in Grenada. The chapter also identifies ongoing initiatives aimed at improving logistics performance and their impact on trade and economic development in the region. Hence, the chapter deals specifically with the second objective of the study (see **Figure 10**).

Infrastructure has an important impact on the efficiency of the transport and logistics sector and its potential growth. As such, emphasis shall also be given to the state of connectivity and capacity perspectives for key highways, airports, ports, warehousing facilities, and distribution centres, and their integration with various transport modes. Findings from chapters three and four will therefore serve as a basis and provide the context for subsequent analyses in the study.

4.1 KEY TRANSPORT AND LOGISTICS INFRASTRUCTURE IN GRENADA

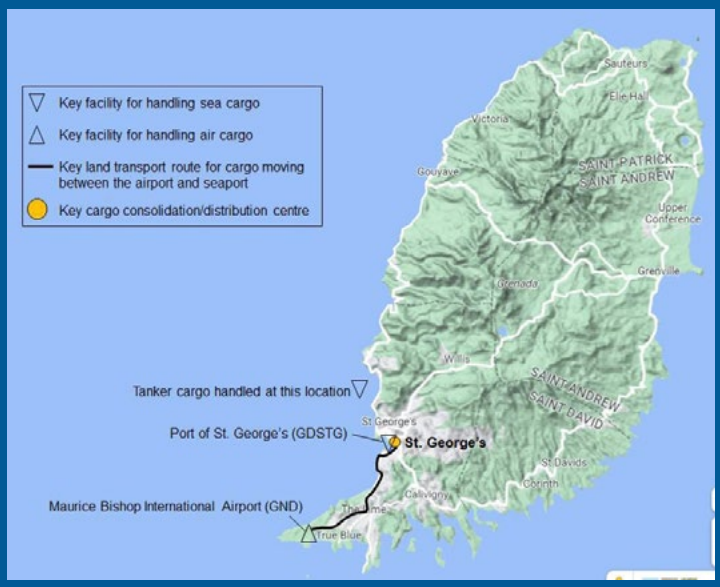
We begin by examining the state of key transport and logistics infrastructure. With reference to **Figure 11**, the country comprises the main seaport at the Port of St. George's and main air cargo-handling facility at the Maurice Bishop International Airport. These two facilities are the main international gateways to trade for Grenada. It is worth mentioning that tanker vessels can be handled in the Grand Mal Bay area which is located some 3.0km to the north from the cargo-handling facility that is situated in the capital city of St. George's. Cargo consolidation and distribution is mainly done in the city of St. George's at the port area or in the surrounding vicinity. The distance by road between the main cargo terminal in the Port of St. George's and cargo shed at Maurice Bishop International Airport is about 10km or about 25 minutes during non-peak hours.

Figure 10: Framework for Proposed Approach to the Study – Transport and Logistics Sector Performance



Source: International Consultant.

Figure 11: Key Transport and Logistics Infrastructure in Saint Lucia



Source: International Consultant, using map data from Google Maps.

For the port sector, majority of cargo-handling is performed at the multi-purpose terminal located in the inner harbour of the Port of St. George's (see **Figure 12**). The Grenada Ports Authority is responsible for management, operation and regulatory functions of the port. The facility consists of a 335m single quay which serves as the main berth with depth alongside ranging up to 9.1m. However, visual observation of port operations made on 26 April 2023 saw that the port could accommodate the cargo vessels Nordic Skagen and Duncan Island simultaneously (see **Figure 13**). The 33,740 Deadweight Ton (DWT) Liberia-registered Nordic Skagen has a length overall (LOA) of 185.1m while the 14,140 DWT Bahamas- registered Duncan Island has an LOA of 178.5m. This is made possible by working only a portion of the Duncan Island.

Situated at the southern end of the terminal is an 82.5m schooner berth for handling inter-island ferry operations. The depth alongside of the schooner berth is 5m. The multi-purpose cargo terminal is equipped with 260,000 sqft of container stacking area, 25 reefer plugs, and almost 50,000 sqft of covered sheds[15]. To support apron and yard operations, the port has 14 forklift trucks, two reachstackers, one top lifter, and five trailers. However, the port does not have quay cranes. As such, loading and unloading cargo at the berth has to rely on the vessel's cranes. In other words, vessels that call at the Port of St. George's must be geared or possess capability to handle Roll-on Roll-off (RoRo) cargo. Berth productivity for containers ranges from 9 to 12 TEUs per hour per gang worked for a vessel. If there are two gangs deployed to work on the vessel, berth productivity increases to 20 to 24 TEUs. Grenada Ports Authority shared that there are about 100-150 stevedores used and they are paid according to the tasks completed.

While pilotage is compulsory on all vessels of 200 Gross Registered Tonnage (GRT) and above, Grenada Ports Authority shared that the port does not have tugs at the moment. Larger vessels will have to arrange for tugs to come from neighbouring islands. This could result in the vessel having to wait outside the port. In the case of the Nordic Skagen, the vessel had to wait for almost 24 hours at the anchorage before entering the port. Conversations with the logistics community indicated that the tug could come from nearby countries. For example, to bring a tug from Martinique, there is a charge of USD21,000 to mobilise the tug, working time of USD250 per hour, and USD1,500 for each movement of the vessel.

Turning to the air cargo sector, the main facility for handling air cargo in Grenada is at Maurice Bishop International Airport (see **Figure 14**). The airport is equipped with a single asphalt-paved runway of 2,743, x 45m which makes it capable of handling

Figure 12: Main Cargo-Handling Facilities at Port of St. George's

Source: International Consultant, using information from various sources; map data from Google Maps.

Figure 13:Simultaneous Berthing of Two Vessels at the Port of St. George's

Source: International Consultant.

[15]Ahmed, Z. (2022) '7 Major Ports of Grenada', Marine Insight, 29th June [Online]. Available at: https://www.marineinsight.com/know-more/7-major-ports-of-grenada/ (Accessed 6 May 2023).

the B747-400F. The cargo shed is located approximately 400m to the east of the passenger terminal. It comes equipped with storage facilities and a scanner. As of now, handling of cargo is usually performed in the open air which offers more space. However, such operations had to be moved into the shed when there is rain. Note that air cargo handling is done by operators such as SwiftAir Cargo Handlers. Cold storage is made possible by a FEU reefer container stationed outside the cargo shed. Air cargo is typically handled on a Just-in-Time (JIT) basis, arriving at the airport ready to be loaded onto the aircraft. During the high season, cargo has to arrive as early as 3-4 am to make the flight. The reefer container is used when there are delays in flights and is estimated to take 3-4 hours to reach ideal temperatures when plugged in.

Maurice Bishop International Airport is managed and regulated by the GAA. The GAA also manages the Lauriston Airport[16] which is located at the neighbouring island of Carriacou. Operations and management of the airport are governed by protocols of ICAO and IATA. Audits are conducted regularly by ICAO as well as by the Eastern Caribbean Civil Aviation Authority.

In 2022, Maurice Bishop International Airport handled 2,170 tonnes of air cargo. Volumes remain lower the pre-COVID years although GAA expects the recovery to continue. Amerijet operates full cargo flights from Grenada to Miami, transporting fish and fresh produce. The airline transported about 1,100 tonnes of air cargo in 2022. Amerijet operates a cargo aircraft which was converted from passenger use. The second biggest customer by cargo volume is American Airlines (585 tonnes), followed by Mountain Air (142 tonnes), British Airways (104 tons), and Virgin Atlantic (53 tons). Mountain Air Cargo is a cargo airline based in Denver North Carolina. It is a major contract carrier for FedEx Express. Cargo is also handled for Caribbean Airlines.

The capital city of St. George's serves as the main area for cargo consolidation and distribution, especially in the port area and surrounding vicinity. The road network consists mostly of two lane-carriageways with each direction taking up a single lane. Given the hilly terrain in and around the capital city, roads can be narrow at certain stretches. As such, movement of cargo vehicles may necessitate traffic handlers to manage the traffic on occasions where movement of heavy vehicles are involved (see **Figure 15**). The situation can be exacerbated by incidences such as random parking of vehicles at the side of the road or drivers coming in opposite directions making a quick stop for conversations. Traffic inadvertently builds up and the congestion can take hours to clear.

Figure 14: Cargo-Handling Facility at Maurice Bishop International Airport

Source: International Consultant, using map data from Google Maps.

Figure 15: Holding Up Traffic to Let Heavy Vehicles Pass Through in St. George's

Source: International Consultant

[16]The airport has one runway measuring 800 x 18m. As such, the airport can only accommodate small aircraft and limited cargo traffic.

Warehousing and storage facilities mainly located in the Parish of St. George's with higher levels of concentration near the seaport and airport. An example would be the Frequente Industrial Park and its surrounding area (see **Figure 16**). The figure shows several logistics facilities located on both sides of the Maurice Bishop Memorial Highway and Dusty Highway. The Frequente Industrial Park sits on 25 acres of land and with nineteen buildings that offer almost 250,000 sqft of industrial and warehousing space[17]. It is the main industrial park in Grenada and houses the headquarters of the Grenada Investment Development Corporation (GIDC). The industrial park is located about 4.0km driving distance from the cargo gate at the airport and approximately 6.0km driving distance from the main gate at the seaport in St. George's city.

Tenants in the park are provided with access to electricity, water, sewerage and telecommunications infrastructure. Tenants can also supplement these provisions by installing their own generators and water storage tanks. Leases in the industrial park are for a period of five years where current rental rates are:

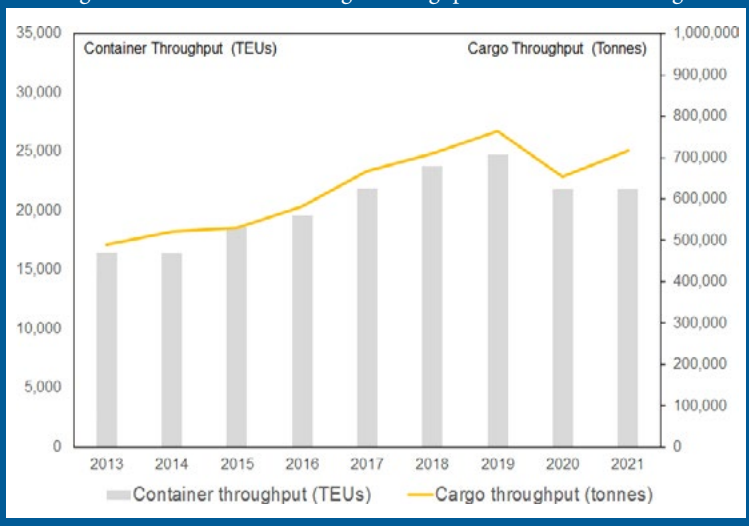
- Manufacturing XCD1.60 per sqft
- Services XCD1.50 per sqft
- Warehousing XCD1.60 per sqft
- ICT XCD2.50 per sqft
- Office XCD2.50 per sqft
- Basement XCD1.00 per sqft

The park is managed by a dedicated Facilities Business Unit. The Facilities Business Unit is a strategic business unit of the GIDC and supports the parent organisation's goal of promoting local and foreign investment and strengthening and facilitating entrepreneurial development in Grenada.

Figure 16: Frequente Industrial Park and Surrounding Logistics Facilities

Source: International Consultant, using map data from Google Maps.

Figure 17: Container and Cargo Throughput for Port of St. George's*



*Source: International Consultant, using data from Grenada Ports Authority[18] and Central Statistical Office Grenada (2023)[19]. * Information presented is assumed to refer to the Port of St. George's as it is the primary port-of-call in Grenada.*

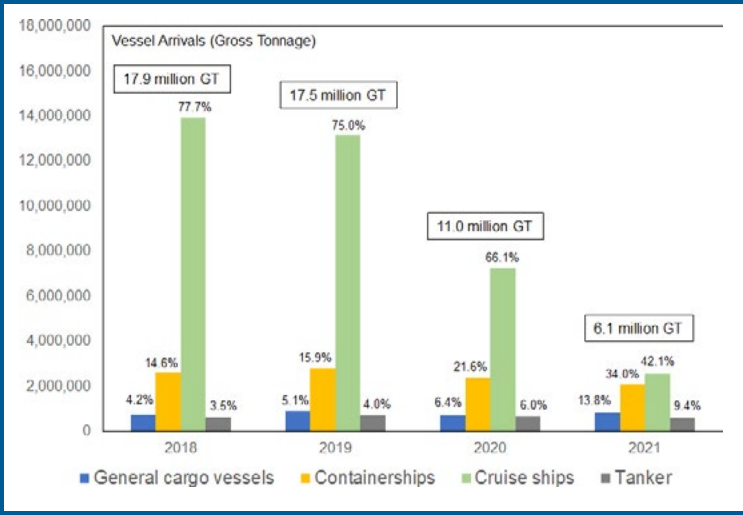
4.3 PERFORMANCE OF SEAPORT AND AIR CARGO SECTORS

Having presented the state of transport and logistics infrastructure in Grenada, we shall analyse the performance of this sector. Our focus shall be on the seaport and airport given that these facilities are the primary gateways to international trade for the island economy.

With reference to **Figure 17**, we saw throughput for cargo and container traffic handled by the Port of St. George's moving in tandem over the period of observation. Port throughput has been growing steadily over the years until the pre-COVID period, rising from 488,792 tonnes in 2013 to reach 764,636 tonnes in 2019. Total cargo throughput saw a decline of 14.5% in 2020, inflicted by disruptions to global supply chains caused by the pandemic. The sharp decline in port throughput was due to contraction across all cargo categories. For example, breakbulk, liquid bulk and containerised cargo fell by 20.1%, 12.4% and 10.6% respectively in 2020. However, the recovery in breakbulk cargo was the strongest

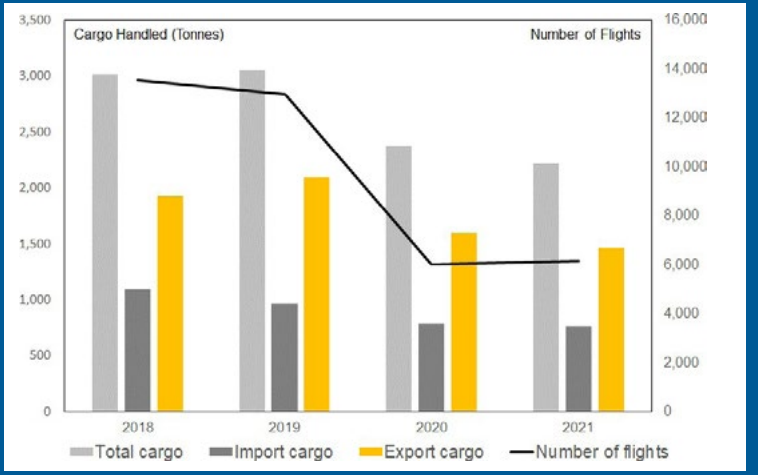
[17] Grenada Investment Development Corporation (2023) Frequente [Online]. Available at: https://facilities.gd/frequente-park/ (Accessed 6 May 2023).
[18] Information provided by Grenada Ports Authority through survey exercise conducted in March 2023.
[19] Central Statistical Office Grenada (2023) Subjects [Online]. Available at: https://stats.gov.gd/ (Accessed 4 May 2023).

Figure 18: Vessel Arrivals for Port of St. George's*



*Source: International Consultant, using data from Grenada Ports Authority[20]. * Information presented is assumed to refer to the Port of St. George's as it is the primary port-of-call in Grenada*

Figure 19: Cargo and Flights Handled at Maurice Bishop International Airport



Source: International Consultant, using data from Grenada Airports Authority[21].

in 2021, rising by 24.9% almost back to the level seen before the pandemic. This development contributed to the strong rebound for total port throughput by 9.6% in 2021 to reach 716,268 tonnes.

The strong pace of recovery in breakbulk cargo was not witnessed for the container trade. The pandemic saw container throughput fell by 11.5% in 2020. The year 2021 saw container throughput decline marginally by 0.2% to 21,815 TEUs. Based on information provided by Grenada Ports Authority, containerised cargo accounted only for 40% to 50% of total cargo handled during 2018 to 2020. The information also indicates containerised imports to be a key driver of the container trade. Specifically, the weight of each import container averaged 25 tonnes per TEU. This contrast sharply to the weight of each export container which averaged 3.0 tonnes per TEU, meaning that export containers were almost all empties. The trend seen for liquid bulk cargo generally mirrored total volumes handled for containers with volumes falling by 12.4% and 0.9% respectively in 2020 and 2021.

For vessel arrivals, the Port of St. George's saw three consecutive years of decline, falling from 17.9 million GT in 2018 to 6.1 million GT in 2021 (see **Figure 18**). The massive decline in vessel throughput was attributed largely to the cruise trade which bore the brunt of disruptions caused by the COVID-19 pandemic. Cruise ship arrivals at the port fell by 81.5% between 2018 and 2021. The exception was for general cargo vessels which bucked the trend and instead, grew by 12.4% in the same period. This corresponded to the trend seen for breakbulk cargo in the previous figure. In the case for containerships and tankers, the growth in vessel arrivals 2019 was countered by consecutive declines seen in 2020 and 2021. Overall vessel arrivals for containerships fell by 20.3% between 2018 and 2021 whereas the corresponding figure for tankers was 7.2%.

In terms of air cargo handled in Grenada, we take reference to performance for Maurice Bishop International Airport which serves as the primary aviation gateway for the country. With reference to **Figure 19**, the airport saw air cargo traffic fell by 22.3% in 2020 and further by 6.6% in 2021. This resulted in air cargo handled by the airport falling from 3,054 tonnes in 2019 to 2,217 tonnes in 2021. The substantial decline in cargo volumes for 2020 was no doubt affected by the sharp fall in number of flights from almost 13,000 in 2019 to only 6,015 in 2020. There was a slight recovery in number of flights though in 2021. However, the numbers remained far below the levels of traffic seen in the pre-COVID period. Volumes remain low in 2022 with the airport handling 2,170 tonnes of cargo.

During the pre-COVID period, Grenada exported close to 1,000 tonnes of fish, fruits, and vegetables by air annually[22]. The peak seasons are from March to July, followed by September to November. This was done through two flights a week using converted B767-300 aircraft. Carrying capacity of the aircraft was 62.5 tonnes. In March 2020, the pandemic saw the number of flights reduced to one per week using a chartered A321 which has a capacity of only 22.5 tonnes. In early 2022, a B757 was used which has a capacity of 42.5 tonnes. In April 2023, the twice a week flight resumed with a B767-300 deployed on Mondays and the B757 on Fridays. For 2023, Maurice Bishop International Airport could see volume of air cargo reach approximately 2,500 tonnes.

[20]Information provided by Grenada Ports Authority through survey exercise conducted in March 2023.
[21]Information provided by Grenada Airports Authority through survey exercise conducted in March 2023.
[22]Information provided by George F. Huggins Company during face-to-face meeting held on 25 April 2023 at the company's office at GCNA Complex in St. George's.

4.4 INITIATIVES IMPLEMENTED OR PLANNED TO IMPROVE LOGISTICS PERFORMANCE

This section discusses the list of initiatives implemented or are planned to improve logistics performance in the country. A list of major initiatives pertaining to the transport and logistics sector in Grenada is summarised in **Table 6**. The list of projects covers a wide spectrum of aspects including customs clearance, road transport infrastructure, food security, intra-region trade, and infrastructure, operations and storage capacity at the seaport and airport. We note that the initiatives comprise those which have or are receiving funding from international sources and foreign governments, as well as projects that are driven largely by local efforts.

Table 6: Examples of Major Initiatives to Improve Logistics Performance in Grenada

Initiative	Description
1. ASYCUDA World Single Window (2016 implemented)[23]	The Automated System for Customs Data (ASYCUDA) World System was implemented in 2016 by government agencies and customs of Grenada. With the system, all import and export licence application will be applied using the single window module of the system from 1 August 2016. According to the news release, paper copies of import licences will no longer be accepted by the Customs and Excise Division. The system aims to improve customs operations and enhance trade facilitation for Grenada.
2. Maurice Bishop International Airport Runway and Road Up-grade and Rehabilitation Project (2017 im-plemented)[24]	China's Eximbank signed a concessional loan of USD67.7 million to the Government of Grenada to upgrade the Maurice Bishop International Airport. The project will see to the construction of a parallel taxiway, a bypass road, loading bridges, addition of a new runway, passenger tunnels, passport kiosks, emergency centre, and an expanded cargo centre. Official ground-breaking took place in 2020 and the project is undergoing implementation.
3. Cargo Scanner at Maurice Bishop International Airport (2018 implemented)[25]	To facilitate handling of air cargo, the airport saw installa-tion of a state-of-the-art cargo scanner which allowed moving larger pallet loads for screening. The scanner improved efficiency of cargo operations without compromising security.
4. Handling of Refrigerated Cargo at Maurice Bishop International Airport (implementation date not known)[26]	A 40-foot refrigerated container was installed to increase cold storage capacity at the airport. The FEU reefer container is stationed outside the cargo shed. It is used when there are delays in flights.
5. Caribbean Regional Air Transport Connectivity Project (2020 implemented)[27]	The World Bank approved US$17 million in 2020 to fund the project with the objectives of (1) improving operational safety and navigation efficiency of air transportation; (2) increasing the climate disaster resilience of Maurice Bishop International Airport; and (3) strengthening Grenada's capacity in civil aviation and airport management. The implementing agency is the Ministry of Infrastructure and Physical Development, Public Utilities, Civil Aviation and Transportation. The project is slated to end by 30 June 2026.
6. Grenada Resilience Improvement Project (2022 implemented)[28]	The World Bank approved USD15 million of international development finance to improve the resilience of Grenada's transport infrastructure to the impacts of climate change and natural hazards. The project will see to interventions to principal transport corridors against coastal erosion due to rising sea level and flooding. The project will also support development of risk-informed strategies to assist the government in planning and prioritisation of future resilienceinvestments at additional critical sites. The project is slated to end by 31 March 2027.

[23]Grenada Ministry of Finance (2016) 'Government Agencies and Customs to Implement Asycuda World Single Window', News Releases, 11th July [Online]. Available at: https://www.finance.gd/index.php/news/17-news-release/381-185-government-agencies-and-customs-to- implement-asycuda-world-single-window (Accessed 6 May 2023).
[24] AidData (2017) 'China Eximbank provides $67 million loan to Grenada for Maurice Bishop International Airport Upgrade and Runway Paving Project', Project Search Records [Online]. Available at: https://china.aiddata.org/projects/54894/ (Accessed 6 May 2023).
[25] Grenada Airports Authority (2018) 'Facilitation Focus', Grenada Airport Authority Company Insight June 2018, 11th July [Online]. Available at: https://airport.nridigital.com/air_jun18/grenada_airport_authority_company_insight_air1806 (Accessed 6 May 2023).
[26] Information provided by Grenada Airports Authority during a face-to-face meeting held on 24 April 2023 at the organisation's office at Maurice Bishop International Airport.
[27] The World Bank (2023b) 'Grenada – Caribbean Regional Air Transport Connectivity', What We Do, 28th April [Online]. Available at: https://projects.worldbank.org/en/projects-operations/project- detail/P172951 (Accessed 6 May 2023).
[28] The World Bank (2022) 'Grenada Resilience Improvement Project, What We Do, 24th March [Online]. Available at: https://projects.worldbank.org/pt/projects-operations/project-detail/P175720 (Accessed 6 May 2023).

Initiative	Description
7. Customs and Excise Division Electronic Payments and E- Stamp System (2023 implemented)[29]	Customs is working on having an electronic payments system. The RFP has been completed and evaluation is underway. The system is expected to be implemented in 1H2024. There are also plans to have an e-stamp system. Intention is to move from fixed stamps to electronic stamps.
8. Maritime Cargo Service Study (2023 implemented)[30]	Grenada was identified along with three other Caribbean countries (i.e., Barbados, Guyana and Trinidad and Tobago) as part of a maritime cargo service study to be conducted by the CDB. The aim is to derive strategies to boost agricultural trade in the Southeast Caribbean. The initiative is also part of the CDB's pledge to improve food security within the Caribbean, and to promote regional cooperation. A technical working group to provide oversight of the study will include representatives from governments of the participating countries, CARICOM Secretariat, CARICOM Private Sector Organisation, and the CDB.
9. Port Community System and Terminal Operating System for Port Operations (to be implemented)[31]	GPA sees getting a TOS as priority. This will be followed by a PCS. For the TOS, concerns are cost, remote connection and service support. GPA shared that the submarine volcano north of Grenada saw the severing of the submarine cable which resulted in loss of internet connection for one day. Hurricanes can also cause the connection to be severed.
10. Review Layout of St. George's Port (to be implemented)[32]	GPA is reviewing the layout of the port. The facility was designed and built in 1959 with an upgrading done in 2000. As such, the current facility is not suited to serve as a container port. GPA is also looking to conduct a port masterplan study to review the physical structure of the port and making recommendations on what is required to be done. The study will be funded by GPA.
11. Storage Space for Containers (in discussion)[33]	GPA is considering to container stripping out of the port area to a location within 5 to 8 miles radius from the terminal at the Port of St. George's.

Source: compiled by National Consultant of Grenada and International Consultant.

4.5 CHAPTER SUMMARY

The chapter reviews the current state and performance of the transport and logistics sectors in Grenada. The chapter also identifies ongoing initiatives aimed at improving logistics performance and their impact on trade and economic development in the region. The chapter deals specifically with the second objective of the study.

Key transport and logistics infrastructure in Grenada comprises the main seaport at the Port of St. George's and main air cargo-handling facility at the Maurice Bishop International Airport. Cargo consolidation and distribution is mainly done in the city of St. George's at the port area or in the surrounding vicinity. Given the hilly terrain in and around the capital city, roads can be narrow at certain stretches. Road traffic can build up due to incidences such as random parking of vehicles at the side of the road or drivers coming in opposite directions making a quick stop for conversations.

The GPA is responsible for management, operation, and regulatory functions of the Port of St. George's. Maurice Bishop International Airport is managed and regulated by the GAA. The GAA also manages Lauriston Airport at the neighbouring island of Carriacou. There is a cargo shed although handling of cargo is usually performed in the open air which offers more space. Cold storage is made possible by a FEU reefer container stationed outside the cargo shed.

For the Port of St. George's, throughput has been growing steadily over the years until the pre-COVID period. For vessel arrivals, the port saw three consecutive years of decline. This was attributed largely to the cruise trade which bore the brunt of disruptions caused by the COVID-19 pandemic. In terms of air cargo handled in Grenada, Maurice Bishop International Airport saw its air cargo traffic fell by 22.3% in 2020 and further by 6.6% in 2021. Volumes remain low in 2022 with the airport handling 2,170 tonnes of cargo.

Analysis of the list of initiatives implemented or are planned to improve logistics performance in Grenada saw projects covering a wide spectrum of aspects including customs clearance, road transport infrastructure, food security, intra- region trade, and infrastructure, operations and storage capacity at the seaport and airport. We note that the initiatives comprise those which have or are receiving funding from international sources and foreign governments, as well as projects that are driven largely by local efforts.

[29] Information provided by Grenada Customs and Excise Division during a face-to-face meeting held on 26 April 2023 at the organisation's office at The Carenage in St. George's.
[30] Caribbean Development Bank (2023) 'CDB to Fund Maritime Cargo Service Study to Boost Agricultural Trade in the South-East Caribbean', Caribbean Development Bank, 5th April [Online]. Available at: https://www.caribank.org/newsroom/news-and-events/cdb-fund-maritime-cargo-service-study-boost- agricultural-trade-south-east-caribbean (Accessed 6 May 2023).
[31] Information provided by Grenada Ports Authority during a face-to-face meeting held on 26 April 2023 at the organisation's office at Burns Point in St. George's.
[32] Ibid.
[33] Ibid.

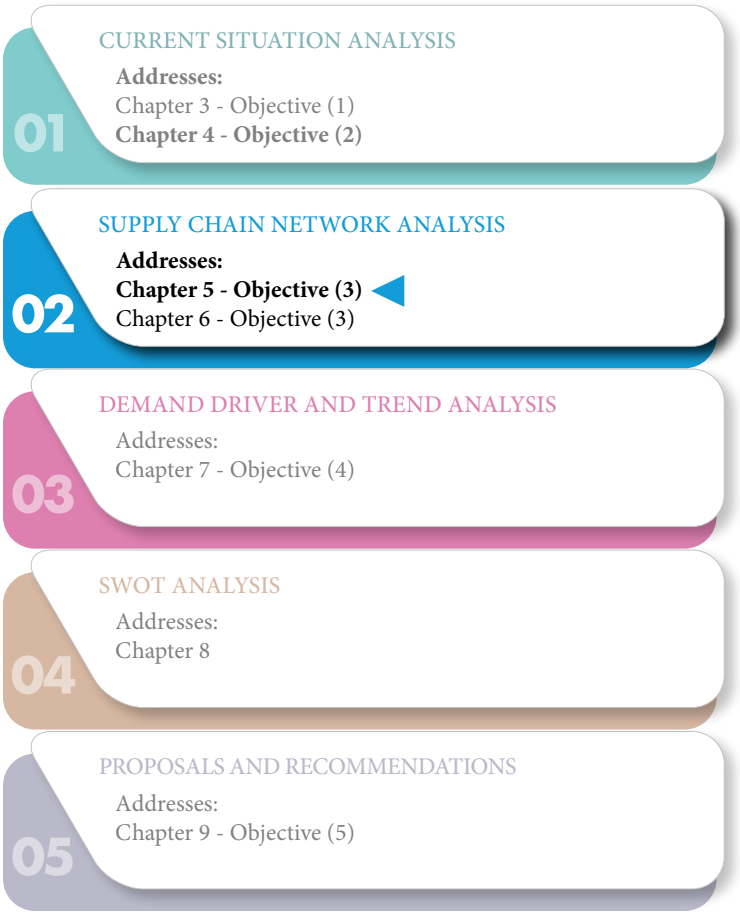
CHAPTER 5

SUPPLY CHAIN NETWORK ANALYSIS

The third objective of the study shall be addressed in two chapters. With reference to **Figure 20**, Chapter 5 of the report analyses supply chain networks from the perspectives of shipping and air connectivities. The chapter will also identify areas to address regarding supply chain inefficiencies across the different levels and sectors. Specifically, we aim to identify key concerns and priorities faced in providing for transport and logistics services for products and commodities in international trade. User requirements will be determined in relation to developments for international trade logistics for Grenada.

Chapter 6 of the report shall quantify and qualify transport and various logistics costs incurred for imports and exports in relation to the three modes of transport. The chapter shall establish the duration and costs involved for trade activities using the main ports in the country. Supply chain networks for key products in the agriculture and manufacturing sectors are presented by taking reference to data from ITC. Examining supply chain networks includes identifying key customers, stakeholders and key cargo consolidation and distribution nodes, as well as user requirements.

Figure 20: Framework for Proposed Approach to the Study – Supply Chain Network Analysis



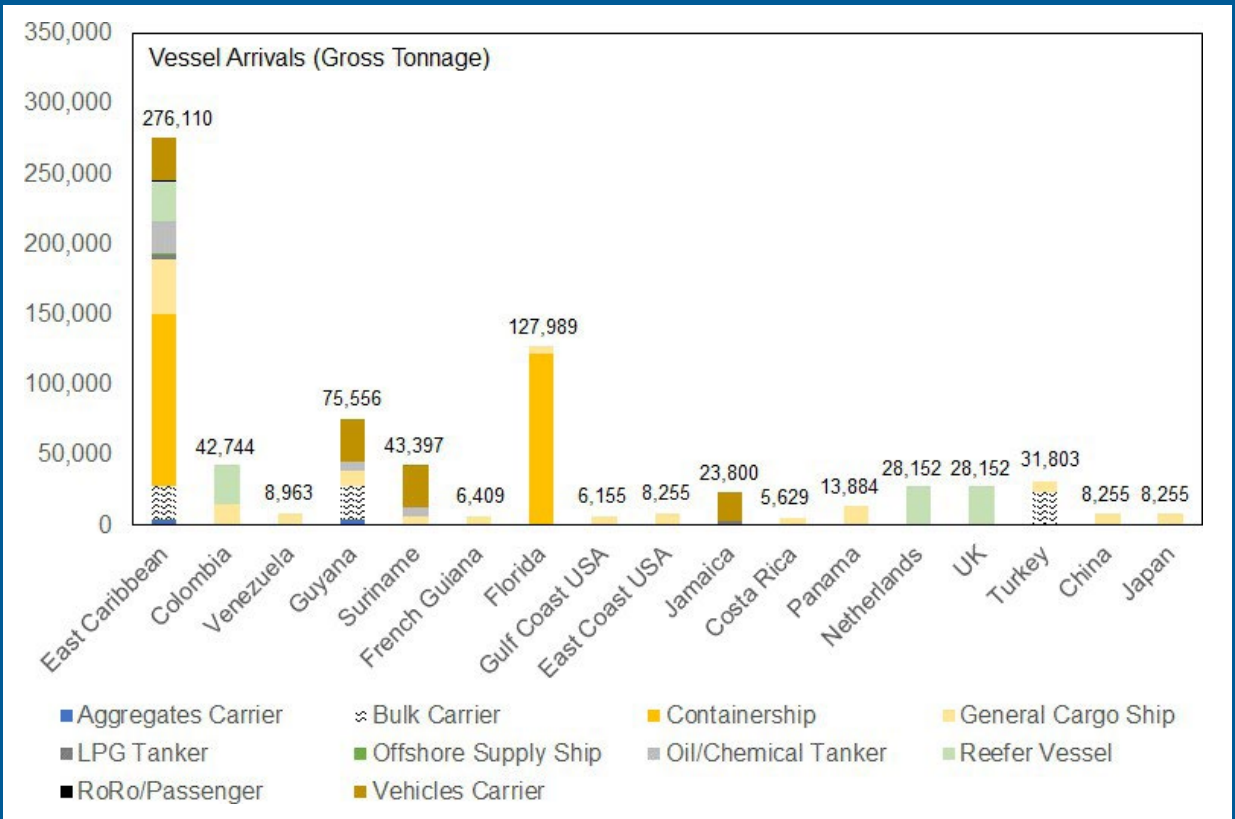
Source: International Consultant.

5.1 SHIPPING NETWORK AND CONNECTIVITY

Analysis of supply chains requires knowledge of international networks to which associated logistics activities are connected to. The primary source of international connectivity is shipping networks that connect Grenada to overseas exports markets and import sources. This is because information from the previous chapters showed the bulk of international trade to take place through main port of the country. The Port of St. George's handled almost 720,000 tonnes of cargo in 2021 (see Section 4.3). By comparison, Maurice Bishop International Airport (GND) handled 2,200 tonnes of air cargo in the same year. In the pre-COVID year of 2019, the seaport and airport handled respectively 765,000 tonnes and 3,100 tonnes of cargo. As such, we begin the supply chain network analysis by presenting shipping networks and their connectivity to the country. The analysis will be made using data collected daily for cargo vessel arrivals over the month of April 2023 at the main cargo port of Grenada.

The Port of St. George's received calls from 33 cargo vessels totalling 287,114 GT in April 2023. With reference to **Figure 21**, containerships formed the biggest group by accounting for 42.6% or 122,360 GT of total cargo vessel traffic. This was followed by general cargo ships at 17.4% or 49,942 GT. Vehicle carriers and reefer vessels formed the third and fourth

Figure 21: Cargo Vessel Arrivals at the Port of St. George's for April 2023



Source: International Consultant, using data from MarineTraffic (2023)[34].

largest categories of vessel arrivals with respective shares of 10.5% and 9.8%. As such, we saw the four largest vessel types that called at the Port of St. George's in Grenada comprising of ships that transported containerised and breakbulk cargoes. The four vessel types together made up 80.3% of vessel arrivals at the port totalling 230,490 GT. Please see Table A1 in Annex 1 for details of the vessels involved, including the dimensions, date of call and duration of stay at the port.

In terms of shipping connectivity, the Port of St. George's was found to be highly connected to the East Caribbean where vessel calls to and from the region made up 96.2% by tonnage capacity and 93.9% by vessel numbers. Specifically, 31 of the 33 vessel calls made at the port in April provided connection between the mainport of Grenada and other ports in the East Caribbean area. Containerships were a significant contribution to this development. The four vessels Tropic Jewel (15,215 GT), Tropic Island (15,215 GT), Fouma (15,375 GT) and AS Fabrizia (15,375 GT) each made fortnightly calls at the port, linking Grenada to the State of Florida in the US. Tropic Jewel and Tropic Island provided connectivity between the East Caribbean region to the Port of Palm Beach in Florida whereas Fouma and AS Fabrizia provided shipping connectivity between the same region to the ports of Everglades and Fort Lauderdale. We also note all the four vessels sail from Florida to the East Caribbean region and turn around in Trinidad and Tobago.

Tropic Jewel and Tropic Island turn around at the Port of Point Lisas while Fouma and AS Fabrizia turn around at the Port of Spain in Trinidad and Tobago.

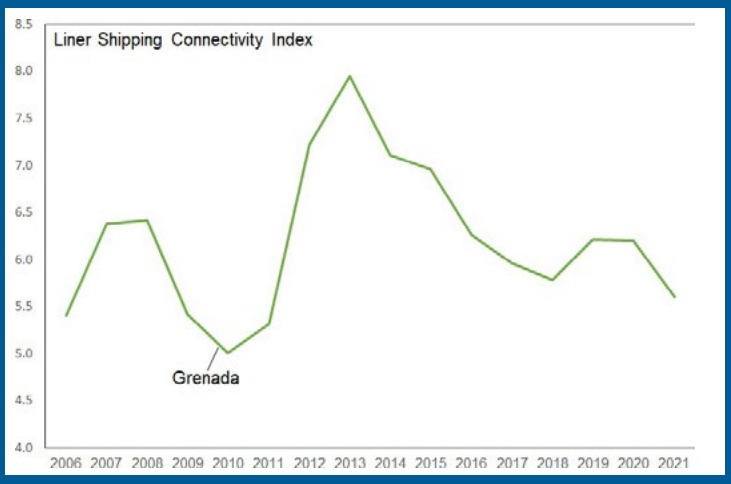
For the second largest group of vessels which are general cargo ships, shipping connectivity provided is more diverse. Data collected for vessel calls at the Port of St. George's saw the port being connected to countries and regions including Guyana, Suriname, French Guiana, Jamaica, Costa Rica, Panama, Gulf coast and east coast of the US, and even as far as China and Japan. Nonetheless, majority of shipping connectivity was made to the East Caribbean islands, followed

[34]MarineTraffic (2023) St George's Port [Online]. Available at: https://www.marinetraffic.com/en/ais/details/ports/2742?name=ST-GEORGES&country=Grenada (Accessed 30 March to 2 May 2023).

by Guyana in South America. For the two vehicle carriers (i.e., Hoegh Caribia and Viking Princess) that called at the port, connectivity was provided between the East Caribbean region with Guyana and Suriname. For Hoegh Caribia, connectivity was also provided to Jamaica. For the two reefer vessels (i.e., Baltic Klipper and Duncan Island) that called at the port, connectivity was provided that linked the East Caribbean area to Colombia, The Netherlands and UK. Both vessels are operated by Geest Line.

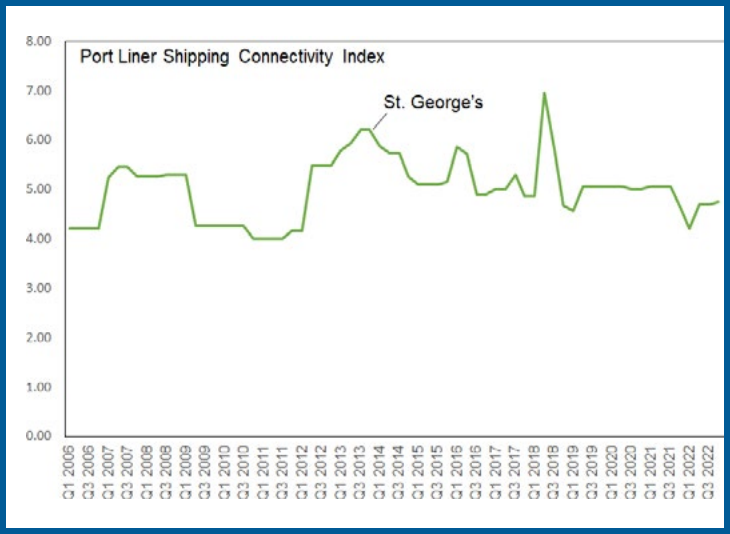
A proxy for developments in shipping connectivity for Grenada can inferred by analysing the Liner Shipping Connectivty Index (LSCI) of the country. With reference to **Figure 22**, we saw LSCI for Grenada taking a significant dip during the period of the Global Financial Crisis before recovering to pre-crisis levels in 2012. The peak was reached in 2013 and the LSCI has been trending down ever since. In 2021, Grenada registered a score of 5.61 for its LSCI. For comparison, the LSCI for Jamaica was six times as much at 33.8 for 2021. The LSCI for neighbouring country of Trinidad and Tobago was 15.1 for the same year. If we examine liner shipping connectivity at the port level, **Figure 23** shows that shipping connectivity for the Port of St. George's has fluctuated largely between the scores of 4.0 and 6.0. Nonetheless, the Port Liner Shipping Connectivity Indices (PLSCI) of the port appears to be trending down.

Figure 22: Liner Shipping Connectivity Index for Grenada



Source: International Consultant, using data from The World Bank (2023a)[35].

Figure 23: Port Liner Shipping Connectivity Index for the Port of St. George's



Source: International Consultant, using data from UNCTAD (2023)[36].

5.2 ISSUES AND CONCERNS RELATING TO SHIPPING CONNECTIVITY AND PORT OPERATIONS

Having presented the shipping connectivity, this section discusses supply chain inefficiencies across the different levels and sectors in Grenada pertaining to the seaport and shipping aspects. The first issue concerns the limited shipping connectivity faced by Grenada. This issue gives rise to a series of issues and concerns for supply chain networks in the country. These challenges are exacerbated by inefficiencies in cargo operations at the port and customs processes. We shall discuss these issues and concerns in this section.

Container shipping routes connected to the Port of St. George's are primarily serviced by four feeder containerships that make fortnightly calls at the port. These are the 1,148-TEU Tropic Jewel and Tropic Island, and the 1,284-TEU Fouma and AS Fabrizia. The four vessels provide feeder services connecting between ports in Florida in the US and island destinations in the East Caribbean. Container throughput is also contributed by the reefer ships 434-TEU Duncan Island and 552-TEU Baltic Klipper which ply between Europe and Colombia, making stops at selected ports in the East Caribbean. However, contribution from the reefer vessels is limited given their once-a-month port visit and small carrying capacity. The limited ship size and capacity available by the four feeder and two reefer vessels translates to a total shipping capacity of only 128,568

[35]The World Bank (2023a) World Development Indicators [Online]. Available at: https://datatopics.worldbank.org/world-development-indicators/ (Accessed 3 May 2023).
[42]Port Liner Shipping Connectivity Index, Quarterly [Online]. Available at: https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=170026 (Accessed 3 May 2023).

TEUs in a year. Note that this shipping capacity has to be shared with other ports in the region. If we assume that 20% of the shipping capacity is allocated for the port, this means St. George's will only handle a maximum of 25,714 TEUs if this capacity was fully utilised. For general cargo ships, shipping capacity available by such vessels is even lower given that they are smaller in size and making only one call a month at the port. For Fouma, AS Fabrizia, Duncan Island and Baltic Klipper, a key port-of- call in the region is the Port of Roseau in the Dominican Republic. The port serves as a major maritime transport for container shipping routes that connect to Europe. In 2021, container throughput for the Dominican Republic reached 2.2 million TEUs[37].

The issue of limited shipping connectivity and shipping capacity available at the Port of St. George's is partly attributed to inadequate capabilities of the port in handling large containerships as well as inefficiencies in port operations. This is the second area of concern. For example, the vessels Tropic Island and Tropic Jewel will not be able to call at the Port of St. George's at their maximum drafts. Not to mention, lack of quay crane at the Port of St. George's requires vessels to have their own cargo-handling equipment.

Inefficiencies with operations at the port can result in shipping lines skipping the port-call. Draft limitations may also cause a fully loaded vessel to bypass the port. For example, CMA CGM was known to have done so for Grenada such as during the high season from October to December[38]. The shipping line may skip the Port of St. George's and drop the container in Trinidad and Tobago instead. There were times when containers are dropped at Castries in Saint Lucia. In both cases, the container will have to be transported back to Grenada where additional charges are incurred. Discussions with stakeholders indicate priority is given by shipping lines to refrigerated cargo, followed by food, and lastly non-food items.

Table 7: Shipping Freight Rate for a FEU Container to Port of St. George's

Shipping route	Pre-Covid	During Covid	Current period
From China	USD5,000-7,000	Up to USD18,000	Up to USD10,000
From Europe	About UD$6,000-7,000 (hardly change)		
From US	USD4,000	USD7,000	USD4,000-6,000
From Trinidad and Tobago			Direct: USD2,500 Via Miami or Sint Maarten: USD4,000
From Saint Kitts and Nevis			USD4,000
From Antigua			USD6,000

Source: International Consultant, using information collected through face-to-face interviews and survey exercises conducted in March and April 2023 for Grenada.

The third area of concern is expensive shipping and port charges facing the trade community in the country. Discussion with stakeholders in Grenada suggested the following freight rates for shipping a FEU container as shown in **Table 7**. Shipping freight rates to other ports in the East Caribbean are provided in **Table 8** for comparison. Shipping costs could be 2-3 times as much to send a container to Grenada compared to the selected locations in the East Caribbean. Using the example of Rotterdam in Europe, sending a FEU container to Grenada would be 2.1 times more expensive than sending the same container to Trinidad and Tobago. Sending a FEU container from Miami to Trinidad and Tobago would also be much cheaper, at about one-third the cost of shipping the same container to Grenada. As for shipment from China, the price difference for sending the container to Grenada would be twice as expensive compared with shipping to other countries in the East Caribbean. There are also congestion surcharges during peak seasons such as Christmas where shipping lines imposed extra charges of USD100-150 per container.

[37]The World Bank (2023a) World Development Indicators [Online]. Available at: https://datatopics.worldbank.org/world-development-indicators/ (Accessed 3 May 2023).
[38]Information obtained through face-to-face interviews and survey exercises conducted in March and April 2023 for Grenada and Saint Lucia.

Table 8: Approximate Shipping Freight Rates for Containers to Other Ports in the East Caribbean for Current Period

Rotterdam, The Netherlands	Kingston, Jamaica	Port of Spain, Trinidad and Tobago	Caucedo, Dominican Republic	Bridgetown, Barbados
TEU	USD2,000	USD1,900	USD1,900	USD1,900
FEU	USD3,000	USD2,800	USD2,800	USD2,700
Miami, USA				
TEU	USD600	USD900	USD700	USD900
FEU	USD800	USD1,300	USD900	USD1,300
Shanghai, China				
TEU	USD3,200	USD3,000	USD3,300	USD2,900
FEU	USD4,900	USD4,700	USD5,000	USD4,700

Source: International Consultant, using information collected SeaFreightCalculator.com (2023)[39].

In addition to the expensive shipping freight charges, importers and exporters are further burdened with expensive port charges. Landing charges in the country are approximately USD1,200 per FEU, making it the second most expensive in the region[40]. If duties, customs surcharge, and VAT are included, these additional costs could go up to 100% of the shipping freight charges. In other words, these additional costs charges can double the costs of imports for the country. For the case of customs brokers, they could charge an average of XCD400 per TEU or XCD800 per FEU to prepare and handle documentation. The fees for customs brokerage could also be pegged at 2.5-4.0% on CIF value of the import cargo. During the high season, customs brokers may charge XCD800 per TEU or XCD1,200-1,600 per FEU as a fixed charge. The high level of shipping and port charges ultimately makes it expensive for cost of business in Grenada. For example, getting parts for machinery, semi-manufactures for assembly into final products, or importing food items can result in companies having to incur higher costs. Inefficiencies associated with port and shipping operations are estimated to add another 25% to the landing charge. This can undermine the attraction of doing business and competitiveness in international trade for the country.

The fourth concern is the seemingly archaic system of port tariffs currently in place. There are calls by the logistics and trade community in Grenada to review the system of port tariffs. Specifically, there are calls to review and revise the port tariffs as these were developed during the pre-container era and changes should be made to reflect the benefits that are brought about by containerisation. Communities in the country also suggested that labour arrangements are a key contributing factor for the current situation and developments. As such, amending labour arrangements can be key to addressing inefficiencies at the port. However, making changes can be a major exercise.

Inefficiencies in port operations can be seen for activities that occur at the berth and in the yard. This is the fifth area of concern regarding impact on the logistics and supply chain network. For berthing operations in Grenada, vessels that require tug assistance will have to rely on tug services that are provided from neighbouring countries such as Martinique. For example, bringing a tug from Martinique which is located about 300km away will cost USD21,000 to mobilise the tug, working time of USD250 per hour, and USD1,500 charged for each ship movement[41]. Tug assistance is not mandatory at the Port of St. George's although some vessels may still seek for such services. Berth operations at the Port of St. George's also require vessels to use their own cranes because the apron cannot support the weight of the quay crane. The situation can be made worse by the impression from the logistics community that priority would be given to wheat, sand and cement cargo as there is more money to be made for unloading such cargo by stevedores. The Grenada Ports Authority shared that berth productivity ranges from 9 to 12 TEUs per hour per gang worked for a vessel. If there are two gangs deployed to work on the vessel, berth productivity can be raised to 20 to 24 TEUs per hour.

Locating containers present further challenges to supply chain operations. Runners are employed to locate containers in the Port of St. George's. The overall process of locating and

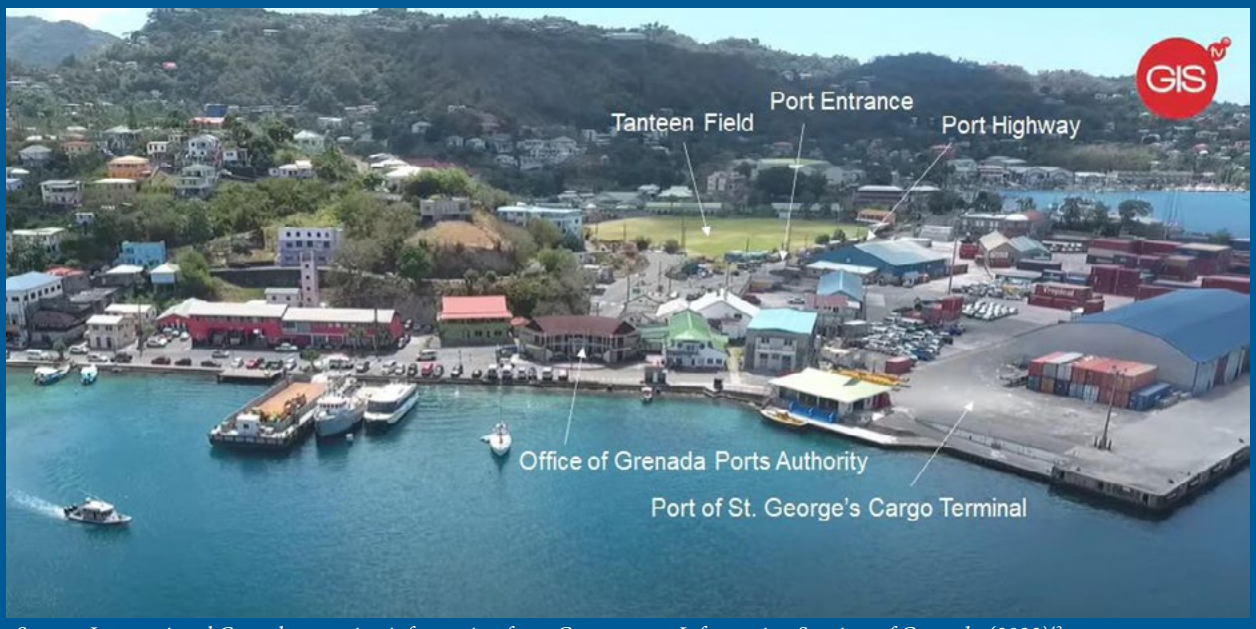
[39]SeaFreightCalculator.com (2023) Sea Freight Calculator [Online]. Available at: https://www.seafreightcalculator.com/ (Accessed 8 April 2023).
[40]Information collected through face-to-face interviews conducted in April 2023 for Grenada.
[41]Information collected through face-to-face interviews conducted in April 2023 for Grenada.

collecting containers can be time-consuming and involve cumbersome processes of company representatives having to make separate queues at the port. There were occasions where the wrong containers are collected by cargo owners and even cases where the wrong containers are loaded onto vessels and inadvertently sent away. Shipping by using LCL was also mentioned by stakeholders interviewed and surveyed in Grenada to be difficult and avoided unless necessary. Companies prefer to handle their cargo in FCL and tended to stay away from breakbulk cargo due to issues of cargo being damaged or lost. Lack of storage space is another major concern which has a negative impact on supply chain networks for Grenada. Growing container volumes are a concern especially when there is insufficient space to store containers at the port. The situation usually worsens in the period of October to January.

Destuffing containers are performed in the shed for customs inspection. Containers may spend days waiting in the port before they can be destuffed should there be inadequate space in the port shed. There appears to be the impression that companies may need to leverage on special relationships to expedite the process. As for container stuffing operations, these are performed in the open. Such activities may stop when there is heavy rain, and not to mention, the container being dirtied by workers loading the cargo. To accommodate container stripping and stuffing operations at the port, there are views that additional warehouse capacity should be made available. Grenada Ports Authority shared that considerations are given to move container stripping out of the port area to a location within a 5-8 miles radius from the terminal. The Tanteen field situated opposite the terminal would be ideal as it can be seen as a natural extension of the port (see **Figure 24**). However, doing so would take away green space as the venue is used for sporting activities by the local community. There is also the issue of flooding at the field. For reefer containers, these can be pulled to the company's premise for destuffing works. It may also be the situation where normal containers are destuffed at the own premises of companies. For such cases, the customs officer will come after 4pm and they are paid for overtime. Companies may need to pay for their meals and provide transport as well. We note that some of the companies have customs officials stationed at their premises. There are others thinking of doing the same.

There are calls by the logistics and trade communities in Grenada for the port to be operational 24 hours a day, seven days a week. Regular operating hours for cargo terminals are from 8:00am to 4:00pm during weekdays with an hour for lunch in between. Operating hours may be extended during

Figure 24: Location of Tanteen Field Next to Port of St. George's Cargo TerminalTerminal in Port of Castries



Source: International Consultant, using information from Government Information Services of Grenada (2022)[42].

[42]Government Information Services of Grenada (2023) 'Reopening of Grenada's eleven ports of entry' YouTube, 6 April [Online]. Available at: https://www.youtube.com/watch?v=vQd7vTv1Rm8 (Accessed 8 May 2023).

peak seasons or upon request. Nonetheless, there remain issues which the local community would like to see addressed. For example, in the Port of St. George's, they were mentions of vessels having to wait should they arrive after a certain time in the night. If the vessel is unable to wait, it may choose to skip the port in order to keep to their sailing schedule. The community also requested that working overtime be facilitated as cargo operations may not be completed in time before the weekend or public holidays. Vessels are unlikely to disrupt their sailing schedules by having to wait over the weekend. A possible solution is to implement a shift system for port workers. However, this will likely have implications tor corresponding adjustments needed to the working hours of customs offices.

The sixth area of concern is also related to customs operations where stakeholders in the country are calling for a fully electronic and paperless system to be implemented. The ASYCUDA system is supposed to bring about a paperless process. However, customs require documents to be printed and submitted manually. The Customs and Excise Division shared that they are working on an electronic payments system. The system is expected to be implemented in the first half of 2024[43]. The Division also shared their intentions to develop an electronic stamp system as well as de minimis system. Customs further shared that they are considering developing a system for risk management. Intention is to facilitate customs inspection particularly for import cargoes. An estimated 40% of the cargo goes through the green lane where no checks required and about 30% of cargo goes through the red lane where physical and document checks are conducted.

The seventh concern relates to availability of empty containers and such equipment being in good shipping condition. There were several mentions of the shortage of empty twenty-foot containers available for use. For example, a company needing ten empty containers may take a few days to get them and on occasions, being unable to obtain all of them. There is also the issue of empty containers obtained being damaged. A common practice is to inspect the container at the port, followed by a secondary inspection at the company's premise.

5.3 FLIGHT NETWORK AND AIR CONNECTIVITY

This section discusses the flight network and air connectivity available to Grenada from the supply chain perspective. The network of direct flights connected to GND in Grenada is presented in **Table 9** while **Figure 25** shows a map of cities connected to GND by flights. Information provided by Flightradar24 shows the main aviation gateway of Grenada connected to the cities of Miami and New York in the US, Toronto in Canada, the capital city of Georgetown in Guyana in South America, and six cities in the Caribbean region. In addition, there are flights operated by SVG Air that provide flight connectivity to Lauriston Airport in the neighbouring island of Carriacou.

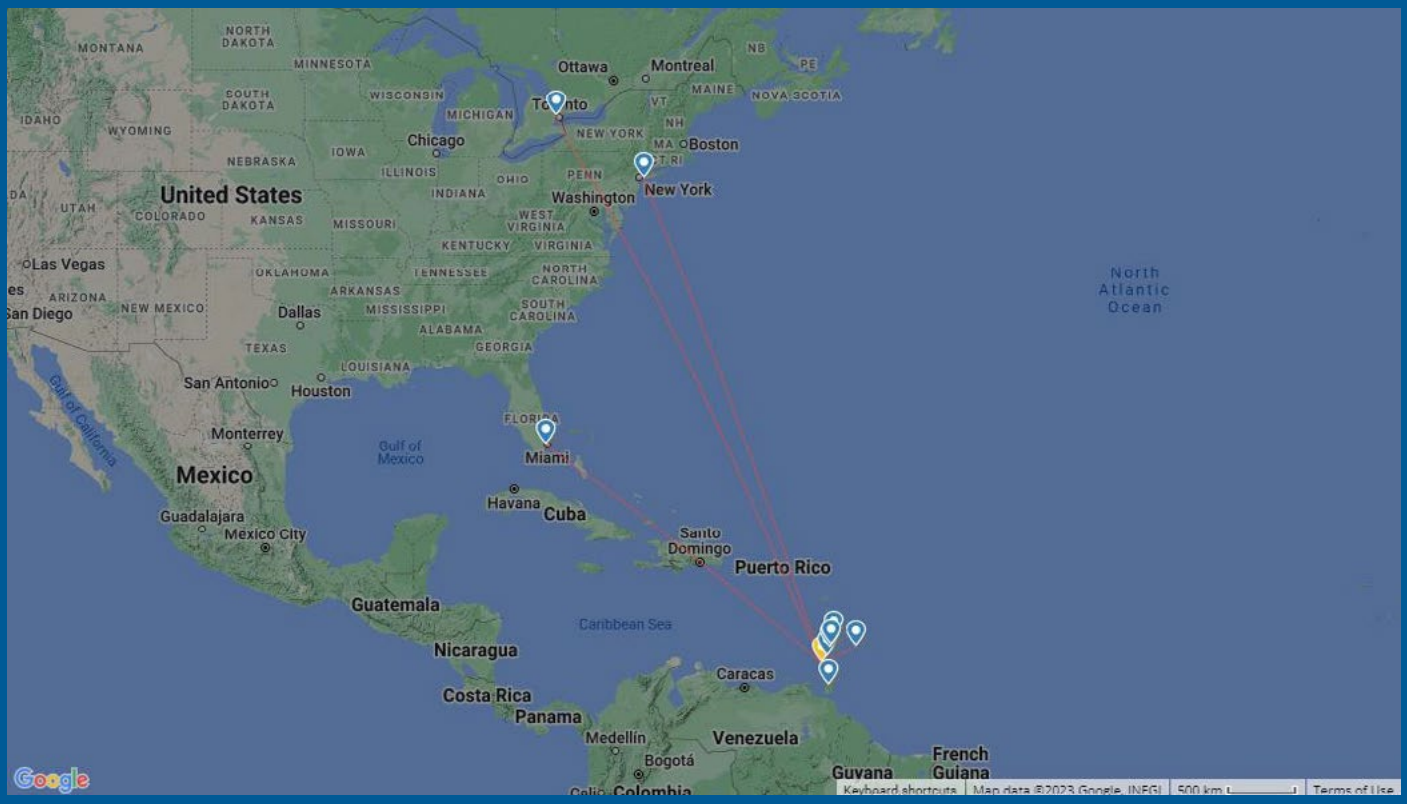
Table 9: Direct Flights Connected to Maurice Bishop International Airport (GND)

Airport	To GND	From GND
Miami, MIA	American Airlines	American Airlines | Amerijet International
New York, JFK	JetBlue Airways	JetBlue Airways
Toronto, YYZ	Air Canada	Air Canada
San Juan, SJU	Ameriflight	-
Bridgetown, BGI	InterCaribbean Airways | LIAT | Virgin Atlantic Caribbean Airlines	InterCaribbean Airways | LIAT | Virgin Atlantic | Caribbean Airlines |Ameriflight
Port of Spain, POS	Caribbean Airlines | Kingfisher Air (DHL)	Caribbean Airlines | Kingfisher Air (DHL) | Amerijet International
Vieux Fort, UVF	British Airways	British Airways
Castries, SLU	Mountain Air Cargo (FedEx Feeder) | Ameriflight	Mountain Air Cargo (FedEx Feeder)
Georgetown, GEO	Amerijet International	-
Kingstown, SVD	InterCaribbean Airways | Kingfisher Air (DHL) | LIAT	InterCaribbean Airways | Kingfisher Air (DHL) | LIAT
Carriacou, CRU	SVG Air	SVG Air

Source: International Consultant, using data from Flightradar24 (2023)[44]. See Table A2 in Annex 2 for details on airline operators, flight frequency and type of aircraft deployed on each route.

[43]Information provided by Grenada Customs and Excise Division during face-to-face meeting held on 26 April 2023 at the organisation's office at The Carenage in St. George's.
[44]Flightradar24 (2023) Grenada Maurice Bishop International Airport [Online]. Available at: https://www.flightradar24.com/data/airports/gnd/routes (Accessed 16 May 2023).

Figure 25: Map of Flight Connections to Maurice Bishop International Airport (GND)



Source: Flightradar24 (2023)[45.]

Table 10: Flight History for Amerijet International Flight M68114 from Georgetown to Grenada and on to Miami

DATE	FROM	TO	AIRCRAFT	FLIGHT TIME	STD	ATD	STA	STATUS
22 May 2023	Point Salines (GND)	Miami (MIA)	76Y	—	1:25 PM	—	5:10 PM	Scheduled
22 May 2023	Georgetown (GEO)	Point Salines (GND)	76Y	—	10:25 AM	—	11:55 AM	Scheduled
15 May 2023	Point Salines (GND)	Miami (MIA)	B763 (N432AX)	3:32	1:25 PM	1:12 PM	5:10 PM	Landed 4:43 PM
15 May 2023	Georgetown (GEO)	Point Salines (GND)	B763 (N432AX)	1:08	10:25 AM	10:06 AM	11:55 AM	Landed 11:14 AM

Source: Flightradar24 (2023)[46.]

[46]Flightradar24 (2023) Flight history for Amerijet International flight M68114 [Online]. Available at: https://www.flightradar24.com/data/flights/m68114 (Accessed 17 May 2023).

Table 11: Flight History for Amerijet International Flight M6850 from Port of Spain to Grenada and on to Miami

DATE	FROM	TO	AIRCRAFT	FLIGHT TIME	STD	ATD	STA	STATUS
26 May 2023	Point Salines (GND)	Miami (MIA)	75F	—	7:35 PM	—	11:20 PM	Scheduled
26 May 2023	Port of Spain (POS)	Point Salines (GND)	75F	—	5:00 PM	—	5:50 PM	Scheduled
20 May 2023	Port of Spain (POS)	Miami (MIA)	75F	—	12:01 AM	—	2:55 AM	Scheduled
19 May 2023	Point Salines (GND)	Miami (MIA)	75F	—	7:35 PM	—	11:20 PM	Scheduled
19 May 2023	Port of Spain (POS)	Point Salines (GND)	75F	—	5:00 PM	—	5:50 PM	Scheduled
13 May 2023	Point Salines (GND)	Miami (MIA)	B752	—	5:02 PM	—	8:19 PM	Unknown
13 May 2023	Port of Spain (POS)	Miami (MIA)	B752	—	12:11 AM	—	—	Unknown
12 May 2023	Point Salines (GND)	Miami (MIA)	B752 (N192AN)	3:33	7:35 PM	8:14 PM	11:20 PM	Landed 11:48 PM
12 May 2023	Port of Spain (POS)	Point Salines (GND)	B752 (N192AN)	0:28	5:00 PM	4:21 PM	5:50 PM	Landed 4:50 PM

Source: Flightradar24 (2023)[47]

Based on information provided by the Grenada Airports Authority, the bulk of air cargo is accounted by Amerijet International. The airline operates full cargo flights using an aircraft which was converted from passenger use to transport fish and fresh produce from Grenada to Miami. The twice-a-week flights operated by the airline departs on Mondays from Georgetown (flight M68114) and Fridays from Port of Spain (flight M6850) with brief stops in Grenada ranging from 2-3 hours (see **Table 10** and **Table 11**). Flights on Mondays use a B767-300 aircraft which has a cargo capacity of more than 50 tonnes[48]. The airline is handled by George F Huggins Co/Swift Air for 25 years. During the pre-COVID period, there were two flights a week using the converted B767-300 aircraft. In March 2020, the airline reduced the number of flights to one per week using a chartered A321 aircraft which has a carrying capacity of only 20 tonnes. In early 2022, the aircraft was replaced by a B757-200F with payload of 36 tonnes[49]. In April 2023, the twice a week flight was resumed with the B767-300 deployed on Mondays and B757-200F deployed on Fridays.

Total cargo carried by Amerijet International reached about 1,100 tonnes in 2022. This was followed by American Airlines at 585 tonnes. The airline operates daily flights between Miami in the US and Grenada using mostly a B737-800 passenger aircraft. In the third position is Mountain Air Cargo which accounted for 142 tonnes of cargo handled at GND. We note that Mountain Air Cargo is a contract carrier for FedEx. In the fourth and fifth positions are respectively British Airways which handled 104 tonnes of cargo, and Virgin Atlantic with 53 tonnes of cargo. British Airways uses a B777-200 aircraft which flies from London Gatwick Airport to Grenada three times a week. The flight involves a brief stop in Hewanorra International Airport in Saint Lucia along the way. Virgin Atlantic operates a A330- 300 aircraft which flies twice a week from London Heathrow Airport to Grenada. The flight involves a brief stop in Barbados along the way. The B777-200 and A330-300 are wide-bodied passenger aircraft with cargo carrying capacity.

[47] Flightradar24 (2023) Flight history for Amerijet International flight M6850 [Online]. Available at: https://www.flightradar24.com/data/flights/m6850 (Accessed 17 May 2023).
[48] Information provided by George F Huggins Co/Swift Air during face-to-face meeting held on 25 April 2023 at the company's office at the GCNA Complex, Kirani James Boulevard, in St. George's.
[49] Air Charter Service (2023) Boeing 757-200F [Online]. Available at: https://www.aircharter.co.uk/aircraft- guide/cargo/boeing-usa/boeingb757-200f (Accessed 17 May 2023).

Table 12: Flight History for Ameriflight Flight A88118 from Castries to Grenada

DATE	FROM	TO	AIRCRAFT	FLIGHT TIME	STD	ATD	STA	STATUS
17 May 2023	Aguadilla (BQN)	Castries (SLU)	SW4	—	10:45 AM	—	12:44 PM	Canceled
15 May 2023	Aguadilla (BQN)	Castries (SLU)	SW4	—	10:55 AM	—	12:47 PM	Canceled
15 May 2023	Castries (SLU)	Point Salines (GND)	SW4	—	10:45 AM	—	11:29 AM	Canceled
12 May 2023	Castries (SLU)	Point Salines (GND)	SW4	—	10:55 AM	—	11:30 AM	Canceled
12 May 2023	Aguadilla (BQN)	Castries (SLU)	SW4	—	10:45 AM	—	—	Canceled

Source: Flightradar24 (2023)[50].

Table 13: Flight History for Ameriflight Flight A87118 from San Juan to Grenada

DATE	FROM	TO	AIRCRAFT	FLIGHT TIME	STD	ATD	STA	STATUS
17 May 2023	Point Salines (GND)	Aguadilla (BQN)	SW4	—	3:00 PM	—	5:47 PM	Canceled
15 May 2023	Point Salines (GND)	Aguadilla (BQN)	SW4	—	3:00 PM	—	5:45 PM	Canceled
12 May 2023	Point Salines (GND)	Aguadilla (BQN)	SW4	—	3:00 PM	—	5:45 PM	Canceled

Source: Flightradar24 (2023[51].

Together, these airlines accounted for almost 2,000 tonnes of air cargo handled at GND. Air cargo is also handled by Caribbean Airlines and Kingfisher Air. We note that Kingfisher Air Services is a contract cargo carrier for DHL in the Caribbean. By inference, the remaining airlines contributed significantly less to cargo tonnage handled at the airport. We also note that flights operated by the airline Ameriflight that connect Puerto Rico and Saint Lucia to Grenada liable to cancellations as shown by **Table 12** and **Table 13**.

5.4 ISSUES AND CONCERNS RELATING TO FLIGHT CONNECTIVITY AND AIRPORT OPERATIONS

Having presented the flight connectivity, we shall discuss supply chain inefficiencies across the different levels and sectors in Grenada for aspects pertaining to air cargo. The first challenge deals with the issue of flight delays which can cascade through the network.

[50]Flightradar24 (2023) Flight history for Ameriflight flight A88118 [Online]. Available at: https://www.flightradar24.com/data/flights/a88118 (Accessed 17 May 2023).
[51]Flightradar24 (2023) Flight history for Ameriflight flight A87118 [Online]. Available at: https://www.flightradar24.com/data/flights/a87118 (Accessed 17 May 2023).

Using the example of Kingfisher Air Services, which is the contract cargo carrier for DHL in the Caribbean, we saw a late departure on 12 May 2023 from the originating airport in Dominica causing delays in subsequent stopovers enroute (see **Table 14**). The flight had departed late by about an hour from Dominica which caused the plane to arrive late in Kingstown by almost an hour. The stopover in Kingstown which was scheduled for 38 minutes was reduced by half to just 17 minutes. Even so, the same aircraft landed only at 5:05pm in Grenada where the scheduled departure time from the airport was 5:00pm. With reference to the same table, delays were also seen for the same flight on 15 May 2023 where the plane departed by almost two hours late from Kingstown. As a result, the aircraft arrived in Grenada at 6:27pm instead of the scheduled 4:31pm.

Delays were also observed for flight BEZ416 which is operated by Kingfisher Air. With reference to **Table 15**, the flight had departed by more than two hours late from Port of Spain on 12 May 2023 and therefore arrived late in Grenada. To make up for lost time, the scheduled stopover in Grenada which was supposed to be more than an hour was reduced

Table 14: Flight History for Kingfisher Air Flight BEZ415

DATE	FROM	TO	AIRCRAFT	FLIGHT TIME	STD	ATD	STA	STATUS
15 May 2023	Point Salines (GND)	Port of Spain (POS)	C208 (N963HL)	0:42	6:15 PM	6:57 PM	7:03 PM	Landed 7:39 PM
15 May 2023	Dominica (DOM)	Kingstown (SVD)	C208 (N963HL)	0:58	4:00 PM	4:52 PM	5:06 PM	Landed 5:49 PM
15 May 2023	Kingstown (SVD)	Point Salines (GND)	C208 (N963HL)	0:31	3:50 PM	5:56 PM	4:31 PM	Landed 6:27 PM
12 May 2023	Point Salines (GND)	Port of Spain (POS)	C208 (N962HL)	0:39	5:00 PM	5:34 PM	5:50 PM	Landed 6:13 PM
12 May 2023	Kingstown (SVD)	Point Salines (GND)	C208 (N962HL)	0:35	3:50 PM	4:29 PM	4:32 PM	Landed 5:05 PM
12 May 2023	Dominica (DOM)	Kingstown (SVD)	C208 (N962HL)	1:04	2:05 PM	3:07 PM	3:12 PM	Landed 4:11 PM
11 May 2023	Point Salines (GND)	Port of Spain (POS)	C208 (N962HL)	0:40	5:00 PM	4:37 PM	5:50 PM	Landed 5:18 PM
11 May 2023	Kingstown (SVD)	Point Salines (GND)	C208 (N962HL)	0:34	3:00 PM	3:49 PM	3:41 PM	Landed 4:23 PM
11 May 2023	Dominica (DOM)	Kingstown (SVD)	C208 (N962HL)	1:03	2:05 PM	1:53 PM	3:13 PM	Landed 2:56 PM

Source: Flightradar24 (2023)[52]

Table 15: Flight History for Kingfisher Air Flight BEZ416

DATE	FROM	TO	AIRCRAFT	FLIGHT TIME	STD	ATD	STA	STATUS
15 May 2023	Kingstown (SVD)	Dominica (DOM)	C208 (N962HL)	1:06	12:00 PM	12:06 PM	1:08 PM	Landed 1:11 PM
15 May 2023	Point Salines (GND)	Kingstown (SVD)	C208 (N962HL)	0:37	11:00 AM	11:08 AM	11:40 AM	Landed 11:45 AM
15 May 2023	Port of Spain (POS)	Point Salines (GND)	C208 (N962HL)	0:45	9:00 AM	9:46 AM	9:49 AM	Landed 10:30 AM
12 May 2023	Kingstown (SVD)	Dominica (DOM)	C208 (N962HL)	1:02	1:00 PM	1:31 PM	2:07 PM	Landed 2:33 PM
12 May 2023	Point Salines (GND)	Kingstown (SVD)	C208 (N962HL)	0:36	11:00 AM	12:28 PM	11:40 AM	Landed 1:04 PM
12 May 2023	Port of Spain (POS)	Point Salines (GND)	C208 (N962HL)	0:39	9:00 AM	11:06 AM	9:49 AM	Landed 11:46 AM

Source: Flightradar24 (2023)[53]

[52] Flightradar24 (2023) Flight history for Kingfisher Air flight BEZ415 [Online]. Available at: https://www.flightradar24.com/data/flights/bez415 (Accessed 18 May 2023).
[53] Flightradar24 (2023) Flight history for Kingfisher Air flight BEZ415 [Online]. Available at: https://www.flightradar24.com/data/flights/bez416 (Accessed 18 May 2023).

Table 16: Flight History for Mountain Air Cargo Flight MTN7113

DATE	FROM	TO	AIRCRAFT	FLIGHT TIME	STD	ATD	STA	STATUS
18 May 2023	Point Salines (GND)	Castries (SLU)	C208 (N851FE)	0:55	4:00 PM	3:43 PM	4:44 PM	Landed 4:38 PM
17 May 2023	Point Salines (GND)	Castries (SLU)	C208 (N851FE)	0:54	4:00 PM	3:33 PM	5:00 PM	Landed 4:27 PM
16 May 2023	Kingstown (SVD)	Castries (SLU)	C208 (N851FE)	0:22	4:40 PM	4:40 PM	5:06 PM	Landed 5:02 PM
16 May 2023	Point Salines (GND)	Castries (SLU)	C208 (N851FE)	—	4:00 PM	3:36 PM	5:03 PM	Diverted to SVD
15 May 2023	Point Salines (GND)	Castries (SLU)	C208 (N851FE)	0:54	4:00 PM	3:26 PM	4:59 PM	Landed 4:20 PM
12 May 2023	Point Salines (GND)	Castries (SLU)	C208 (N851FE)	0:50	4:00 PM	4:59 PM	4:59 PM	Landed 5:50 PM

Source: Flightradar24 (2023)[54].

to about 40 minutes. Stopover in the next airport in Kingstown was also reduced from the scheduled 1 hour 20 minutes to just 27 minutes in order to make up for lost time. Hence, flight delays which cascade through the network can caused reliability of schedules to be affected but also lead to significantly shorter handling times at the stopover airports enroute.

We may also see flights diverted as in the case of flight MTN7113 which occurred on 16 May 2023 (see **Table 16**). The flight which was supposed to go from Grenada to Castries was instead diverted to Kingstown in St. Vincent and the Grenadines. Industry players know there are risks associated with making unscheduled stops enroute as such events have the potential to cause further delays for the flight. Not to mention, logistics companies and cargo owners may also have to deal with flight cancellations which can occur from time to time such as flights A87118 and A88118 which are operated by Ameriflight.

For the case of Amerijet International, the airline has a window of 1.5 hours to complete cargo operations in Grenada. The aircraft could have come from Georgetown (flight M68114) or from Port of Spain (flight M6850) on its way to Miami. Any delays in the loading may result in missing the flight schedule as the flight crew have limitations on the number of hours worked and therefore have to spend the night in Grenada. We have seen from the cases of other airlines that delays in departure from other airports can lead to significantly reduced time for cargo-handling at stopovers enroute. Discussions with the logistics and trade communities indicate that although the option could be to use the services of another operator such as Mountain Air Cargo (handles for FedEx) or Kingfisher Air, the flights could also be affected by diversion to other airports and unreliable timings.

Figure 26: Cargo Shed at Maurice Bishop International Airport (GND)

Source: International Consultant, using information from Grenada Airports Authority[56].

The second concern relates to improvements needed for cargo-handling facilities at GND. The logistics community in Grenada viewed the current location at Sandals as not ideal for handling air cargo (see **Figure 26**). The make-shift facility does not provide a clear distinction between the landside and airside of the airport. This is because truck drivers carrying cargo to the airport must enter the airside to have the cargo scanned. After the cargo has gone through scanning, the truck will be driven out of the airside area. Although operations and management of the airport are governed by protocols of International Civil Aviation Organisation (ICAO) and International Air Transport Association (IATA), and regular audits are conducted by ICAO as well as by the Eastern Caribbean Civil Aviation Authority, concerns on this issue have been raised by air transport regulatory agencies in the US and EU[55].

[54]Flightradar24 (2023) Flight history for Kingfisher Air flight BEZ416 [Online]. Available at: https://www.flightradar24.com/data/flights/bez416 (Accessed 18 May 2023).
[55]Information provided by George F. Huggins Company during face-to-face meeting held on 25 April 2023 at the company's office at GCNA Complex in St. George's.
[56] Photos of cargo shed at Maurice Bishop International Airport taken on 24 April during a visit to the airport.

Cargo is typically handled on a JIT basis, arriving at the airport ready to be loaded onto the aircraft. During the high season, cargo has to arrive as early as 3-4 am to make the late morning or early afternoon flight. Cargo operations are usually done in the open area. As such, there are instances when the cargo is damaged by rain. Damaged goods are a major issue and flight delays with cargo left standing can see their value drop substantially. Reliability of equipment was also mentioned during meetings with stakeholders in the logistics community. For example, forklift breaking down may see cargo be handled by hand. In the event when the scanner breaks down, technical expertise has to be flown in from Barbados to make repairs. As a whole, the dedicated cargo facility should have bays where trucks can back up and offload their cargo. There should be clear distinction between the landside and airside for each bay with security stationed on-site. Each bay should also be equipped to weigh and screen the cargo.

The third issue is the concern raised by the logistics communities on the need to have a dedicated facility with cold storage capabilities at the airport. At the moment, cold storage at GND airport is done using a FEU reefer container stationed outside the cargo shed (see above figure). The reefer container is used when there are delays in flights and takes about 3-4 hours to reach ideal temperatures when plugged in. It may also be the case where the flight is delayed or cancelled, and producers have to bring the cargo back to their premises. For fresh produce, cargo exposed to the elements can also see a significant portion of the shipment lost. Even without the rain, loss to value can occur as the ripening process has started.

The fourth issue relates to customs operations pertaining to air cargo. There are separate rates for engaging services for customs inspection at the company's premise. The rates are different depending on whether the person is a senior or junior officer. There are also occasions where there are no customs officers available. To address these issues, companies may opt to have a customs officer stationed at the premise. The time taken for inspection will depend on the competency of the customs officer. Ideally, customs officers should be well trained on the aspects of tariff description, classification knowledge and standard operating procedures pertaining to different types of air cargo. Regarding clearance for air shipments, it is common to have a single shipment comprising of several individual packages in the air cargo business. The current process requires clearance for every individual package with accompanying documentation. As such, the process should allow for consolidated clearance by the whole shipment. The process should also be paperless and allow for electronic payments.

As a whole, many companies interviewed in Grenada felt that there is potential to do more air cargo. Air cargo volumes have yet to recover from pre-COVID levels. However, the outlook is optimistic as demand returns and as flights resume to operating at pre-COVID levels. George F. Huggins Co shared that Grenada used to be a regional hub in 2000 for Amerijet International. The airline operates daily flights to St. Vincent and the Grenadines, Saint Lucia, Dominica, Martinique and even Guyana. Today, a regional hub would be at Barbados. The airport serves as a hub for flowers going from South America to the UK[57]. Barbados was also viewed as an established hub for pharmaceuticals and serves to distribute to various places in the region[58]. The airline LIAT also noted that flights from Barbados to Castries saw the main cargo being shipments of pharmaceuticals[59]. For Grenada, George F. Huggins Co views a huge potential for exports of fish, fruits and vegetables from the country. In the pre-COVID period, the country exported about 900 tonnes of such products annually with the peak seasons in March to July, and September to November.

5.5 CHAPTER SUMMARY

This chapter analyses supply chain networks from the perspectives of shipping and air connectivities. The chapter further identifies areas to address regarding supply chain inefficiencies across the different levels and sectors. User requirements are determined in relation to developments for international trade logistics for Grenada.

[57] Information provided by George F. Huggins Company during face-to-face meeting held on 25 April 2023 at the company's office at GCNA Complex in St. George's.
[58] Information provided by Massy Stores (SLU) during face-to-face meeting held on 18 April 2023 at the company's office at Cul De Sac in Saint Lucia.
[59] Information provided by Leeward Islands Air Transport Services (LIAT) during face-to-face meeting held on 17 April 2023 at the company's office at George F. L. Charles Airport in Castries.

The primary source of international connectivity is shipping networks that connect Grenada to overseas exports markets and import sources. The analyses were made using data collected daily for cargo vessel arrivals over the month of April 2023 at the main cargo port in Grenada.

For the Port of St. George's, vessels transporting containerised and breakbulk cargoes made up 80.3% of vessel arrivals totalling 230,490 GT. In terms of shipping connectivity, the port was found to be highly connected to the East Caribbean. Containerships were a significant contribution to this development. The vessels sail from Florida to the East Caribbean region and turn around in Trinidad and Tobago.

We saw the Liner Shipping Connectivity Index (LSCI) for Grenada taking a significant dip during the period of the Global Financial Crisis before recovering to pre-crisis levels in 2012. The peak was reached in 2013 and the LSCI has been trending down ever since. At the port level, the Port Liner Shipping Connectivity Indices (PLSCI) of the Port of St. George's also appears to be trending down.

For issues concerning shipping connectivity and port operations, the first challenge is the limited shipping connectivity faced by Grenada. The issue is partly attributed to inadequate capabilities of the mainport in handling large containerships as well as inefficiencies in port operations. This is the second area of concern. Inefficiencies with operations at the port can result in shipping lines skipping the port-call.

The third area of concern is expensive shipping and port charges facing the trade community in the country. Landing charges in the country are approximately USD1,200 per FEU, making it the second most expensive in the region.

The fourth concern is the seemingly archaic system of port tariffs currently in place. There are calls by the logistics and trade communities in Grenada to review the system of port tariffs. The fifth area of concern pertains to inefficiencies in port operations that occur at the berth and in the yard. There are calls by the logistics and trade communities in Grenada for the port to be operational 24 hours a day, seven days a week.

The sixth area of concern is related to customs operations where stakeholders in the country are calling for a fully electronic and paperless system to be implemented. The seventh concern relates to availability of empty containers and such equipment being in good shipping condition.

Regarding flight networks and air connectivity, the main aviation gateway of Grenada is connected to the cities of Miami and New York in the US, Toronto in Canada, the capital city of Georgetown in Guyana in South America, and six cities in the Caribbean region. The bulk of air cargo is accounted by Amerijet International. This was followed by American Airlines, Mountain Air Cargo, British Airways and Virgin Atlantic.

For issues concerning flight connectivity and airport operations, the first challenge is the issue of flight delays which can cascade through the network. The second concern relates to improvements needed for cargo-handling facilities at GND. Cargo is typically handled on a JIT basis, arriving at the airport ready to be loaded onto the aircraft. The third issue is the concern raised by the logistics communities on the need to have a dedicated facility with cold storage capabilities at the airport. The fourth issue relates to customs operations pertaining to air cargo. The time taken for inspection will depend on the competency of the customs officer.

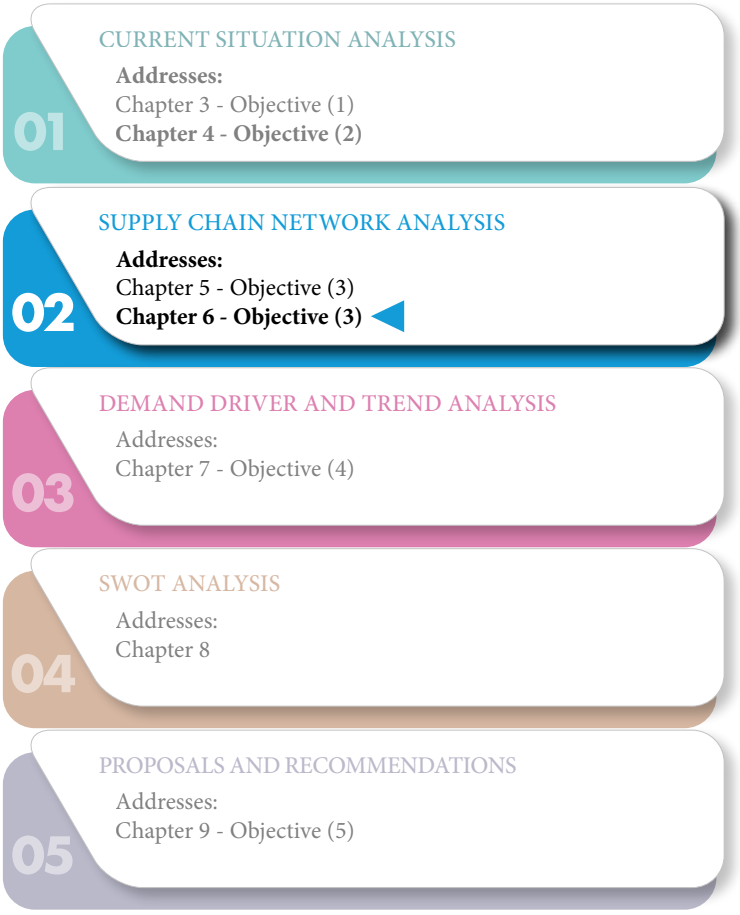
As a whole, many companies interviewed in Grenada felt that there is potential to do more air cargo. Air cargo volumes have yet to recover from pre-COVID levels. However, the outlook is optimistic as demand returns and as flights resume to operating at pre-COVID levels.

CHAPTER 6

SUPPLY CHAIN COSTS
FOR SELECTED PRODUCTS AND NOTE ON FOOD SECURITY

The chapter presents the duration and costs involved for logistics activities through supply chain networks for selected key products in the agriculture and manufacturing sectors of Grenada. The chapter aims to quantify and qualify transport and various logistics costs incurred for imports and exports in relation to the three modes of transport. Reference is made using data from ITC. Examining supply chain networks includes identifying key customers, stakeholders and key cargo consolidation and distribution nodes as well as user requirements. The chapter also discusses the aspect of food security. Analysis of performance for the country is made with reference to the four pillars which are physical availability of food, economic and physical access to food, food utilisation, and stability over time of the aforementioned dimensions. Developments in food staples and considerations for alternative import sources are also addressed. With reference to **Figure 27,** chapters 5 and 6 of the report fulfils the requirements of objective (3) of the study.

Figure 27: Framework for Proposed Approach to the Study – Supply Chain Network Costs and Note on Food Security



Source: International Consultant.

6.1 SUPPLY CHAIN COSTS FOR SELECTED PRODUCTS

This section discusses the costs and duration of transport using cases from selected products and commodities in the agriculture and manufacturing sectors from Grenada. Respective selected products are:

Grenada	HS Code	Export/import value (USD mil)	Rank	Share
Nutmeg	0908	5.58	#1 Export	15.9%
Cocoa	1801	2.61	#4 Export	7.4%
Meat and edible offal	0207	12.11	#2 Import	2.7%

Grenada exported approximately 447.5 tonnes of cocoa beans at value of XCD4,743.5 million or USD1.76 million in 2020 [60] . This translates to roughly XCD10.60 or USD3.93 per kilogram of cocoa beans exported. Data from the International Trade Centre showed cocoa beans (according to HS Code 1801) to form the fourth biggest source exports for Grenada at USD2.61 million in 2021[61].

[60] Central Statistical Office Grenada (2023) Subjects [Online]. Available at: https://stats.gov.gd/ (Accessed 4 May 2023).
[61] International Trade Centre (2023) Trade Map [Online]. Available at: https://www.trademap.org/Index.aspx (Accessed 3 May 2023).

Table 17: Examples of Supply Chain Costs of Exporting Cocoa from Grenada

Supply Chain Segment	Supply Chain Cost for 1 FEU	Cost in XCD per kg
Farm gate to buying station	XCD50 per trip for load of 136 kg	About 0.37
Buying station to warehouse in St. George's	XCD300 per truck trip for load of 5,900 kg	About 0.05
Warehouse in St. George's to the port	XCD275-300 per truck trip for load of 5,900 kg	About 0.05
Weighing of cargo and stuffing of container at the port	XCD300 for container carrying 150 bags; XCD800 for container carry-ing 400 bags	About 0.03
Container lifting charge at the port	USD1,200 per FEU	About USD0.05 or XCD0.14
Shipping freight charge	USD3,000 per FEU	About USD0.125 or XCD0.34

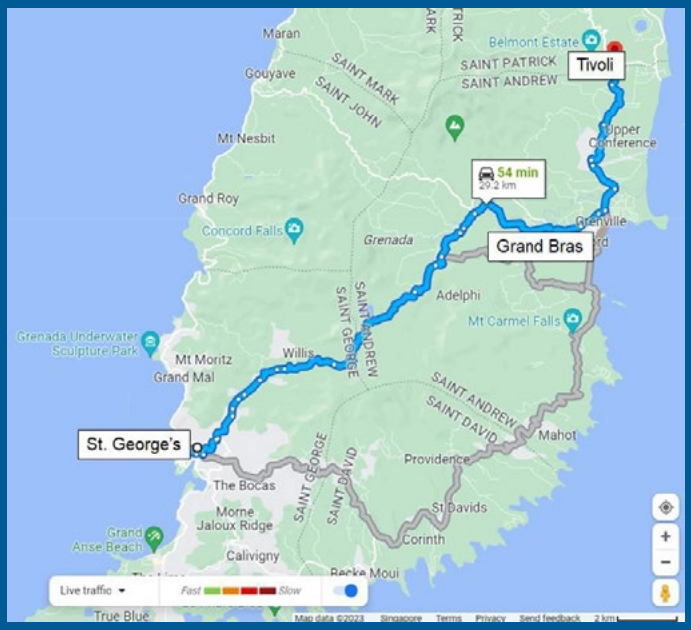
Source: International Consultant, using information provided by Grenada Cocoa Association[62].

Transport and handling costs associated with various segments of the supply chain process is shown in **Table 17**. The Grenada Cocoa Association exports about 12 FEUs per month through the port. The association provides services that include fermenting, drying, sorting, bagging and labelling for the commodity. The association purchases cocoa beans from farmers and does consolidation at their packhouses. With reference to the table, cocoa beans are collected from farms at a cost of XCD50 for each trip that bears a load of 300 pounds or about 136 kg.

The main buying station for cocoa beans is located at Grand Bras with another buying station located at Tivoli. Following the consolidation process, the product is transported using trucks from the buying stations to the warehouse in St. George's (see **Figure 28**). Transport distance from Tivoli to St. George's is about 30 km with the journey taking about an hour to complete. The distance from Grand Bras to the capital city is shorter at about 20 km and takes about 40 minutes. Transport is performed at a cost of XCD300 per truck trip, with each truck carrying 13,000 pounds or about 5,900 kg in weight of cocoa beans. The Grenada Cocoa Association shared that wet cocoa could do significant damage to the truck. Another issue which arose from meetings with stakeholders is that truck drivers may not be licenced to provide cargo transportation. Furthermore, connection of the trailer may not be properly done or the equipment is faulty, resulting in the trailer not "lighting up" when the vehicle breaks.

From the warehouse in St. George's, transportation to the port is performed using trucks with transport cost ranging from XCD275-300 for each truck trip. The same type of truck

Figure 28: Land Transport Route for Cocoa Exports in Grenada



Source: International Consultant, using map data from Google Maps.

which can carry 13,000 pounds or about 5,900 kg is used. At the port, the cargo is weighed using a top lifter, followed by stuffing of the container which is performed by stevedores. The cost of these operations ranges from XCD300 for a container carrying 150 bags to XCD800 for a container carrying 400 bags. The cargo is charged by number of bags handled at a fee of XCD2.00 for each bag. Shipping freight rate for a FEU container costs about USD3,000.

The table suggests the most expensive component of the supply chain to be transportation from farms to the buying stations. The cost per kilogram is the highest compared to other segments

[62]Information provided by Grenada Cocoa Association during face-to-face meeting held on 25 April 2023 at Lagoon Road Street in St. George's.

Table 18: Examples of Supply Chain Costs of Exporting Nutmeg from Grenada

Supply Chain Segment	Supply Chain Cost for 1 FEU	Cost in XCD per kg
Farm gate to buying station	XCD100 per trip for 227 kg load	About 0.44
Buying station to warehouse in St. George's	XCD500 per truck trip 4,500 kg load	About 0.11
Warehouse in St. George's to the port	XCD275-300 per truck trip for 4,500 kg load	About 0.06
Cargo weighing and con-tainer stuffing at the port	XCD375 for container carrying 250 bags	About 0.03
Container lifting charge at the port	USD1,200 per FEU	About USD0.10 or XCD0.26
Shipping freight charge	USD3,000-5,000 per FEU	About USD0.24-0.40 or XCD0.65-1.08

Source: International Consultant, using information provided by Grenada Cooperative Nutmeg Association[63].

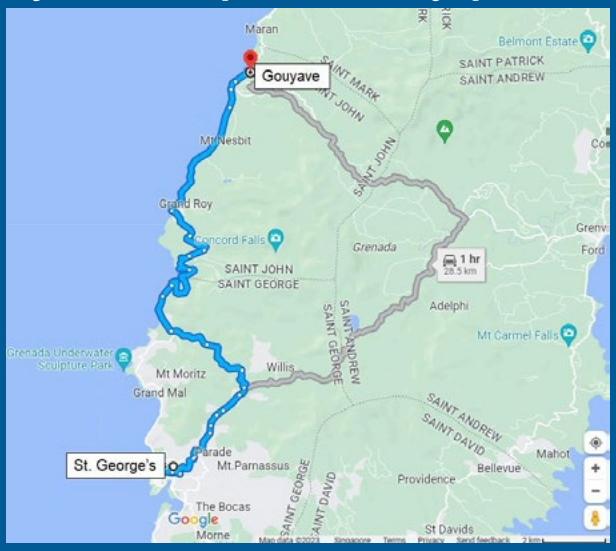
of the supply chain. This is attributed to the state of farm roads which can become difficult to use during the rainy season. The association suggested improvement to farm roads can help to reduce the cost of transportation. The second most expensive segment of the supply chain is the sea transport leg. Having more alternative shipment providers may help to address the high freight charges in this area.

For nutmegs, Grenada exported an estimated 634.5 tonnes of the commodity in 2020 with total value of XCD10.7 million[64]. This translates to roughly XCD16.9 or USD6.24 for each kilogram of nutmeg exported. Data from the International Trade Centre showed that exports of the commodity (according to HS Code 0908) reached USD5.58 million in 2021[65]. These products account for the biggest source of exports for Grenada taking a 15.9% share. Transport and handling cost for with various segments of the supply chain process is shown in **Table 18**.

The Grenada Cooperative Nutmeg Association (GCNA) exports about 6 to 8 FEUs of the commodity per month through the Port of St. George's. The association provides drying, sorting, bagging, and labelling for the commodity. The first leg of the export process involves farmers sending the commodity to the buying station at Gouyave for consolidation (see **Figure 29**). Transporting the product from farm gate to the buying station is estimated at XCD100 for a load of 500 pounds or 227 kg. From the buying station, trucks are used to transport nutmegs to the warehouse in St. George's at a cost of XCD500 per truck trip. Each truck can load 10,000 pounds or about 4,500 kg. The journey of about 22 km will take approximately 45 minutes. From the warehouse, the same trucks can be used to send the nutmeg to the port. Transport cost for this segment ranges from XCD275-300 for each truck trip. When the cargo reaches the port, weighing and stevedoring costs about XCD375 for 250 bags totalling 12,500 kg. Shipping freight charges ranges from USD3,000 to USD5,000 per FEU.

For nutmeg exports, the biggest cost component on a per kilogram basis would be shipping charges. Addressing this issue will require developing shipping connectivity where alternative service providers are available. If we consider the distance of transportation involved, the largest cost component in the supply chain for nutmeg exports would be the segment from farm gate to the buying station. Cost per kilogram of nutmeg transported is estimated at about XCD0.44. Addressing the cost issue may require improvements to farm roads.

Figure 29: Land Transport Route for Nutmeg Exports in Grenada



Source: International Consultant, using map data from Google Maps.

[63] Information provided by Grenada Cocoa Association during face-to-face meeting held on 25 April 2023 at Lagoon Road Street in St. George's.
[64] Central Statistical Office Grenada (2023) Subjects [Online]. Available at: https://stats.gov.gd/ (Accessed 4 May 2023).
[65] International Trade Centre (2023) Trade Map [Online]. Available at: https://www.trademap.org/Index.aspx (Accessed 3 May 2023).

Table 19: Examples of Supply Chain Costs for Importing Meat and Edible Offal to Grenada*

Supply Chain Segment	Supply Chain Cost for 1 FEU	Cost in XCD per kg
Ocean transportation from the US (CIF)	USD12,007	XCD1.62 or USD0.60
Container lifting charge at the port	USD1,200	XCD0.16 or USD0.06
Reefer charge at the port (per day)**	USD157	XCD0.02 or USD0.01
Brokerage fee	USD445	XCD0.06 or USD0.02
Customs inspection (conducted at own premise; includes transport and overtime)	USD148	XCD0.02 or USD0.01
Trucking port to warehouse in St. George's	USD260	XCD0.04 or USD0.01

*Source: National Consultant and International Consultant, using information provided by a supermarket chain in Grenada. * Assuming payload of 20 tonnes.*

*** Assuming container stays at the port for only one day.*

Supply chain costs for the product meat and edible offal is presented in **Table 19**. The product constitutes the second biggest import item based on the HS Code 0207 obtained from the International Trade Centre[66]. Grenada imported USD12.1 million worth of the product in 2021, accounting for 2.7% of total imports. With reference to the table, the largest cost component is ocean transportation from a port that is located in the US. Assuming a payload of 20,000 kg for one forty-foot reefer container, the transportation cost works out to be roughly USD0.60 or XCD1.62 per kilogram of poultry meat shipped.

If the shipment is performed using the vessels Tropic Island or Tropic Jewel, it will take about seven days to reach the Port of St. George's from Palm Beach in Florida USA. With reference to **Figure 30,** the vessels take fourteen days to complete the loop and be back at Palm Beach. Interestingly, the vessel sails directly from Castries in Saint Lucia to Point Lisas in Trinidad and Tobago before turning back to call at the Port of St. George's. This incurs an additional day of sailing time. As with the situation faced by exports of cocoa and nutmeg, addressing the issue of high shipping freight charges will require having alternative shipping service providers. The remaining charges shown in the table amounted to XCD0.30 or USD0.11. This is only a fraction of the supply chain cost involved for ocean transportation. Note that there are no charges reflected for container stripping as the work is performed by employees of the consignee.

Figure 30: Sailing Route and Port-of-Rotation for Tropic Island

Source: International Consultant, using information from MarineTraffic (2023)[67]; map data from Google Maps.(2023)67; map data from Google Maps.

Discussions with the local logistics community further suggest that supermarket deliveries should be conducted in the morning at 4-6 am or in the evenings at 7-9 pm to avoid adding to traffic congestion on the roads. This will also require shift system to be adopted at the port as current normal working hours by stevedores are weekdays from 8:00am to 4:00pm.

[66] International Trade Centre (2023) Trade Map [Online]. Available at: https://www.trademap.org/Index.aspx (Accessed 3 May 2023).
[67] MarineTraffic (2023) St George's Port [Online]. Available at: https://www.marinetraffic.com/en/ais/details/ports/2742?name=ST-GEORGES&country=Grenada (Accessed 30 March to 2 May 2023).

6.2 ANALYSIS OF PERFORMANCE IN FOOD SECURITY

The analysis is conducted with reference to Saint Lucia and Grenada. It takes reference to the interpretation of food security based on the 1996 World Food Summit which was held at the headquarters of the Food and Agriculture Organisation of the United Nations in Rome Italy[68]. Following from the Summit, food security is defined to exist *"when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."* There are four key dimensions or pillars of food security. These are:

a. Physical availability of food
b. Economic and physical access to food
c. Food utilisation
d. Stability over time of the above three dimensions

The state of food insecurity can be further distinguished by "chronic food insecurity" and "transitory food security" (see **Table 20**). Between the two states of food insecurity, chronic food security follows a sequence of known events and is usually predictable. By comparison, transitory food insecurity can be associated with cropping patterns, disease, seasonal fluctuations in the climate, and work environments. Although transitory food insecurity is of limited duration, it can also be cyclical as there can be a recurrent pattern of inadequate access to food and its availability.

We shall consider a selection of performance indicators that pertain to each of the four pillars for Grenada and Saint Lucia. The pillars are chosen based on availability and relevance of data for both countries.

The first pillar considers physical availability of food. Specifically, the pillar addresses food security from the supply aspects. Physical availability of food is determined by food production levels, stock levels and net trade. Performance of selected indicators for the pillar of physical availability of food for Grenada and Saint Lucia is presented in **Table 21**.

The table shows dependence on imports for various food items which include seafood, fruits and vegetables, eggs, and food.

Table 20: State of Food Insecurity

	Chronic Food Insecurity	Transitory Food Insecurity
is...	long-term or persistent	short-term and temporary
occurs when...	people are unable to meet their minimum food requirements over a sustained period of time.	there is a sudden drop in the ability to produce or access enough food to maintain a good nutritional status.
results from...	extended periods of poverty, lack of assets and inadequate access to productive or financial resources	short-term shocks and fluctuations in food availability and food access, including year-to-year varioations in domestic food production, food prices and household incomes.
can be overcome with...	typical long term development measures also used to address poverty, such as education or access to productive resources, such as credit. The may also need more direct access to food to enable them to raise their productive capacity.	transitory food insecurity is relatively undpredictable and can emerge suddenly. This makes planning and programming more difficult and requires different capacities and types of intervention, including early warning capacity and saget net programmes (see Box1).

Source: Food and Agriculture Organisation (2008)[69].

Of these food items, both countries are largely self-sufficient on eggs with very little amounts imported. In contrast, dependence on vegetable imports is relatively high for both countries at more than 70%. Grenada has a lower dependency on seafood and in particular for fish compared to Saint Lucia. As a whole, Saint Lucia has a higher dependency on imported food compared to Grenada. Nonetheless, Grenada saw food imports forming 24.0% of merchandise imports whereas the comparative figure is significantly lower at 10.4% for Saint Lucia. For Saint Lucia, food imports came from more than 82 countries whereas the comparative number for Grenada is more than 50.

Data from The Observatory of Economic Complexity showed that the largest food import item for Saint Lucia in 2021 was poultry[70]. The country imported USD667 million worth of poultry which accounted for 19.0% of total imports. 97.8% of poultry imported came from Brazil. Bovine meat (i.e., beef) frozen or otherwise formed the second largest food import totalling USD185 million or 5.3% share. 98.3% of the product

[68] Food and Agriculture Organisation (1996) 'Report of the World Food Summit', World Food Summit, 13- 17 November [Online]. Available at: https://www.fao.org/3/al936e/al936e00.pdf (Accessed 18 May 2023).
[69] Food and Agriculture Organisation (2008) 'Introduction to the Basic Concepts of Food Security', FAO Food Security Programme [Online]. Available at: https://www.fao.org/3/al936e/al936e00.pdf (Accessed 18 May 2023).
[70] The Observatory of Economic Complexity (2023) Saint Lucia [Online]. Available at: https://oec.world/en/profile/country/lca?yearlyTradeFlowSelector=flow1 (Accessed 15 May 2023).

Table 21: Performance for Selected Indicators to Physical Availability of Food

Indicator	Grenada	Saint Lucia
Local production and landings of seafood (2021, tonnes)	*2,700*	*1,386*
Percentage of seafood imported (2021, %)	20.6	62.7
Percentage of fruits and vegetables imported (2021, %)	*>70.0*	*>80.0*
Percentage of eggs imported (2021, %)	2.1	*<1.0*
Percentage of food imported (2020, %)	*70.0*	*>90.0*
Food imports as % of merchandise imports (2021, %)	24.0	*10.4*
Number of countries and territories from which food is imported (2019)	>50	>82
Total arable land (2020, hectares)	3,000	*17,360*
Arable land in hectares per person (2020)	0.02	*0.45*
Arable land as percentage of total land area (2020, %)	8.8	*8.2*
Employment in agriculture as % of total employment (2021, %)	11.5	*16.9*

Source: National Consultants and International Consultant, using information from various sources including The World Bank (2023)[71], Central Statistical Office Grenada (2023) [72] , Central Statistical Office Saint Lucia (2023) [73] , Food and Agriculture Organisation (2023)[74], and International Trade Centre (2023)[75]. Figures in italics depict estimates.

was imported from Brazil. The third largest food-related import was soybeans at USD172 million or 4.9% of imports which came entirely from Brazil. If we look at other major food-related imports by Saint Lucia which are corn and wheat (2.6% and 2.3% of total imports respectively), more than 98% of these products are imported from Brazil. The evidence from imports of major food items for Saint Lucia thus reveals a high dependence on Brazil, reaching more than 98% in many cases.

For Grenada, data from The Observatory of Economic Complexity also showed poultry meat to be the largest food item imported in 2021[76]. Imports of poultry meat totalled USD12.7 million or 2.8% of all imports. 61.2% of poultry meat came from Brazil with another 23.2% coming from the US. Corn formed the second largest food-related item imported at USD6.1 million with 95.9% of the commodity coming from the US. Other key food-related items imported include soybeans and wheat which are entirely from the US. Combined value of these items reached USD8.6 million or 1.9% of imports. We also note that Grenada exported sizeable amounts of fruits and fresh fish with the US being the primary destination. The data thus indicates that Grenada's food trade has close relations to the US although the country also imports from other sources in Europe and South America.

The other indicators relating to physical availability of food, the table show Saint Lucia to have more than five times the amount of arable land at 17,360 hectares compared to 3,000 hectares in Grenada. Measured on per capita basis, this translated to Saint Lucia having 22.5 times more arable land per person than Grenada. Arable land made up 8.2% and 8.8% of total land area in Saint Lucia and Grenada respectively. As for employment numbers, Saint Lucia saw employment in agriculture reaching 16.9% of total employment. The comparative figure for Grenada was lower at 11.5%.

The second pillar considers economic and physical access to food. The pillar recognises having adequate supply of food at both the national and international levels does not guarantee food security at the household level. Awareness of insufficient food access saw greater policy attention on the aspects of income, expenditure, prices and markets in achieving food security objectives. Performance of selected indicators for the pillar of economic and physical access to food is presented in **Table 22**.

[71] The World Bank (2023a) World Development Indicators [Online]. Available at: https://datatopics.worldbank.org/world-development-indicators/ (Accessed 3 May 2023).
[72] Central Statistical Office Grenada (2023) Subjects [Online]. Available at: https://stats.gov.gd/ (Accessed 4 May 2023).
[73] Central Statistical Office of Saint Lucia (2023) Data [Online]. Available at: https://stats.gov.lc/data/data- tables/ (Accessed 4 May 2023).
[74] Food and Agriculture Organisation (2023) FAOSTAT [Online]. Available at: https://www.fao.org/faostat/en/#data/FS (Accessed 18 May 2023).
[75] International Trade Centre (2023) Trade Map [Online]. Available at: https://www.trademap.org/Index.aspx (Accessed 3 May 2023).
[76] The Observatory of Economic Complexity (2023) Grenada [Online]. Available at: https://oec.world/en/profile/country/grd?yearlyTradeFlowSelector=flow1 (Accessed 15 May 2023).

Table 22: Performance for Selected Indicators to Economic and Physical Access to Food

Indicator	Grenada	Saint Lucia
Prevalence of moderate or severe food insecurity in the total population (%, 3-year average for 2019-2021)	22.3	***22.2***
Prevalence of severe food insecurity in the total population (%, 3-year average for 2019-2021)	*7.5*	***4.5***
Absolute poverty rate (2021, %)	11.0	***18.7***
Relative poverty rate (including housing costs) (2021, %)	33.0	***22.5***
Meal at an inexpensive restaurant (2022, XCD)	22.50	20.00
Meal at KFC (or equivalent fast-food combo meal) (2022, XCD)	17.50	21.60
Water (0.33 litre bottle) (2022, XCD)	2.00	2.37
Milk (regular 1 litre) (2022, XCD)	6.00	6.12
Loaf of fresh white bread (500g) (2022, XCD)	5.00	2.62
Rice (white, 1 kg) (2022, XCD)	4.50	4.98
Eggs (regular, 12) (2022, XCD)	12.00	8.60
Chicken fillets (1 kg) (2022, XCD)	23.21	29.14
Banana (1 kg) (2022, XCD)	6.64	4.99
Potato (1 kg) (2022, XCD)	4.50	11.55
Average monthly household expenditure on food (2021, XCD)	800.0	***867.2***
Percentage of monthly household expenditure on food (2021, %)	60.0	***30.3***
Consumer Price Index for food (2022, %)	6.5%	*7.8%*
GDP per capita (current local currency) (2021, XCD)	24,329	25,418
GDP per capita (PPP, current international dollar) (2021)	15,038	14,332
Human Development Index (2021)	0.739	*0.747*
Farmer annual income (2021, XCD)	***23,600***	***33,600***

Source: National Consultants and International Consultant, using information from various sources including Food and Agriculture Organisation (2023)[77], United Nations (2023)[78], and Numbeo (2023a[79]; 2023b[80]). Figures in italics depict estimates.

The table showed that prevalence of moderate or severe food insecurity in the total population was almost the same at about 22% for Grenada and Saint Lucia over the period 2019 to 2021. Nonetheless, prevalence of severe food insecurity was significantly higher in Grenada at 7.5% of the total population relative to 4.5% for Saint Lucia. Absolute poverty rate for Saint Lucia was estimated at 18.7% while Grenada's number stood at 11.0%. However, including housing costs for Grenada would raise the country's poverty rate to 33.0% of the population compared to 22.5% for Saint Lucia.

Analysis of cost of common food items in both countries revealed a mixed scene. While the cost of a meal at an inexpensive restaurant was higher in Grenada, the cost of a fast-food meal was comparatively cheaper in the country relative to Saint Lucia. We noted water, rice, chicken fillets and potato to be more expensive in Saint Lucia compared to Grenada. On the other hand, a loaf of fresh white bread, eggs and bananas was cheaper in Saint Lucia. The price of milk was found to be almost the same in both countries. In any case, the pressure on food security at the household level is likely to be much higher in Grenada with 60% of monthly household expenditure spent on food. By comparison, monthly spending on food accounted for 30.3% of household expenditure in Saint Lucia. We also noted both countries to have approximately the same levels of GDP per capita (measured at current prices or Purchasing Power Parity (PPP) using international dollars) and human development although food price inflation was slightly higher in Saint Lucia at 7.8% relative to 6.5% seen for Grenada in 2021. We also saw that annual income for farmers in Saint

[77] Food and Agriculture Organisation (2023) FAOSTAT [Online]. Available at: https://www.fao.org/faostat/en/#data/FS (Accessed 18 May 2023).
[78] United Nations (2023) Human Development Index (HDI) [Online]. Available at: https://hdr.undp.org/data-center/human-development-index#/indicies/HDI (Accessed 18 May 2023).
[79] Numbeo (2023a) Cost of Living in Castries [Online]. Available at: https://www.numbeo.com/cost-of- living/in/Castries-Saint-Lucia (Accessed 3 May 2023).
[80] Numbeo (2023b) Cost of Living in St. George's [Online]. Available at: https://www.numbeo.com/cost-of- living/in/St-George%27s (Accessed 3 May 2023).

Lucia was considerably higher at XCD33,600. On average, a farmer in Saint Lucia would be earning 1.4 times the income of a farmer in Grenada.

The third pillar considers the aspect of food utilisation. Utilisation is understood as the manner where the body makes the most of different nutrients contained in the food. Adequate nutrient and energy intake by the individual are the result of good food preparation, care and feeding practices, intra-household distribution of food, and diversity of the diet. When we consider the good biological utilisation of food consumed, the nutritional status of individuals can be determined. Performance of selected indicators for the pillar of food utilisation is presented in **Table 23**.

Looking at the selected indicators for food utilisation, Grenada and Saint Lucia had roughly the same percentage of people using at least basic drinking water services. The figures were 95.6% and 96.9% for Grenada and Saint Lucia respectively. However, the table showed that Grenada has significantly higher levels of anaemia in children aged below five years, and women. For example, anaemia in children was 1.5 times higher in Grenada compared to Saint Lucia. Anaemia in non-pregnant women and women of reproductive age was 1.6 times higher in Grenada as well when compared to Saint Lucia. The table also showed prevalence of underweight in adults aged 18 years and over to be 2.4 times higher for females in Grenada compared to Saint Lucia. The same metric measured for adult males was 1.6 times higher in Grenada than Saint Lucia.

For prevalence of thinness in children and adolescents aged 5-19 years, Saint Lucia saw 9.2% of its girl population affected while the comparative figure for Grenada is slightly lower at 8.1%. For boys however, Grenada had a higher figure with 11.6% of its boy population affected. The figure for Saint Lucia was 8.6%. As for infant and neonatal mortality rate, the indicators showed Saint Lucia to register higher rates compared to Grenada. Using the example for 2021, infant mortality rate in Saint Lucia was 22.4 per 1,000 live births while the same metric for Grenada was 16.0 per 1,000 live births. Similarly for neonatal mortality rate, Saint Lucia saw 13.0 cases per 1,000 live births while Grenada's figure stood at 10.0 cases per 1,000 live births.

Table 23: Performance for Selected Indicators to Food Utilisation

Indicator	Grenada	Saint Lucia
People using at least basic drinking water services (2019, % of population)	***95.6***	***96.9***
Vitamin and mineral deficiencies: Anaemia in children <5 years (Hb<110 g/L) (2019, %)	***34.0***	***22.5***
Vitamin and mineral deficiencies: Anaemia in non-pregnant women (Hb<120 g/L) (2019, %)	***23.3***	***14.2***
Vitamin and mineral deficiencies: Anaemia in pregnant women (Hb<110 g/L) (2019, %)	***27.5***	***19.1***
Vitamin and mineral deficiencies: Anaemia in women of reproductive age (2019, %)	***23.5***	14.3
Vitamin and mineral deficiencies: Anaemia in women aged 15 to 49 (2019, %)	19.2	14.3
Adult nutrition status and disease: prevalence of underweight in adults aged 18 years and over (2019, %)	Female: 9.1 Male: 8.1	***Female: 3.8*** ***Male: 5.2***
Child and adolescent nutrition status: prevalence of thinness in children and adolescents aged 5-19 years (2019, %)	Girls: 8.1 Boys: 11.6	***Girls: 9.2*** ***Boys: 8.6***
Infant mortality rate (per 1,000 live births) (2021)	***16.0***	22.4
Neonatal mortality rate (per 1,000 live births) (2021)	***10.0***	13.0

Source: National Consultants and International Consultant, using information from various sources including World Health Organisation (2023)[81], Global Nutrition Report (2023) [82] , and Food and Agriculture Organisation (2023) [83] . Figures in italics depict estimates.

[81] World Health Organisation (2023) Nutrition Landscape Information System (NLiS) [Online]. Available at: https://apps.who.int/nutrition/landscape/nlis (Accessed 18 May 2023).
[82] Global Nutrition Report (2023) Country Nutrition Profiles [Online]. Available at: https://globalnutritionreport.org/resources/nutrition-profiles/ (Accessed 18 May 2023).
[83] Food and Agriculture Organisation (2023) FAOSTAT [Online]. Available at: https://www.fao.org/faostat/en/#data/FS (Accessed 18 May 2023).

Table 24: Performance for Selected Indicators to Stability of Other Three Dimensions Over Time

Indicator	Grenada	Saint Lucia
Cereal import dependency ratio (%, 3-year average for 2017-2019)	100.0	100.0
Food imports as % of merchandise imports (2021, %)	24.0	***10.4***
Consumer price inflation (2022, %)	4.5	6.4
Consumer Price Index for food (2022, %)	6.5	*7.8*
Percent of arable land equipped for irrigation %, 3-year average for 2017-2019)	66.7	100.0
Unemployment rate (2021, %)	21.0	15.1
Risk of strikes, riots and civil commotion (2021)	3.7 (low risk)	3.2 (low risk)
Risk of terrorism (2021)	1.6 (very low risk)	1.5 (very low risk)
Risk of war and civil war (2021)	1.7 (very low risk)	1.8 (very low risk)
Country economic risk (2021)	*5.2* (medium risk)	*5.1* (medium risk)
Currency inconvertibility and transfer risk (2021)	3.7 (low risk)	3.4 (low risk)
Sovereign credit risk (2021)	*7.2* (high risk)	6.0 (medium risk)
Lack of adaptive capacities – related to future natural events and climate change (2021)	***38.1 (medium risk)***	40.0 (medium risk)
Exposure of population to natural hazards (earthquakes, hurricanes, floods, droughts, sea-level rise) (2021)	***0.3 (very low risk)***	9.8 (low risk)

Source: National Consultants and International Consultant, using information from various sources including The World Bank (2023)[84], Marsh (2023)[85], and United Nations Office for the Coordination of Humanitarian Affairs (OCHA) (2023)[86]. Figures in italics depict estimates.

The fourth pillar analyses stability of the aforementioned three dimensions over time. The pillar highlights the fact that even if food intake by the individual is adequate today, the person can still be considered as food insecure if there is insufficient access to food on a periodic basis. Thus, there is risk of deterioration of the person's nutritional status. Political instability, adverse weather conditions, or economic factors such as rising food prices and unemployment, may impact on food security status. Performance of selected indicators for the pillar of stability to the other three dimensions over time is presented in **Table 24**.

The table revealed both Grenada and Saint Lucia to be entirely dependent on overseas imports for cereals. We also saw from earlier analysis that cereal imports for Saint Lucia came largely from Brazil while those for Grenada were mainly from the US. The exception was imports of rice for Grenada where 83.8% of the product was imported from Guyana. Grenada was seen to have food imports accounting for a larger share of the country's merchandise imports compared to Saint Lucia. For 2021, food imports as a share of merchandise imports for Grenada stood at 24.0%, more than double the figure of 10.4% for Saint Lucia.

In terms of price inflation, we saw Saint Lucia to experience higher levels of price increase with 7.8% registered for food and 6.4% for overall CPI. The figures for Grenada in the same year were 6.5% and 4.5% respectively. The table also showed that Saint Lucia had all of its arable land that equipped for irrigation while Grenada only had two-thirds of its arable land equipped. The rate of unemployment was also relatively higher in Grenada at 21.0% in 2021 compared to 15.1% in Saint Lucia. Even so, unemployment rate in Saint Lucia is considered to be high when compared to the world average figure of 6.2%.

If we consider the set of indicators measuring various risks that could impact on food security, both countries generally had risk ratings ranging from medium to very low levels. For example, risks of terrorism, war, civil war, strikes, riots and civil commotion was given the rating of low or very low for Grenada and Saint Lucia. Both countries received a medium risk rating for country economic risk. The risk of lacking in adaptive capacities relating to future natural events and climate change was also given a medium risk rating for both countries. The risk of currency inconvertibility and transfer risk was seen to be low, as with the risk of the population being exposed to natural hazards such as earthquakes and hurricanes. The only exception would be sovereign credit risk for Grenada which was given a high risk rating whereas Saint Lucia received a medium risk rating. Sovereign credit risk is the risk where the government becomes unable or unwilling to meet its loan obligations.

[84] The World Bank (2023a) World Development Indicators [Online]. Available at: https://datatopics.worldbank.org/world-development-indicators/ (Accessed 3 May 2023).
[85] Marsh (2023) Political Risk Map 2021 [Online]. Available at: https://www.marsh.com/sg/services/political-risk/insights/political-risk-map-2021.html (Accessed 18 May 2023).
[86] United Nations Office for the Coordination of Humanitarian Affairs (2023) World Risk Report 2021 [Online].
Available at: https://reliefweb.int/report/world/worldriskreport-2021-focus-social-protection (Accessed 18 May 2023).

6.3 DEVELOPMENTS IN FOOD STAPLES AND CONSIDERATIONS FOR ALTERNATIVE IMPORT SOURCES

Food staples form the cornerstone of food security. Food staples constitute the dominant part of the diet of the population. They are consumed regularly, usually daily, and provide the major proportion of an individual's nutritional and energy needs. Food staples can vary from place to place. For most communities and places, food staples are likely to comprise one or more of the following food crops which are cassava, corn (maize), rice, plantains, potatoes, millet, sorghum, soybeans, sweet potatoes, yams and taro[87]. Of these food items, corn, wheat and rice provide 60% of global food energy intake.

With reference to **Table 25**, exports of coarse grains formed the biggest segment of the global grain trade. 237 million tonnes of coarse grains were exported in the period October 2021 to September 2022. Looking within the trade, corn took up a share of 81.7% at 193 million tonnes. The largest exporting countries were the US (63 million tonnes or 32.5% share), followed by Argentina (39 million tonnes or 20.1%) and Brazil

Table 25: Global Grain Trade

Commodity	Exports	Million Metric Tonnes	Global Share
Coarse Grains	Total	236.77	100.0%
Corn	**Total for Corn**	**193.49**	**100.0%**
(Oct 2021-Sep 2022)	1. USA	62.98	32.5%
	2. Argentina	38.85	20.1%
	3. Brazil	31.92	16.5%
	4. Ukraine	26.98	13.9%
	5. EU	6.03	3.1%
	Others	32.76	16.9%
Barley	**Total for Barley**	**28.50**	**100.0%**
(Oct 2021-Sep 2022)	1. Australia	8.23	28.9%
	2. EU	6.36	22.3%
	3. Argentina	3.77	13.2%
	4. Russia	3.10	10.9%
	5. Ukraine	2.71	9.5%
	Others	4.33	15.2%
Sorghum	**Total for Sorghum**	**11.78**	**100.0%**
(Oct 2021-Sep 2022)	1. USA	7.35	62.4%
	2. Australia	2.27	19.3%
	3. Argentina	1.80	15.3%
	Others	3.6	3.0%
Wheat, Flour and Products	Total	205.42	100.0%
(Jul 2021-Jun 2022)	1. Russia	33.00	16.1%
	2. EU	32.00	15.6%
	3. Australia	25.96	12.6%
	4. USA	21.50	10.5%
	5. Argentina	18.84	9.2%
	Others	74.11	36.1%
Rice	Total	56.11	100.0%
(Jan 2022-Dec 2022)	1. India	22.12	39.4%
	2. Thailand	7.68	13.7%
	3. Vietnam	7.05	12.6%
	4. Pakistan	4.53	8.1%
	5. Myanmar	2.34	4.2%
	6. USA	2.18	3.9%
	Others	10.22	18.2%

Source: International Consultant, using information from US Department of Agriculture Foreign Agricultural Service (2023)[88].

[87] Food and Agriculture Organisation (2023) Staple foods: What do people eat? [Online]. Available at: https://www.fao.org/3/u8480e/u8480e07.htm (Accessed 18 May 2023).
[88] US Department of Agriculture Foreign Agricultural Service (2023) Grain: World Markets and Trade, May [Online].
Available at: https://www.fas.usda.gov/data/grain-world-markets-and-trade (Accessed 18 May 2023).

(32 million tonnes or 16.5%). The top three countries active in the trade are located in the Americas where they accounted for almost 70% of total corn exports in the world. We saw from the previous section that corn imports by Grenada are almost entirely from the US. If we consider the aspect of import diversification for corn, other major sources of import which could be explored will be Argentina in South America and countries in Europe. Other types of coarse grains exported include Barley and Sorghum. Argentina is a major exporter of these commodities while the US was the top exported of Sorghum.

Turning to wheat, the table shows 205 million tonnes of the commodity and its products exported between July 2021 and June 2022. Major exporting countries were Russia (33 million tonnes or share of 16.1%), the EU (32 million tonnes or 15.6%), Australia (26 million tonnes or 12.6%), the US (21.5 million tonnes or 10.5%), and Argentina (19 million tonnes or 9.2%). The US, which was ranked as the fourth biggest exporter of wheat, flour and products in the world, is a key supplier to Grenada. The US accounted for 100% of wheat and 39% of wheat flour imported by Grenada in 2021[89]. For the case of wheat flour, Saint Vincent and the Grenadines is the biggest source of supply where the country accounted for 48.5% of imports for this product by Grenada. The other key import source for Grenada is Saint Lucia at 11.5% share. Note that Saint Vincent and the Grenadines is a member of CARICOM which means the commodity is imported duty free for Grenada. Grenada is entirely dependent on overseas imports of wheat and its products as neither country produces this commodity. Diversification of wheat imports could consider other major exporting countries and regions which include the EU (second-biggest exporter), Argentina (5th), and Canada (ranked 7th).

Rice is also an important source of food in Grenada. Global trade in rice totalled 56 million tonnes in 2021 with the biggest exporters mainly coming from South and Southeast Asia. India was the biggest exporter with 22 million tonnes or global share of 39.4%. This was followed by Thailand (7,7 million tonnes or 13.7%), Vietnam (7.1 million tonnes or 12.6%), Pakistan (4.5 million tonnes or 8.1%) and Myanmar (2.3 million tonnes or 4.2%). The US was ranked in the sixth position with 2.2 million tonnes exported i 2021. Other major rice exporters in the Americas were Brazil (ranked 9th with 1.4 million tonnes or global share of 2.6%), Uruguay (#10 with 982,000 tonnes or 1.8%), Paraguay (#11 with 752,000 tonnes or 1.3%), Argentina (#12 with 402,000 tonnes or 0.7%), and Guyana (#14 with 358,000 tonnes or 0.6%). Guyana is a key supplier of rice to Grenada, accounting for 83.8% of rice imports in 2021. Guyana is a member of the CARICOM which also means that the commodity is imported duty free for Grenada. Given the importance of rice in the local diet, considerations for import diversification could evaluate alternative sources of supply which may include major exporting countries in the region such as the US, Uruguay, Paraguay, and Argentina. Alternative import sources may also consider countries in South Asia or Southeast Asia.

The commodity of soybeans also constitutes a major source of food supply. With reference to **Table 26**, the world saw 154 million tonnes of soybeans exported in 2021/2022. If we include soybean meal and soybean oil, total volume of exports increases to 235 million tonnes. Major exporting countries for these products are Brazil, the US and Argentina. For the soybean trade, Brazil and the US dominated the global market by accounting for 89.4% of total exports. In the case for soybean meal, the top three exporting countries of Argentina, Brazil and the US made up 67.4% share of the export trade. For soybean oil, Argentina and Brazil made up 59.5% of total exports with the EU taking the third position with 7.9% of global exports.

The fertile soil and climate of Grenada and Saint Lucia makes both countries suitable for growing crops such as yams, plantains, sweet potatoes, cassava, and breadfruit. For Saint Lucia, discussions with the Ministry of Foreign Affairs, International Trade, Civil Aviation and Diaspora Affairs suggest that green bananas can be seen as an important local staple as the country has self- sufficiency on this item[90]. This is followed by plantains. Green bananas have very quick snap back period to allow for regrowth after a major storm or hurricane. More importantly, green bananas can be grown year-round. For sweet potato, dasheen, and yam, these are root crops that offer a good source of complex carbohydrates, fibre, and vitamins. They are often boiled, mashed, or roasted and served as a side dish or in stews. The region's vulnerability to storms and hurricanes presents theses crops as viable options for food security purposes [91] . In the case for Grenada, the root crops are also grown locally. Small quantities are imported from Saint Vincent and the Grenadines during shortages.

[89]The Observatory of Economic Complexity (2023) Saint Lucia [Online]. Available at: https://oec.world/en/profile/country/lca?yearlyTradeFlowSelector=flow1 (Accessed 15 May 2023).
[90] Information provided by Saint Lucia Ministry of Foreign Affairs, International Trade, Civil Aviation and Diaspora Affairs during a face-to-face meeting held on 17 April 2023 at the organisation's office at The Baywalk Rodney Bay in Gros Islet.
[91] Mc Dowell, C.E. (2019) 'Cathy Advises from Taiwan on St Lucia's Food Security', The Star, 16 June [Online]. Available at: https://stluciastar.com/cathy-advises-from-taiwan-on-st-lucias-food-security/ (Accessed 10 May 2023).

Table 26: Global Soybeans Trade

Commodity	Exports	Million Metric Tonnes	Global Share
Soybeans	Total	154.02	100.0%
(2021/2022)	1. Brazil	79.06	51.3%
	2. USA	58.72	38.1%
	3. Canada	4.28	2.8%
	4. Argentina	2.86	1.9%
	5. Paraguay	2.27	1.5%
	Others	6.81	4.4%
Soybean Meal	Total	68.75	100.0%
(2021/2022)	1. Argentina	26.59	38.7%
	2. Brazil	20.21	29.4%
	3. USA	12.27	17.8%
	4. Paraguay	2.08	3.0%
	5. Bolivia	1.27	1.8%
	Others	6.34	9.2%
Soybean Oil	Total	12.24	100.0%
(2021/2022)	1. Argentina	4.87	39.8%
	2. Brazil	2.41	19.7%
	3. EU	0.97	7.9%
	4. Bolivia	0.51	4.2%
	5. Russia	0.48	3.9%
	Others	3.00	24.5%

Source: International Consultant, using information from US Department of Agriculture Foreign Agricultural Service (2023)[92].

Table 27: Global Trade in Chicken Meat, Pork, and Beef and Veal

Commodity	Exports	Million Metric Tonnes	Global Share
Chicken Meat	Total	13.54	100.0%
(2022, ready to cook equivalent)	1. Brazil	4.45	32.9%
	2. USA	3.32	24.5%
	3. EU	1.74	12.8%
	4. Thailand	1.02	7.5%
	5. Turkey	0.58	4.3%
	Others	2.44	18.0%
Beef and Veal	Total	12.04	100.0%
(2022, carcass weight equivalent)	1. Brazil	2.89	24.1%
	2. USA	1.60	13.3%
	3. India	1.44	12.0%
	4. Australia	1.24	10.3%
	5. Argentina	0.82	6.8%
	Others	4.03	33.5%
Pork	Total	10.95	100.0%
(2022, carcass weight equivalent)	1. EU	4.18	38.2%
	2. USA	2.88	26.3%
	3. Canada	1.41	12.9%
	4. Brazil	1.32	12.0%
	5. Mexico	0.28	2.6%
	Others	0.88	8.1%

Source: International Consultant, using information from US Department of Agriculture Foreign Agricultural Service (2023)[93].

[92] US Department of Agriculture Foreign Agricultural Service (2023) Oilseeds: World Markets and Trade, May [Online]. Available at: https://apps.fas.usda.gov/psdonline/circulars/oilseeds.pdf (Accessed 18 May 2023).
[93] US Department of Agriculture Foreign Agricultural Service (2023) Livestock and Poultry: World Markets and Trade, April [Online]. Available at: http://www.fas.usda.gov/psdonline/circulars/livestock_poultry.pdf (Accessed 18 May 2023).

For meat products, poultry form the biggest segment of meat imports by Grenada. With reference to **Table 27** above, the volume of trade in chicken meat is also the largest compared to the global trade in pork, beef and veal. Exports of chicken meat reached 13.5 million tonnes in 2022 with the biggest exporters being Brazil (4.5 million tonnes or global share of 32.9%), the US (3.3 million tonnes or 24.5%), the EU (1.7 million tonnes or 12.8%) and Thailand (1.0 million tonnes or 7.5%). Import data for Grenada showed that 61% of poultry imported by the country are sourced from Brazil with another 23.2% from the US[94]. Imports of pork for the country are mainly from the US with share of 48.9% for Grenada. Pork imports from Canada were also substantial, accounting for share of 33.7%. For the case of beef, Grenada saw imports coming from the US and Brazil, with the former having a greater share. As such, considerations for diversification of import sources may see Grenada looking at countries such as those in the EU as alternative supply sources.

6.4 CHAPTER SUMMARY

The chapter presents the duration and costs involved for logistics activities through supply chain networks. The chapter makes reference to selected key products in the agriculture and manufacturing sectors. The chapter also discusses the aspect of food security in relation to its four pillars which are physical availability of food, economic and physical access to food, food utilisation, and stability over time of the aforementioned dimensions.

For the cocoa trade of Grenada, the product forms the fourth biggest source exports in 2021. Cocoa beans are collected at buying stations in Grand Bras and Tivoli, before being transported by trucks to the warehouse in St. George's. After which, the cocoa beans are transported to the port and shipped overseas. The most expensive component of the supply chain on a cost per kilogram basis is transportation from farms to the buying stations. This is attributed to the state of farm roads which can become difficult to use during the rainy season.

Nutmegs form the biggest source of exports for Grenada. The commodity is collected at the buying station at Gouyave before sending to the warehouse in St. George's. They are then transported to the port and exported. The biggest cost component would be shipping charges. Addressing this will require developing shipping connectivity where alternative service providers are available.

On the import side, meat and edible offal constitutes the second biggest import item. A key source of import is the US. The largest cost component is ocean transportation. It takes about seven days to reach St. George's from Palm Beach in Florida USA. Interestingly, the vessel sails directly from Castries in Saint Lucia to Trinidad and Tobago before turning back to call at St. George's.

On the state of food security, Saint Lucia seemed to have a higher dependency on imported food compared to Grenada.

[94]The Observatory of Economic Complexity (2023) Grenada [Online]. Available at: https://oec.world/en/profile/country/grd?yearlyTradeFlowSelector=flow1 (Accessed 15 May 2023).

Nonetheless, Grenada saw food imports forming 24.0% of merchandise imports whereas the comparative figure is significantly lower at 10.4% for Saint Lucia. Saint Lucia also have more than five times in arable land compared to 3,000 hectares in Grenada.

For the pillar of economic and physical access to food, prevalence of moderate or severe food insecurity in the total population was almost the same at about 22% for Grenada and Saint Lucia. However, the pressure on food security is likely to be much higher in Grenada with 60% of monthly household expenditure spent on food. By comparison, monthly spending on food accounted for 30.3% of household expenditure in Saint Lucia. We also saw that annual income for farmers in Saint Lucia was considerably higher at 1.4 times the income of a farmer in Grenada.

For the pillar on food utilisation, Grenada has significantly higher levels of anaemia in children aged below five years, and women. Prevalence of underweight in adults aged 18 years and over was 2.4 times higher for females in Grenada compared to Saint Lucia. For infant and neonatal mortality rate, the indicators showed Saint Lucia to register higher rates compared to Grenada.

On the fourth pillar of stability, both Grenada and Saint Lucia are entirely dependent on overseas imports for cereals. In terms of price inflation, we saw Saint Lucia to experience higher levels of price increase compared to Grenada. For the set of indicators measuring various risks that could impact on food security, both countries generally had medium to very low risk ratings. The only exception would be sovereign credit risk for Grenada which was given a high risk rating.

Food staples form the cornerstone of food security. Corn imports by Grenada are almost entirely from the US. Turning to wheat, the US is a key supplier to Grenada. For wheat flour, Saint Vincent and the Grenadines is the biggest source of supply to Grenada. The exporter is a member of the CARICOM. Rice is also an important source of food in Grenada. Guyana, who is a member of the CARICOM, is a key supplier of rice to the country. Diversification of cereal imports could consider other major exporting countries and regions which include the EU and South America.

For soybeans, diversification of import sources may be difficult as the trade is dominated by Brazil and the US. With the importance of corn, wheat, soybeans and rice, it may also be prudent for the government to consider creating stockpiles of these commodities for emergency use.

The fertile soil and climate of Grenada makes the country suitable for growing crops such as yams, plantains, sweet potatoes, cassava, and breadfruit. In Grenada, the root crops are grown locally. Small quantities are imported from Saint Vincent and the Grenadines during shortages.

CHAPTER 7

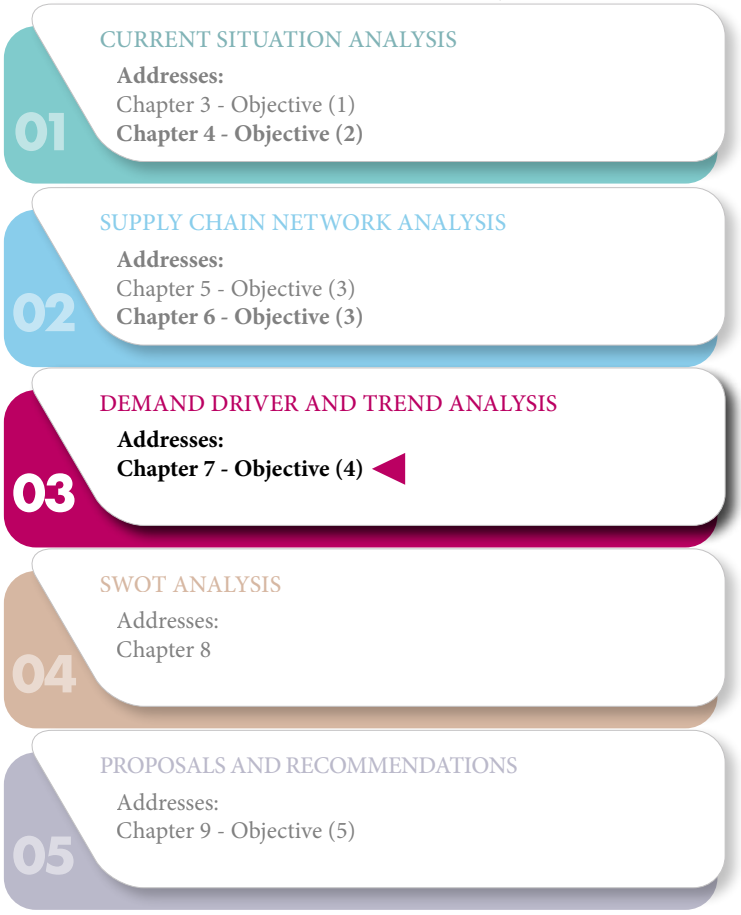
DEMAND DRIVER AND TREND ANALYSIS

256. The next step is to determine critical demand drivers and emerging trends relevant for the transport and logistics sector in Grenada. With reference to **Figure 31**, this is addressed under **Point (3)** of the proposed approach and the fourth objective of the study. Increasing penetration of digitisation and digitalisation reinforces the impetus to develop integrated logistics systems and trade platforms that can facilitate information flows, track and trace capabilities, materials handling, and financial services especially in international trade. Performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions shall be proposed. While no new index will be created, a set of indicators will be suggested for consideration when assessing the sector. Intention is to provide the context for a comprehensive overview of major challenges and opportunities likely to be faced by the transport and logistics sector.

7.1 CONCERNS ARISING FROM INEFFICIENCIES IN THE LOGISTICS SECTOR

Analysis of demand drivers and emerging trends requires appreciation of the challenges faced by the transport and logistics sector in Grenada. We have discussed many of these challenges and concerns in the previous chapters and they are recapped by **Table 28**. Pertinent issues reflect a combination of perspectives that could include economic, trade, technological and other relevant developments.

Figure 31: Framework for Proposed Approach to the Study – Demand Driver and Trend Analysis



Source: International Consultant.

Table 28: Recap of Challenges Facing Logistics Sector in Grenada

Logistics Aspect	Issue Affecting Logistics Operations
Shipping and port operations	
Limited shipping connectivity	• Freight rates are expensive • Containers not loaded at the port of origin during the high season; shipping lines put priority on refrigerated cargo, followed by food, and lastly non-food • Port of St. George's being bypassed especially during the high season
Inadequate capability of port to handle mainline containerships	• Limited by port draft and berth capacity • Lack of cargo-handling equipment (e.g., no quay cranes at Port of St. George's) • Unreliable port equipment
Expensive shipping and port charges	• Expensive landing charges (second highest in the region)
Archaic port tariffs	• Tariffs were developed during the pre-container era
Berth and yard operation inefficiencies	• Shipping using LCL is difficult and expensive with issues of damaged or missing cargo • Companies have to use runners to locate containers, which also depends on personal relations with the stevedore • Insufficient space to store containers at the port • Lack of space for container stripping and stuffing at the port • Port does not operate 24/7, and is closed on public holidays • Making multiple queues to collect cargo from the port • Should have holding area for trucks • Tugs have to be brought from neighbouring islands
Damaged containers and lack of empty containers	• Lack of empty containers and especially 20-foot containers • Lack of container repair service
Inefficient customs operations and processes	• Inspections can be conducted in the open area, however work has to stop when there is heavy rain • Containers being stripped at the premise need to wait for the customs officers who will come after 4pm • Officers are provided with breakfast, lunch or dinner if they have to work outside of normal working hours • Customs is trying to go fully electronic although they are still asking for physical documents • De minimis system is being evaluated
Flight network and airport operations	
Flight connectivity	• Flights have not returned to pre-COVID levels • Grenada used to be regional cargo hub in 2000 for Amerijet
Flights delays and cancellations	• Can cascade through the network • Fresh produce cargo exposed to the elements can see 50- 70% of the shipment lost • There is no insurance for shipping fresh produce by air available in Grenada
Improvements needed to cargo- handling facilities	• Need for a dedicated cargo-handling building • Cargo is often handled in the open which offers more space • Cargo shed at Sandals has no clear distinction between the landside and airside • Need to train people on maintenance and repair of the scanner; when breakdowns occur, technical expertise has to be flown in from Barbados to make repairs
Lack of cold storage facilities	• There is a FEU reefer container at Sandals which will take 3- 4 hours to reach ideal temperatures when plugged in • Dedicated cold storage facility should have bays where trucks can back up and offload their cargo • Each bay should be equipped to weigh and screen cargo
Inefficient cargo operations	• Delays in the loading may result in missing the flight schedule as flight crew have limitations on number of hours worked and therefore have to spend the night in Grenada
Inefficient customs operations and processes	• Time taken for inspection depends on competency of the customs officer • Customs officers should be trained on tariff description, classification knowledge and standard operating procedures
Land transportation	
Condition of trucks	• Truckers may not be licenced to provide transport for cargo • Trailers may not be properly connected or equipment faulty, resulting in trailer not "lighting up" when the vehicle breaks
Poor condition of farm roads	• Farm roads need to be improved with drainage and binders, farmers have difficulty sending products to buying stations
Road connectivity	• Given the hilly terrain in and around the capital city of Grenada, roads can be narrow at certain stretches, necessitating traffic handlers to manage the traffic on occasions where movement of heavy vehicles are involved

Source: International Consultant.

Note that the above information presented is gathered from a comprehensive review of the transport, logistics and relevant activities across different stakeholders, transport modes, and product types in the country. In addition to the issues mentioned above, there were further concerns which were gathered from stakeholders of the transport and logistics community in Grenada.

Firstly, there is the issue with port labour. In the Port of St. George's there are about 100-150 stevedores used by the Grenada Ports Authority and they are paid according to the tasks completed. Specifically, the port authority contracts the Grenada Seamen and Waterfront Union to perform stevedoring functions. Discussions with stakeholders in the country indicate there is significant scope for improvements to the efficiency and productivity of stevedoring services. Discussions with the community also indicated that the port authority can become a political tool which is called upon to support election efforts by political parties. A plausible approach is to separate the commercial and regulatory functions of the port authority. The current organisation sees the port authority being both a regulator and operator. This could present a situation where there is conflict of interest. However, taking this approach will require political will and relevant Acts of Parliament to be amended. Any reforms will also need to be done by working through the port labour unions. With the split, the port authority can focus on regulatory work while the commercial entity can operate on concessions awarded by the port authority.

Secondly, there are calls to improve conduct of businesses with the port through electronic means. In St. George's, the Grenada Ports Authority aims to acquire a terminal operating system and sees this as a priority. This will be followed by a port community system. The port authority shared concerns for the terminal operating system are with cost, remote connection, and service support. A terminal operating system can help to address the issue of tracking containers. With the port community system, speed of receiving invoices can be accelerated with the process made electronic. It will also be unnecessary to pick up invoices at the port.

Thirdly, there is a need to have a fundamental review of current port capacity and its capability of meeting the needs over the medium to long term in the country. Grenada Ports Authority is reviewing the layout of the port. The facility was designed and built in 1959 with an upgrading done in 2000. The port authority acknowledged that the current facility is not suited as a container port. As such, GPA is looking to conduct a port study which includes doing a port masterplan, review the physical structure of the port, and make recommendations on what is required to be done. There are also considerations given to move container stripping out of the port area to a location within 5-8 miles radius from the terminal. The greenfield adjacent to the port appears to be suitable as it can be seen as a natural extension of the port. However, GPA recognises there are social implications for using the greenfield site. On the topic of installing a quay crane at the port, upgrading of the apron area will be required. GPA mentioned it is possible to have half of the berth undergo upgrading works where the port can continue to operate at about 70% capacity. Regarding the option of moving cargo operations to a new location, discussions with stakeholders in the local logistics community indicated a potential site could be at Beausejour, about 9km north of St. George's issues mentioned above, there were further concerns which were gathered from stakeholders of the transport and logistics community in Grenada.

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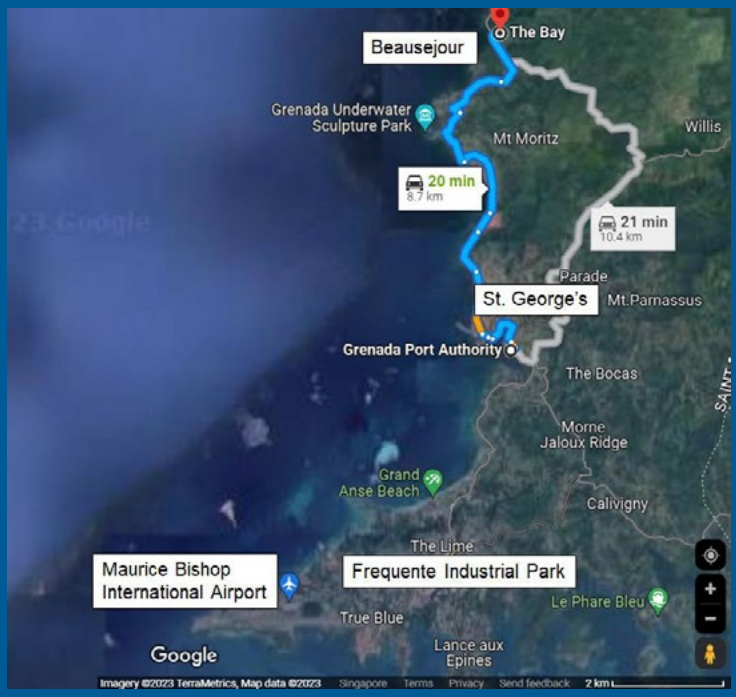
The fourth issue relates to having a national single window system. Stakeholders in the trade, transport and logistics community recognise the importance and necessity of having such a system. Discussion with stakeholders in Grenada highlighted the issues of the need to go fully electronic. Even with ASYCUDA, companies still need to print and stamp every invoice before sending them physically to customs. Hence the work is still done manually. This is despite the information being entered electronically into the system. As the name suggest, a national single window will provide a single platform for all relevant parties involved in international trade. It will coordinate and process documents for a suite of government agencies without having to submit documents manually to each department for processing and clearance.

Figure 32: Location of Beausejour in Grenada



Source: International Consultant, using map data from Google Maps.

Table 29: Modules Covered by MSc Programme in Logistics and Supply Chain Management by The University of the West Indies

Course Code	Course Title
LGSC 6000	Logistics and Supply Chain Management I
LGSC 6001	Strategic Marketing
LGSC 6002	Transportation Administration
LGSC 6003	Operations Research I
LGSC 6004	Logistics and Information Systems
LGSC 6005	Strategic Supply Chain Management
LGSC 6006	Operations Research II
LGSC 6007	Production Management
LGSC 6008	International Trade and Exchange
LGSC 6011	Pricing and Revenue Management
LGSC 6014	Logistics and Supply Chain Management II
	LGSC 6010 / BUSA 6001 Computer Simulation Or PTMT 6001 Project Analysis and Appraisal Or PTMT 6023 Project Management Concepts, Frameworks and Processes
	LGSC 6999 Research Paper Or Three electives from the Faculty of Social Sciences

Source: The University of the West Indies (2023)[95].

On the fifth issue which relates to training and education, stakeholders highlighted the need for better access to education in the area of logistics and supply chain management courses. Attention should be given to vocational training and higher education opportunities. For higher education, options are the University of West Indies with campuses in Barbados, Jamaica and Trinidad and Tobago. Other options are the US and UK. There is also the possibility of attracting the Caribbean Maritime University based in Jamaica to open divisions in Grenada. The course on shipping and logistics management which was offered by the University of West Indies used to be conducted on-site in Grenada for a few years before being stopped due to COVID. The course has not resumed since then. Based on information available from the University of West Indies, there is a MSc degree programme in Logistics and Supply Chain Management offered at the university's Cave Hill Campus in Barbados (see **Table 29**). The postgraduate programme requires a duration of 15-18 months for full time students, or 24-30 months for part time students. Modules included in the programme cover subjects such as logistics and supply chain management, strategic marketing, transportation administration, operations research, logistics and information systems, strategic supply chain management, production management, international trade, and pricing and revenue management. For vocational training, discussions with the community highlighted such training is currently done on an informal basis, relying largely on learning on-the-job. As such, there should be avenues where formal training can be provided.

For the sixth issue, the concern relates to export promotion. Stakeholders interviewed and surveyed highlighted that using LCL cargo in the region is expensive and difficult. This includes possibilities where the cargo is damaged or goes missing. However, filling a container may pose challenges as there are exporters who may not want to work together. This issue is exacerbated by the lack of 20-foot containers. For the commodity export sector, there are mentions on the need to improve on the quality of the product, packaging and labelling.

Last but not least, stakeholders mentioned the importance of having an unbroken cold chain for products. The lack of cold storage facilities and sufficient equipment to handle temperature-controlled products can impede efforts to achieve this. Ideally, temperature should be monitored remotely and throughout the transportation process.

[95] The University of the West Indies (2023) Faculty of Social Sciences – Department of Economics [Online]. Available at: https://www.cavehill.uwi.edu/fss/econ/programmes/postgraduate/msc-logistics- supply-chain-management.aspx (Accessed 19 May 2023).

7.2 KEY DEMAND DRIVERS AND EMERGING TRENDS

Having presented the main issues and concerns regarding the transport and logistics sector in Grenada, we shall discuss key demand drivers and emerging trends affecting the industry. These developments can exacerbate weaknesses that are experienced in the supply chain networks or become opportunities that can be capitalised on.

From the perspective of stakeholders in both the private and public sectors, there are two major sets of drivers and trends which operators will be most concerned about. The first set of developments concern the macroeconomic environment which businesses operate within. The second set of developments are related to operational parameters which span the dimensions of market demand, technologies, work conditions, sustainability, environmental protection, and sourcing among other perspectives.

From the macroeconomic perspective, demand for logistics services is driven largely by the external sector in view of high dependence of the country on international trade in goods and services. As such, economic performances of key trade partners to Grenada become important. With reference to **Table 30**, GDP growth of key trade partners in goods and services to the country are listed. The closest region will be other economies in the OECS. Data from The World Bank and IMF showed that while sharp declines in economic growth was seen for several states in 2020, many of them saw positive growth in 2021. For example, Saint Lucia which saw the steepest contraction in GDP growth in 2020 of 24.4% also saw the strongest recovery at 12.2% in 2021. Similarly, Antigua and Barbuda which saw major contraction in its economy by 20.2% in 2020 subsequently recovered by 5.3% in 2021. The exception was Saint Kitts and Nevis which continued to experience negative growth of 0.9% in 2021. Going forward, the IMF projected GDP growth to range mostly from 2.0% to 6.0% for the period 2022 to 2025. Countries in the OECS are expected to see continued expansion of their respective economies and contribute to intra-regional trade.

Table 30: GDP Growth of Key Trade Partners of Grenada (%)

Country/Economy	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Real GDP Growth					Forecast by IMF			
Organisation of Eastern Caribbean States									
Antigua & Barbuda	3.1	6.9	4.9	-20.2	5.3	6.4	5.5	5.4	4.1
Dominica	-6.6	3.5	5.5	-16.6	6.7	6.0	4.9	4.7	4.3
Grenada	4.4	4.4	0.7	-13.8	4.7	6.0	3.7	4.1	3.6
Montserrat	-3.8	16.5	7.4	-4.0	5.5	-	-	-	-
Saint Kitts and Nevis	0.0	2.1	4.0	-14.5	-0.9	9.0	4.5	3.8	3.0
Saint Lucia	3.4	2.9	-0.7	-24.4	12.2	14.9	3.0	2.2	2.0
Saint Vincent & Grenadines	1.7	3.1	0.4	-5.3	1.4	5.3	6.0	5.0	3.9
Caribbean Community (CARICOM)									
Bahamas	3.1	1.8	1.9	-23.8	13.7	11.0	4.3	1.8	1.6
Barbados	0.5	-1.0	-0.1	-13.3	-0.2	10.0	4.9	3.9	2.8
Belize	-1.7	1.1	4.5	-13.4	15.2	11.4	3.0	2.0	2.0
Bermuda*	3.6	-0.4	0.3	-6.8	5.4	-	-	-	-
Cayman Islands'	3.2	4.3	3.9	-5.7	1.8	-	-	-	-
Guyana	3.7	4.4	5.4	-43.5	20.1	62.3	37.2	45.3	3.4
Haiti	2.5	1.7	-1.7	-3.3	-1.8	-1.7	0.3	1.2	1.5
Jamaica	1.0	1.9	0.9	-10.0	4.6	4.0	2.2	2.0	1.7
Suriname	1.6	4.9	1.2	-16.0	-2.7	1.3	2.3	3.0	3.0
Trinidad and Tobago	-4.7	-0.9	0.1	-7.7	-1.0	2.5	3.2	2.3	2.7
Turks and Caicos Islands	-2.5	5.6	5.3	-26.8	2.1	-	-	-	-

Table 30: GDP Growth of Key Trade Partners of Grenada (%) (cont'd)

Country/Economy	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Real GDP Growth						Forecast by IMF		
North and South America									
Argentina	2.8	-2.6	-2.0	-9.9	10.4	5.2	0.2	2.0	2.0
Brazil	1.3	1.8	1.2	-3.9	4.6	2.9	0.9	1.5	1.9
Canada	3.0	2.8	1.9	-5.2	4.5	3.4	1.5	1.5	2.2
United States	2.2	2.9	2.3	-2.8	5.9	2.1	1.6	1.1	1.8
Europe									
France	2.3	1.9	1.8	-7.8	6.8	2.6	0.7	1.3	1.9
Germany	2.7	1.0	1.1	-3.7	2.6	1.8	-0.1	1.1	2.0
Netherlands	2.9	2.4	2.0	-3.9	4.9	4.5	1.0	1.2	1.5
United Kingdom	2.4	1.7	1.6	-11.0	7.5	4.0	-0.3	1.0	2.2

*Source: International Consultant, using data from International Monetary Fund (2023)[96] and The World Bank (2023)[97]. * Associate member.*

Looking at the CARICOM countries, the most dramatic performance would be Guyana which saw its economy contract by 43.5% in 2020, followed by recovery of 20.1% in 2021. The country is an important trade partner to Grenada. The IMF expects oil to be a main driver with Guyana projected to see continued strong growth going forward. Other countries with important implications to the logistics sector in Grenada through activities such as imports, exports, and international transport connectivity include Barbados, Jamaica, Suriname and Trinidad and Tobago. For Jamaica, the decline in GDP by 10.0% in 2020 was met with a positive growth of 4.6% in 2021. For Suriname and Trinidad and Tobago however, negative growth continued in 2021 although the rate of decline has softened significantly. A similar observation was made for Barbados where the country has been experiencing negative GDP growth since 2018. The IMF is projecting 2022 to see positive economic performances for these countries with GDP growth ranging largely from 2.0% to 5.0% for the period 2023-2025.

Turning to the region of the Americas, the previous sections have identified the US, Brazil and Argentina to be major trade partners of Grenada. For Argentina, the country had been experiencing negative GDP growth even before the pandemic. However, the effects of COVID-19 led to a massive contraction of 9.9% for the economy in 2020. Nonetheless, the decline was short lived and strong growth was registered in 2021 at 10.4%. The country is projected to see continued strong performance in 2022 with GDP projected to grow by 5.2%. For the remaining three countries, the negative impact of the pandemic on GDP performance in 2020 was reversed as recovery took place in the subsequent year. Recovery in the US was particularly strong at 5.9% for 2021. For the period 2023 to 2025, the IMF projects GDP to grow mostly ranging from 1.0% to 2.0% for these economies.

Moving to Europe, the major trade partners and source of tourism arrivals are the UK, France, Germany and The Netherlands. Of these countries, the UK saw the biggest contraction in its economy by 11.0% in 2020. However, the country also experienced the strongest recovery at 7.5% in 2021. This was followed by France with the second sharpest contraction as well as recovery for the same period. GDP for the country fell by 7.8% in 2020 and recovered by 6.8% in 2021. Economic performances for Germany and the Netherlands were less dramatic with both countries experiencing the same pattern of GDP contraction in 2020 followed by recovery in 2021 as seen for many other economies in the world. However, it is worth noting that the IMF is projecting for Germany and the UK to see negative GDP growth in 2023. For the remaining period to 2025, the IMF is projecting for these economies to grow at 1.0% to 2.2%.

[96] International Monetary Fund (2023) World Economic Outlook Database [Online]. Available at: https://www.imf.org/en/Publications/WEO/weo-database/2023/April (Accessed 2 May 2023).
[97] The World Bank (2023a) World Development Indicators [Online]. Available at: https://datatopics.worldbank.org/world-development-indicators/ (Accessed 3 May 2023).

For the second set of drivers and trends that the logistics industry will be most concerned about, they span many dimensions although these are ultimately related to operational issues. Key trends and drivers for this second set of drivers and trends are presented in **Figure 33**. The Logistics Trend Radar 6.0 was developed by DHL and depicts major developments that will impact on the logistics industry. The trend radar was recently updated to reflect insights and perspectives from stakeholders that the company interacts with. Apart from customers and employees of the company, insights were also sought from key opinion leaders from influential think tanks, academics and renowned consultancy firms. Impact on the logistics industry has been classified into those which are high impact and low impact. High impact developments are expected to be revolutionary and potentially disruptive. Low impact developments are seen as evolutionary changes with incremental improvements. The trend radar further identifies the developments by timeline of realisation, distinguished by two time periods, which are those which are likely to occur in 'less than five years' and those that are likely to see maturity or widespread adoption in 5-10 years.

Table 31 shows the list of trends or drivers that are likely to have a high impact on the logistics industry. Those expected to take place within five years are digital marketplaces, omnichannels, stationary robotics, and indoor mobile robots. As mentioned, these developments are expected to be revolutionary and potentially disruptive for the industry. In the case for digital marketplaces, DHL reports seeing B2B players planning to acquire them, and some suppliers have either built or are planning to develop their own platforms. For omnichannels systems, they can empower customers to browse in all channels and choose any channel for to make the product purchase, receive the product, and return the product. For stationary robotics, more logistics companies are realising the benefits of leveraging on such systems for repetitive processes as well as address labour shortages. For indoor mobile robots, the key is to have them deployed at scale to reap the benefits of reduced cost and increase efficiency.

Figure33: Key Trends in the Logistics Business

Source: Deutsche Post DHL Group (2023)[98].

[98]Deutsche Post DHL Group (2023) 'The Logistics Trend Radar', Insights & Innovation [Online]. Available at: https://www.dhl.com/global-en/home/insights-and-innovation/insights/logistics-trend-radar.html (Accessed 18 May 2023).

Table 31: Major Drivers and Trends with High Impact on the Logistics Industry

Driver or Trend	Important Aspects
Impact: High; Realisation: <5 years	
Digital Marketplaces	• Offer suppliers and customers access to larger markets while providing transparency. • Incorporates digital brokerage platforms which match customer demand for products and services with available supply. • Ease of comparing shipping options and pricing. • B2B players are planning to acquire digital marketplaces; some suppliers have built or are planning to build their own platforms.
Omnichannel	• Omnichannel systems empower customers to browse in all channels and choose any channel for product purchase, product receipt, and return. • Requires seamless integration of offline and online channels with clear focus on the end customer. • Important components are a fully integrated fulfilment centre, order management system, transport management system, and inventory management system. • Ideal omnichannel logistics network needs active communication, visibility, and coordination among many players and engagement point with customers.
Stationary Robotics	• Comprises all robots that undertake value-added tasks from a fixed location. • Logistics companies are recognising the benefits of having stationary robots for repetitive processes, especially in view of warehouse labour shortages which is exacerbated by volatility in demand. • Market for robotic arms projected to grow from USD26.2 billion in 2021 to USD74.4 billion by 2029.
Indoor Mobile Robots	• Includes various types of portable robots which fulfil tasks mainly inside facilities without the need for direct input from human operators. • Automated guided vehicles (AGVs) follow predetermined invisible or visible paths while the next-generation successors autonomous mobile robots (AMRs) use real-time path planning and thus can move freely around obstacles. • Have enormous potential to reduce cost and increase efficiency when deployed at scale.
Impact: High; Realisation: 5-10 years	
Supply Chain Diversification	• Reconfigure supply chain to broaden supplier ecosystem and increase manufacturing and distribution networks. • Aim to improve resilience, responsiveness, agility and competitiveness. • Product of geopolitical tensions.
Circularity	• Aims to eliminate pollution and waste by considering the full product life cycle and seeking to reuse, repair, recycle and remanufacture products as much as possible. • Logistics is an essential partner and backbone of circularity.
Decarbonisation	• Movement to reduce amount of CO2 and equivalents in the atmosphere. • Will have high impact on supply chains as many segments have to be adjusted to eliminate CO2 emissions from operations. • Pressure to decarbonise is also coming from B2B and B2C customers.
Alternative Energy Solutions	• Includes technologies and related infrastructure that harness, store, and use energy from inexhaustible and/or renewable sources. • Trend is seeing conventional fossil energy systems being replaced by those which rely on wind, water, sunlight, geothermal and other sources. • UN roadmap for clean energy aims to reduce share of fossil fuels in global energy mix to 30% by 2030.
Outdoor Autonomous Vehicles	• Includes self-driving robots operating mainly outside on land or water. • Focus is on vehicles that are highly automated with occasional control by the human driver, or completely driverless. • Requires societal confidence and will take some time before regulations permit unhindered application on a global scale.

Source: International Consultant, using information from Deutsche Post DHL Group (2023)[99] .

The next set of trends and drivers are seen to have a moderate impact on the logistics industry (see **Table 32**). For developments that are likely to see realisation within five years, they include the need to have a new generation of technologies that focus on proactive cyber defence (i.e., Cybersecurity 2.0), 'smartification' of assets, harnessing large quantities of structured and unstructured data for big data analytics, use of smart labels, use of next-generation packaging, and adoption and proliferation of edge computing to aid logistics solutioning. For developments likely to see realisation in 5-10 years, they include widespread adoption of blockchain technology in logistics transactions, use of drones, use of computer visioning, use of a physical internet where logistics processes can be further integrated and synchronised, and widespread embrace of environmental stewardship.

[99]Ibid.

Table 32: Major Drivers and Trends with Moderate Impact on the Logistics Industry

Driver or Trend	Important Aspects
Impact: Moderate; Realisation: <5 years	
Cybersecurity 2.0	• Next generation of processes, solutions and operating rules that leverage on AI and other advanced technologies to protect critical systems, devices and sensitive information against cyberthreats. • Trend of rising spate of incidents require new levels of resilience and focus on proactive defence as the digital backbone of the organisation.
Smartification	• Process of having previously disconnected analog assets retrofitted with wireless technologies and sensors to make them 'smart' and connected. • Drives visibility and transparency to allow data-driven decision making. • Number of connected devices in the world is anticipated to grow exponentially.
Big Data Analytics	• Analysis of large quantities of data that encompasses descriptive, diagnostic, predictive and prescriptive big data analytics. • Leverages on structured and unstructured data. • Logistics companies are harnessing big data to drive strategic decisions.
Smart Labels	• Use of labels with special intelligent inlay technology which can communicate more information than conventional printed physical labels. • Technologies integrated in such labels include radio frequency identification (RFID), time-temperature indicators (TTIs), near-field communication (NFC), and quick response (QR) codes. • Value of smart labels expected to grow from USD9.5 billion in 2022 to reach USD24.8 billion by 2030.
Next-Generation Packaging	• Refers to evolving changes in materials that are used for packaging and technology that is added to the packaging. • Trend will incorporate aspects of sustainability and using materials that are more bio-based, reusable, recyclable and biodegradable. • Next-generation packaging solutions allow cargo owners to track shipment locations, monitor package condition, and receive notifications if the package is being tampered with.
Edge Computing	• Decentralisation of IT architecture, which allows computer processing to be brought closer to sensors and other sources of data (i.e., at the edge of a network), away from remote data centres and cloud servers. • Volume of data generated by IoT devices is growing too quickly for traditional data centre infrastructures to cope. • Platooning of trucks is likely to be the first use cases.
Impact: Moderate; Realisation: 5-10 years	
Blockchains	• Development, implementation and management of decentralised and digitally recorded ledgers which are distributed across networks. • Blockchain technology can become a single source of truth for the user. • Challenge is to coordinate and collaborate among many players in a typically disjointed logistics ecosystem.
Drones	• Also known as 'unmanned aerial vehicles or UAVs'. • UAVs can be embedded with sensors and transceivers for navigation and control, which advanced versions capable of operating autonomously beyond visual line of sight. • Companies ranked 'saving time' and 'improving work safety' as the top two reasons for using drones.
Computer Vision	• Using cameras to capture videos or photos and apply AI algorithms to analyse data extracted from the digital imagery. • Rudimentary visual AI systems can be trained to differentiate objects while more advanced versions are being developed to track objects across viewpoints and learn on their own.
Physical Internet	• Logistics in the physical world is fragmented. • Some standardisation exists such as the 20-foot container. • Industry leaders imagine a world where logistics processes can be further integrated and synchronised. • Need to shift from closed to open networks.
Environmental Stewardship	• Major behavioural changes across industries, societies and governments to maximise environmental protection and minimise degradation. • Many players are just beginning to embrace environmental stewardship.

Source: International Consultant, using information from Deutsche Post DHL Group (2023)[100].

[100]Ibid.

Last but not least, we present the list of drivers and trends that are expected to have a mild impact on the logistics industry (see **Table 33**). Low impact developments are seen as evolutionary changes with incremental improvements. It may also be the case that they are already in advanced stages of development and/or beginning to see widespread adoption across the industry. Hence the anticipated impact is likely to be mild. For trends and drivers that are expected to see realisation within five years, we have quick commerce which saw particularly strong growth in urban areas during the pandemic, prospects offered by specialised needs of the silver economy, mass personalisation of shipping experiences, remote work and teleoperation, wearable sensors, integration of cloud computing and web-based services, proliferation of extended reality, adoption of next generation wireless technology, interactive AI, exoskeletons, and greater inclusivity of women in logistics roles. For developments that are expected to see realisation beyond five years, they include sharing economy, digital twins, 3D printing, bio- based materials, tube systems, quantum computing, space economy, metaverses, and everything as a service. See the table for details on each driver and trend.

Table 33: Major Drivers and Trends with Mild Impact on the Logistics Industry

Driver or Trend	Important Aspects
Impact: Mild; Realisation <5 years	
Quick Commerce	• Also referred to 'on-demand delivery', is e-commerce with convenience in online ordering, accuracy of order fulfilment, and speedy delivery. • Particularly strong growth in urban areas during the pandemic. • Applied mainly to B2C fulfilment and last-mile segments of the supply chain.
Silver Economy	• Specialised needs and demands of growing elderly population around the world. • Involves redesigning work practices and processes to cater to an ageing workforce.
Mass personalisation	• Creation of highly personalised experiences which can be applied on a mass scale. • Personalised shopping can create significant impacts on consumer behaviour. • Limited application in B2B logistics settings.
Remote Work and Teleoperation	• Refers to notion that employees can work from their homes and different workplaces to get the tasks completed. • Companies are increasingly using devices that can be operate remotely, and adopting use of autonomous moving vehicles, robotic technologies, and digital twins.
Wearable Sensors	• Includes sensors that are worn on or being close to the human body for purpose of tracking vital functions or body movement. • Valuable data can be obtained from employees to make work environments more efficient and safer.
Cloud and APIs (Application Programming Interfaces)	• Growing integration of cloud computing and using web-based services to exchange and store data online instead of on-premise solutions. • Examples include third-party payment processing (e.g., PayPal), and location services (e.g., routing option via Google Maps). • E-commerce is an area with good prospects for implementation with benefits including lower administrative costs.
Extended Reality	• Also known as 'XR', encompasses different experiential technologies such as augmented reality (AR) and virtual reality (VR). • Through AR, the environment around us can be enhanced by overlaying our physical world with digital content. Consumers can use AR to view products in 3D or try on virtual clothes before making a purchase. • Through VR, the digital environment can simulate real-life experiences such as trying on products or visiting a store from consumer's home.
Next Generation Wireless	• Develop and implement evolutionary wireless communication technologies and the supporting infrastructure. • Expected to be close to realisation as they already exist. • Adoption is beginning to accelerate across supply chains around the world
Interactive AI	• Involves AI algorithms which can process human user input such as speech and text and offer a reasonable response. • Chatbots are becoming useful tools to engage with customers.
Exoskeletons	• Involves wearable devices developed to support and enhance human physical capabilities. • Preventing workplace injuries while increasing worker health and happiness.
Diversity, Equity, Inclusion, Belonging	• Also known as 'DEIB', refers to working jointly to improve social responsibility within organisations. • Realms which were previously predominantly male are seeing greater inclusivity of women in various roles.

Table 33: Major Drivers and Trends with Mild Impact on the Logistics Industry (cont'd)

Driver or Trend	Important Aspects
Impact: Mild; Realisation 5-10 years	
Sharing Economy	• An ecosystem where businesses and consumers temporarily share, borrow or rent assets or services rather than buy and own them. • Typically facilitated by digital platforms to connect demand and supply. • Yet to see revolutionary industry-changing solutions for the logistics industry.
Digital Twins	• Encompasses virtual models which mirror the real-time behaviours and conditions of physical objects and processes. • Will take some time for digital twins to move from individual applications to whole ecosystems. • Ultimate digital twin for logistics would be real-time replica of the entire supply chain network.
3D Printing	• Also known as 'additive manufacturing', where a 3D object is fabricated using physical materials from a digital model file. • World of widespread 3D printing being still in the early stages.
Bio-Based Materials	• Encompasses materials produced exclusively using substances derived from modern bio-synthetic processes as well as traditional sustainable biomass. • Logistics companies are seeking to eliminate materials seen as unsustainable from daily operations to reduce waste.
Tube Systems	• Major behavioural changes across industries, societies and governments to maximise environmental protection and minimise degradation. • Many players are just beginning to embrace environmental stewardship.
Quantum Computing	• Next-generation transport networks that offer unimpeded transit from one location to another using tubes or tube-like systems. • Hyperloops can provide quick delivery opportunities especially when urban road traffic continues to worsen.
Space Economy	• Encompasses all activities of exploring, utilising and administrating space. • Space economy projected to become the next USD1 trillion market. • Space logistics projected to generate more than 20% of total revenue from the space economy.
Metaverses	• Encompasses virtual worlds which exist in parallel with physical reality. • Users adopt avatars to live and experience their digital lives. • Relatively distant in terms of realisation, being in a nascent stage.
Everything as a Service (or Anything as a Service)	• Known as 'XaaS' or 'servitisation', is the shift to vending of services where the customer pay on per-unit basis such as amount of time utilised. • XaaS business models will redefine asset management to provide a more flexible customer experience

Source: International Consultant, using information from Deutsche Post DHL Group (2023)[101].

Notwithstanding the aforementioned drivers and trends, there are five important developments to watch in the near term. Firstly, inflation and tight budgets will impact logistics demand significantly as prices for goods rise. This could see fewer purchases and therefore lower revenue for the supply chain. Customers across the value chain are likely to look for discounts, deals and various ways to save money. Secondly, personalisation is going to become the biggest logistics trend. Through personalisation of logistics services, customers can be given tailored experiences based on their needs. At the individual level, we are already experiencing some degree of this by the YouTube Channels that pop up in our digital devices. Evolvement of technology in this aspect should see greater targeted approach in reaching customers by using data to create unique selling propositions and develop customer loyalty. This is especially critical in view of intensifying competition with impending global economic downturn.

Thirdly, use of AI logistics and supply chain management is expected to grow with manual processes increasingly replaced by automated systems which have started to incorporate AI. As mentioned, the supply chain itself is a goldmine of structured and unstructured data. AI can be defined as simulating human intelligence processes through machines such as computer systems[102]. Applied to logistics, AI can be applied to enhance logistics experience by lowering costs of transportation, enable faster processing, increase reliability, and decide optimal routes for last-mile deliveries. In the near future, humans and robots will work together where robots take care of repetitive data-related tasks while humans are involved in more complex tasks that include interpretation and decision making. This will also shift logistics workforces to higher value-added and more meaningful work. Given the intense competition prevailing in the logistics industry, satisfaction of customers and employees becomes a key battleground for business success.

[101] Ibid.
[102] The European Business Review (2021) 'AI in Logistics: How artificial Intelligence is Transforming the Logistics Industry', The European Business Review, 4 October [Online]. Available at: https://www.europeanbusinessreview.com/ai-in-logistics-how-artificial-intelligence-is-transforming-the- logistics-industry/ (Accessed 18 May 2023).

Figure 34: IoT in Logistics Operations

Source: Barun (2018)[103] .

Fourthly, Internet of Things (IoT) will see greater proliferation and adoption in supply chain management. With reference to **Figure 34**, IoT allows assets to be tracked between premises of the vendor from the manufacturing facility. Analysing data created by tracing and tracking assets allows companies to identify patterns, make predictions for consumer preferences, and determine potential breakdowns in advance in the supply chain. Location-based data captured by IoT in logistics technologies enables companies to ensure quality of goods right from the manufacturing facility to the time it arrives at the destination. This information will be extremely important for perishable goods and temperature sensitive shipments. For example, location-based data can help companies determine the exact point where quality of the product may have deteriorated. Ability to monitor temperature throughout the shipment process allows companies to maintain quality of the goods involved. A system can notify respective personnel should there be a fluctuation in the temperature. IoT-based technologies also allow capturing of data related to environmental factors such as pressure, humidity, and light exposure. Real-time location data thus provides a more insightful understanding of every link in the supply chain network.

Meeting demand is an important efficiency metric for the supply chain sector. However, application of IoT technologies for logistics and supply chain management is not limited to technical aspects. The same technologies can offer insights that improve ability of forecasting demand. Data captured through IoT can provide better understanding of customer needs, customer behaviour, product usage, and product demand. IoT devices can offer data which is much more than the simple Point-of-Sales data. Hence, IoT can make it easier for businesses to interpret customer perspectives.

Fifthly, data analytics is expected to further transform the logistics business. Valuable insights gained will enable industry players to optimise routing, streamline factory functions and obtain transparency to the entire supply chain for benefit of cargo owners and logistics companies. For data analytics to be optimised, the company will need to digitalise critical operations. The logistics industry is undergoing many developments. Adapting to challenges and opportunities brought about by the new digital environment allow companies to access better and new data and employ them for more robust applications. This is likely to lead to more efficient supply chain operations.

The demand drivers and trends presented cover a wide spectrum of dimensions and issues. This is inevitable with the all-encompassing and cross-cutting nature of the logistics industry which transcend many aspects of society at the government, business, and individual levels. It is worth remembering from the previous analyses that the logistics sector is an important anchor on which competitiveness of several industries and societies depends upon.

[103]Barun, S. (2018) 'The Internet of Things (IoT) and its impact on Supply Chain Visibility', LinkedIn, 7 December [Online]. Available at: https://www.linkedin.com/pulse/internet-things-iot-its-impact-supply- chain-barun-sarkar (Accessed 18 May 2023).

7.3 INDICATORS TO ASSESS LOGISTICS PERFORMANCE

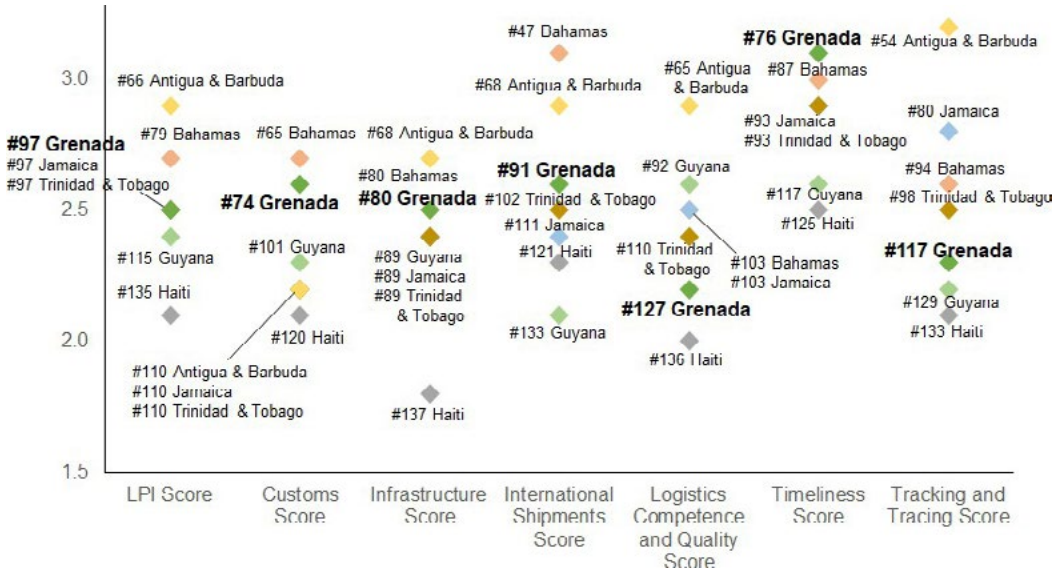
Having analysed the challenges and issues concerning the logistics sectors in Grenada, and key demand drivers and emerging trends, this section of the chapter shall discuss logistics performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions. The discussion makes reference to the framework of the Logistics Performance Index (LPI) from The World Bank[104]. The LPI for 2023 comprises six dimensions of trade. These are:

- Customs: efficiency of customs and border management clearance;
- Infrastructure: quality of trade and transport infrastructure;
- Arranging shipments: ease of arranging competitively priced shipments;
- Logistics services: competence and quality of logistics services (trucking, forwarding and customs brokerage);
- Track and trace: ability to track and trace consignments; and
- Timeliness: frequency with which shipments reach consignees within scheduled or expected delivery times.

LPIs for 2023 for countries in the Caribbean region have been extracted from the database and are presented in **Figure 35.** The figure shows data being available for the countries of Antigua and Barbuda, Bahamas, Grenada, Guyana, Haiti, Jamaica, and Trinidad and Tobago. Antigua and Barbuda and Grenada are new additions to the list of countries measured for the Caribbean. The previous LPIs for 2016 and 2018 considered only the other five countries. Results for LPI 2023 showed Antigua and Barbuda to be the best performer in the Caribbean, ranking 66th globally. In the second position was Bahamas which was ranked in the 79th position globally. Grenada, Jamaica and Trinidad and Tobago were tied in the third position in the Caribbean. Globally, these countries were ranked in the 97th position. Scores received by Guyana and Haiti saw the two countries placed in the fourth and fifth positions respectively. Globally, Guyana and Haiti were ranked in the 115th and 135th positions.

Compared to other countries in the region, Grenada was ranked in the third position, alongside Jamaica and Trinidad and Tobago. The country received an LPI score of 2.5 which puts Grenada in the 97th position globally. Grenada saw relatively good performance for timeliness, which measures frequency with which shipments reach consignees within scheduled or expected delivery times, and customs, which measures the efficiency of customs and border management clearance. The country received the second-highest scores among countries in the region. Grenada also performed relatively well, receiving the third-highest score in the region for infrastructure, which measures the quality of trade and transport infrastructure, and international shipments, which measures the ease of arranging competitively priced shipments. However, the country did not perform as well for the aspect of tracking and tracing, which refers to the ability to track and trace consignments. Grenada also did poorly for the dimension of logistics competence and quality, being ranked second-last among the list of countries measured by LPI.

Figure 35: Logistics Performance for Selected Countries in the Caribbean



Source: International Consultant, using data from The World Bank (2023e)[105].

[104]The World Bank (2023e) Logistics Performance Index (LPI) [Online]. Available at: https://lpi.worldbank.org/international (Accessed 18 May 2023).
[105] Ibid

The study leveraged on the dimensions considered in the 2023 LPI study by the World Bank and included three other dimensions based on information gathered from desktop research. These are:

- Security: security of shipments handled;
- Tariffs: tariffs which are transparent and consistently applied; and
- Regulatory framework: fair and clear regulatory framework that provides a level playing field.

While no new index was created, the study rode on the LPI framework which was developed by the World Bank and included three additional dimensions to assess logistics performance for Grenada. Furthermore, the focus of the study is to identify gaps that are seen to require urgent attention by the logistics and transport communities in both countries. For this purpose, survey exercises were conducted over the period of March and April 2023. The surveys were conducted using both emails and through face-to-face interviews. Survey forms were sent out to 67 companies/organisations. Responses were received from 22 entities which yielded a response rate of 32.8%.

The logistics communities were asked to rate a list of logistics performance attributes in terms of their importance to the organisation or company, followed by their views on its performance for that country. The scores for Grenada are shown in **Table 34**. For Grenada, respondents view the supply chain attributes to be "very important" to their companies or organisations. This was especially for the aspects of customs and infrastructure which received respective scores of 4.90 and 4.81. Many respondents gave these attributes the rating of "extremely important", which resulted in their high scores. However, scores received for views on their performance for the country were mostly in the rating of "poor". Only the aspects of customs, quality and competency of logistics services, track and track ability, and security of shipments were seen to be adequate.

The lowest scores were received for the aspects of infrastructure, international shipments, and timeliness. Comparing between the views on importance of the attribute to the company or organisation, and their performance for Grenada, the largest gap was seen for the attribute of quality of trade and transport infrastructure, followed by the attribute of frequency with which shipments reach consignees within scheduled or expected delivery times (i.e., timeliness). Considerable gaps were also observed for the aspects of efficiency of customs and border management clearance, having a fair clear regulatory framework that provides a level playing field,

Table 34: Logistics Performance for Grenada Based on Survey Results Conducted as Part of Logistics Chain Study

Supply Chain Attributes*	(A) Importance to Company/ Organisation**	(B) Performance for Saint Lucia***	(B) – (A)
Components of Logistics Performance Index by The World Bank			
Efficiency of customs and border management clearance ("customs")	4.90	3.05	-1.86
Quality of trade and transport infrastructure ("infrastructure")	4.81	2.76	-2.05
Ease of arranging competitively priced shipments ("international shipments")	4.38	2.76	-1.62
Competence and quality of logistics services (inclusive of trucking, forwarding and customs brokerage) ("logistics competence and quality")	4.71	3.05	-1.67
Ability to track and trace consignments ("tracking and tracing")	4.52	3.00	-1.52
Frequency with which shipments reach consignees within scheduled or expected delivery times ("timeliness")	4.76	2.76	-2.00
Additional Components Proposed Based on Desktop Research			
Security of shipments handled ("security")	4.76	3.43	-1.33
Tariffs which are transparent and consistently applied ("tariffs")	4.57	2.86	-1.71
Fair and clear regulatory framework that provides a level playing field ("regulatory framework")	4.76	2.86	-1.90

*Source: International Consultant and National Consultant, based on results of survey conducted from 14 March to 26 April. * Based on 13 responses. ** 1 – not important; 5 – extremely important. *** 1 – very poor; 5 – very good.*

and having tariffs which are transparent and consistently applied.

We proposed for regular assessments using this approach to ascertain the effectiveness of policy and practical responses to improve the state of transport and logistics performance in the country. The usefulness of the approach is that it draws on the methodology of the LPI study by the World Bank and is further tailored to identify priority areas of concern by stakeholders in the country.

The logistics community in Grenada was also asked to rate the quality of service for the main seaport and airport of the country. For Grenada, attention was on performances for the Port of St. George's and the Maurice Bishop International Airport.

Respondents to the survey for Grenada rated overall quality of service by the port to be slightly below "adequate" (see **Table 35**). Areas found to be below the rating of "adequate" are information technology capability and reliability of service by the port operator. In particular, low score obtained for information technology capability pulled down the overall score with 2.77 given to overall service quality by the port. Respondents were also encouraged to provide comments to support their responses given in the survey. Areas mentioned for the port having performed well included those of having reliable cargo-handling equipment as well as on the aspect of safety. However, respondents pointed to areas that require improvements to include customer service, inefficient port labour and need for a quay crane. Reasons that caused delays in vessel arrivals and departures can be attributed to bad weather, industrial actions, and holidays. As for reasons that caused delays to cargo operations, they include the aforementioned reasons as well as malfunctioning of port and/or ship equipment, and documentation issues.

Turning to the airport sector in Grenada, ratings were generally higher for Maurice Bishop International Airport with overall service quality by the airport operator receiving a rating of 3.30, putting it as "adequate". The only area found to be slightly below "adequate" is that of reliability of service by airlines. Otherwise, the airport was found to receive higher scores in almost all aspects of performance compared to the seaport. Details of scores for Maurice Bishop International Airport are shown in **Table 36**. Based on comments given by respondents, areas that the airport has performed well included cargo loading, relaying flight information and security screening of cargo. The last aspect was made possible by installation of an x-ray scanner. However, areas that needed improvement included reliability and availability of cargo flights, capacity on these flights, refrigerated storage capacity, dedicated facility to store cargo, and having better trained service providers. Reasons that cause delays to flights are mainly attributed to weather or technical issues. These reasons also contributed to delays in cargo operations. Responses obtained from the survey were used to develop and prepare for workshops that were held in both countries in April 2023. Results of the workshops are presented in the next chapter.

Table 35: Performance for Port of St. George's in Grenada

Attribute	Score*
Quality of cargo-handling service	3.00
Security provided to cargo	3.00
Transport capacity by vessels	3.31
Frequency of service by vessels	3.38
Reliability of service by vessels	3.15
Reliability of service by port operator	2.85
Ability to track and trace cargo	3.31
Information technology capability	2.69
Overall service quality by the port	**2.77**

*Source: International Consultant and National Consultant, collated from results of survey conducted from 14 March to 26 April. * Based on 13 responses (1 – very poor; 3 – adequate; 5 – very good).*

Table 36: Performance for Maurice Bishop International Airport in Grenada

Attribute	Score*
Quality of cargo-handling service	3.40
Security provided to cargo	3.80
Transport capacity by airline flights	3.00
Frequency of service by airline flights	3.20
Reliability of service by airlines	2.90
Reliability of service by airport operator	3.30
Ability to track and trace cargo	3.50
Information technology capability	3.30
Overall service quality by the airport	**3.30**

*Source: International Consultant and National Consultant, collated from results of survey conducted from 14 March to 26 April. * Based on ten responses (1 – very poor; 3 – adequate; 5 – very good).*

7.4 CHAPTER SUMMARY

The chapter presents critical demand drivers and emerging trends relevant for the transport and logistics sector in Grenada. This addresses the fourth objective of the study. Performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions are also proposed.

The chapter gave a recap of challenges faced by the transport and logistics sector in the country. For shipping and operations, concerns are with limited shipping connectivity, inadequate capability of the port to handle mainline containerships, expensive shipping and port charges, archaic port tariffs, inefficiencies with berthing and yard operations, damaged containers, lack of empty containers, and inefficient customs operations and processes. For flight network and airport operations, concerns are with limited flight connectivity, flight delays and cancellations, improvements needed to cargo-handling facilities, lack of cold storage facilities, inefficient cargo operations, and inefficient customs operations and processes. For land transportation, concerns are with the condition of trucks, poor condition of farm roads, and road infrastructure as a whole.

In addition to these issues, there were other concerns gathered from stakeholders. Firstly, there is the issue with port labour. Discussions with various stakeholders indicate there is significant scope for improvements for stevedoring services. Secondly, there are calls to improve conduct of businesses with the port through electronic means. Thirdly, there is a need to have a fundamental review of current port capacity and its capability of meeting the needs over the medium to long term in the country. The fourth issue relates to having a national single window system that allows for full electronic transactions. The fifth issue relates to training and education in the area of logistics and supply chain management. The sixth issue relates to export promotion. Last but not least, stakeholders mentioned the importance of an unbroken cold chain for products.

For stakeholders in both the private and public sectors, there are two major sets of drivers and trends of concern. The first set of developments concern the macroeconomic environment which businesses operate within. Demand for logistics services is driven largely by the external sector with high dependence of both countries on international trade. As such, economic performances of key trade partners are important concerns. This will be other countries in the OECS, CARICOM and major economies in North America, South America and Europe.

The second set of developments relate to operational parameters which span the dimensions of market demand, technologies, work conditions, sustainability, environmental protection, and sourcing among other perspectives. Based on the Logistics Trend Radar 6.0 developed by DHL, the list of trends or drivers that are likely to have a high impact on the logistics industry especially within five years are digital marketplaces, omnichannel, stationary robotics, and indoor mobile robots. For trends or drivers that will take 5-10 years to reach realisation, they include supply chain diversification, circularity, decarbonisation, alternative energy solutions, and outdoor autonomous vehicles.

Trends and drivers seen to have a moderate impact on the logistics industry include cybersecurity 2.0, smartification, big data analytics, smart labels, next- generation packaging, edge computing, blockchains, drones, computer vision, physical internet, and environmental stewardship. For the list of drivers and trends that are expected to have a mild impact on the logistics industry, it may be the case that they are already in advanced stages of development and/or beginning to see widespread adoption across the industry.

Notwithstanding the aforementioned drivers and trends, there are five important developments to watch in the near term. Firstly, inflation and tight budgets will impact logistics demand significantly. Secondly, personalisation is going to become the biggest logistics trend. Thirdly, use of AI logistics and supply chain management is expected to grow. Fourthly, IoT will see greater proliferation and adoption in supply chain management. Fifthly, data analytics is expected to further transform the logistics business.

The demand drivers and trends cover a wide spectrum of dimensions and issues. This is inevitable with the all-encompassing and cross-cutting nature of the logistics industry which transcend many aspects of society at the government, business, and individual levels.

Proposed logistics performance indicators that are aligned to the aspects of time, cost and complexity of trade transactions makes reference to the LPI from The World Bank. Results for LPI 2023 showed Grenada ranked in the 97th position globally. In addition to the attributes analysed, the community was asked to rate the attributes in terms of their importance to the organisation or company, followed by their views on their performance for the country.

Respondents view the supply chain attributes to be "very important" to their companies or organisations. However, scores received for logistics performances were mostly in the rating of "poor". The lowest scores were seen for infrastructure, international shipments, and timeliness. Results also revealed the biggest gap in terms of importance to the company or organisation and performance for the country was seen for the attribute of infrastructure.

The logistics community in Grenada was also asked to rate the quality of service for the main seaport and airport of the country. Respondents rated overall quality of service by the port to be slightly below "adequate". Areas found lacking are information technology capability and reliability of service by the port operator. Ratings were generally higher for the airport compared to the seaport. The only area found to be slightly below "adequate" is that of reliability of service by airlines.

CHAPTER 8

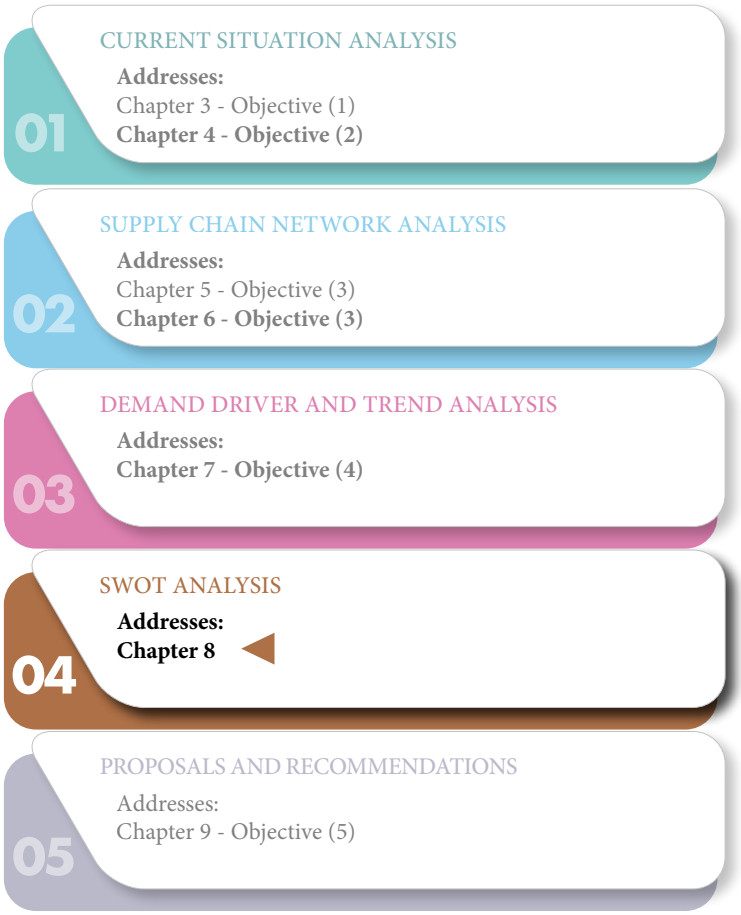
ANALYSIS OF STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS (SWOT)

SWOT analysis is conducted to assess prospects and potential transport and logistics development strategies for the fourth component of the study (see **Figure 36**). The analysis draws on findings from points (1), (2) and (3) of the study. Intention is to outline core competitive advantages and strengths that are possessed in serving as attractive logistics centres for international trade and market access. The analysis will also propose logistics positioning strategy based on attributes of key transport and logistics infrastructures. The analysis considers the perspectives of manufacturers, traders, freight forwarders and policy makers.

The SWOT analysis draws on findings from desktop research, surveys and field trips made in Grenada. Interviews with stakeholders of the logistics community and site visits lasted from 24-26 April 2023. The site visits and interviews were followed by focus group workshops which were held on 27-28 April at the Kirani James Athletic Stadium.

Workshops held in the country were used to validate key observations regarding the transport and logistics sectors. Purpose is to validate key observations made during the interviews and information obtained through background research. There are three groups of entities of interest. The first group consists of manufacturers, importers and exporters where their focus is on specific commodities or products of interest. They are the cargo owners who require logistics services to be performed. Their emphasis will be on expedient, reliable, cost-efficient, and secure handling of their cargo. The second group consists of logistics service providers who include customs brokers, shipping lines and trucking companies among others. Their business stems from demand for logistics services by the cargo owners. The third group consists of government entities. They are supposed to drive the policy and regulatory aspects of the logistics sector.

Figure 36: Framework for Proposed Approach to the Study – SWOT Analysis



Source: International Consultant.

The participants were asked to assess a set of aspects pertaining to strengths, weaknesses, opportunities, and threats (SWOT) facing the logistics sector in the country. The list of aspects presented in worksheets disseminated during the workshops were obtained from desktop research conducted before the field trip and responses from surveys submitted by various stakeholders of the logistics sector. Worksheets used for workshops in Grenada can be found in **Annex 3**.

8.1 SWOT ANALYSIS FOR GRENADA

Consolidated views from participants at the workshops for Grenada revealed the top aspects for the four dimensions of SWOT to be those shown in **Table 37**. Low cost of operations for businesses received the highest score as a **strength** favouring the logistics sector in Grenada. Competitive and high-quality airport sector and services, and competitive exports of food and beverages regime also received high scores from participants at the workshops. This was followed by having a stable currency and a competitive and high-quality freight forwarding sector and services. For **weaknesses**, consolidated views from participants across the three groups rated highly the lack of cold storage facilities, inadequate road network and poor road conditions, and insufficient capacity at the airport to serve logistics needs of users to be key weaknesses suffered by the logistics sector in Grenada. Other weaknesses which received high scores were inefficient labour practices at the port and ageing port infrastructure.

As for **threats**, the top concerns were limited or lack of sufficient cold-chain handling capacity and facilities, insufficient cargo volumes to grow transport connectivity to overseas markets, and low rate of technology adoption. Consolidated views from workshop participants also highlighted failure to develop an export-oriented economy and limited or lack of sufficient cargo-handling capacity and facilities for seaport sector as major threats facing the logistics sector in Grenada. Consolidated views from participants at the workshops ranked training and education to develop logistics and supply chain management skills, developing a National Single Window for customs and border processes, and adopting technology such as use of IoT devices for tracking and tracing shipments as top **opportunities** to work on. This was followed by improving logistics performance in the area of cost for greater competitiveness and galvanising the logistics community through regular dialogues and sharing sessions.

Details of scores obtained for views on strengths, weaknesses, threats and opportunities for the logistics sector in Grenada are shown in **Annex 4**. Note that the scores are tabulated for responses given for aspects that require immediate attention or action to be taken within five years.

Table 37: Consolidated Views from Workshop Participants for Key SWOT Aspects

Strengths	Weaknesses	Threats	Opportunities
#1 Low cost of operations for businesses	#1 Lack of cold stor-age facilities	#1 Limited or lack of sufficient cold-chain handling capacity and facilities	#1 Training and education to develop logistics and supply chain management skills
#2 Competitive and high-quality airport sector and services	#2 Inadequate road network and poor road conditions	#2 Insufficient cargo volumes to grow transport connectivity to overseas markets	#2 Develop National Single Window for customs and border processes
#3 Competitive exports of food and beverages (spices, wheat, cocoa, fish etc.)	#2 Insufficient capacity at the airport to serve logistics needs of users	#3 Low rate of technology adoption (e.g., e-invoicing)	#2 Adopt technology such as use of IoT devices for tracking and tracing shipments
#4 Stable currency	#4 Inefficient labour practices at the port	#4 Failure to develop an export-oriented economy	#4 Improve logistics performance in the area of cost for greater competitiveness
#5 Competitive and high-quality freight forwarding sector and services	#5 Ageing port infrastructure	#5 Limited or lack of sufficient cargo- handling capacity and facilities for seaport sector	#5 Galvanise the logistics community through regular dialogues and sharing sessions

Source: International Consultant and National Consultant, collated from results of workshops conducted from 27 to 28 April.

The following paragraphs of this section analyses views obtained from each group of participants. Interesting similarities and differences can be observed for the top concerns of each group. The top five scoring aspects for **strengths** possessed for Grenada are shown in **Table 38.** The analysis revealed consensus for key strengths possessed by Grenada which can benefit the logistics sector to be low cost of operations for businesses, having a competitive and high-quality airport sector and services, and having a stable currency. Agreement was also seen for manufacturers, importers and exporters and the government sector in viewing competitive exports of food and beverages to be a major strength. However, while manufacturers, importers and exporters saw Grenada having a competitive manufacturing sector as a key strength, the other participants gave a lower rating for this aspect. On the other hand, the government sector saw its efforts to develop and grow the export sector as a major strength although this view was not shared by the private sector. As for logistics service providers, concentration of cargo consolidation and distribution centre in St. George's, having a high level of safety and security, and having a competitive and high-quality freight forwarding sector and services were seen as major strengths that can benefit the logistics sector in Grenada. However, this viewed was not shared by cargo owner participants or those from the government sector.

For **weaknesses**, the top five scoring aspects for Grenada are shown in **Table 39**. There was consensus between participants from the private sector on major weaknesses that require priority attention in Grenada. These are lack of cold storage facilities, inadequate road network and poor road conditions, insufficient capacity at the airport to serve logistics needs or users, inefficient labour practices at the port, and inefficient customs and border processes. The first three weaknesses were also viewed as top concerns by participants from the government sector. Participants from the government sector also identified top weaknesses to be limited investment opportunities with export potential and absence of a single window for border procedures. However, these aspects received lower scores from participants from the private sector. Another weakness was ageing port infrastructure was ranked highly by participating logistics service providers. However, this aspect too received lower scores from participants from the other groups.

Table 38: Top Five Scoring Aspects for Strengths of Grenada's Logistics Sector

Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
#1 Low cost of operations for businesses	#1 Low cost of operations for businesses	#1 Government's proactive efforts to develop and grow the export sector
#1 Competitive exports of food and beverages (spices, wheat, cocoa, fish etc.)	#2 Concentration of cargo consolidation and distribution centre in St. George's	#2 Competitive exports of food and beverages (spices, wheat, cocoa, fish etc.)
#3 Competitive and high-quality airport sector and ser-vices	#2 Competitive and high-quality airport sector and services	#2 Competitive and high-quality airport sector and services
		#5 Competitive exports of beverages (beer, spirits, liqueurs, alcoholic beverages)
#3 Competitive manufacturing sector	#2 High level of safety and security	#4 Low cost of operations for businesses
#5 Stable currency	#5 Stable currency	#4 Stable currency
	#5 Competitive and high-quality freight forwarding sector and services	

*Source: International Consultant and National Consultant, collated from results of workshops conducted from 27 to 28 April. * Aspects ranked in the top positions which are common across the three groups of participants have been highlighted.*

As for **threats**, the top five scoring aspects for Grenada are shown in **Table 40**. Participants from all the three groups of participants ranked highly the aspects of limited or lack of sufficient cold-chain handling capacity and facilities, insufficient cargo volumes to grow transport connectivity to overseas markets, and low rate of technology adoption to be the top threats posed to logistics performance for Grenada. Participants from logistics service providers and the government sector also view highly the threats posed by failure to develop an export-oriented economy and stagnating or slow economic growth in key export markets of the Caribbean and Europe. Logistics service providers also shared with manufacturers, importers and exporters on the view that limited or lack of sufficient cargo-handling capacity and facilities for seaport sector as a major threat. However, while manufacturers, importers and exporters view limited or lack of sufficient cargo-handling capacity and facilities for airport sector, and failure to coordinate, manage and bring much needed changes to the logistics sector as top threats to the logistics sector of Grenada, this concern was not shared by participants from the other two groups.

In terms of **opportunities**, the top five scoring aspects for Grenada are shown in **Table 41**. There was consensus among the three groups of participants at the workshops for action needed to capitalise on the opportunities for developing a National Single Window for customs and border processes, training and education to develop logistics and supply chain management skills, and adopting technology such as use of IoT devices for tracking and tracing shipments. Participants from the private sector also rated highly the need to capitalise on opportunities presented by improving logistics performance in the area of cost for greater competitiveness.

Table 39: Top Five Scoring Aspects for Weaknesses of Grenada's Logistics Sector

Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
#1 Inefficient labour practices at the port	#1 Inefficient labour practices at the port	#1 Limited investment opportunities with export potential
#1 Lack of cold storage facilities	#1 Lack of cold storage facilities	#2 Lack of cold storage facilities
#1 Inadequate road network and poor road conditions	#3 Inadequate road network and poor road conditions	#3 Inadequate road network and poor road conditions
#1 Insufficient capacity at the airport to serve logistics needs of users	#3 Insufficient capacity at the airport to serve logistics needs of users	#3 Insufficient capacity at the airport to serve logistics needs of users
#1 Inefficient customs and border processes	#3 Inefficient customs and border processes	#3 Absence of a single window for border procedures
	#3 Ageing port infrastructure	

*Source: International Consultant and National Consultant, collated from results of workshops conducted from 27 to 28 April. * Aspects ranked in the top positions which are common across the three groups of participants have been highlighted.*

Table 40: Top Five Scoring Aspects for Threats to Grenada's Logistics Sector

Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
#1 Limited or lack of sufficient cargo-handling capacity and facilities for airport sector	#1 Limited or lack of sufficient cold-chain handling capacity and facilities	#1 Limited or lack of sufficient cold-chain handling capacity and facilities
#2 Insufficient cargo volumes to grow transport connectivity to overseas markets	#1 Insufficient cargo volumes to grow transport connectivity to overseas markets	#1 Failure to develop an export-oriented economy
#2 Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector	#3 Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector	#3 Insufficient cargo volumes to grow transport connectivity to overseas markets
#2 Low rate of technology adoption (e.g., e-invoicing)	#3 Low rate of technology adoption (e.g., e-invoicing)	#4 Low rate of technology adoption (e.g., e-invoicing)
#2 Limited or lack of sufficient cold-chain handling capacity and facilities	#3 Failure to develop an export-oriented economy	#4 Stagnating or slow economic growth in key export markets of the Caribbean and Europe
#2 Failure to coordinate, manage and bring much needed changes to the logistics sector	#3 Stagnating or slow economic growth in key export markets of the Caribbean and Europe	

*Source: International Consultant and National Consultant, collated from results of workshops conducted from 27 to 28 April. * Aspects ranked in the top positions which are common across the three groups of participants have been highlighted.*

For the case of manufacturers, importers and exporter, participants from this group gave high scores to the aspect of upgrading and developing cargo-handling capacity and facilities for seaport sector, as well as having a Whole-of-Government approach to advance competitiveness of the logistics ecosystem. On the last aspect, the view was shared by participants from the government sector. However, while government participants rated highly the need to develop and grow the e- commerce sector, this aspect received lower scores from participants from the other two groups. Similarly, the view from participating logistics service providers on the need to galvanise the logistics community through regular dialogues and sharing sessions and adopt blockchain technology for trade facilitation was not shared by other participant groups who gave these aspects lower scores.

Participants in each of the focus groups were further asked to identify which export industries Grenada should develop competitiveness in. The results were unanimous across the three groups of participants with agro-processing, production and distribution of local produce receiving the most mentions. Products mentioned include cocoa, spices, fish, fruits, soursop, bananas and vegetables among others. For the areas of assistance required for SMEs to improve their supply chain performance, the areas of financing, technical know-how and concessions for critical items brought in as raw materials for processing or manufacturing received the most number of mentions in the focus groups.

8.2 STRATEGISING THE WAY FORWARD FOR GRENADA'S SECTOR

Participants at the focus group workshops were also asked to discuss possible actions or initiatives required to improve logistics chain efficiency as well as positioning strategies for the sector. They were further required to identify the lead entity to drive developments for each specific area. The list of areas deliberated during the workshops and results of the discussions are presented in **Table 42**.

Entities proposed to lead efforts to drive developments for each of the areas identified can come from the public or private sector. Based on the recommendations provided in the table, we saw the Ministry of Foreign Affairs, Trade and Export Development receiving the most mentions. This was followed by the Ministry of Economic Development, Planning, Tourism, ICT, Creative Economy, Agriculture and Lands, Fisheries and Cooperatives, Ministry of Finance, and Grenada Ports Authority. The Ministry of Infrastructure and Physical Development, Public Utilities, Civil Aviation and Transportation and Grenada Customs and Excise Division also received quite a few mentions. Other public sector agencies mentioned included the Grenada Investment Development Corporation, Grenada Authority for the Regulation of Financial Institution, Ministry of Education, Youth, Sports and Culture, Ministry of Mobilisation, Implementation and Transformation, and Grenada Airports Authority. For the private sector, relevant chambers of commerce, export manufacturers, shipping lines, airlines and other logistics service providers received mentions.

Table 41: Top Five Scoring Aspects for Opportunities for Grenada's Logistics Sector

Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
#1 Training and education to develop logistics and supply chain management skills	#1 Galvanise the logistics community through regular dialogues and sharing sessions	#1 Develop National Single Window for customs and border processes
#2 Adopt technology such as use of IoT devices for tracking and tracing shipments	#2 Adopt technology such as use of IoT devices for tracking and tracing shipments	#2 Adopt technology such as use of IoT devices for tracking and tracing shipments
#2 Upgrade and develop cargo-handling capacity and facilities for seaport sector	#2 Training and education to develop logistics and supply chain management skills	#3 Training and education to develop logistics and supply chain management skills
#2 Develop National Single Window for customs and border processes	#2 Develop National Single Window for customs and border processes	#4 Develop and grow the e- commerce sector
#2 Whole-of-Government approach to advance competitiveness of the logistics ecosystem	#2 Adopt blockchain technology for trade facilitation (e.g., e-bill of lading, smart contracts)	#5 Whole-of-Government approach to advance competitiveness of the logistics ecosystem
#2 Improve logistics performance in the area of cost for greater competitiveness	#2 Improve logistics performance in the area of cost for greater competitiveness	

*Source: International Consultant and National Consultant, collated from results of workshops conducted from 20 to 21 April. * Aspects ranked in the top positions which are common across the three groups of participants have been highlighted.*

Table 41: Top Five Scoring Aspects for Opportunities for Grenada's Logistics Sector

Area of Concern	Recommended Actions or Initiatives	Proposed Entity(ies) to Drive Development
Promote and Develop Data Processing and Management	• Provide security to data and greater awareness on why data is collected, as well as benefits of using data for informed business decisions. • Develop integrated information management systems to facilitate collection and analysis of data for evidence-based decision making. • Better visibility with data made accessible and available. • Create a 'single window' and streamline business processes among all key actors (i.e., customs, ports, trade, statistics, service providers, service users).	Ministries dealing with finance and trade, Grenada Ports Authority, Customs, logistics service providers
Grow Cargo Volume	• Reduce border taxes and implement de minimis system. • Mechanisation of manufacturing processes with incentives to mechanise. • Reduce transit times to the port. • Need more empty containers to facilitate trade. • Set up incubators for agro-processors, storage facilities, laboratories for testing and production, financial support, access to land for agricultural production, incorporate technology in farming, implement structures for post harvesting, access to market, and facilitate development of clusters.	Ministries dealing with trade, finance and agriculture, export manufacturers, shipping lines, airlines, Grenada Ports Authority
Attract Investments	• Trade shows, local and international advertising, and e-marketing. • Increased storage facilities, invest in better handling equipment and procedures at the port. • Greater ease of doing business using electronic means. • Clear guidance and procedures for imports and exports. • Promote attraction of tax incentives and tax breaks, political stability, availability of property and low labour costs.	Grenada Investment Development Corporation, Ministries dealing with infrastructure, transport, mobilisation and transformation, foreign trade, tourism and culture, chambers dealing with industry and commerce
Customs and Border Processes	• Having standardised tax system and efficient customs officers. • Standard operating procedures for engaging logistics providers and agencies (i.e., port and customs). • Use of technology and digital processes (e.g., port community system, one-stop services in a single platform to facilitate electronic payments and document processing).	Ministry dealing with trade, Grenada Ports Authority, Customs
Develop and Grow E- Commerce	• Reliable internet and internet service providers. • Technical training and development in the use of electronic platforms and systems by all stakeholders. • Promote e-payment and implement total e- processing of customs documentation. • Discussions with financial institutions on protocols, regulations, cyber security, fraud preventions, training and awareness.	Ministries dealing with information technology, fi-nance and eco-nomic develop-ment, private and public sector
Training and Education	• Comprehensive training and education programs for logistics personnel involving expertise from the industry. • Training of customs officers, brokers, and government clerks. • Training at the primary and secondary ed-ucation for logistics career opportunities • Need courses on warehouse management, customs brokerage, ordering and receiving goods, and programs should have certification. • Collaboration with universities (e.g., Uni-versity of West Indies). • Shipping and logistics course currently of-fered has low demand, causing the course to stop running. • Support from agencies, supporting materi-als, supporting facilities for face-to- face and online lectures, and identify persons to be trained.	Ministries dealing with education and trade, chambers of commerce, department dealing with public administration

Table 41: Top Five Scoring Aspects for Opportunities for Grenada's Logistics Sector (cont'd)

Area of Concern	Recommended Actions or Initiatives	Proposed Entity(ies) to Drive Development
Improve Transport Infrastructure	• Road network for St. George's area needs improvements. • Roads are too narrow. • Improved enforcement of traffic laws. • Lack of space for truck parking and storage of containers at the port. Utilise the playing field for port storage. Use a second gate for container exit. • Closure of the port highway to the public between 0800-1600 hours. • Trucks can operate at night and the port should be open at night to facilitate. • Insurance coverage for cargo being transported. • Develop regional ferry services for sea connectivity, and competitive regional air transport services for air connectivity. • Import cargo-handling equipment. • Develop cargo-handling facility. • Reduced reliance on expensive labour. • Competitive pricing of transport related tariffs and fees through periodic reviews. • Servicing of the equipment and training of mechanics	Ministries dealing with infrastructure, planning and transport, Grenada Ports Authority, Grenada Authority for the Regulation of Financial Institutions (GARFIN), effort to be led through CARICOM for sea and air transport.
Promote and Grow Research and Development	• Set up incubators. • Make data and information available to facilitate market research. • Promote and adopt a research-oriented approach to develop and grow the logistics sector among key stakeholders (e.g., develop laboratories, bureau of standards). • Design and execute a research strategy or agenda through the conduct of surveys, questionnaires etc. in collaboration with stakeholders.	Ministry dealing with trade, information and technology, Grenada Investment Development Corporation
Promote Automation	• Automate online transactions to facilitate ease of doing business (e.g., billing, payments, invoicing, procurement, tax system, cargo management). • Automate operations between shipping agents, border control, customs and port authority. • Analyse and identify key areas for automation, develop action plans, training and awareness, develop policies (e.g., track and trace shipments, cargo processing).	Ministries dealing with information and technology, finance and infrastructure, Customs, Grenada Ports Authority
Facilitate Financial Transactions	• More businesses should allow or accept online payments (e.g.,very few patrol stations accept credit cards). Online payments should be promoted. • Improved banking capacity for conducting international transactions. • Improved communications between banks and business. • Having e-payments, single window, single transaction (there can be multiple charges for multiple payments). • Increased cyber security, e-billing and e- invoicing.	Ministries dealing with finance, information and technology, financial institutions, GARFIN
Export Promotion	• Assistance for marketing, labelling, certification, quality control, technical support, storage facilities and financing.	Ministries dealing with trade and commerce

Source: International Consultant and National Consultant, collated from results of workshops conducted from 27 to 28 April.

8.3 CHAPTER SUMMARY

SWOT analysis is conducted to assess prospects and potential transport and logistics development strategies. Intention is to outline core competitive advantages and strengths that are possessed in serving as attractive logistics centres for international trade and market access.

Workshops held in the country were used to validate key observations regarding the transport and logistics sectors. Groups of interest are manufacturers, importers and exporters, logistics service providers, and government entities. The participants were asked to assess a set of aspects pertaining to strengths, weaknesses, opportunities, and threats (SWOT) facing the logistics sector in the country.

Consolidating views from all participants at the workshops for Grenada showed low cost of operations for businesses as a core strength. Competitive and high- quality airport sector and services, and competitive exports of food and beverages regime also received high scores from participants at the workshops. This was followed by having a stable currency and a competitive and high-quality freight forwarding sector and services.

For weaknesses, consolidated views from participants across the three groups in Grenada rated highly the lack of cold storage facilities, inadequate road network and poor road conditions, and insufficient capacity at the airport to serve logistics needs of users to be key weaknesses suffered by the logistics sector in Grenada. Other weaknesses which received high scores were inefficient labour practices at the port and ageing port infrastructure.

As for threats facing the logistics and transport sector in Grenada, the top concerns by participants were limited or lack of sufficient cold-chain handling capacity and facilities, insufficient cargo volumes to grow transport connectivity to overseas markets, and low rate of technology adoption. Consolidated views from workshop participants also highlighted failure to develop an export-oriented economy and limited or lack of sufficient cargo-handling capacity and facilities for seaport sector.

Consolidated views from participants at the Grenada workshops ranked training and education to develop logistics and supply chain management skills, developing a National Single Window for customs and border processes, and adopting technology such as use of IoT devices for tracking and tracing shipments as top opportunities to work on. This was followed by improving logistics performance in the area of cost for greater competitiveness and galvanising the logistics community through regular dialogues and sharing sessions.

Participants at focus group workshops were also asked to discuss possible actions or initiatives required to improve logistics chain efficiency as well as positioning strategies for the sector. Topics discussed include the areas of promoting and developing data processing and management, growing cargo volume, attracting investments, addressing customs and border processes, developing and growing e-commerce, training and education, improving transport infrastructure, promoting and growing research and development, promoting automation, facilitating financial transactions, and export promotion.

CHAPTER 9

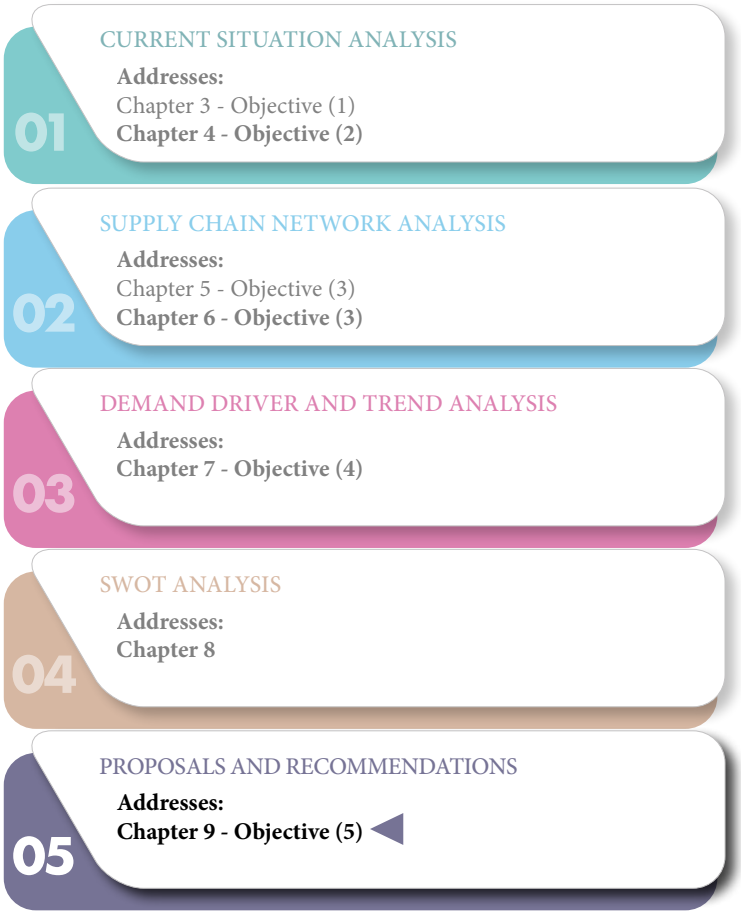
RECOMMENDATIONS FOR THE LOGISTICS SECTOR

Concrete initiatives and policy and institutional measures are proposed in this chapter. This forms the last component of the study and addressed the fifth objective (see **Figure 37**). The aim of the proposed actions and initiatives is to reduce costs and improve competitiveness of the transport and logistics sector in Grenada. Proposals and recommendations along with main cost drivers will also include considerations and recommendations to strengthen food security and intra-regional trade. The recommendations drew on findings from points (1), (2), (3) and (4) of the study. Implementation timeline of the proposed recommendations are provided and the strategic road map makes reference to implementation over the short term (1 to 2 years), medium term (3 to 5 years), and longer term (6 to 10 years).

The recommendations proposed for Grenada took account of the strengths that favour the logistics sector. These are stable currency and competitive exports (i.e., cocoa, nutmeg and fish). There is the added advantage of having the bulk of logistics activities concentrated in Saint George Parish. The recommendations are

targeted at addressing weaknesses and threats faced by the logistics and transport sectors, and take advantage of opportunities that could propel the industry forward.

Figure 37: Framework for Proposed Approach to the Study – Proposals and Recommendations



Source: International Consultant.

9.1 RECOMMENDATION #1: STRENGTHEN THE CONSENSUS BUILDING MECHANISMS BETWEEN PUBLIC AND PRIVATE SECTORS FOR TRADE FACILITATION REFORM

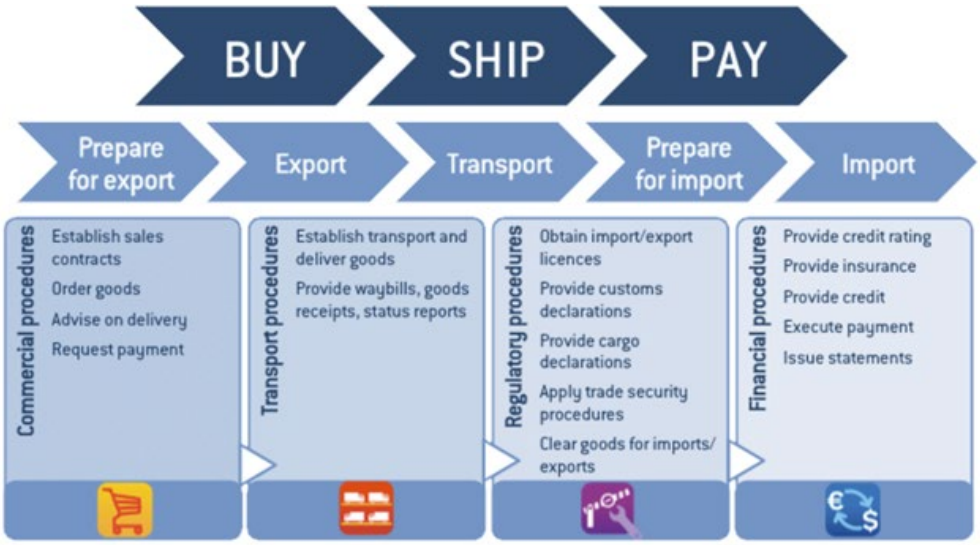
The recommendation calls to strengthen the consensus building mechanism between public and private sectors for trade facilitation reform. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Lack of cold storage facilities • Ageing port infrastructure • Inefficient customs and border processes • Limited coordination and cooperation between private and public sector
	Threat	• Failure to coordinate, manage and bring much needed changes to the logistics sector • Connectivity to overseas markets • Failure to develop an export-oriented economy • Limited or lack of sufficient cold-chain handling capacity and facilities • Uncompetitive seaport sector
	Opportunity	• Develop National Single Window for customs and border processes • Galvanise the logistics community through regular dialogues and sharing sessions • Upgrade and develop cargo-handling capacity and facilities for seaport sector • Whole-of-Government approach to advance competitiveness of the logistics ecosystem • Improve logistics performance in the area of cost for greater competitiveness.

Logistics activities serve as the bedrock which brings about efficient business processes, trade competitiveness, and better quality of life. Through the logistics and supply chain services available, the country's economy can function efficiently where flow of products and commodities are not interrupted by congestion or various forms of disruptions. Transport and trade connectivity offered by the quality of sea, air and land transport infrastructure becomes an important component in trade facilitation. A competitive and competent logistics sector will help to integrate

the country into regional and international trade and manufacturing networks. Specifically, export and import processes are realised with an efficient logistics system that connects the country's logistics facilities via seaport and airport facilities to foreign markets. Having an internationally competitive logistics sector will also enhance investment attractiveness of the country.

Figure 38: The United Nations Centre for Trade Facilitation and Electronic Business Buy Ship Pay (BSP) Model



Source: United Nations (2012)[106] .

[106]United Nations (2012) Trade Facilitation Implementation Guide [Online]. Available at: https://tfig.unece.org/details.html#:~:text=The%20fundamental%20principles%20of%20trade,simplification%2C%20harmonization%2C%20and%20standardization. (Accessed 30 June 2023).

A critical task of developing and enhancing international trade competitiveness that is enabled by an efficient and productive logistics sector is to secure consensus between the public and private sectors for trade facilitation reform. Trade facilitation refers to efforts and outcome that lead to the simplification, standardisation and harmonisation of procedures as well as associated information flows needed to move goods between buyers and sellers and make payment[107] . Simplification requires eliminating all unnecessary duplications in trade processes, procedures and formalities. Standardisation requires developing formats for procedures, documents and information that are agreed by various parties. Harmonisation requires alignment of national operations, procedures and documents with international standards and conventions. Trade facilitation is also about making the process transparent. Transparency requires governments to promote openness and accountability of its administrative actions. There are several dimensions to transparency for trade facilitation. At the minimum, it entails disclosure of information such that the public can access readily and use it. Hence, the fundamental principles of trade facilitation are simplification, standardisation, harmonisation and transparency. From the supply chain perspective, activities involved in international trade is depicted in **Figure 38**. The BSP model reveals many entities involved. Trade facilitation encompasses all actors and processes for the entire trade environment associated with the international trade transaction. The actors go beyond customs administrations and include traders, service intermediaries, transport providers and other regulatory agencies from the public sector. As such, building and strengthening the consensus for mechanisms involving the public and private sectors that enable trade facilitation reform becomes an important step.

Trade facilitation reform requires taking actions that include the following areas:

- Legal: regulatory reforms to bring about a concise, clear, and transparent legal framework.
- Organisation: private sector consultation, inter-agency cooperation and institutional development.
- Technology: modernisation of trade-related infrastructure for electronic processing of required trade documents and data exchange.
- Processes: changes in business procedures and processes.
- People: capacity building for implementing officers.

9.2 RECOMMENDATION #2: ESTABLISH NATIONAL LOGISTICS SKILLS CURRICULA

The recommendation calls for establishing a national logistics skills curriculum for the country. Implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Threat**	• Lack of skilled logistics professional (e.g., management, supervisory, operational levels) • Uncompetitive port sector
	Opportunity	• Training and education to develop logistics and supply chain management skills • Improve logistics performance in the area of cost for greater competitiveness.

The national logistics skills curricula focus on desired attributes and essential skills required by the logistics industry. The content draws from findings of a national exercise which was conducted on skills demanded for the logistics sector in Singapore[108]. The nationwide exercise considered feedback from industry leaders, human resource professionals, educators and trainers as well as policy makers. The curriculum also emphasises lifelong engagement and learning for continuous improvements that are aligned to the needs of the industry.

At the core, the logistics work environment aims to bring about greater efficiency and productivity. The discussion further recognises logistics as an essential enabler of economic growth and progress. As an evolving industry, the logistics sector offers challenging and rewarding career opportunities that are grounded in highly transferable skills. Even more, those who work in the industry are placed at the forefront of technology advancements and globalisation that constantly have to keep pace with emerging business trends. Essential skills likely to be in demand for the logistics industry are identified to be:

- Process improvement
  Ability to improve processes that align requirements of the organisation and maximise quality while reducing waste.

[107]Ibid.
[108]SkillsFuture Singapore (2017) Skills Framework for Logistics, September [Online]. Available at: https://www.skillsfuture.gov.sg/skills-framework/logistics (Accessed 20 May 2023).

- Business innovation management
  Ability to manage decisions, practices, and activities which takes ideas to realisation to create business value.
- Solutioning and program management
  Ability to provide a single touch point between key customers and project managers for executing logistics solutions.
- Technology management
  Ability to obtain productivity savings via technology that includes IoT, big data, robotics and automation.
- Stakeholder and customer management
  Ability to manage contracts to maximise financial and operational performance while minimising risks.

Customers are expecting to receive their shipments faster, with greater transparency and at lower prices. This imply apart from pressure levied on the top- line, the logistics industry is also under constant pressure to lower costs. Technology becomes a key enabler and logistics talent with skill sets to operate and leverage on new technology applications will be sought after. Looking at the B2B sector, customers will be striving for greater transparency and efficiency. They expect faster time-to-market, customised products and services, and low or zero-defect rates. Industry 4.0 is enabling companies to redefine the approaches in which they interact with customers and how the supply chain is structured. For logistics companies, integrating data analytics for better predictability and traceability with smart warehousing solutions will become necessary.

For the B2C sector, more and more retailers are operating on a "total retail" concept that integrates brick and mortar, online, mobile and other retail channels. They aim to offer a seamless brand experience for the customer across physical stores, personalised marketing, digital experience, and payment options. Logistics companies thus become a critical component in delivering this experience. For end-consumers, they will not care about the entity that delivers their goods as long as they get them quickly, reliably, and cheaply. They are also reluctant to pay premium for additional services. Consumers expect to pay the same price regardless of challenges which the logistics industry will continue to face.

In addition to essential skills, those who are working or aspiring to work in the logistics sector should possess the following desired attributes:

Analytical:	Able to identify interconnectedness of issues and of different services and products, service providers, stakeholders and institutions within the context of the logistic industry.
Eye for detail:	Meticulous and strong multitasking and organisational skills to remain on top of daily challenges.
Resilience:	Persevere in the face of challenges and difficulties.
Teamwork:	Able to work with colleagues and industry partners from various functional areas and bring about success for any project.
Effective communicator:	Effective communication skills to creäte good rapport with colleagues, customers and industry partners.
Adaptability:	Have a positive attitude to take on challenges in a fast-evolving industry landscape and operating environment.
Professionalism:	Poised and confident even when facing a difficult situation, always displaying reliability and accountability.
Passionate:	Strong work ethic and uncompromising integrity, and willingness to take initiative to learn and keep updated with logistics industry knowledge and trends.

9.3 RECOMMENDATION #3: REVIEW WORK PROCESSES FOR CARGO COLLECTION AND CLEARANCE AT THE PORT

The recommendation calls for a thorough review of work processes involved in collecting cargo and customs inspection and clearance at the port. Areas of attention are yard operations, gate operations and customs processes. The implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Inefficient labour practices at the port • Inefficient customs and border processes • Long dwell time for containers at the port • Truck traffic congestion at the port
	Threat	• Gridlock for truck traffic accessing and leaving the port • Uncompetitive port sector
	Opportunity	• Improve logistics performance in the area of cost for greater competitiveness.

Key processes of the port can be distinguished by those that are associated with four areas. These are the vessel arrival and departure cycle, apron operations, yard operations and gate operations. The four areas determine the eventual operational capacity of the port. Shortfalls or inefficiencies in work processes experienced in any of the four areas will result in the port being unable to operate at its design capacity. Given the working conditions and feedback received from various stakeholders of the logistics and transport sector in Grenada, the focus of our attention for this recommendation is on yard operations and gate operations that pertain to handling of import cargo for seaports.

Feedback gathered from primary and secondary research indicated preference of companies to handle cargo in full container loads and trying to stay away from breakbulk cargo over concerns of damaged or missing cargo. Furthermore, there is the impression that there is inconsistency in terms of cargo handling and the procedures involved. Relationships are seen to play an important role in expediting the work. The matter is not made easier by those who are collecting their cargo having to multiple queues. For example, in the Port of St. George's, the company's representative needs to make multiple queues to collect the cargo and make payments to customs and the port authority. Locating the cargo in the port is also a concern. Companies have to engage a runner to locate the cargo or container. The runner often needs to tap on relationships with stevedores to expedite the process. Locating and getting containers out of the port can take hours. The process can be hampered by cargo inspection and clearance by customs. Cargo checks can last for minutes to the next day.

9.4 RECOMMENDATION #4: REVIEW IMPLEMENTING 24/7 WORK SYSTEM AT THE PORT

The recommendation calls for implementing 24 hours, 7 days a week work system for the port. The work system may exclude public holidays until deemed necessary later. The implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Inefficient labour practices at the port • Inefficient customs and border processes • Long dwell time for containers at the port • Truck traffic congestion at the port • Port prioritising cruise traffic
	Threat	• Gridlock for truck traffic accessing and leaving the port • Uncompetitive port sector • Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector
	Opportunity	• Improve logistics performance in the area of cost for greater competitiveness.

There are calls for working hours of the port to be made operational 24 hours a day, seven days a week. Discussions with port users revealed there were occasions where vessel loading may not be completed in time before the weekend or public holidays. There were mentions that vessels have to come into the port before 9pm where stevedores will start work at 11pm and through the night. If the vessel comes in after 9pm, stevedores will only start work at 6am the next day. As such, vessels may have to wait or leave early in order to keep to their schedule. There were also occasions where the vessel had to wait, which caused disruption to the sailing schedule and potentially impacting on subsequent port-calls.

Data for vessel arrivals and departures handled by the Port of St. George's in April 2023 showed that almost all vessels involved port stays that either included Saturdays, Sundays, after normal working hours, or a combination of these timings (see **Table 43**). Exception was the vehicle carrier Viking Princess. The vessels either had to wait or incur overtime costs or both.

To address these issues, the proposal is to implement a shift system instead of imposing overtime charges. However, buy-in has to be sought from those who are affected by such a change. A compelling argument to support such an action will be growing vessel traffic which the port could potentially handle. Failure to accommodate the traffic could see the port being bypassed and missed revenue earning opportunities for the stevedores and other port service providers as well. The opportunity costs of such losses can be significant. The shift system for port services could potentially affect working hours for customs officers as well. Hence, smooth implementation of the work system will require support and collaboration from other

Table 43: Example of Vessel Arrivals in April 2023 at the Port of St. George's for containerships, general cargo ships, vehicle carriers and reefer vessels

Name	Type	ATA	Length of Stay	Departure
Industrial Royal*	General Cargo	2 Apr 0848 hrs Sun	11h 17min	Sunday
Hoegh Caribia	Vehicles Carrier	4 Apr 0559 hrs Tue	6h 15min	Tuesday
Tropic Jewel**	Containership	6 Apr 1008 hrs Thu	19h 13min	Friday
Viking Princess	Vehicles Carrier	6 Apr 1258 hrs Thu	4h 2min	Thursday
Fouma	Containership	6 Apr 1818 hrs Thu	4h 25min	Thursday
Oslo Bulk 5	General Cargo	9 Apr 0830 hrs Sun	21h 30min	Monday
Hein	General Cargo	11 Apr 0410 hrs Tue	2days 8h	Thursday
Fast Wil	General Cargo	12 Apr 0713 hrs Wed	1day 8h	Thursday
Baltic Klipper#	Reefer/Container	12 Apr 0737 hrs Wed	8h 16min	Wednesday
Tropic Island**	Containership	13 Apr 1748 hrs Thu	10h 11min	Friday
Nomadic Hjellestad*	General Cargo	14 Apr 1225 hrs Fri	1day 9h	Saturday
AS Fabrizia@	Containership	16 Apr 0131 hrs Sun	4h 48min	Sunday
Syros Wind	General Cargo	17 Apr 0438 hrs Mon	12h 53min	Monday
BBC Gdansk	General Cargo	20 Apr 1109 hrs Thu	19h 11min	Friday
Tropic Jewel**	Containership	20 Apr 1601 hrs Thu	15h 21min	Friday
Fouma	Containership	22 Apr 1319 hrs Sat	5h 55min	Saturday
Duncan Island#	Reefer Vessel	26 Apr 0710 hrs Wed	7h 38min	Wednesday
Tropic Island**	Containership	27 Apr 0626 hrs Thu	12h 50min	Thursday
AS Fabrizia@	Containership	28 Apr 0416 hrs Fri	7h 55min	Friday
Janina	General Cargo	30 Apr 0618 hrs Sun	12h 9min	Sunday
BBC Olympus	General Cargo	30 Apr 1430 hrs Sun	18h 39min	Monday

*Source: International Consultant, using data from MarineTraffic (2023)[109]. * Operated by CMA CGM. ** Operated by Tropical Shipping. # Operated by Geest Line. @ Operated by Crowley.*

[109]MarineTraffic (2023) St George's Port [Online]. Available at: https://www.marinetraffic.com/en/ais/details/ports/2742?name=ST-GEORGES&country=Grenada (Accessed 30 March to 2 May 2023).

regulatory authorities. Having the port work 24/7 could also help to alleviate truck traffic that could congest the roads during the day. Deliveries to warehouses could be made at night or in the early morning, contributing to alleviating traffic congestion especially on weekday peak hours.

9.5 RECOMMENDATION #5: IMPLEMENT NATIONAL SINGLE WINDOW (NSW) SYSTEM FOR TRADE AND LOGISTICS FACILITATION

The recommendation calls for a national single window system to facilitate trade and logistics processes. The implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short to medium term: 1-5 years	
SWOT aspects addressed:	**Weakness**	• Absence of a single window for border procedures • Inefficient customs and border processes
	Threat	• Low rate of technology adoption (e.g., e-invoicing)
	Opportunity	• Develop National Single Window for customs and border processes • Improve logistics performance in the area of cost for greater competitiveness • Adopt technology such as use of data analytics for data processing and management.

The NSW is an electronic platform which enables traders, regulatory agencies and other stakeholders to submit and receive information pertaining to international trade and customs processes. The system facilitates exchange of information various government agencies dealing with regulating trade and simplifies procedures of trade by allowing submission of information and documents electronically via a single-entry point. The NSW aims to promote trade facilitation by reducing time and costs associated with trading across borders. It also helps to improve transparency and coordination among public agencies and private sector by offering a centralised platform for exchange of information.

Through the NSW, cross-border trade can experience:

- Improved efficiency: NSW allows traders to submit information and documents electronically via a single point and interface, lowering the time and cost associated with trade procedures. This leads to faster clearance of goods at borders, minimising delays and improving efficiency.
- Increased transparency: NSW facilitates exchange of information between various government agencies involved in regulating trade. This promotes transparency and reduces likelihood of errors or fraud in the trade process.
- Enhanced coordination: NSW offers a centralised platform for exchange of information between various government agencies involved in regulating trade. This helps to facilitate better coordination among agencies, which leads to a more streamlined trade process.
- Reduced costs: NSW reduces need for physical visits to government agencies and paper-based documentation, thereby reducing the costs of trade procedures.
- Improved compliance: NSW enables government agencies to monitor and regulate trade activities more effectively, allowing improved compliance with trade policies and regulations.
- Facilitation of cross-border trade: NSW facilitates cross-border trade by offering a common platform for traders to submit documents and information to various government agencies involved in regulating trade.

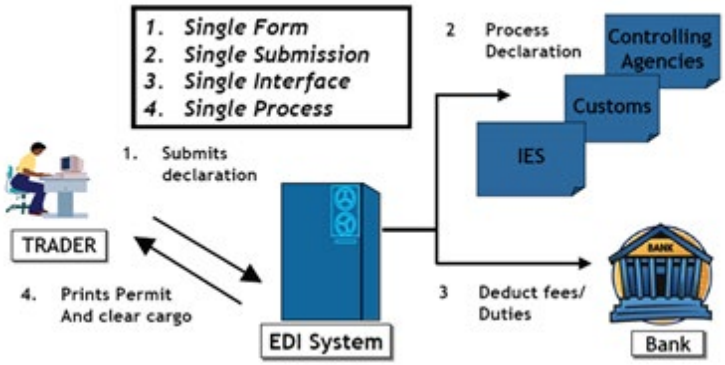
Key systems in the NSW will include the customer management system and electronic country of origin certificate (eCO). An example of a customer management system is ASYCUDA World which is used to automate customs administration. The ASYCUDA system can be retained and integrated with the proposed NSW. The certificate of origin can be issued by Chambers of Commerce or Customs. The eCO thus offers a digital and online platform for application and issuance of such certificates and the system should also be integrated with the NSW. The PCS integrates and processes information for the seaport community from other systems deemed essential for the NSW will include those of various government agencies involved in the trade regulatory and monitoring process, and gates of entry or departure by other modes of transport (e.g., air borders). The example of Singapore's experience in developing and implementing an NSW is given.

CASE 1: SINGAPORE'S NATIONAL SINGLE WINDOW SYSTEM

TradeNet is Singapore's National Single Window which provides a single platform for trade declaration[110] . The trade and logistics community of the country can fulfil all export, import and transhipment related regulatory requirements with a single point of entry for submitting a single declaration to multiple regulatory agencies (see **Figure 39**. TradeNet began operations in 1989 as an electronic data interchange (EDI) system which enables computer-to-computer exchange of inter-company business documents using an established format in the Singapore trading community. The system has gone through several iterations and now integrates all the controlling agencies' (including customs) requirements and processing rules and processes all trade declarations including processing export and import permits and certificates of origin (see **Figure 40**). Fees are computed automatically and collected through interbank direct-debit facilities. Impact on business processes and costs after implementation being:

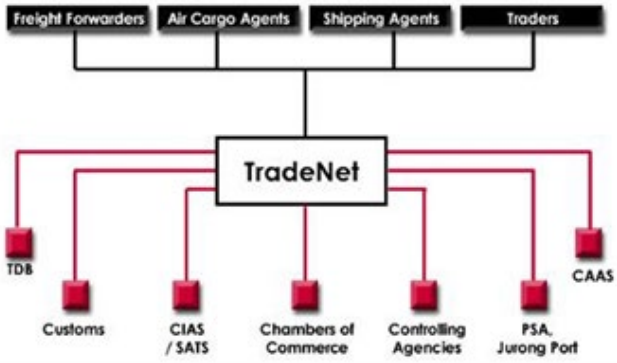
	Before TradeNet	After TradeNet
Processing time for each permit	2 – 7 days	10 minutes
Submission of documents	Multiple submissions	Single document
Number of documents	3 – 35	1 electronic form
Fees charged	US$6.25/document	US$1.80 per application

Figure 39: TradeNet System



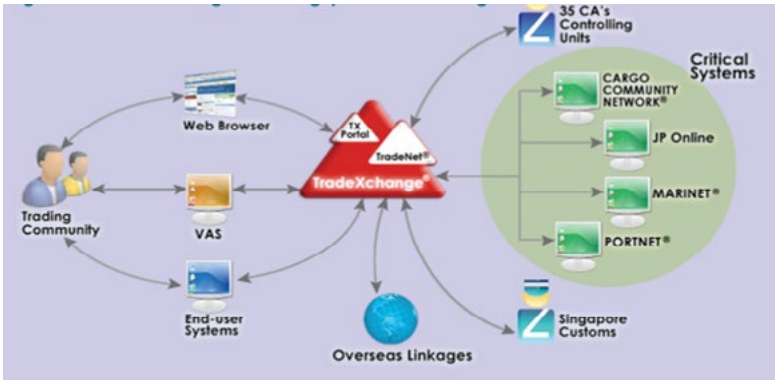
Source: United Nations Network of Experts for Paperless Trade in Asia Pacific (2010)[111].

Figure 40: Impact of TradeNet



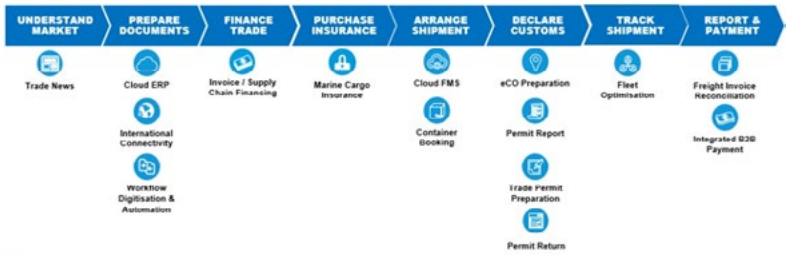
Source: CrimsonLogic (2008)[112] .

Figure 41: TradeXchange System



Source: United Nations Network of Experts for Paperless Trade in Asia Pacific (2010)[113] .

Figure 42: Networked Trade Platform Value-Added Services Ecosystem



Source: Networked Trade Platform (2019)[114].

[110]Singapore Customs (2023) Overview [Online]. Available at: https://www.customs.gov.sg/businesses/national-single-window/overview (Accessed 20 May 2023).
[111]United Nations Network of Experts for Paperless Trade in Asia Pacific (2010) 'Towards a Single Window Trading Environment', UNNExT Brief No. 2, March [Online]. Available at: https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.unescap.org%2Fsites%2Fdefault%2Ffiles%2Fbrief2.pdf&psig=AOvVaw0LmLHnGqp0FvcmuDIysqfi&ust=1685236175193000&source=images&cd=vfe&ved=0CBAQjhxqFwoTCLDN6ZaolP8CFQAAAAAdAAAAABAI (Accessed 20 May 2023).
[112]Ibid.
[113]Ibid.
[114]Networked Trade Platform (2019) 'Helping SMEs digitalise trade with the Networked Trade Platform, Networked Trade Platform, 1 August [Online]. Available at: https://www.ntp.gov.sg/public/news/publication/2019/helping-smes-digitalise-trade-with-the-networked-trade-platform (Accessed 20 May 2023).

From October 2007, TradeNet became a core application within the Singapore TradeXchange platform. The system is an electronic platform that facilitates exchange of information between members of the trade and logistics community (see **Figure 41**). Apart from TradeNet which connects users to Singapore government agencies, TradeXchange offers connectivity to commercial and regulatory systems of other countries. Value added services (VAS) in areas such as trade finance and insurance are offered. In 2017, the Networked Trade Platform (NTP) became operational as an upgraded and expanded version of TradeXchange. While NTP is owned by Singapore Customs, the platform allows third party developers to provide value added services to NTP account holders. Services include trade research and insights, marine cargo insurance, container booking, eCO preparation, and supply chain financing among others (see **Figure 42**). The services available aim to assist companies through various segments of the supply chain. NTP is also a key driver of digitisation and digitalisation efforts for the logistics community in Singapore. Through TradeNet and NTP companies are encouraged to adopt technology such as use of data analytics for data processing and management.

9.6 RECOMMENDATION #6: ACCELERATE EFFORTS TO GO FULLY PAPERLESS WITH CUSTOMS DECLARATION, PAYMENTS AND INSPECTIONS

The recommendation calls for efforts to go fully paperless with customs declaration, payments and inspections. This will accelerate digitisation and digitalisation of customs processes and facilitate trade. The implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Inefficient customs and border processes • Truck traffic congestion at the port
	Threat	• Low rate of technology adoption (e.g., e-submission, risk assessment and e-stamp) • Gridlock for truck traffic accessing and leaving the port
	Opportunity	• Training and education to develop logistics and supply chain management skills • Improve logistics performance in the area of cost for greater competitiveness • Adopt technology such as use of data analytics for data processing and management.

Discussions with stakeholders of the trade and logistics communities in Grenada indicated that customs require documents to be printed and submitted manually. Technically, the ASYCUDA system is supposed to enable the process to be paperless. Work is still done manually where companies need to print and stamp every invoice before sending them physically to customs. This is even with ASYCUDA in place and information being entered electronically into the system. There were also suggestions to consolidated clearance for each shipment rather than having to do clearance for every individual package with accompanying documentation. The process should be paperless and allow for electronic

payments. The time cost to prepare physical documents was estimated at about XCD20 for each invoice. The Grenada Customs and Excise Division shared that they are working on having an electronic payments system. However, the work was more intensive than expected. The RFP has been completed and evaluation is underway. The system is expected to be implemented in the first half of 2024. The Division also shared intentions to have an electronic stamp system. It would also be ideal to make electronic the risk assessment process.

Commitment by customs authorities in Grenada to go paperless is affirmed. However, the private sector has voiced concerns over the state of implementation, in particular, for having to

make manual submissions despite the ASYCUDA system being operational. Barriers to a paperless customs regime can include legal and authentication issues, differences in paperwork requirements, and differences in standards. There are also the concerns with risk of smuggling and commercial fraud. Nonetheless, the benefits of going paperless is recognised with considerable savings expected for the international trade and logistics community and to government as well.

The biggest impact is likely to be time savings for cargo clearance. For example, In Japan, average time taken to clear cargo estimated to fall from 400 minutes to 15 minutes[115]. In Mexico, clearance time was reduced from 730 minutes to 65 minutes. For the case of Singapore, submission of cargo manifest of vessels at sea to customs enables cargo to be cleared up to 8 hours before the vessel arrives at the port, allowing the cargo to be sent directly to a truck and released. Pre- clearance of cargo prior to the vessel's arrival thereby allows customs and quarantine departments and agencies to manage their inspection resources with greater efficiency. Faster processing times coupled with more efficient handling procedures imply fewer government resources will be needed to bond, store and inspect import cargo. To address concerns by the trade and logistics communities in the country, it may be necessary to be forthcoming and transparent with the status of implementation as well as outstanding issues that needs to be resolved be it from the political, legislative, penal, social, financial, commercial, operational or technical dimensions or a combination of these aspects.

9.7 RECOMMENDATION #7: INSTALL TERMINAL OPERATING SYSTEM TO ENHANCE PRODUCTIVITY AND EFFICIENCY OF SEAPORT TERMINAL OPERATIONS

The recommendation calls for installation of a terminal operating system (TOS) to enhance port productivity and efficiency in the seaports of Saint Lucia. The implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Inefficient labour practices at the port • Inefficient customs and border processes • Long dwell time for containers at the port • Truck traffic congestion at the port
	Threat	• Low rate of technology adoption (e.g., e-invoicing) • Gridlock for truck traffic accessing and leaving the port • Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector • Uncompetitive seaport sector
	Opportunity	• Promote digitalisation for integrated supply chain management • Adopt technology such as use of data analytics for data processing and management • Adopt technology such as use of IoT devices for tracking and tracing shipments • Improve logistics performance in the area of cost for greater competitiveness.

We note that the Grenada Ports Authority intends to acquire a TOS and sees this as priority. Concerns are cost, remote connection, and service support. Cargo terminals vary in terms of location, size, configuration, volume of traffic handled, and composition of the traffic. Regardless, all cargo terminals have one primary purpose which is to enable interchange of cargo between water and land in a manner that is secure, safe, efficient and environmentally sustainable[116]. Port operations inevitably revolve around the need to accommodate vessel and cargo traffic. As such, the TOS is designed to handle the following challenges faced in terminal operations:

[115] Commonwealth of Australia (2001) 'Paperless Trading: Benefits to APEC', Asia-Pacific Economic Cooperation [Online]. Available at: https://www.apec.org/docs/default- source/publications/2001/12/paperless-trading-benefits-to-apec-2001/01_ecsg_paperless.pdf (Accessed 20 May 2023).
[116] Yap, W. Y. (2021) 'Every port is unique'. In: Business and Economics of Port Management: An Insider's Perspective, Routledge, pp. 21. DOI: 10.4324/9780429439926-3

Berth management	Scheduling berth windows for vessel calls, arrange for loading and unloading equipment according to the schedule, and communicating with shipping lines to synchronise operations in view of disruptions that may be caused by vessel delays or otherwise.
Yard space management	Includes optimal space allocation, equipment and staff coordination, and organising truck movement.
Gate management	Managing incoming and outgoing vehicles, includes granting permission, monitoring, and clearance.
Equipment scheduling	Coordinates multiple operational units with vessel calls and truck visits, handling equipment failures, delays, and maintenance schedules.
Track and trace cargo	Monitoring and managing cargo within the terminal., includes monitoring and tracking of reefer cargo and dangerous goods.
Billing	Accurate capture of charges and correct billing to customers.
Reporting and data analytics	Important KPIs to monitor include berth utilisation, yard utilisation, crane productivity, terminal inventory, gate events, demurrage and others.

Table 44: Example of TOS Providers

System Provider	Cargo Type	Number of Installations	Hosting	Description
Navis (Octopi, N4, N4 SaaS, Master Terminal)	General cargo and containers	About 300	Cloud and on-premise	World-leading provider with variety of products for different needs
CARGOES (TOS+, GC+, IOT+, AVA+)	General cargo and containers	>70	Cloud and on-premise	Solutions bearing heavy usage of ML techniques and IoT devices
CATOS	Containers	70	On-premise	User-friendly interface with planning, operation and management modules
TBA Group (Autostore, CommTrac)	General cargo and containers	>30	Cloud and on-premise	Full-fledged system with seamless ERP integration
RBS (TOPS Expert, TOPS Expert Cloud)	Containers	About 30	Cloud and on-premise	Comprehensive base solution bearing choice of optional modules

Source: Altexsoft (2022)[117] .

The TOS is a digital platform designed to manage all the logistics and supply chain operations at the seaport terminal. Main functions are to coordinate all the logistics elements in the terminal (e.g., vessels, cranes, trucks, stevedores etc.), optimise asset utilisation, track cargo movement, and analyse data to support decision making. Examples of TOS providers are shown in **Table 44**. The choice TOS will depend on balancing between the budget available, scope of services required, level of functionality, system support and end result. In any case, the chosen TOS should be mobile-friendly where field staff in particular can access the software from any device, capable of supporting different types of cargo especially for general cargo operations, scalable, and customisable. Given increasing concerns for cyberthreats, the data should be securely stored and backed-up. Customer support with implementation, training and post-implementation services will also be important criteria for considerations.

[117]Altexsoft (2022) 'Terminal Operating Systems: Main Features, Integration, and Providers Overview', Blog, 22 July [Online]. Available at: https://www.altexsoft.com/blog/terminal-operating-system/ (Accessed 20 May 2023).

9.8 RECOMMENDATION #8: SET UP THE PORT COMMUNITY SYSTEM

The recommendation calls for setting up a port community system (PCS) to further enhance efficiency and productivity of port operations. The PCS is an extension of the TOS by incorporating other port service providers in the logistics and supply chain. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Short to medium term: 1-5 years	
SWOT aspects addressed:	**Weakness**	• Inefficient labour practices at the port • Inefficient customs and border processes • Long dwell time for containers at the port • Truck traffic congestion at the port
	Threat	• Low rate of technology adoption (e.g., e-invoicing) • Gridlock for truck traffic accessing and leaving the port • Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector • Uncompetitive seaport sector
	Opportunity	• Promote digitalisation for integrated supply chain management • Adopt technology such as use of data analytics for data processing and management • Adopt technology such as use of IoT devices for tracking and tracing shipments • Improve logistics performance in the area of cost for greater competitiveness • Adopt green initiatives for logistics and supply chain management.

A PCS is an electronic platform that connects multiple systems which are operated by various organisations and companies that constitute the seaport community[118]. The system provides secure exchange of information between private and public stakeholders. The PCS is also applicable for the airport community. This is also known as the Airport Community System. Typical services of a PCS are:

- exchange of information between port users, transport operators such as truck drivers, port operator, customs and other regulatory authorities;
- electronic exchange of customs declarations and cargo releases between customs and companies;
- electronic handling of information concerning different types of cargo for the port community;
- status information with tracking and tracing of cargo through the whole logistics chain; and
- processing declarations of dangerous goods.

In Grenada, GPA intends to get a PCS after the TOS. Essentially, the PCS manages and automates port and logistics processes via a single submission of data and connecting transport and logistics chains.

[118]International Port Community Systems Association (2023) 'Port Community Systems - General', PCS [Online]. Available at: https://ipcsa.international/pcs/pcs-general/ (Accessed 20 May 2023).

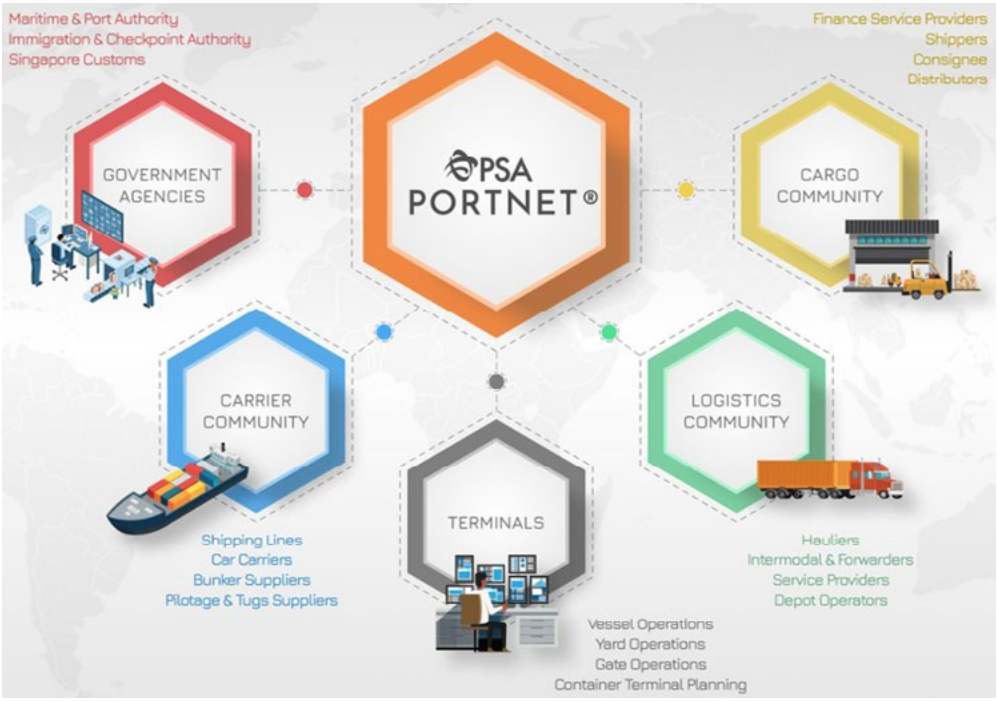
CASE 2: PORT COMMUNITY SYSTEMS IN SINGAPORE

There are two PCS in Singapore. They are Portnet which is developed and operated by the commercial terminal operator PSA, and digitalPORT@SG which is developed and operated by the port authority. Portnet is a B2B port community system that handles all electronic vessel and container data that passes through the terminals in Singapore. It is an automated PCS that consolidates and synchronises information and transactions for players in the port community. With reference to Figure 43, the PCS serves to provide an interactive platform that integrates the carrier community, cargo community, logistics community, terminals, and government agencies. A key feature of the PCS is that it allows online ordering of port services that include berth application, stevedoring services, pilots, tugs, water boat services, reefer monitoring services, on- dock depot facilities, labelling and fumigation. The PCS offers the benefits of:

- Streamlining documentation and business processes for the port community;
- Providing a single-view consolidate platform that eliminates repetitive data entry, processing and transcription errors;
- Simplifying processes by integrating systems of port users with those of the government and port authority;
- Offering real-time tracking and notification on business exceptions;
- Providing information real time on demand via multiple channels such as SMS and email; and
- Offering simple to use system that provides maximum security.

The second PCS is the digitalPORT@SG developed by the Maritime and Port Authority of Singapore (MPA). With reference to **Figure 43**, the system serves as a one-stop port clearance portal for vessels calling at Singapore. It is also a one-stop platform for booking of marine services. It streamlines 16 regulatory applications which were previously submitted separately to the portals of government agencies MPA, Immigration and Checkpoints Authority, and National Environment Agency. The system replaces MPA's Marinet electronic portal in June 2020. In the next phase of digitalPORT@SG, the system will be integrated with PSA's Portnet and Jurong Port's JP Online. PSA and JP (i.e., Jurong Port) are the two main container and general cargo terminal operators in Singapore. The PCS developed by MPA will thus become one single entity which serves all maritime needs for the national and international port and shipping community.

Figure 43: Key Modules of the PORTNET PCS



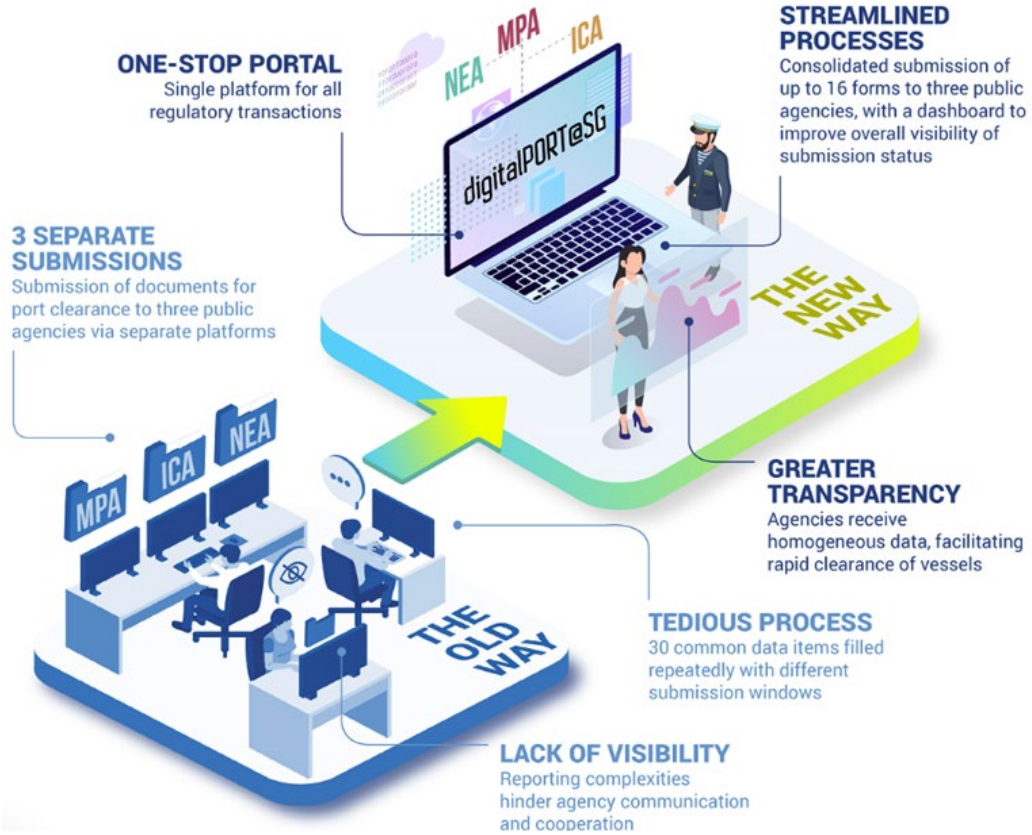
Source: PSA Portnet (2023)[119] .

[119]PSA Portnet (2023) 'Overview', Products [Online]. Available at: https://www.portnet.com/WWWPublic/products.html (Accessed 20 May 2023).
[120]Maritime and Port Authority of Singapore (2023) About digitalPORT@SG [Online]. Available at: https://digitalport.mpa.gov.sg/about (Accessed 20 May 2023).

The second PCS is the digitalPORT@SG developed by the Maritime and Port Authority of Singapore (MPA). With reference to **Figure 44**, the system serves as a one-stop port clearance portal for vessels calling at Singapore. It is also a one-stop platform for booking of marine services. It streamlines 16 regulatory applications which were previously submitted separately to the portals of government agencies MPA, Immigration and Checkpoints Authority, and National Environment Agency. The system replaces MPA's Marinet electronic portal in June 2020. In the next phase of digitalPORT@SG, the system will be integrated with PSA's Portnet and Jurong Port's JP Online. PSA and JP (i.e., Jurong Port) are the two main container and general cargo terminal operators in Singapore. The PCS developed by MPA will thus become one single entity which serves all maritime needs for the national and international port and shipping community.

A key driver of PCS is the requirement for collaboration between key regulatory agencies, local trade associations, port service providers. Typically developed for port users, the PCS will encompass imports, exports, transhipment, consolidation, hazardous cargo and maritime statistics reporting. Core benefits of the PCS are higher speed and efficiency regarding port processes, reduction of paperwork, and automation of work processes. PCS can contribute to sustainable transport logistics by optimising resource allocation and usage. As with the TOS, having the PCS can be an important step to boost digitisation and digitalisation of the logistics and supply chain community in Grenada and Saint Lucia.

Figure 44: digitalPORT@SG by the Maritime and Port Authority of Singapore



Source: Maritime and Port Authority of Singapore (2023)[120].

[120]Maritime and Port Authority of Singapore (2023) About digitalPORT@SG [Online]. Available at: https://digitalport.mpa.gov.sg/about (Accessed 20 May 2023).

9.9 RECOMMENDATION #9: REVIEW SYSTEM OF PORT TARIFFS

The recommendation calls for a review of existing port tariff system. The implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Inefficient labour practices at the port • Limited cargo volumes • Poor shipping connectivity
	Threat	• Uncompetitive port sector • Insufficient cargo volumes to grow transport connectivity to overseas markets
	Opportunity	• Improve logistics performance in the area of cost for greater competitiveness • Positioning as the container transhipment hub for the Caribbean.

Discussions with stakeholders in the logistics and transport community in Grenada highlighted the concern of expensive port charges. Discussions with the community also indicated that port tariffs were designed for the era of breakbulk cargo and have not been amended to adapt to the era of containerisation. The expensive port charges were seen to be attributed to labour arrangements in a large part.

Port tariffs reflect the diversity of services offered. They typically form an important source of revenue for the port authority. The design of port tariffs can be meant to meet financial objectives of the organisation or even the country at the national level[121]. Financial reserves built up by the port authority can be used to finance redevelopment of facilities or acquire new equipment. In certain cases, they may even be used to contribute to national projects or serve political agendas. From a national perspective, port tariffs have a bearing on national competitiveness. Expensive port charges can undermine attractiveness of the port. In the case where there are practically no alternative seaports to use, high tariffs charged by the port can potentially become detrimental to trade creation by serving as a key source of inefficiency in the supply chain. The port as the primary maritime trade gateway effectively becomes a monopoly to the whole country.

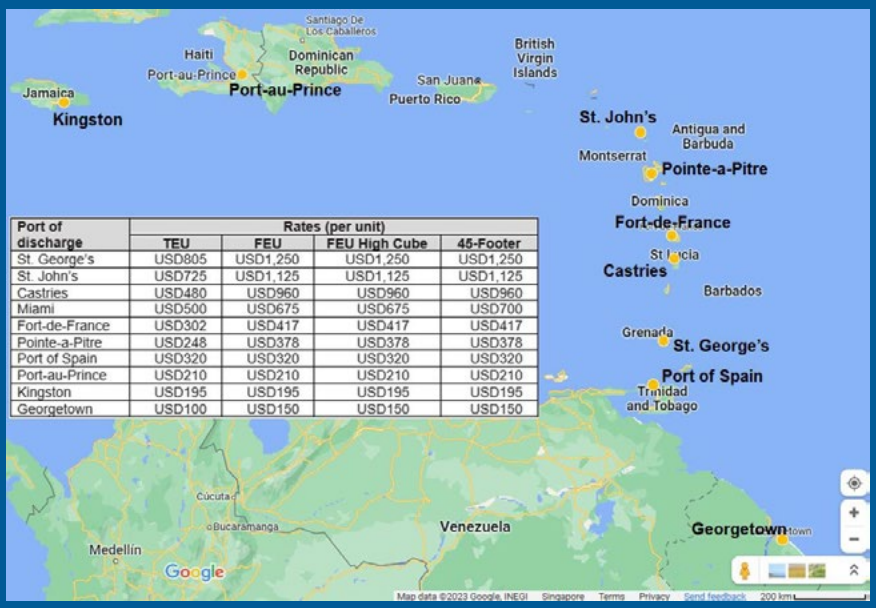
CASE 3: COMPARISON OF TERMINAL HANDLING CHARGE FOR THE CARIBBEAN REGION

Landing charges is Grenada were reported to be among the most expensive in the region. With reference to **Figure 45**, terminal handling charges in the country are USD805 pe TEU and USD1,250 per FEU, making it one of the most expensive in relative to other ports in the region. Terminal handling charges in the Port of Castries are also expensive at USD 480 per TEU and USD960 per FEU. Nonetheless, we saw that terminal handling charges in the Port of St. George's are 1.3 times higher for an FEU container and 1.7 times higher for a TEU container.

By comparison, landing charges for a similar container are much cheaper in Fort-de- France (Martinique) at USD417, Pointe-a-Pitre (Guadeloupe) at USD378, and Port of Spain (Trinidad and Tobago) at USD320. Port charges are even lower for the same container in Port-au-Prince (Haiti) at USD210, Kingston (Jamaica) at USD195, and Georgetown (Guyana) at USD150. Terminal handling charge for a TEU for the Port of St. George's is also comparatively expensive at USD805. The table shows port charges for a similar 20-footer container to be considerably lower in other ports in the region. For example, terminal handling charge for a TEU is only USD320 in neighbouring Port of Spain in Trinidad and Tobago. This is about 40% of the rates charged in the Port of St. George's.

[121]United Nations Economic and Social Commission for Asia and the Pacific (2023) 'The context of port pricing', Comparative Analysis of Port Tariff Levels in ESCAP Region [Online]. Available at: https://www.unescap.org/sites/default/files/pub_2190_ch2.pdf (Accessed 20 May 2023).

Figure 45: Comparison of Terminal Handling Charge for Selected Ports in the Region



Port of discharge	Rates (per unit)			
	TEU	FEU	FEU High Cube	45-Footer
St. George's	USD805	USD1,250	USD1,250	USD1,250
St. John's	USD725	USD1,125	USD1,125	USD1,125
Castries	USD480	USD960	USD960	USD960
Miami	USD500	USD675	USD675	USD700
Fort-de-France	USD302	USD417	USD417	USD417
Pointe-a-Pitre	USD248	USD378	USD378	USD378
Port of Spain	USD320	USD320	USD320	USD320
Port-au-Prince	USD210	USD210	USD210	USD210
Kingston	USD195	USD195	USD195	USD195
Georgetown	USD100	USD150	USD150	USD150

Source: International Consultant, using information from CMA CGM (2023)[122]; map data from Google Maps.

Port tariffs reflect the diversity of services offered. They typically form an important source of revenue for the port authority. The design of port tariffs can be meant to meet financial objectives of the organisation or even the country at the national level[123]. Financial reserves built up by the port authority can be used to finance redevelopment of facilities or acquire new equipment. In certain cases, they may even be used to contribute to national projects or serve political agendas. From a national perspective, port tariffs have a bearing on national competitiveness. Expensive port charges can undermine attractiveness of the port. In the case where there are practically no alternative seaports to use, high tariffs charged by the port can potentially become detrimental to trade creation by serving as a key source of inefficiency in the supply chain. The port as the primary maritime trade gateway effectively becomes a monopoly to the whole country.

9.10 RECOMMENDATION #10: REVIEW IMPORT TARIFFS TO ADDRESS HIGH COST OF IMPORTS

The recommendation calls for a review of the import tariff system. Implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Limited cargo volumes • Poor shipping connectivity
	Threat	• Uncompetitive port sector
	Opportunity	• Improve logistics performance in the area of cost for greater competitiveness

Importers are burdened with expensive port charges which are approximately USD1,200 per FEU, making among the most expensive in the region. If duties, customs surcharge, and VAT are included, these additional costs could go up to 100% of the shipping freight charges. In other words, these additional costs charges can double the costs of imports for the country. This ultimately makes it expensive for cost of business in Grenada. For example, getting parts for machinery, semi-manufactures for assembly into final products, or importing food items can result in companies having to incur higher costs compared to the region. This can undermine the attraction of doing business and competitiveness in international trade for the country.

[122]CMA CGM (2023) 'Carrier charge finder'. My CMA CGM, 27 May [Online]. Available at: https://www.cma-cgm.com/ebusiness/tariffs/charge-finder (Accessed 27 May 2023).
[123]United Nations Economic and Social Commission for Asia and the Pacific (2023) 'The context of port pricing', Comparative Analysis of Port Tariff Levels in ESCAP Region [Online]. Available at: https://www.unescap.org/sites/default/files/pub_2190_ch2.pdf (Accessed 20 May 2023).

Table 45: Tariff Rate for CARICOM and OECS Members (2020, Simple Mean, %)

Countries	All Products	Manufactured Products	Primary Products
Member of OECS and CARICOM			
Antigua and Barbuda	12.39	11.51	16.12
Grenada (2019)	**10.55**	**9.24**	**16.46**
Dominica	10.36	8.66	19.32
Saint Kitts and Nevis	10.03	9.82	10.87
Saint Vincent and the Grenadines	9.23	7.99	15.65
Saint Lucia	**8.93**	**7.85**	**15.27**
CARICOM Members			
Bahamas (2018)	23.66	25.63	13.98
Belize	11.76	9.99	24.15
Barbados	10.18	8.73	19.21
Guyana	9.40	8.38	16.92
Jamaica	9.00	8.14	15.86
Haiti	6.39	5.68	11.16

Source: International Consultant, using data from The World Bank (2023a)[124].

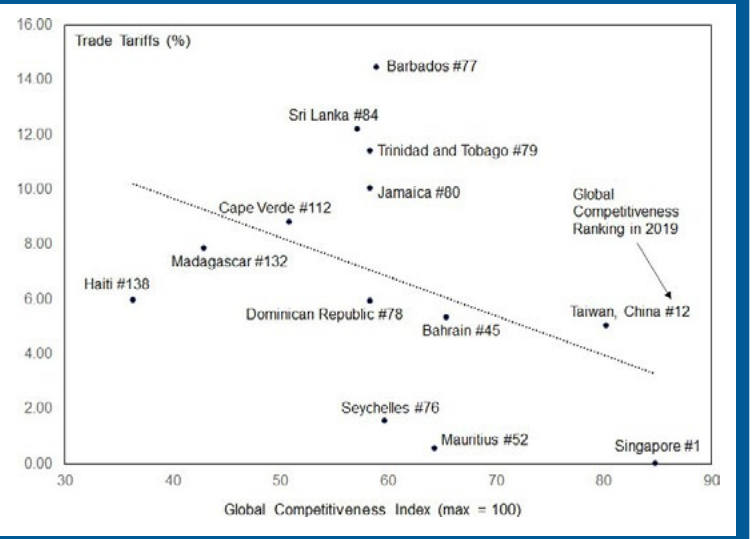
With reference to **Table 45**, tariff rates for selected members of OECS and CARICOM are shown. The data reflects tariff rates applied to all products, manufactured products, and primary products. The table shows Grenada to have one of the highest tariff rates in the region at 10.55% for all products in 2020. The country was exceeded by Antigua and Barbuda's tariff rate at 12.39% for all products, as well as Bahamas' 23.66% and Belize's 11.76%. In terms of manufactured products, Grenada also has one of the highest tariff rates in the region at 9.24%. The country is exceeded by Bahamas at 25.63%, Antigua and Barbuda at 11.51%, Belize at 9.99%, and Saint Kitts and Nevis at 9.82%. As for primary products, Grenada has the second highest tariff rate among OECS countries at 16.46%. The highest tariff rate for primary products was seen for Dominica at 19.32%. By comparison, tariff rates for Saint Lucia are significantly lower at 8.93% measured by simple mean for all products, 7.85% for manufactured products, and 15.27% for primary products.

Tariff applied to all products is measured by the unweighted average of effectively applied rates for all the products that are subjected to tariffs. For tariffs applied to manufactured products, this is calculated by the unweighted average of effectively applied rates for all manufactured products subject to tariffs. Manufactured products being commodities that are classified in SITC revision 3 sections 5 to 8 and excludes division 68 (i.e., non-ferrous metals)[125] . The products comprise chemicals and related products, manufactured goods, machinery and transport equipment, and miscellaneous manufactured articles. For primary products, these are commodities classified in SITC revision 3 sections 0-4 plus division 68. They include food and live animals, beverages and tobacco, crude materials (inedible, except fuels), mineral fuels, lubricants and related materials, and animal and vegetable oils, fats and waxes.

Figure 46 further suggests there appears to be a rough relationship between country competitiveness and tariff rates. The figure shows data obtained from the World Economic Forum for global competitiveness for small island countries. While trade tariffs are just one determinant of global competitiveness, small island countries which are ranked among the most competitive have trade tariffs below the 6.00% rate. The figure also showed that countries such as Barbados, Trinidad and Tobago and Jamaica in the Caribbean region have some of the highest trade tariffs at 14.47%, 11.43% and 10.07% respectively. For information, the tariff rate for Grenada was 10.55% for 2019.

[124]The World Bank (2023a) World Development Indicators [Online]. Available at: https://datatopics.worldbank.org/world-development-indicators/ (Accessed 3 May 2023).
[125]UNCTAD (2023) 'Standard International Trade Classification (SITC) Revision 3', UNCTADSTAT [Online].
Available at: https://unctadstat.unctad.org/en/Classifications/DimSitcRev3Products_Official_Hierarchy.pdf (Accessed 23 May 2023).

Figure 46: Comparison of Global Competitiveness and Trade Tariffs for Small Island Countries (2019)



Source: International Consultant, using information from World Economic Forum (2019)[126].

9.11 RECOMMENDATION #11: PROVIDE TECHNICAL ASSISTANCE FOR EQUIPMENT REPAIR, MAINTENANCE AND REPLACEMENT

The recommendation calls for technical assistance to be provided for equipment repair, maintenance and where necessary, replacement at mainport in Grenada. It may also be necessary to acquire additional new equipment to address deficiencies seen in port productivity levels. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Short to medium term: 1-5 years	
SWOT aspects addressed:	**Weakness**	• Long dwell time for containers at the port • Unreliable port equipment • Ageing port infrastructure
	Threat	• Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector • Uncompetitive port sector
	Opportunity	• Improve logistics performance in the area of cost for greater competitiveness • Upgrade and develop cargo-handling capacity and facilities for seaport sector • Training and education to develop logistics and supply chain management skills.

Discussions with port users highlighted the issue of port equipment breaking down as a key factor that could impede efficiency and productivity of port operations. For the Port of St. George's in Grenada, there are no quay cranes and vessels have to rely on their own equipment to load and unload cargo. Furthermore, the apron cannot support the weight of quay cranes even if they were installed. Breakdowns in port equipment such as forklifts and reachstackers can also affect port productivity. In addition, the lack of tugs meant that vessels requiring their assistance will have to wait outside the port until the tug arrives from a neighbouring country. For the ports of Castries and St. George's, there are calls for installation of at least one weighbridge which could be located close to the gate.

While an overhaul of port equipment required is underway, a short-term solution is to have a technical team deployed to the port for quick repairs or replacement of spare parts to restore malfunctioning equipment to working conditions where possible. This will require identifying the list of affected port equipment, assess the level and type of repairs required, identing of spare parts, and performing the repair. It may be the case where the port equipment may need to be replaced or is due for replacement. This will be determined in part by condition of the port equipment and in part by the depreciation and asset replacement policy of the port operator. Where replacement is needed, this may include purchase of new or second-hand equipment, or receiving sponsors and development aid in the form of the physical port equipment or in-kind financial assistance.

The objective is to improve overall serviceability of equipment which leads to better asset utilisation as well as reduced dwell time for containers at the port. Not to mention, customer satisfaction and productivity levels are likely to improve as well. Smooth operation of the port requires all segments of the port supply chain to be operating at their optimal capacity. Dislocations occurring in any segment can reverberate through other activities in the port supply chain. For example, a reachstacker breaking down which affects yard productivity will cause productivity levels at the apron and gate operations to be affected. In worst cases, vessel productivity is affected, causing the vessel to either having to wait longer than expected and thereby affecting subsequent port-of-call schedules, or leave without completing cargo operations at the port.

[126]World Economic Forum (2019) The Global Competitiveness Report 2019 [Online].
Available at: https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf (Accessed 27 May 2023).
[127]The World Bank (2007) 'Module 3: Alternative Port Management Structures and Ownership Models, In: Port Reform Toolkit, The World Bank, pp. 91 [Online]. Available at: https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/Portoolkit/Toolkit/pdf/modules/03_TOOLKIT_Module3.pdf (Accessed 23 May 2023).

9.12 RECOMMENDATION #12: ALLOCATE LAND TO BE DESIGNATED AS CONTAINER DEPOT

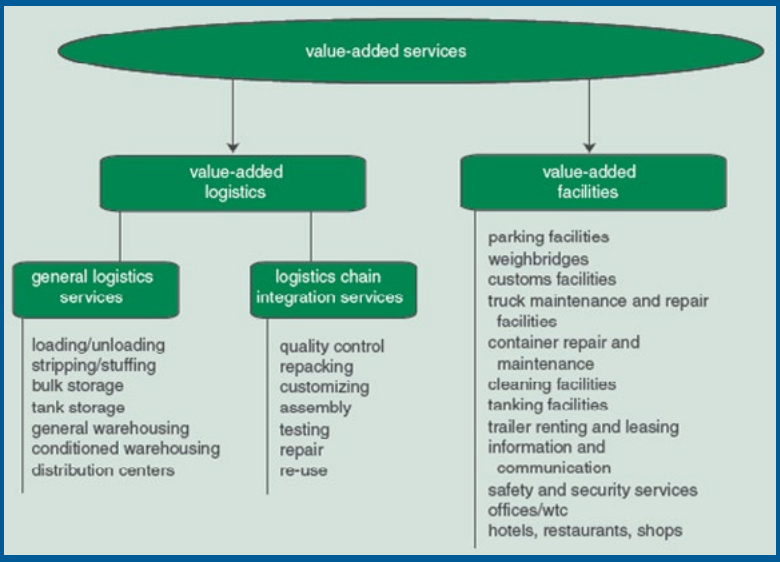
The recommendation calls for locating and setting aside land to establish a container depot to provide value added services for cargo operations. Implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short to medium term: 1-5 years	
SWOT aspects addressed:	**Weakness**	• Truck traffic congestion at the port • Long dwell time for containers at the port
	Threat	• Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector • Uncompetitive port sector
	Opportunity	• Upgrade and develop cargo-handling capacity and facilities for seaport sector • Improve logistics performance in the area of cost for greater competitiveness.

The recommendation is also related to port operations. The new container depot is designed to expand the range of value-added services pertaining to cargo op-erations at the main ports of both countries. With reference to **Figure 47**, the container depot aims to accommodate fully the range of general logistics ser-vices such as stripping, stuffing, and general warehousing, as well as logistics chain integration services which include quality control, repacking, customising and other services where required. Given the nature of activities performed in the container depot, the new area could be designated as a free trade zone to encourage and attract co-location of light manufacturing for re-export. The con-tainer depot should also contain value-added facilities including weighbridges, container inspection, repair and maintenance, container certification, truck maintenance and repair, and even a truck stop with amenities for truckers.

Discussions held with stakeholders of the logistics and transport communities in Grenada indicated that additional space is required for cargo operations. This includes additional warehouse capacity being made available for container stripping and stuffing operations at the port. GPA is considering moving container stripping out of the port area to a location within 5-8 miles radius from the terminal. This practically covers the entire Parish of Saint George. The Tanteen field located across the Port Highway would be ideal as it can be seen as a natural extension of the port (see **Figure 48**). However, GPA recognises there are social implications for using the greenfield as the venue is used for sporting activities by the local community.

Figure 47: Overview of Value-Added Services in Ports



Source: The World Bank (2007)[127].

Figure 48: Location of Tanteen Field in Relation to the Port of St. George's

Source: International Consultant, using map data from Google Maps.

[127]The World Bank (2007) 'Module 3: Alternative Port Management Structures and Ownership Models, In: Port Reform Toolkit, The World Bank, pp. 91 [Online]. Available at: https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/Portoolkit/Toolkit/pdf/modules/03_TOOLKIT_Module3.pdf (Accessed 23 May 2023).

9.13 RECOMMENDATION #13: TRAINING AND EDUCATION FOR LOGISTICS SECTOR

The recommendation calls for reviewing the delivery of training and education for the logistics community. Implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Short to medium term: 1-5 years	
SWOT aspects addressed:	**Threat**	• Lack of skilled logistics professional (e.g., management, supervisory, operational levels) • Uncompetitive port sector
	Opportunity	• Training and education to develop logistics and supply chain management skills • Improve logistics performance in the area of cost for greater competitiveness.

Training and education are recognised as a key component and enabler of the logistics sector. Stakeholders in the country highlighted the need for better access to education in the area of logistics and supply chain management courses. Attention should be given to vocational training and higher education opportunities. Courses with certification are especially needed in the areas of warehouse management, customs brokerage, and ordering and receiving goods among others. Much of the training is currently done on an informal basis, relying largely on learning on-the-job. The community called for formal training and education in this regard. Training on specialised areas such as robotics, automation, artificial intelligence, and maintenance and repair of equipment were also proposed. There were suggestions that training should be extended to customs officers and relevant government departments dealing with international trade and logistics matters. Delivery of the courses could be conducted by experts from the local industry and through collaboration with tertiary institutions such as the University of West Indies. The University of West Indies operates campuses in Barbados, Jamaica and Trinidad and Tobago. Other options for higher education are the US and UK.

At the global level, the logistics industry is being transformed, with data analytics, big data, automation, artificial intelligence and machine learning expected to see greater proliferation and play bigger roles. These applications will be evident in all areas of the logistics value chain including customs broking, freight forwarding, domestic transport, international transport, seaport operations, airport operations, and warehousing, storage and cargo management. In addition to attempting to lower logistics costs, the future logistics worker will have a critical role in enabling their respective logistics clusters to become major domestic and international hubs for value-added logistics services. In this regard, transport connectivity enables an ecosystem of logistics activities to become a logistics cluster by bringing together a comprehensive suite of services and logistics solutions.

Expectations of learners are evolving, and delivery modes and methods must keep pace with these changing expectations to attract and retain talent. Important trends that are changing the training and education landscape include:

- Rise of e-learning:
  Increasing costs of classroom-based and instructor-led training is contributing to greater use of e-learning. Continuous pursuit of life-long learning is also driving growth of e-learning. Certain topics can be effectively and efficiently handled through e-learning. They include awareness training covering data security, inclusiveness, and diversity.

- Microlearning:
  Bite-sized training content is showing popularity with busy employees needing to accommodate learning in their schedules. For example, attention span is typically not more than 20 minutes. Longer time can lead to learning fatigue. Hence, microlearning must be value-centred and human-focused.

- Attract and retain employees through training and development:
  Training is progressively viewed as an employee incentive, along with health and other benefits. Employees recognise training will help them improve current skills and develop new ones, eventually enabling them to be more successful in fulfilling their roles. Training therefore can be used to attract and retain talent.

- Growing skill gap among companies:
  Rapid pace of technology innovation and constantly changing industry landscape made most employees realise the need to be lifelong learners so as to stay competitive. Skills needed to succeed yesterday would

not be the same as those required for tomorrow. Skill shortages are also created by digital transformation. Companies may have positions open for months due to lack of qualified candidates. Hence, they can offer employees with training and development opportunities to meet the requirements of future roles.

- Millennials see learning differently from previous generations:
  Millennials see learning and development as high priority. They expect their training to employ mobile devices that have become integral to their lives. They can access training and information when they need it and expect new information can be internalised and translated quickly into action. This is similar to the "just-in-time" model.

- Anywhere and anytime with flexible blended learning:
  Learners are demanding ever more that training is immediately accessible. They expect learning to take place whenever and wherever they happen to have the time. Given that people are frequently connected to a mobile device, they will be close to a point of internet access. This means never having to wait for the training opportunity. While instructor-led classes are not likely to disappear, mobile training options are proliferating.

- Personalised experiences:
  The days of "off-the-shelf" training and education programs are ending. Learners expect their training to be relevant to their own distinctive situations. This will mean adapting content to their work environment, organisational culture, job performance, and company background.

- Distance learning:
  Companies are increasingly encouraging their employees to take charge of their own learning. As such, distance learning is viewed as important for employees. Distance learning becomes an excellent mean to attract and retain talent, keeping employees motivated and productive.

Experiential and immersive learning is growing. The intention is to create authentic learning experiences where learners are put in the context of real-world experiences and challenges. Learners can attain key skills and competencies to proactively handle real-world challenges. This is distinct from learning that relies on textbook or theory-based content. The learning experience can also be applied to collaborative environments. Requirements of the individual learner will take precedence. Using personalised and inclusive learning, the instructional method and pace of learning are adapted to each learner. Traditionally, organisations offer fit-for-all textbooks, lectures, and assignments, with few or no variation between learners. In inclusive and personalised learning, this learner-centric approach enables each employee to have the flexibility of "pulling" content they want instead of being compelled to attend mandatory courses.

CASE 4: LOGISTICS TRAINING AND EDUCATION IN SINGAPORE

Logistics is viewed as an essential enabler of economic growth and development. As an industry that interacts with many facets of the economy and society, the sector offers challenging and yet rewarding careers that are grounded in highly transferable skills. Those who work in logistics are placed at the forefront of globalisation, technology advancements and emerging business trends.

At the tertiary level, there are two polytechnics in Singapore offering full-fledged diplomas in logistics and supply chain management. The Diploma in Supply Chain Management is offered by the Republic Polytechnic. Courses are offered in the areas of logistics, transport, inventory management, facilities planning and warehousing. The diploma aims to equip students with a good understanding of how suppliers, distributors, manufacturers, and retailers come together in international trade. Students are also be exposed to digitalisation and technologies that are transforming supply chain operations. Modules offered in the program are warehousing and storage, lean manufacturing and Six Sigma, supply chain management, facilities planning and design, distribution and transportation, inventory management, IT for supply chain management, procurement and supplier development, retail logistics, cold chain and pharmaceutical supply chain, programming and data analysis, fundamentals of industrial Internet of Things, and operations planning[128].

[128]Republic Polytechnic (2023) 'Diploma in Supply Chain Management (R21)', School of Engineering [Online]. Available at: https://www.rp.edu.sg/SEG/full-time-diplomas/Details/diploma-in-supply-chain- management (Accessed 20 May 2023).

The other full-fledged logistics diploma is offered by Temasek Polytechnic. The Diploma in International Trade and Logistics enables students to acquire current knowledge and skills in international trade and supply chain management. Training in supply chain functions such as freight forwarding operations, supply management and sustainability- driven logistics are taught. Modules offered in the program are supply chain management and technology, procurement and materials management, distribution centre management, logistics analytics, international trade and transport, international trade and digitalisation, international finance, international freight and trade compliance, enterprise resource management, business technology and analytics, business process improvement, and chemical and cold chain logistics[129].

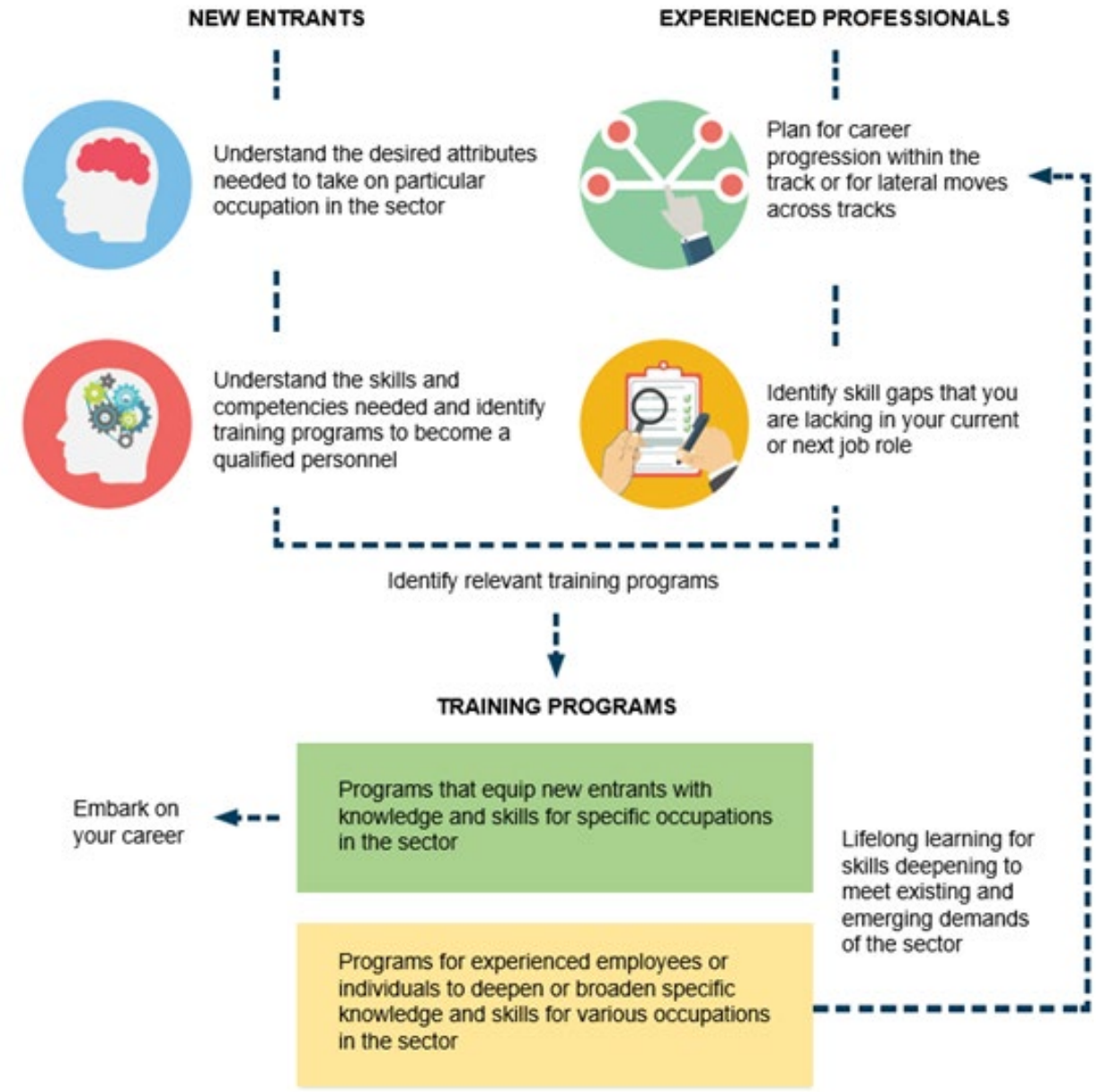
At the university level, the bachelor's degree is offered by the Singapore University of Social Sciences. The Bachelor of Science in Logistics and Supply Chain Management is developed in recognition that logistics is an essential pillar of Singapore's economy. The Singapore Logistics Association is a key partner. The program's curriculum is constructed to blend theory and industry practice to equip learners with problem- solving, decision-making, digital and innovation-thinking skills for managing supply chains. Students can also dwell deeper into specialised topics relating to the aviation, maritime and other supply chain areas. Modules offered include urban logistics, Industry 4.0 logistics applications, optimisation and simulation for decision-making, Python for data analytics, fundamentals of data mining, machine learning, ocean freight management, port management and technology, airport and airline logistics, air freight management, digital twin for supply chains, contract management for supply chains, solutions design for logistics and supply chain management, and geospatial analytics for decision-making among other courses[130].

An important aspect of training and education is progressive upgrading of the logistics workforce. For diploma education, the focus is on certification for specific skill sets to cater to specific job roles in the industry. This is different from university education where a multidisciplinary and more holistic curriculum with depth of learning exposes students and broaden their minds to a fast-evolving industry landscape. The training and education landscape in Singapore encourages the workforce to take up continuous learning to stay abreast of industry developments and be future-ready.

A typical pathway for career development for an individual is presented in **Figure 49.** The framework differentiates between experienced professionals and new entrants. For a new entrant, the person should find out desired attributes required to take on roles needed by the sector, and competencies and skills to become qualified. With this understanding, the individual can identify relevant training programs to equip herself/himself with relevant skills and knowledge prior to embarking on a career in the logistics industry. For an experienced professional or worker, the person may be looking for career progression within the individual's occupational track or lateral moves to another track. The person should also identify gaps in skills required for the next potential job role. The person can then identify suitable training programs to deepen specific skills or broaden knowledge of the industry. The figure emphasises the idea of lifelong learning as the logistics industry is constantly undergoing change to meet emerging demands.

[129] Temasek Polytechnic (2023) 'Course Overview', Diploma in International Trade and Logistics (T07), [Online]. Available at: https://www.tp.edu.sg/schools-and-courses/students/schools/bus/international- trade-and-logistics.html (Accessed 20 May 2023).
[130] Singapore University of Social Sciences (2023) 'BSc Logistics and Supply Chain Management', Programme Finder [Online]. Available at: https://www.suss.edu.sg/programmes/detail/bsc-logistics-and- supply-chain-management-blscm (Accessed 20 May 2023).

Figure 49: Pathway for Career Development for New Entrants and Experienced Professionals



Source: SkillsFuture Singapore (2017)[131] .

[131] SkillsFuture Singapore (2017) Skills Framework for Logistics, September [Online]. Available at: https://www.skillsfuture.gov.sg/skills-framework/logistics (Accessed 20 May 2023).

9.14 RECOMMENDATION #14: EXPLORE DEVELOPMENT OF A NEW PORT

The recommendation calls for fundamental review of current port capacity and its capability of meeting the needs over the long term in the country. Implementation timeframe and SWOT aspects addressed are:

Implementation timeframe:	Long term: 6-10 years	
SWOT aspects addressed:	**Weakness**	• Truck traffic congestion at the port • Long dwell time for containers at the port • Limited berths for vessels • Port prioritising cruise traffic • Unreliable port equipment • Ageing port infrastructure • Inadequate road network and poor road conditions
	Threat	• Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector • Gridlock for truck traffic accessing and leaving the port • Low rate of technology adoption (e.g., e-invoicing) • Uncompetitive port sector
	Opportunity	• Upgrade and develop cargo-handling capacity and facilities for seaport sector • Set up free trade zone with proximity to the main cargo centre which is Castries • Upgrade and develop cold-chain handling capacity and facilities • Adopt green initiatives for logistics and supply chain management • Adopt technology such as use of IoT devices for tracking and tracing shipments • Adopt technology such as use of data analytics for data processing and management • Promote digitalisation for integrated supply chain management (e.g., WMS, TMS, ERP) • Adopt blockchain technology for trade facilitation (e.g., e-bill of lading, smart contracts) • Improve logistics performance in the area of cost for greater competitiveness.

Developing a new port is likely to involve multiple government departments and stakeholders. It will also include several rounds of public consultation before and during the construction process. Primary concerns will be the long-term impact of the project on the country and local community.

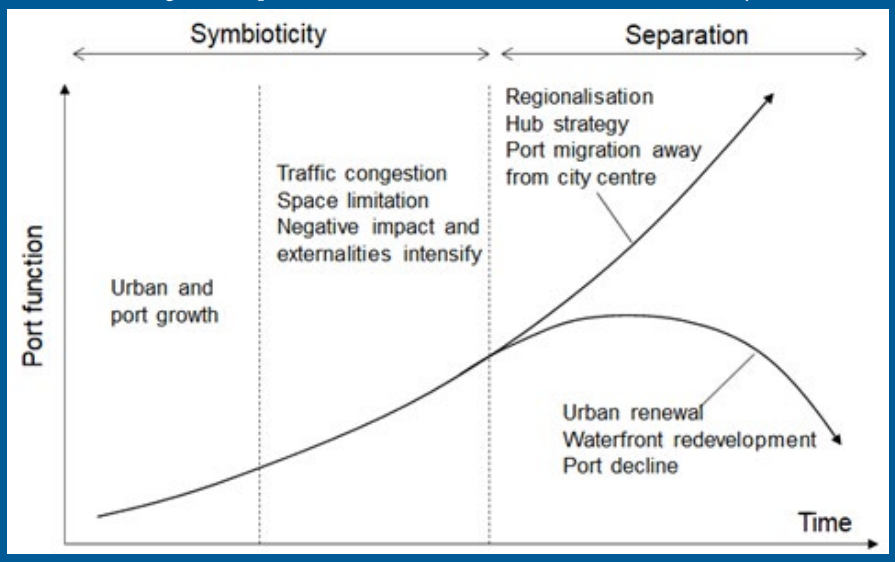
Discussions with stakeholders in the local logistics community indicated a potential site could be at Beausejour, about 9km north of St. George's by driving distance. However, there appears to be little interest as the location would mean further distance away from the airport and main industrial areas which are situated in the southern part of the country. Furthermore, certain sections of the Western Main Road will need to upgraded to accommodate cargo traffic. Hence, other alternative sites may need to be considered if the current port facility is deemed unable to accommodate projected growth in vessel and cargo traffic.

For a thorough investigation, it will be prudent and necessary to investigate the traffic forecasts for container and breakbulk cargo, projections for vessel traffic, port design and layout, berth design and layout, approach planning for vessel traffic, efficiency and productivity indicators linked to terminal operations, terminal operating system and port community system operating considerations, ancillary services for logistics activity taking place in the port, hinterland connectivity and potential impact on road traffic. The investigations should also include economic impact analysis, traffic impact analysis, and environment impact analysis. Social impact of the port would be included in the economic impact analysis.

Relationship between the city and the port is interactive and dynamic. A typical relationship will go through different phases. With reference to **Figure 50,** there is strong dependence between the port and city with each fuelling the growth of the other. As traffic of the port grows, traffic congestion and competition for space creates negative impact and externalities from port activities gradually outweigh the benefits generated. This is stage faced by the Port of St. George's in Grenada. Port activities which used to be the raison d'état for existence of the city may be eclipsed by other sectors less reliant on the port. Limited space for expansion will also restrict capabilities of the port to accommodate growing traffic. As the situation worsens, separation occurs where the port is relocated away from the

city. Otherwise, we are likely to see the decline of the port. As the relationship weakens between port and city, and the port being moved away, there is also an opportunity to review the potential of the port in maximising its full competitive potential to become a major maritime hub for the wider region.

Figure 50: Spatial and Functional Evolution of the Port and City



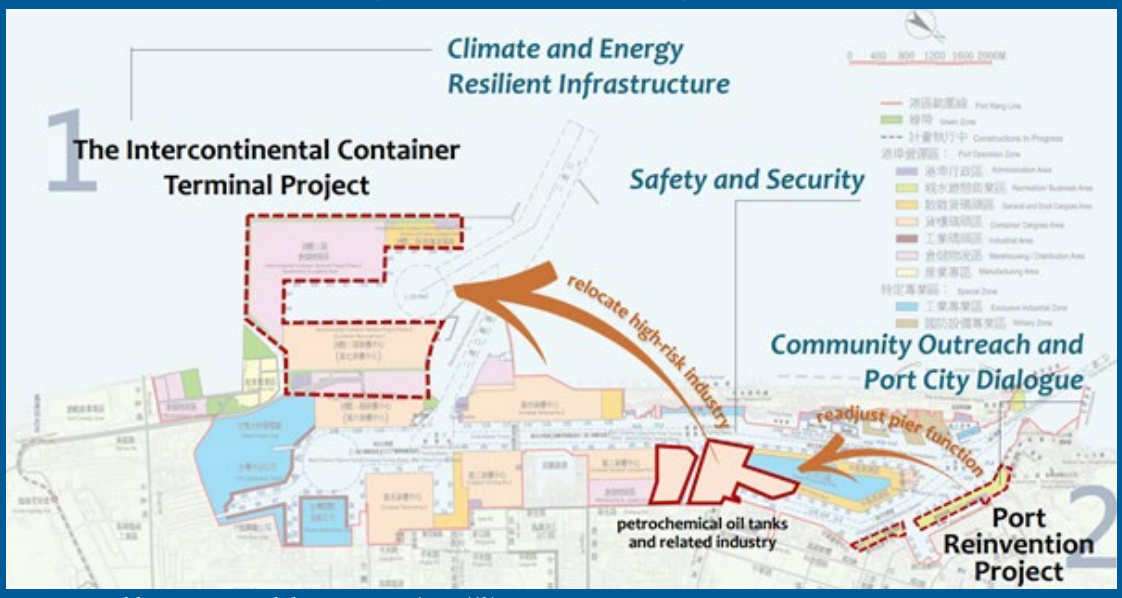
Source: Yap (2021)[132] .

CASE 5: DEVELOPING THE PORT OF KAOHSIUNG IN TAIWAN, CHINA

The Port of Kaohsiung handled 9.5 million TEUs of containers in 2022[133] . The Port of Kaohsiung used to be a major container port in the world. It is located in the south of the island and serves as a key container transhipment and major port of bulk cargo import and export for Taiwan. Challenges faced by the port are:

- Lack of shoreline in the port for future development
- Insufficient hinterland connectivity
- Growing vessel and cargo traffic
- High-risk petrochemical oil storage and related facilities in the old port area
- Intense competition with other major maritime centres in East Asia
- Lack of integration in port-city development

Figure 51: Expansion of Kaohsiung Port



Source: World Port Sustainability Program (2021)[134].

[132]Yap, W. Y. (2021) 'The port and the city'. In: Business and Economics of Port Management: An Insider's Perspective, Routledge, pp. 266. DOI: 10.4324/9780429439926-16

[133] Li, M. (2023) 'Evergreen's new terminal Kaohsiung to boost container volumes'. Container News, 8 May [Online]. Available at: https://container-news.com/evergreens-new-terminal-in-kaohsiung-to-boost- container-volumes/ (Accessed 23 May 2023).

[134] World Port Sustainability Program (2021) 'Master Plan 2017-2021 – Detailed Project Presentation'.
Port of Kaohsiung – Master Plan 2017-2021 [Online]. Available at: https://sustainableworldports.org/project/port-of-kaohsiung-master-plan-2017-2021/ (Accessed 23 May 2023).

To address these challenges, the port underwent an expansion with the creation of the new Intercontinental Container Terminal (see **Figure 51**). The project will be constructed in phases. The first phase involves building four container terminals with length of 1,500 metres and depth of 16.5 metres to accommodate large containerships. The new infrastructure development will see port capacity increase by 3.0 million TEUs in annual container handling capacity. The second phase comprises building of a petrochemical oil storage and transport centre with 19 new piers. Phase 2 of the project will allow berthing of containerships with capacity of 22,000 TEUs. Meanwhile, the old port area will be developed with recreational, retail, residential and convention facilities to rejuvenate the dynamism of the port area. This includes a 14,215 sqm water garden where more than 50,000 landscaping plants were planted. As a whole, the port development project aims to fulfil the following Sustainable Development Goals which are #3 good health and wellbeing; #6 clean water and sanitation; #7 affordable and clean energy; #8 decent work and economic growth; #9 industry, innovation and infrastructure; #11 sustainable cities and communities; #12 responsible consumption and production; #13 climate action; #14 life below water; #15 life on land; and #17 partnerships for the goals.

In May 2023, the newly constructed No. 7 terminal began operations by Evergreen Marine Corporation. The terminal is also fully automated, using unmanned vehicles, remote control, IoT network coverage, 5G and artificial intelligence systems. The terminal possesses a berth length of over 2.4 kilometres and depth alongside of 18 metres. The terminal was built at a cost of USD1.33 billion with about USD660 million funded by the Taiwan International Port Corporation. Evergreen contributed the remaining USD670 million. Nonetheless, it is worth noting that the Port of Kaohsiung was once among the busiest container ports in the world. In 1985, the port was ranked in the fourth position globally, rising to the third position in 1999, after Singapore and Hong Kong. However, lacklustre attitude towards the importance of the port sector, hesitancy to embark on redevelopment of the port contributed to the demise of Kaohsiung as the leading container port in the region.

9.15 RECOMMENDATION #15: ATTRACT AND GROW TRANSHIPMENT TRAFFIC

The recommendation calls for attracting and growing transhipment traffic with the purpose of transforming the port to become a major maritime hub in the Caribbean region. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Long term: 6-10 years	
SWOT aspects addressed:	**Weakness**	• Poor shipping connectivity • Limited cargo volumes
	Threat	• Insufficient cargo volumes to grow transport connectivity to overseas markets
	Opportunity	• Positioning as the container transhipment hub for the Caribbean • Improve logistics performance in the area of cost for greater competitiveness.

Shipping lines are attracted to cargo as bees are attracted to honey. As such, developing the transhipment business can be used to attract shipping lines, which in turn helps to grow shipping connectivity. Transhipment cargo can therefore be used to address the concerns of poor shipping connectivity and limited cargo volumes simultaneously. As mentioned, the attraction of a port to a shipping line lies in the potential amount of cargo which the carrier's vessels will handle at the cargo terminal. Shipping lines are attracted to ports with possess large volume of captive cargo. Without having a major production or consumption centre in Grenada, the alternative would be to market the country to serve particular confluences of trade or shipping routes. This means that cargo can be consolidated and distributed through the port via transhipment. The position of the port in the overall network of the shipping line becomes an important consideration.

Shipping lines will also consider factors such as maritime access, cost incurred to make the port-call, vessel productivity, port safety and reliability, and range of ship and cargo-

related services in their vessel route planning and strategy. For maritime access, there must be sufficient capacity and capability for the port to accommodate mainline vessels of the trade. Increasing size of containerships deployed on the primary container trades in the world led to the displacement of mainline vessels previously operating on these trades. The cascading effect which resulted meant that larger vessels are also increasingly deployed in smaller trades. As such, ports which aim to become a transhipment hub must endeavour to meet the strategic, commercial and operational requirements of shipping line customers.

There are three categories of transhipment traffic. They are hub-and-spoke transhipment, relay transhipment and interlining transhipment. For the case of hub- and-spoke transhipment, the current hubs in the Caribbean are commonly viewed to be Freeport in Bahamas (operated by Hutchison Ports), Kingston in Jamaica (operated by CMA CGM), and Caucedo in the Dominican Republic (joint venture between DP World and local interests)[135]. Other significant transhipment hubs in the region include various terminals in Panama and Colombia. Cargo is feedered from these hubs to smaller ports in the Caribbean. The transhipment hubs also service relay and interlining transhipment which consists of transferring containers between mainline and feeder vessels and between mainline vessels. Transhipment operations can take place between two or more vessels at the same time. A key driving force for transhipment is shipping lines aiming to achieve greater scale and network economies through higher vessel utilisation and load factors with fewer port calls. We note that the Caribbean region is the crossroads of intra-America trades and east-west services from the transpacific and transatlantic connections. The potential is offered to consider this option for Grenada.

CASE 6: DEVELOPMENT OF TANJUNG PELEPAS AS A TRANSHIPMENT HUB

The Port of Tanjung Pelepas (TPP) in Malaysia offers an interesting case study for developing the transhipment business. In 2022, TPP handled more than 11 million TEUs where transhipment incidence of the port exceeded 95%[137] . Despite starting from zero base, TPP was able to become an important transhipment port in the world in a relatively short time even though the port is located close to two of the world's largest transhipment hubs. The port began operations in 1999 and within a short span of two years, secured a market share of 11.4% (see **Figure 52**). The port continued to expand its market share which grew to reach 17.6% in 2017. The port has been engaged in intense competition with neighbouring Port Klang and Singapore ever since.

Competition for traffic lies in three major areas. Firstly, the ports compete actively to handle import and export containers in the Malayan Peninsular. The second area of competition consists of efforts to bring shipping lines to hub their operations at the port. The third area of competition is to target selected trade routes to develop or strengthen shipping connectivity. Success was made in 1999 when TPP managed to secure Maersk Sealand, which was then the largest container shipping line in the world, to transfer its hub from Singapore to the port. In 2002, a similar move was made by Evergreen, which was then the second largest container line in the world. In 2005, Maersk's acquisition of P&O Nedlloyd saw another 1.5 million TEUs moving from Singapore to TPP. These efforts helped to secure the position of TPP as a key hub for relay transhipment.

To grow hub-and-spoke and interlining transhipment, subsequent moves were made by Maersk to establish feeder operators targeted at the Vietnamese and Indonesian markets. An important strategy which helped to kick start the transhipment business was to position TPP as a hub for repositioning of empty containers. By 2017, the feeder service network at TPP has grown to cover other countries in Southeast Asia. Mainline carriers calling at TPP has also increased beyond Maersk and Evergreen to include other major shipping lines.

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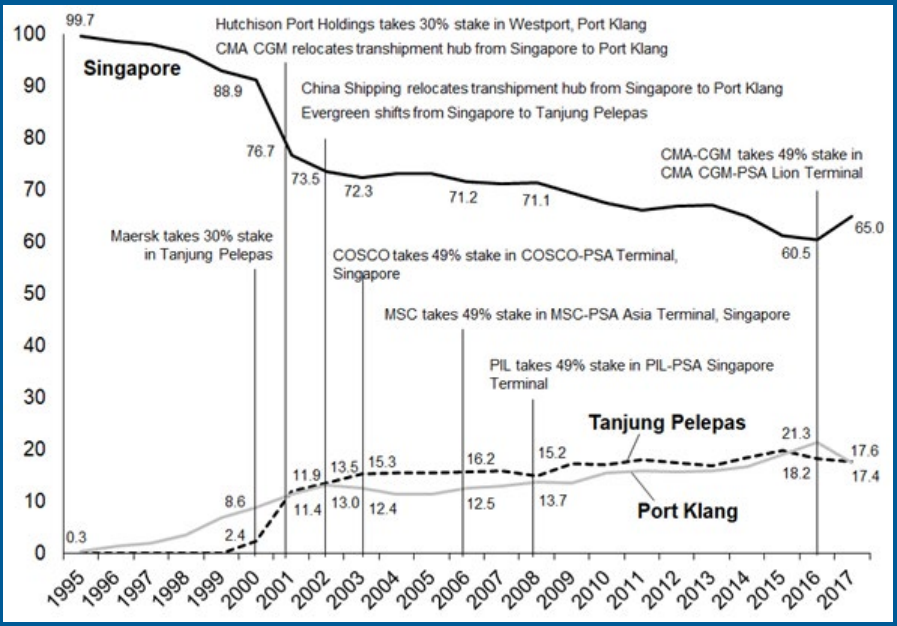
[135]Miller, G. (2019) 'Inside box shipping's Caribbean 'transshipment triangle". Freight Waves, 11 July [Online]. Available at: https://www.freightwaves.com/news/inside-container-shippings-caribbean- transshipment-triangle (Accessed 23 May 2023).
[136]Bernama (2023) 'PTP to invest RM3 bln in next five years for additional 3.5 mln TEUs capacity'. Bernama, 22 March [Online]. Available at: https://bernama.com/en/business/news.php?id=2175486 (Accessed 23 May 2023).

Figure 52: Market Share of Transhipment Containers by Major Ports in Southeast Asia



Source: Yap (2021)[137] .

9.16 RECOMMENDATION #16: CONSTRUCT A PROPER DEDICATED CARGO-HANDLING FACILITY AT MAURICE BISHOP INTERNATIONAL AIRPORT

The recommendation calls for constructing a proper facility dedicated for cargo- handling at Maurice Bishop International Airport in Grenada. More importantly, the facility should conform to the stipulated requirements for safe and secure airport operations. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Short to medium term: 1-5 years	
SWOT aspects addressed:	**Weakness**	• Insufficient capacity at the airport to serve logistics needs of users • Limited cargo volumes • Lack of cold storage facilities
	Threat	• Limited or lack of sufficient cargo-handling capacity and facilities for airport sector • Limited or lack of sufficient cold-chain handling capacity and facilities • Failure to develop an export-oriented economy • Insufficient cargo volumes to grow transport connectivity to overseas markets
	Opportunity	• Upgrade and develop cargo-handling capacity and facilities for airport sector • Upgrade and develop cold-chain handling capacity and facilities • Adopt green initiatives for logistics and supply chain management • Adopt technology such as use of IoT devices for tracking and tracing shipments in the cold chain process • Improve logistics performance in the area of cost for greater competitiveness.

[137]Yap, W. Y. (2021) 'Competition in the port industry'. In: Business and Economics of Port Management: An Insider's Perspective, Routledge, pp. 192. DOI: 10.4324/9780429439926-12

In 2022, Maurice Bishop International Airport handled 2,170 tonnes of air cargo. Volumes remain lower the pre-COVID years although GAA expects the recovery to continue. During the pre-COVID period, Grenada exported close to 1,000 tonnes of fish, fruits, and vegetables by air annually. For 2023, Maurice Bishop International Airport could see volume of air cargo reach approximately 2,500 tonnes.

The main concern with Maurice Bishop International Airport is that the current location at Sandals as not ideal for handling air cargo. There is no proper cargo- handling facility despite the airport handling higher volume of cargo traffic relative to Hewanorra International Airport in Saint Lucia. The make-shift facility does not provide a clear distinction between the landside and airside of the airport. This is because truck drivers carrying cargo to the airport must enter the airside to have the cargo scanned. After the cargo has gone through scanning, the truck will be driven out of the airside area. Although operations and management of the airport are governed by protocols of ICAO and IATA, and regular audits are conducted by ICAO as well as by the Eastern Caribbean Civil Aviation Authority, concerns on this issue have been raised by air transport regulatory agencies in the US and EU[138]. To address this issue for Maurice Bishop International Airport, the airport could consult the design and layout of the facility operated by HACS at Hewanorra International Airport in Saint Lucia (see **Figure 53**). The cargo building has a dedicated parking area for trucks with road connections to the Saint Lucia Freezone and Micoud Highway that links to Castries and other parts of the country. The cargo building is divided into the landside and airside, with security and customs officers stationed onsite. The facility is also located next to aircraft parking stands which offers easy access to transfer cargo between HACS's facility and parked aircraft. There are dedicated bays where trucks can back up to load or offload cargo (see **Figure 54**). Each bay is also equipped to weigh and screen cargo.

Figure 53: Cargo Building at Hewanorra International Airport

Source: International Consultant, using map data from Google Maps.

[138]Information provided by George F. Huggins Company during face-to-face meeting held on 25 April 2023 atthe company's office at GCNA Complex in St. George's.

Figure 54: Cargo Building Operated by HACS

Source: Hewanorra Air Cargo Services[139].

Reliability of equipment was also mentioned during meetings with stakeholders in the logistics community. For example, forklift breaking down may see cargo be handled by hand. In the event when the scanner breaks down, technical expertise has to be flown in from Barbados to make repairs. Providing training on equipment maintenance and repair might be an approach to address these issues. We note that there is a project underway to upgrade the airport in Grenada. Developing the cargo-handling facility should be given priority.

9.17 RECOMMENDATION #17: CONSTRUCT COLD STORAGE FACILITIES AT THE AIRPORT

The recommendation calls for providing cold storage facilities at the airport. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Short to medium term: 1-5 years	
SWOT aspects addressed:	**Weakness**	• Insufficient capacity at the airport to serve logistics needs of users • Limited cargo volumes • Lack of cold storage facilities
	Threat	• Limited or lack of sufficient cargo-handling capacity and facilities for airport sector • Limited or lack of sufficient cold-chain handling capacity and facilities • Failure to develop an export-oriented economy • Insufficient cargo volumes to grow transport connectivity to overseas markets
	Opportunity	• Upgrade and develop cargo-handling capacity and facilities for airport sector • Upgrade and develop cold-chain handling capacity and facilities • Adopt green initiatives for logistics and supply chain management • Adopt technology such as use of IoT devices for tracking and tracing shipments in the cold chain process • Improve logistics performance in the area of cost for greater competitiveness.

Of concern is the need for dedicated facility with cold storage capabilities at the airport. At the moment, cold storage at the airport is done using a FEU reefer container stationed outside the cargo shed. The reefer container is used when there are delays in flights and takes about 3-4 hours to reach ideal temperatures when plugged in. It may also be the case where the flight is delayed or cancelled, and producers have to bring the cargo back to their premises. For fresh produce, cargo exposed to the elements can also see a significant portion of the shipment lost. Even without the rain, loss to value can occur as the ripening process has started. As such, the proposed cargo building should be equipped with cold storage facilities as well as having the technical specialists to maintain and make repairs when necessary. Estimated capacity required is at least 72 cubic metres.

[139]Photos of cargo facility at the Hewanorra Air Cargo Services (HACS) taken on 20 April during a visit to the company at Vieux Fort.

Cold storage is provided by using cold rooms, which are spaces where the refrigeration system establishes desired climatic conditions to conserve the properties of the products stored[140]. In general, there are four kinds of cold rooms. The first type of cold room is designed to conserve products at between 0 °C to 10°C. This type of cold room is mainly used to preserve fresh food, medicines or beverages. The second type of cold room are freezing cold rooms which are designed to store frozen products at between 0 °C to -28 °C. These facilities are better insulated and have fewer daily openings. Products stored include vaccines and frozen food. The third type of cold room is the deep-freezing tunnel where temperatures reach -30 °C to -40 °C. This freezing cold room freezes the product individually using cold currents and automatic displacement systems while the product moves around inside the chamber. The facility is mainly employed in the food industry for freezing sweets or meat trays. The fourth type of cold room is the temperature blast chiller. The aim is to reduce the temperature of the product quickly to lower the risk of contamination and being able to preserve the product for longer. This type of cold room is commonly seen in industrial kitchens such as airline catering facilities. Based on the specifications described, it appears that the first or second type of cold room is what the airport requires.

To maintain and preserve the integrity of the product, having cold storage facilities must be complemented by a fleet of refrigerated trucks and associated delivery and handling processes to ensure in an unbroken cold chain. For example, it is important to ensure that temperature conditions are maintained within acceptable limits during the transportation process. Regardless of the transport mode of involved, it must be demonstrated that products were not exposed to conditions that could compromise their quality and integrity. To achieve this, a data logger can be employed. If deviations should occur, the manufacturer or supplier and recipient of the product should be notified. It is also necessary for equipment used for temperature monitoring during transport within vehicles and/or containers to be maintained and calibrated at regular intervals at least once a year.

9.18 RECOMMENDATION #18: DEVELOP AND GROW THE E-COMMERCE SECTOR

The recommendation calls for developing and growing the e-commerce sector in both countries. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Medium to long term: 3-10 years	
SWOT aspects addressed:	**Weakness**	• Limited cargo volumes • Lack of cold storage facilities
	Threat	• Insufficient cargo volumes to grow transport connectivity to overseas markets • Limited or lack of sufficient cargo-handling capacity and facilities for airport sector • Limited or lack of sufficient cold-chain handling capacity and facilities • Failure to develop an export-oriented economy
	Opportunity	• Develop and grow the e-commerce sector • Develop the airport to become an e-fulfilment hub for the Caribbean • Upgrade and develop cargo-handling capacity and facilities for airport sector • Upgrade and develop cold-chain handling capacity and facilities • Improve logistics performance in the area of cost for greater competitiveness.

Globally, the e-commerce market is gaining momentum as more businesses consider their prospects online. This development presents immense opportunities from the logistics perspective given that goods need to be transported from source of production to a distribution centre, and then to the final consumer. There will also be a proportion of reverse logistics involved, estimated at about 30% of the shipment. In addition, there is the trade in semi-manufactures as spare parts and components are moved using e-commerce logistics. Apart from the physical goods trade, logistics activities encompass the host of business services such as financial transaction, insurance and customer care.

[140]INTARCON (2023) 'Types of cold rooms', INTARCON, 15 June [Online]. Available at: https://www.intarcon.com/en/types-of-cold-rooms/ (Accessed 24 May 2023).

For consumers and businesses, the benefits of e-commerce include overcoming geographical limitations, lowering costs, faster location of products, offer comparison shopping, providing abundant information, creating targeted communication, remaining open at all times, and allowing deals, bargains and group buying. In short, businesses can make use of these benefits with the convenience and availability of online shopping to their advantage. Customer reach for companies is raised manifold. Key concerns for e-commerce would be credit card frauds and payment issues. Nonetheless, growing internet penetration and widespread use of mobile devices and social media platforms will continue to be important drivers of e-commerce market growth.

There could be opportunities for the airport to be developed into an e-commerce hub. This will need consultations with potential airline operators and other stakeholders in the trade to determine requirements for such a hub. With reference to **Figure 55**, flight time of 3 hours allows the airport to serve as an e-fulfilment hub for the entire East Caribbean as well as northern parts of South America. Extending the flight time to 4 hours will allow the airport to extend their reach to include Ecuador, Panama, Jamaica, Cuba, and whole of Colombia. With a flight time of 5 hours, express cargo operators will be able to cover central America, east coast of the US, Peru, and Bolivia. There is also potential for the airport to serve as a consolidation and distribution hub for cargo flights between Europe and South America. The airport can be positioned to serve as the primary gateway to the Caribbean and even Americas.

Master planning should be conducted for the potential site allocated to develop the e-commerce industry. Availability of good airport infrastructure, speedy customs clearance, cold storage facilities and security are essential. Stable and reliable internet connection will be particularly crucial and essential. The e-commerce hub can also help to boost air connectivity, air logistics activities as well as lend boost to the manufacturing sector in the respective countries. In the longer term, growing air logistics activities can be used to develop an aviation cluster complete with MRO services, an aerospace industry, and specialised aeronautical training institutes.

Figure 55: Markets Covered Within 5-Hour Flight Time from Grenada

Source: International Consultant, using map data from Google Maps.

9.19 RECOMMENDATION #19: ADDRESS CONCERNS RAISED TOWARDS STATE OF LAND TRANSPORT

The recommendation calls for addressing logistics inefficiencies associated with land transport in the country. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Inadequate road network and poor road conditions • Truck traffic congestion at the port • Port prioritising cruise traffic
	Threat	• Gridlock for truck traffic accessing and leaving the port
	Opportunity	• Improve logistics performance in the area of cost for greater competitiveness.

The first issue concerns traffic building up outside the port especially during peak hours. Should the situation worsen, the authorities may want to consider closing off certain sections of the Port Highway to non-port traffic for certain hours of the day. This may help to alleviate the problem of traffic congestion faced by port- related vehicles. Other vehicles will have to make a detour using Tanteen Road. For the second issue of traffic congestion on the roads in and around the Parish of Saint George, authorities can consider working with cargo owners to arrange for deliveries outside of the peak hours. A suggestion was for supermarket delivery to be done early in the morning or in the evening. This may require shift system to be employed at the port and customs if the delivery involves collecting cargo from the port. In Saint Lucia for Massy Stores, delivery to stores is done very early in the morning (i.e., 6-7am) or early evening (i.e., 8-9pm).

There were concerns raised that trailers may be faulty or not properly connected. This causes the vehicle not to "light up" when it breaks. This can cause traffic accidents. For this third issue, the recommendation is monitor the situation. Should it get worse, authorities may stipulate that trucks above a certain age (e.g., 10 years) are required to undergo annual inspections to certify their working condition. This stipulation can also be applied to other vehicles. The road network in and around the city of St. George's consists mostly of two lane-carriageways with each direction taking up a single lane. Given the hilly terrain in and around the capital city, roads can be narrow at certain stretches. As such, movement of cargo vehicles may need traffic handlers to manage the traffic on occasions where heavy vehicles are involved. The situation can be exacerbated by random parking of vehicles at the side of the road or drivers coming in opposite directions making a quick stop for conversations. Traffic inadvertently builds up and the congestion can take hours to clear. Hence for the fourth issue of random parking of vehicles, authorities may require such actions to be made illegal for certain hours of the day for certain stretches of the road especially when there is heavy traffic.

For the fifth issue, there are allegations that some truckers may not be licenced to provide cargo transport. The recommendation is to monitor the situation to assess the extent to which this problem exist, which will require random checks to be conducted by relevant authorities. For the last issue concerning the poor state of farm roads resulting in farmers having difficulty in sending their products to buying stations, recommendation is to assess the state of these roads to determine the level and extensity of improvements required. Examples can include improvements to drainage and binders.

9.20 RECOMMENDATION #20: DEVELOP AND GROW THE EXPORT SECTOR

The recommendation calls for developing and growing the export sector. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Medium to long term: 3-10 years	
SWOT aspects addressed:	**Weakness**	• Limited cargo volumes • Limited investment opportunities with export potential • Limited coordination and cooperation between private and public sector
	Threat	• Failure to develop an export-oriented economy • Insufficient cargo volumes to grow transport connectivity to overseas markets • Stagnating or slow economic growth in key export markets of the Caribbean, US, Canada and/or Europe
	Opportunity	• Set up free trade zone with proximity to the main cargo centre (Parish of Saint George for Grenada). • Improve logistics performance in the area of cost for greater competitiveness.

Key exports of Grenada included products under HS code 0908 (nutmeg, mace, cardamoms – 15.9%), 1101 (wheat or meslin flour – 10.7%), 2309 (preparations used in animal feed – 7.9%) and 1801 (cocoa beans – 7.4%)[141]. These categories accounted for 41.9% of exports by the country in 2021.

To promote exports, discussion with stakeholders in the trade and logistics communities in Grenada highlighted the need for assistance in the areas of marketing, labelling, certification, quality control, storage facilities and financing. Stakeholders also mentioned the situation is exacerbated by the lack of 20-foot containers and a 40-foot container may be difficult to be filled by a single exporter. Hence for other commodities in Grenada, relevant authorities should consider establishing a cooperative to help facilitate and promote exports. For example, the GCNA provides drying, sorting, bagging, and labelling for the commodity, and exports 6 of 8 FEUs of the commodity per month through the Port of St. George's. In addition to the services mentioned, the GCNA can also be involved in certification, negotiating, marketing and branding. The Grenada Cocoa Association also performs buying, consolidation, marketing and exporting functions on behalf of farmers in the country.

To move up the export value chain, research and development becomes an important process. Stakeholders in Grenada mentioned setting up incubators, developing standards, and collaboration with overseas research institutions as possible strategies. These suggestions indicate potential for authorities to explore subsidies which can be offered to the agricultural and primary industry sectors to assist producers in their research and development efforts, taking into account area of technical expertise and amount of financing required. The aim is to move up the commodity value chain. For commodities identified as key exports, such as nutmeg and cocoa in Grenada, authorities may want to consider devoting efforts at the national level by establishing national research and development institutes to drive such efforts.

Another approach to boost exports and thereby grow cargo volume for the country is attract investments from manufacturers and logistics companies to locate their business in the country. Stakeholders in Grenada highlighted key strengths of the country being low cost of operations for businesses, stable currency and high level of safety and security. There are also organisations tasked with attracting investments which include Grenada Investment Development Corporation among others, as well as schemes and incentives. While these efforts should be continued, it is important to continuously touch base with investors (both current and potential) to understand their concerns and anxieties, as well as deliver on their requests where possible. For reference, invest attraction in Singapore is performed by a dedicated agency called the Singapore Economic Development Board, which assigns an officer to address any requirements of the potential investor. This goes beyond matters that pertain to site selection, incentive package, and construction and operation of facility, and include other issues such as family relocation, housing, and education for their children.

Attracting investment by a key logistics company can also help to promote exports while lending a significant boost to cargo volume and international trade connectivity. This can be complemented with a free zone that is located either as port of the port complex or adjacent to it. The logistics company therefore becomes an important facilitator for investment and development a logistics cluster centred on the port facility. The building up of cargo volumes can boost international trade connectivity and facilitate diversification of export markets as well.

9.21 RECOMMENDATION #21: DESIGNATE LEAD AGENCY TO DRIVE DEVELOPMENT OF LOGISTICS SECTOR

The recommendation calls for designating a lead agency who will be given the authority and responsibility to drive development of the logistics sector. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Short term: 1-2 years	
SWOT aspects addressed:	**Weakness**	• Limited coordination and cooperation between private and public sector
	Threat	• Failure to coordinate, manage and bring much needed changes to the logistics sector connectivity to overseas markets • Uncompetitive seaport sector

[141]International Trade Centre (2023) Trade Map [Online]. Available at: https://www.trademap.org/Index.aspx (Accessed 3 May 2023).

Implementation timeframe:	Short term: 1-2 years	
	Opportunity	• Galvanise the logistics community through regular dialogues and sharing sessions • Whole-of-Government approach to advance competitiveness of the logistics ecosystem • Improve logistics performance in the area of cost for greater competitiveness.

Logistics activities straddle several industries and economic sectors. The logistics sector is the bedrock on which modern economy functions. Given the crucial role and contribution of the sector, the recommendation calls for the establishment of a government agency that is dedicated to driving development of the logistics sector for the benefit of economic growth and development of the country.

Initiatives conceived and implemented will require collaborative efforts across the public sector as well as active participation from private sector organisations and associations. This Whole-of-Government (WOG) approach aims for effective delivery of proposed strategies and action plans that can leverage on expertise and support from various government departments and ministries. The WOG approach is about 'cross-boundary work' which calls for public servants to have a collaborative mindset. Cultural shift is at the core of the WOG approach. The rationale for WOG work is to eliminate 'silos', i.e., departments working in isolation from one another.

The WOG approach emphasises inter-departmental or inter-ministry collaboration as a core feature. It advocates building and sustaining relationships, managing multiple and conflicting accountabilities, and managing complexity and interdependence. At the same time, WOG teams and other inter-departmental and inter-agency structures must align with a common purpose to accomplish the required outcomes. Note that it is important to make available capacity development which can include creating repositories of shared experiences and lessons, joint training, practice guidelines, networking initiatives, and access to training.

Improving logistics performance and efficiency requires a rethink in policies, considerations and priorities. The complexity of the agenda will present significant challenges. The work cuts across administrative boundaries of transportation, infrastructure, industry, commerce, finance, and the environment. As such, policymakers must reconcile the need for depth and consistency of reforms with set priorities. For a start, the workplan of the proposed lead agency can take reference to the recommendations proposed in this report. It is also necessary to establish mechanisms to involve the private sector. In the case for Singapore, logistics development is driven by the Singapore Economic Development Board (SEDB). The agency, which reports to the Ministry of Trade and Industry, works closely with the Ministry of Transport and its subordinate agencies which are the Land Transport Authority, Civil Aviation Authority of Singapore, and Maritime and Port Authority. The SEDB also collaborates with the private sector organisation Singapore Logistics Association to drive affairs of the sector.

9.22 RECOMMENDATION #22: SEPARATION OF REGULATORY AND COMMERCIAL FUNCTIONS OF THE SEAPORT

The recommendation calls for separation of regulatory and commercial functions for the seaport. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Medium to long term: 3-10 years	
SWOT aspects addressed:	**Weakness**	• Inefficient labour practices at the port
	Threat	• Uncompetitive port sector
	Opportunity	• Improve logistics performance in the area of cost for greater competitiveness.

The Grenada Ports Authority carry the dual functions of being an operator and regulator at the same time. As a port authority, the entity is responsible for discharging its responsibilities pertaining to the regulatory aspects of seaport operations. As a commercial operator, the entity is provided held accountable for decisions made and overall port performance. The port authority operates like a private company and is supposed

to be more customer-oriented and efficient. This is the result of deregulation which introduced commercialisation elements to improve overall efficiency and service quality for stevedoring and various port- related services. Nonetheless, this dual responsibility introduces the concern of conflict of interest especially for areas where the port authority has to "regulator itself" while being an operator at the same time. It may also be the case where efficiency levels are affected due to entrenched work practices and cultures which over the years, have become accepted norms.

The authorities could consider going a step further by introducing corporatisation where the commercial components of the port authority are put into a new entity which is given legal status as a company. The ownership is retained by the government. The corporatised entity is expected to be more responsive to customer needs while still subjected to government control and can be used to fulfil unprofitable national interests. The next step is to consider partial privatisation where the authorities can consider the landlord port model. In the landlord port model, the commercial entity becomes a full-fledged private port company. The government can opt to retain majority shareholding. The port authority becomes a regulator and landlord. The regulatory entity presides over the domains of planning and development, property rights and desired levels of efficiency which the port company should achieve. Functions such as terminal operations will be performed by the port company. In the landlord port, the port company owns the superstructure and uses it to perform cargo handling. An alternative structure is the tool port model where equipment is leased to the port company. The company operates under a concession arrangement.

The process can be initiated by examining the costs and benefits of current operating model by having regulatory and commercial functions undertaken by a single entity. From the regulatory perspective, focus will be on ability to carry out fully the responsibilities by the port authority. Reference can be made to international conventions which the country is signatory to, as well as national laws. From the commercial perspective, a benchmarking exercise can be undertaken to assess areas where the port has excelled or underperformed compared to the sample of ports.

Both the regulatory and commercial perspectives can be used to ascertain whether the separation should proceed. Should the case be proven that separation indeed brings greater benefits to the country and local community, decision has to be made on the governance model that best suits the context of conditions faced in the country. There will also be legislative issues to address. Before carrying out the separation, functions that would be commercialised and those that would be retained by the port authority should be decided. Consultation process to engage relevant stakeholders (especially port stevedores and the unions) for political support for the reform will also be key.

9.23 RECOMMENDATION #23: CREATE STRATEGIC STOCKPILE FOR ESSENTIAL FOOD AND FOOD ITEMS TO BOLSTER FOOD SECURITY

The recommendation calls for creation of strategic stockpile for essential food and food items to address concerns over food security. The implementation timeframe and SWOT aspects to be addressed are:

Implementation timeframe:	Short to medium term: 1-5 years	
SWOT aspects addressed:	**Weakness**	• Entirely dependent on imports for grain and grain products
	Threat	• Food security challenges
	Opportunity	• Improve food security.

Food staples form the cornerstone of food security. They constitute the dominant part of the diet of the population and are consumed regularly, usually daily. They provide the major proportion of an individual's nutritional and energy needs. For most communities, food staples are likely to comprise one or more of the following food crops which are cassava, corn (maize), rice, plantains, potatoes, millet, sorghum, soybeans, sweet potatoes, yams and taro. Of these food items, corn, wheat and rice provide 60% of global food energy intake.

On this aspect, Grenada is entirely dependent on overseas imports for cereals. Corn imports by Grenada are almost entirely from the US. For wheat, the US is a key supplier to Grenada. For wheat flour, Saint Vincent and the Grenadines is the biggest source of supply to Grenada. The exporter

is a member of the CARICOM. Rice is also an important source of food in Grenada. Guyana, who is a member of the CARICOM, is a key supplier of rice to the country. Diversification of cereal imports could consider other major exporting countries and regions which include the EU and South America. For soybeans, diversification of import sources may be difficult as the trade is dominated by Brazil and the US. With the importance of corn, wheat, soybeans and rice, it may be prudent for the government to consider creating stockpiles of these commodities for emergency use.

The recommendation therefore calls for creation of a national strategic stockpile for essential food and food items. The first step is to identify the lead agency to drive this initiative. The second step is to determine the composition of the basket of essential items for food security. This is followed by establishing the duration required. For some countries, the government may want to build a stockpile of rice that is sufficient to meet the needs of the population for a period of two months. The duration required for other countries may differ. This is a decision that has to be deliberated and made by policymakers in the country. The fourth step is to determine the quantities required, taking reference to the duration which the stockpile is expected to last. The fifth step is to decide on the location and facilities where the stockpiles will be stored. The next step will be to decide on the administration of the food security plan and stockpile. Lastly, the plan would be put into implementation.

9.24 CHAPTER SUMMARY

Concrete initiatives and policy and institutional measures are proposed in this chapter. This forms the last component of the study and addressed the fifth objective. Implementation timeline of the proposed recommendations are provided and the strategic road map makes reference to implementation over the short term (1 to 2 years), medium term (3 to 5 years), and longer term (6 to 10 years).

Recommendation #1 calls for strengthening the consensus building mechanism between public and private sectors for trade facilitation reform. Areas of attention for the reform include legal, organisation, technology, processes and people. Time frame: 1 to 2 years.

Recommendation #2 calls for establishing a national logistics skills curriculum for the country. Time frame: 1 to 2 years.

Recommendation #3 calls for a thorough review of work processes involved in collecting cargo and customs inspection and clearance at the port. Areas of attention are yard operations, gate operations and customs processes. Time frame: 1 to 2 years.

Recommendation #4 calls for implementing 24 hours, 7 days a week work system for the port. The work system may exclude public holidays for the moment, until deemed necessary at a later time. Time frame: 1 to 2 years.

Recommendation #5 calls for a national single window system to facilitate trade and logistics processes. Time frame: 1 to 5 years. A case study of Singapore's National Single Window System was given.

Recommendation #6 calls for efforts to go fully paperless with customs declaration, payments and inspections. This will accelerate digitisation and digitalisation of customs processes and facilitate trade. Time frame: 1 to 2 years.

Recommendation #7 calls for installation of a TOS to enhance port productivity and efficiency in the seaport. Time frame: 1 to 2 years.

Recommendation #8 calls for setting up a PCS to further enhance efficiency and productivity of port operations. The PCS is an extension of the TOS by incorporating other port service providers in the logistics and supply chain. Time frame: 1 to 2 years. A case study of the PCS in Singapore was given.

Recommendation #9 calls for a review of existing port tariff system. Time frame: 1 to 2 years. A case study comparing terminal handling charges for the Caribbean region was provided.

Recommendation #10 calls for a review of the import tariff system. Time frame: 1 to 2 years.

Recommendation #11 calls for technical assistance to be provided for equipment repair, maintenance and where necessary, replacement at port. It may also be necessary to acquire additional new equipment to address deficiencies seen in port productivity levels. Time frame: 1 to 5 years.

Recommendation #12 calls for locating and setting aside land to establish a container depot to provide value added services for cargo operations. Time frame: 1 to 5 years.

Recommendation #13 calls for a review of courses pertaining to training and education for the logistics sector. Time frame: 1 to 5 years. A case study on logistics training and education in Singapore was given.

Recommendation #14 calls for fundamental review of current port capacity and its capability of meeting the needs over the long term in the country. Time frame: 6 to 10 years. A case of developing the Port of Kaohsiung in Taiwan China was given.

Recommendation #15 calls for attracting and growing transhipment traffic with the purpose of transforming the port to become a major maritime hub in the Caribbean region. Time frame: 6 to 10 years. A case of development of Tanjung Pelepas in Malaysia as a transhipment hub.

Recommendation #16 calls for constructing a proper facility dedicated for cargo- handling at Maurice Bishop International Airport. Time frame: 3 to 5 years.

Recommendation #17 calls for providing cold storage facilities at the airport. Time frame: 1 to 5 years.

Recommendation #18 calls for developing and growing the e-commerce sector in the country. Time frame: 3 to 10 years.

Recommendation #19 calls for addressing logistics inefficiencies associated with land transport. Time frame: 1 to 2 years.

Recommendation #20 calls for developing and growing the export sector. Time frame: 3 to 10 years.

Recommendation #21 calls for designating a lead agency who will be given the authority and responsibility to drive development of the logistics sector. Time frame: 1 to 2 years.

Recommendation #22 calls for separation of regulatory and commercial responsibilities for the seaport. Time frame: 3 to 10 years.

Recommendation #23 calls for creation of strategic stockpile for essential food and food items to address concerns over food security. Time frame: 1 to 5 years.

CHAPTER 10

CONCLUSION

10.1 IMPORTANCE AND CONTRIBUTION OF THE LOGISTICS SECTOR

Logistics activities serve as the gel for the efficient and productive functioning of modern societies. With reference to **Figure 56,** the impact of logistics activities is shown to permeate every sector of the Singapore economy, whether directly or indirectly. For the country, logistics accounts for 1.4% of GDP and employs 86,000 workers across 5,300 enterprises. More importantly, the sector directly supports another 52% of Singapore's economy via the clustering of trade-manufacturing- logistics activities, supporting industry progression to higher value-added activities, attracting investments through increased industry competitiveness, and improving international connectivity enabled by higher cargo traffic which resulted from the congregation of logistics and related activities.

With reference to the figure, contribution of logistics to various economic sectors are elaborated. In manufacturing, logistics activities enable just-in-time services as well as supporting logistics needs of a host of cargo owners. In construction, logistics activities cater to oversize cargo and prefab materials, and encompass all aspects of materials handling. In ownership of dwellings, logistics activities deal with consumer logistics, last mile logistics, as well as reverse logistics. For wholesale and retail trade, logistics serves as the anchor for international trade activities, having to frequently deal with challenges imposed by stringent customer requirements, seasonality, and handling across a variety of products, product- requirements and transportation modes. The expansion of FMCG goods trade (e.g., e-commerce) has also augmented the service geography of firms providing logistics solutions. This help to stimulate further development of the logistics market. Other types of logistics activities can be found embedded in the business services and finance and insurance sectors. The figure thus depicts the composition of a logistics cluster. The explanation underscores the importance of logistics as a crucial driver of industry competitiveness and national economic growth and development.

Figure 65: Contribution of Logistics to the Singapore Economy

Source: International Consultant, using information from Singapore Department of Statistics (2021)[142] .

[142]Singapore Department of Statistics (2021) Singapore Economy [Online]. Available at: https://www.singstat.gov.sg/modules/infographics/economy (Accessed 20 May 2021).

10.2 SUMMARY OF RECOMMENDATIONS AND KEY ACTIONS

The following paragraphs shall recap on key actions and areas for attention required to facilitate implementation of the recommendations.

Recommendation #1: Strengthen the consensus building mechanisms between public and private sectors for trade facilitation reform

The recommendation to strengthen the consensus building mechanism between public and private sectors for trade facilitation reform calls for actions that include the following:

- Identify lead agency to drive trade facilitation reform;
- Determine the scope of reform, focusing on priority areas that require urgent attention at the initial phase;
- Engage relevant stakeholders from across key public and private sector organisations depending on the specific area of reform (may require establishing different task forces with different membership composition to expedite the reform process);
- Determine the desired outcomes and targets to be achieved with respect to each area of reform;
- Hold regular dialogues between the public and private sectors with updates on progress; and
- Conduct periodic reviews on the scope of reform to identify new priority areas that require urgent attention.

Recommendation #2: Establish national logistics skills curricula

The recommendation calls for establishing a national logistics skills curriculum for the country with actions that include the following:

- Establish a working committee tasked with developing a national logistics skills curriculum;
- Identify specific skill sets that are required for the logistics industry through consultation with stakeholders;
- Determine the desired outcomes and targets to be achieved with reference to the national logistics skills curriculum; and
- Identify partners from the public and private sectors for collaboration to design and offer courses with certification to address the skill sets demanded by the logistics industry.

Recommendation #3: Review work processes for cargo collection and clearance at the port

Areas of attention are yard operations, gate operations and customs processes. Key actions include the following:

- Make clear to stakeholders and publicise the process of collecting cargo from the port to avoid inconsistencies or misunderstandings (important to distinguish stipulated safe and efficient work processes from established norms);
- Make clear the guidelines for cargo inspection and clearance, and meticulously following through with the risk assessment criteria and status generated for cargo, with random checks conducted on green lane cargo; severe penalties to be imposed to discourage illegal or erroneous reporting;
- Award importers and exporters with consistent good track record with green lane status, can be evaluated and renewed annually;
- Eliminate the need to queue to enter the port with pre-clearance done using an online platform by the port authority for gate pass application and issuance;
- Establish a one-stop location in the port to handle all payments for services of the port authority and customs, as well as document processing and where possible, such activities should be handled electronically via a Port Community System;
- Establish an electronic system to track and trace containers and cargo in the port, and the system to be updated when the cargo or container is moved to another location (to be meticulously administered which will facilitate keeping track of cargo or containers and eliminate the need for runners to locate them);
- Container assigned to the green lane should be made ready for pick up by the truck at the port at the scheduled time of appointment; and
- Establish key performance indicators for the steps involved in collecting and clearing cargo and identify specific teams or departments responsible for every step, with the intention for progressive improvements to reduce the time and cost involved for the whole process.

Recommendation #4: Review implementing 24/7 work system at the port

The recommendation calls for implementing 24 hours, 7 days a week work system for the port. The work system may exclude public holidays for the moment, until deemed necessary at a later time. Key actions include the following:

- Estimate the volume of cargo and vessel traffic the port could expect to handle in the medium term;
- Review the benefits and costs of converting the port to be operational for 24 hours a day, 7 days a week, with the exception of pubic holidays, to accommodate growing port traffic;
- Work out the implementation plan and timeline including shift arrangement and notices if the 24/7 work system is deemed beneficial;
- Secure buy in from stevedores, customs, regulatory authorities and other port service providers for smooth implementation; and
- Implement the new work system.

Recommendation #5: Implement NSW system for trade and logistics facilitation

Through the NSW, cross-border trade can see improved efficiency, increased transparency, enhanced coordination, reduced costs, improved compliance, and better facilitation of cross-border trade. Key actions include the following:

- Identify sponsor(s) for the project and NSW project team, including project manager who is responsible for leading and driving the project;
- Determine requirements of the NSW, paying special attention to the technical and operational aspects of what is needed for a successful NSW implementation;
- Launch Request for Proposal (RFP) from prospective vendors for proposed NSW solutions, finalise terms and requirements, followed by tender process;
- Project plan should include the implementation timeline, milestones, specific tasks required, budget and resource plan;
- Identify project risks and develop plans to mitigate those risks;
- Training should be provided to all stakeholders who will need to use the NSW system;
- User support is an essential feature especially during the familiarisation and implementation stages;
- Evaluate project implementation, user acceptance testing, and complete procedures for project hand over including knowledge transfer; and
- Maintenance of NSW system with periodic updates and enhancements.

Recommendation #6: Accelerate efforts to go fully paperless with customs declaration, payments and inspections

The recommendation will accelerate digitisation and digitalisation of customs processes and facilitate trade. Key actions include the following:

- Identify lead agency to drive the recommendation (may not necessarily be customs especially when there are entrenched interests to perpetuate current practices and work arrangements);
- Do status check on current implementation of paperless customs processes with the aim to identify outstanding bottlenecks and concerns that need to be addressed (review should consider the entire IT infrastructure and architecture for trade transactions from the user perspective – which means industry consultation forms a critical component of the process);
- Determine specific action plans with implementation timelines and responsible agencies or departments to address outstanding issues including entrenched interests;
- Provide regular updates on progress of the implementation to reporting authorities as well as stakeholders in the trade and logistics community;
- Retrain staff made redundant by the process to be deployed to other roles such as in audit and compliance work;
- As a subsequent phase, conduct review of customs procedures to identify other areas which can go fully electronic to expedite cargo clearance (e.g., risk assessment, schedule of fines, inspection procedures, pre-clearance of import cargo); and
- Determine specific action plans with implementation timelines and responsible agencies or departments for this subsequent phase of implementation.

Recommendation #7: Install TOS to enhance productivity and efficiency of seaport terminal operations

There appears to be significant potential to improve port productivity and efficiency given feedback received from port users. Key actions include the following:

- Determine user requirements with respect to the TOS, taking into account KPIs to be achieved with projected cargo and vessel traffic over the decade;
- Evaluate capabilities of different TOS available in the market in terms of their suitability given local operating conditions (emphasis is on balancing between the factors of budget, scope, functionality, support and end result);
- Having decided on the TOS to use, follow through with implementation, training, and post-implementation follow-up; and
- Conduct periodic reviews to determine adequacy of the TOS, taking reference to port productivity and efficiency parameters benchmarked against other terminals in the region.

Recommendation #8: Set up the PCS

The PCS is an extension of the TOS by incorporating other port service providers in the logistics and supply chain. Key actions include the following:

- Identify and appoint the lead agency for the project;
- Determine the objectives of the PCS, including implementation timeline, coverage and scope of services to offer, including those offered by other public or private entities;
- Consider the legal frameworks which the PCS will need to work with (e.g., data protection acts at the national, regional and international levels);
- Identify the stakeholders to participate in the project and for inclusion in the consultation process;
- Consider the delivery of the PCS, whether through joint venture or PPP model;
- Use the RFP process to refine objectives and scope of the PCS;
- Launch tender to set up the PCS, with tender identifying priority modules and specifying list of systems to be integrated into the PCS;
- Having decided on the PCS to use and operating model, follow through with implementation, training, and post-implementation follow-up; and
- Conduct periodic reviews to determine adequacy of the PCS, taking reference to overall impact on logistics and business costs, and economic competitiveness.

Recommendation #9: Review system of port tariffs

Discussions with stakeholders in the logistics and transport community in Grenada highlighted the concern of expensive port charges. Key actions include the following:

- Review the intended purpose of the port tariff system;
- Modernise the tariff structure to align to the current era of container shipping and national economic development and growth objectives, while meeting the purpose of the tariff system;
- Communicate and engage relevant stakeholders (especially port stevedores and the unions) for political support for the revamp;
- Initiate legislative procedures for the amendments;
- Simplify the tariff structure to make it easy to understand;
- Make the tariff structure transparent;
- Conduct benchmarking with other ports in the region to monitor cost competitiveness; and
- Conduct periodic reviews to ensure cost competitiveness of port tariffs and their consistency in meeting the development objectives of the country.

Recommendation #10: Review import tariffs to address high cost of imports

Key actions include the following:

- Assess the impact of high import tariffs on the country which can inhibit its competitiveness, focusing in particular on the detrimental effects on cost of living and cost of business, as well as effects of trade diversion;
- Review the scheme of trade tariffs for opportunities to reduce the rates (e.g., De Minimis Rule), taking into account potential loss of revenue vis-a-vis possible gains through trade creation and other effects including boost to export competitiveness due to cheaper imports of semi-manufactures or raw materials;

- Initiate the legislative process and consultation sessions necessary for the reform;
- Simplify the tariff structure to make it easy to understand;
- Make the tariff structure transparent;
- Conduct benchmarking with other countries in the region to monitor trade competitiveness; and
- Conduct periodic reviews to ensure trade tariffs are consistently applied and able to meet the economic growth development objectives of the country.

Recommendation #11: Provide technical assistance for equipment, repair, maintenance and replacement

The recommendation calls for technical assistance to be provided for equipment repair, maintenance and where necessary, replacement at the port. It may also be necessary to acquire additional new equipment to address deficiencies seen in port productivity levels. Key actions for the short-term include the following:

- Carry out technical assessment to determine repairs and replacements needed for port equipment;
- Deploy technical team to make quick repairs or replacement of spare parts to restore malfunctioning equipment to working conditions; and
- Determine the schedule of replacement for port equipment where repairs are not possible and perform the replacement.

Key actions for the short to medium term include the following:

- Project port traffic volume for cargo and vessel over the next decade;
- Determine KPIs and targets to be achieved based on desired levels of operation and port asset utilisation;
- Estimate performance levels based on the latest stocktake performed to assess readiness and availability of port equipment;
- Identify equipment needed to be repaired, replaced or acquired by the port to achieve this desired level of operations and KPI targets, based on the existing location and configuration of the terminal (e.g., new or additional quay crane, reachstackers, forklifts, weighbridges, tugs etc.);
- Identify infrastructure works required, such as strengthening the apron at the Port of St. George's to support installation of quay crane for vessel operations;
- Work out the schedule for introducing the equipment and maintenance regime; and
- Train a team of technicians capable of performing equipment maintenance and repair.

Recommendation #12: Allocate land to be designated as container depot

The recommendation calls for locating and setting aside land to establish a container depot to provide value added services for cargo operations. Key actions for the short term include the following:

- Determine the volume of cargo traffic that the container depot should accommodate given existing operational requirements;
- Identify suitable land area to accommodate the container depot (taking into account land use planning and zoning of potential sites);
- Develop arguments based on sound economic, financial and social analysis on net benefits to be brought about by the container depot;
- Engage relevant stakeholders through private and public consultations; and
- Establish the schedule of implementation specifying affected areas, environmental mitigation measures, and completion time.

Key actions for the medium term include the following:

- Forecast port traffic volume for cargo, vessel and trucks over the two decades;
- Develop a port masterplan which necessitates reviewing the layout of the port in terms of its capability to meet the needs of the forecasted volume of vessel, cargo and truck traffic;
- Determine the operational, economic, environmental, social and traffic impact of the proposed port masterplan (inclusive of risk analysis and mitigation plan);
- Engage relevant stakeholders through private and public consultations; and
- Develop implementation plan, including timeline, budget, resource planning and schedule of works involved.

Recommendation #13: Training and education for logistics sector

The recommendation to address lack of skilled logistics professionals in the industry calls for actions that include the following:

- Identify training needs based on consultation with stakeholders in the logistics industry;
- Identify partner tertiary institution to collaborate for training and education of workers in the logistics sector;
- Design and offer courses with flexible delivery modes to address the skill sets demanded by the logistics industry;
- Identify persons to be sent for training, with financial support provided by the company or third-party organisations; and
- Promote awareness, attractions and career opportunities of working in the logistics industry.

Recommendation #14: Explore development of a new port

Developing a new port is likely to involve multiple government departments and stakeholders. It will also include several rounds of public consultation before and during the construction process. Primary concerns will be the long-term impact of the project on the country and local community. Careful considerations should be made for the following aspects in terms of their impact and associated risks:

Economic and social impact	• Impact on value added, economic output, revenue and employment • Social costs and benefits
Environmental impact	• Mitigation and preventive measures • Compliance with national and international legislature
Site assessment	• Suitability of location based on site investigation • hysical constraints to future expansion
Technological impact	• Appropriate systems and applications to deploy • New port can trigger and facilitate adoption of technology such as IoT devices, WMS, TMS, ERP systems in the logistics community
Legal and regulatory impact	• Compliance with national laws for all stages • Transparency and consistency in administration
Financial impact	• Availability and allocation of capital and operating expenditure • Measures for cost control and mitigation
Industry impact	• Potential industries to co-locate • Establishment of free trade zones and support policies
Traffic impact	• Projected cargo, vessel and truck traffic • Composition of traffic and connectivity to shipping lines

Recommendation #15: Attract and grow transhipment traffic

The recommendation calls for attracting and growing transhipment traffic with the purpose of transforming the port to become a major maritime hub in the Caribbean region. Key actions include the following:

- Initiate discussions with shipping lines that are active in the Caribbean or other entities (shipping lines or otherwise) who have interests to grow their activity in the region, on their requirements and conditions to make the port become a transhipment hub including expected container throughput;
- Determine the required capacity in terms of land and other resources necessary to accommodate the projected transhipment traffic;
- Identify potential sites to locate the transhipment port;
- Assess the benefits and costs of becoming a transhipment hub in the region by accommodating to the requirements of the shipping line(s) or interested entities or both;
- Engage relevant stakeholders through private and public consultations; and
- Develop implementation plan, including timeline, budget, financing, resource planning and schedule of works involved.

Recommendation #16: Construct a proper dedicated cargo-handling facility at Maurice Bishop International Airport

The facility should conform to the stipulated requirements for safe and secure airport operations. Key actions include the following:

- Ascertain user requirements and projected cargo volume which GND airport could expect to handle in the next decade;

- Determine capacity required for the new cargo building at the airport which can accommodate the user requirements and projected cargo;
- Identify potential site to locate the building and conduct site assessment, taking into account impact on current and future aircraft movements and other airport operations;
- Engage relevant stakeholders through private and public consultations; and
- Develop implementation plan, including timeline, budget, resource planning and schedule of works involved.

Recommendation #17: Construct cold storage facilities at the airport

Discussions with the logistics community mentioned the inadequacy of cold storage facility at the airport. Key actions include the following:

- Assess the volume of cargo that requires cold storage at the airport with a view for projected traffic in the coming decade;
- Ascertain user requirements with respect to specific products anticipated to be handled by the facility;
- Identify potential site to locate the facility and conduct site assessment, taking into account impact on current and future aircraft and airport operations;
- Engage relevant stakeholders through private and public consultations; and
- Develop implementation plan, including timeline, budget, resource planning and schedule of works involved.

Recommendation #18: Develop and growth the e-commerce sector

Globally, the e-commerce market is gaining momentum as more businesses consider their prospects online. Key actions include the following:

- Initiate discussions with air cargo carriers that are active in the Caribbean, or other airlines, with interest to grow their activity in the region, on their requirements and conditions to operate an e-commerce hub at the airport;
- Determine the required capacity in terms of land and other resources necessary to accommodate the projected e-commerce traffic, taking into account associated cluster of activities and potential free zone;
- Identify potential sites to locate the e-commerce hub, taking into account impact on current and future aircraft and airport operations;
- Assess the benefits and costs of becoming an e-commerce hub in the region by accommodating to the requirements of the airline, taking account of the projected air cargo volume;
- Engage relevant stakeholders through private and public consultations; and
- Develop implementation plan, including timeline, budget, financing, resource planning and schedule of works involved.

Recommendation #19: Address concerns raised towards state of land transport

For the land transport sector, key actions include the following:

- Closing off certain sections of the Port Highway to non-port traffic for certain hours of the day to facilitate movements for port-related vehicles;
- Work with cargo owners to make truck deliveries in the early morning or evening hours, may require arrangements with stevedores and customs to implement a shift system;
- Monitor vehicles above a certain age, requiring them to undergo inspection to certify their working condition;
- Make it illegal for vehicles to be parked at certain stretches of a road during specified timings of the day to alleviate traffic congestion;
- Authorities can perform random checks on truckers' for the validity of their licences; and
- Assess level and extensity of improvements needed for farm roads to improve farmers' access to reach buying stations.

Recommendation #20: Develop and grow the export sector

Key actions include the following:

- Consider setting up cooperatives for other targeted commodities where they can be tasked with buying, consolidation, marketing and exporting functions on behalf of farmers in the country;
- Assess possibilities of subsidising agricultural and primary industry sectors to assist producers in their research and development efforts, taking into account area of technical expertise and amount of financing required;
- For strategic commodities, establish national research and development institutes to drive such efforts at the country level;

- Continuous engagement with investors (both current and potential and especially for export sector) to understand their concerns and anxieties, and deliver on their requests where possible; and
- Initiate discussions with prospective key logistics companies for interest in using the country as a major logistics hub in the entity's supply chain and transportation network, with the aim to boost exports and international trade connectivity.

Recommendation #21: Designate lead agency to drive development of logistics sector

Given the crucial role and contribution of the logistics sector, the recommendation calls for the establishment of a government agency that is dedicated to driving development of the logistics sector for the benefit of economic growth and development of the country. Key actions include the following:

- Designated lead agency to drive logistics matters and development;
- Identify supporting agencies to deliver the Whole-of-Government approach to address challenges and opportunities for the logistics sector;
- Identify key private sector organisations to work with;
- Regularly review composition of WOG team to ensure membership is aligned to contemporary developments; and
- Initiate regular dialogues between stakeholders in the logistics community for consultative approach in developing and growing the logistics sector.

Recommendation #22: Separation of regulatory and commercial functions of the seaport

The recommendation calls for separation of regulatory and commercial responsibilities for the seaport. Key actions include the following:

- Examining the costs and benefits of current operating model by having regulatory and commercial functions undertaken by a single entity;
- Decide on the governance model to adopt (e.g., tool port, landlord port or fully privatised port);
- Identify functions that would be commercialised and those that would be retained by the port authority should the decision be made to go ahead with the separation;
- Determine the implementation timeline and milestones to be achieved;
- Communicate and engage relevant stakeholders (especially port stevedores and the unions) for political support for the reform; and
- Initiate legislative procedures for the amendments.

Recommendation #23: Create strategic stockpile for essential food and food items to bolster food security

The recommendation calls for creation of strategic stockpile for essential food and food items to address concerns over food security. Key actions include the following:

- Identify lead agency to drive the initiative;
- Determine the basket of essential items for food security;
- Establish the duration which the stockpile is required to last during a food emergency or crisis;
- Determine the quantities required, taking reference to the duration which the stockpile is expected to last;
- Decide on the location and facilities for the stockpiles; and
- Decide on the administration of the food security plan and stockpile.

The concept of the logistics and the logistics cluster plays a key role with regards to pursing a logistics strategy and logistics network development of a country. Reference must be made to the role of the country for the wider geographical region. Logistics clusters are well-connected congregation of multimodal transport, logistics, light assembly and manufacturing, and various supporting services. Logistics clusters have enabled domestic and international long-haul shipments of containerised, non-containerised and bulk cargo. Through efficient logistics services, shippers and logistics service providers can operate extended supply chains more efficiently despite increased operational complexities due to longer distances, multiple modes, and several cargo hand-off points involved. Nonetheless, the role logistics clusters go beyond lowering or minimising logistics costs for firms. They are strategic tools for governments to create employment, stimulate economic activities, strengthen regional competitiveness, reduce urban congestion, and strengthen food security.

VESSEL ARRIVALS AT GDSTG FOR APRIL 2023

Table A1: Example of Vessel Arrivals in April 2023 at the Port of St. George's (GDSTG)

Name	Type	Flag	GT	LOA x Beam (m)	ATA	Length of Stay
Seabourn Ovation	Passenger Ship	Bahamas	41,865	210 x 36	1 Apr 0749 hrs	9h 27min
Industrial Royal*	General Cargo Ship	Liberia	8,963	135 x 22	2 Apr 0848 hrs	11h 17min
Epic Caledonia	LPG Tanker	Singapore	3,591	95 x 16	2 Apr 1429 hrs	2h 50min
Rhapsody of the Seas	Passenger Ship	Bahamas	78,878	279 x 36	3 Apr 0735 hrs	7h 52min
Lady Victoria	Offshore Supply Ship	St. Vincent & the Grenadines	692	55 x 12	3 Apr 0811 hrs	9h 31min
Hoegh Caribia	Vehicles Carrier	Marshall Islands	20,209	140 x 22	4 Apr 0559 hrs	6h 15min
MSC Seaside	Passenger Ship	Malta	153,516	323 x 41	4 Apr 0703 hrs	11h 53min
Aidaperia	Passenger Ship	Italy	125,572	300 x 38	5 Apr 0715 hrs	9h 32min
Atlantic	Aggregates Carrier	St. Kitts & Nevis	2,195	80 x 13	5 Apr 0819 hrs	2days 1h
Ocean Explorer	Passenger Ship	Bahamas	8,228	104 x 18	6 Apr 0826 hrs	9h 35min
Tropic Jewel**	Containership	St. Vincent & the Grenadines	15,215	160 x 25	6 Apr 1008 hrs	19h 13min
Cosima PG	Oil/Chemical Tanker	UK	5,241	105 x 18	6 Apr 1222 hrs	1day 22h
Viking Princess	Vehicles Carrier	Marshall Islands	9,827	117 x 20	6 Apr 1258 hrs	4h 2min
Fouma	Containership	Cyprus	15,375	166 x 25	6 Apr 1818 hrs	4h 25min
Volendam	Passenger Ship	Netherlands	61,214	238 x 32	8 Apr 0749 hrs	7h 46min
Marella Explorer 2	Passenger Ship	Malta	72,458	247 x 32	8 Apr 1307 hrs	5h 53min
Oslo Bulk 5	General Cargo Ship	Norway	5,629	108 x 18	9 Apr 0830 hrs	21h 30min
Wisby Barbados	Oil/Chemical Tanker	Malta	6,952	122 x 19	10 Apr 0420 hrs	17h 54min
Cosima PG	Oil/Chemical Tanker	UK	5,241	105 x 18	10 Apr 0426 hrs	1day 20h
Hein	General Cargo Ship	Guyana	861	62 x 10	11 Apr 0410 hrs	2days 8h
Fast Wil	General Cargo Ship	Guyana	1,391	80 x 11	12 Apr 0713 hrs	1day 8h
Baltic Klipper#	Reefer/Containership	Liberia	14,091	165 x 25	12 Apr 0737 hrs	8h 16min
Voyager of the Seas	Passenger Ship	Bahamas	138,194	311 x 47	12 Apr 1010 hrs	1h 49min
Lady Victoria	Offshore Supply Ship	St. Vincent & the Grenadines	692	55 x 12	13 Apr 0615 hrs	9h 6min
Celebrity Millennium	Passenger Ship	Malta	90,963	294 x 32	13 Apr 0730 hrs	9h 24min
Tropic Island**	Containership	St Vincent & Grenadines	15,215	160 x 25	13 Apr 1748 hrs	10h 11min
Admiral Bay II	RoRo/Passenger	St. Vincent & the Grenadines	518	44 x 10	14 Apr 0555 hrs	4h 5min
Rhapsody of the Seas	Passenger Ship	Bahamas	78,878	279 x 36	14 Apr 1038 hrs	7h 30min
Nomadic Hjellestad*	General Cargo Ship	Marshall Islands	9,530	138 x 21	14 Apr 1225 hrs	1day 9h
AS Fabrizia@	Containership	Portugal	15,375	166 x 25	16 Apr 0131 hrs	4h 48min
Cosima PG	Oil/Chemical Tanker	UK	5,241	105 x 18	16 Apr 0640 hrs	2days 6h
Syros Wind	General Cargo Ship	St. Vincent & the Grenadines	3,173	95 x 16	17 Apr 0438 hrs	12h 53min
Atlantic	Aggregates Carrier	St. Kitts & Nevis	2,195	80 x 13	18 Apr 0704 hrs	1day 12h
Rhapsody of the Seas	Passenger Ship	Bahamas	78,878	279 x 36	19 Apr 0723 hrs	10h 4min
Marella Discovery	Passenger Ship	Malta	69,472	264 x 36	19 Apr 0752 hrs	10h 37min
BBC Gdansk	General Cargo Ship	Antigua & Barbuda	6,155	122 x 18	20 Apr 1109 hrs	10h 31min
Tropic Jewel**	Containership	St. Vincent & the Grenadines	15,215	160 x 25	20 Apr 1601 hrs	10h 31min
Admiral Bay II	RoRo/Passenger	St. Vincent & the Grenadines	518	44 x 10	21 Apr 0104 hrs	19h 11min
Fouma	Containership	Cyprus	15,375	166 x 25	22 Apr 1319 hrs	15h 21min
Nordic Skagen	Bulk Carrier	Liberia	23,548	185 x 30	24 Apr 0717 hrs	3h 25min

Table A1: Example of Vessel Arrivals in April 2023 at the Port of St. George's (GDSTG)(cont'd)

Name	Type	Flag	GT	LOA x Beam (m)	ATA	Length of Stay
Duncan Island#	Reefer Vessel	Bahamas	14,061	179 x 25	26 Apr 0710 hrs	5h 55min
Tropic Island**	Containership	St Vincent & Grenadines	15,215	160 x 25	27 Apr 0626 hrs	3days 3h
Seven Seas Navigator	Passenger Ship	Bahamas	28,803	171 x 25	27 Apr 1353 hrs	7h 38min
AS Fabrizia@	Containership	Portugal	15,375	166 x 25	28 Apr 0416 hrs	12h 50min
Janina	General Cargo Ship	Antigua & Barbuda	6,409	123 x 21	30 Apr 0618 hrs	8h 14min
BBC Olympus	General Cargo Ship	Antigua & Barbuda	8,255	126 x 22	30 Apr 1430 hrs	7h 55min

*Source: International Consultant, using data from MarineTraffic (2023)[143] . * Operated by CMA CGM. ** Operated by Tropical Shipping. # Operated by Geest Line. @ Operated by Crowley.*

[143]MarineTraffic (2023)) St George's Port [Online]. Available at: https://www.marinetraffic.com/en/ais/details/ports/2742?name=ST- GEORGES&country=Grenada (Accessed 30 March to 2 May 2023).

ANNEX 2

EXAMPLE OF DIRECT FLIGHT CONNECTIONS FOR GND

Table A2: Example of Direct Flight Connections for Maurice Bishop International Airport (GND)

To GND from:	Airline	MON	TUE	WED	THU	FRI	SAT	SUN
Miami, MIA	American Airlines	1 B738	1 B738	1 B738	1 B738	1 B738	1 B738	1 B738
New York, JFK	JetBlue Airways	1 A321	1 A321	1 A321	1 A321	1 A321	1 A32S	1 A321
Toronto, YYZ	Air Canada	1 7M8	-	-	-	-	-	-
San Juan, SJU	Ameriflight	1 SW4	-	-	-	-	-	-
Bridgetown, BGI	InterCaribbean Airways	2 AT4, EM2	1 AT4	2 AT4, EM2	1 AT4	1 AT4	1 AT4	1 AT4
	LIAT	1 AT4	-	-	-	-	-	-
	Virgin Atlantic	-	1 A333	-	-	-	1 A333	-
	Caribbean Airlines	-	-	1 AT7	1 AT7	-	1 AT7	-
Port of Spain, POS	Caribbean Airlines	1 AT7	1 AT7	1 AT7	1 AT7	2 AT7	1 AT7	2 AT7
	Kingfisher Air (DHL)	1 C208	1 C208	1 C208	1 C208	1 C208	-	-
Vieux Fort, UVF	British Airways	-	-	1 B772	-	1 B772	1 B772	-
Castries, SLU	Mountain Air Cargo (FedEx Feeder)	1 C208	1 C208	1 C208	1 C208	1 C208	-	-
	Ameriflight	1 SW4	-	1 SW4	-	1 SW4	-	-
Georgetown, GEO	Amerijet International	1 B763	-	-	-	-	-	-
Kingstown, SVD	Kingfisher Air (DHL)	1 C208	-	1 C208	1 C208	1 C208	-	-
	InterCaribbean Airways	1 AT4	-	1 EM2	1 AT4	-	1 AT4	-
	LIAT	-	-	-	1 AT4	-	-	-
Carriacou, CRU	SVG Air	-	2 DHT	-	-	2 DHT	2 DHT	2 DHT
From GND to:								
Miami, MIA	American Airlines	1 B738	1 B738	1 B738	1 B738	1 B738	1 B738	1 B738
	Amerijet International	1 B763	-	-	-	-	-	-
New York, JFK	JetBlue Airways	1 A321	1 A321	1 A321	1 A321	1 A321	1 A32S	1 A321
Toronto, YYZ	Air Canada	1 7M8	-	-	-	-	-	-
Bridgetown, BGI	InterCaribbean Airways	1 AT4	-	1 AT4	-	1 AT4	1 AT4	-
	Ameriflight	1 SW4	-	-	-	-	-	-
	Virgin Atlantic	-	1 A333	-	-	-	1 A333	-
	Caribbean Airlines	-	-	1 AT7	1 AT7	-	1 AT7	-
	LIAT	-	-	-	1 AT4	-	-	-
Port of Spain, POS	Caribbean Airlines	2 AT7	1 AT7	1 AT7	1 AT7	1 AT7	2 AT7	1 AT7
	Kingfisher Air (DHL)	1 C208	-	1 C208	1 C208	1 C208	-	-
	Amerijet International	-	-	-	-	B75F	-	-

[145]Flightradar24 (2023) Vieux Fort Hewanorra International Airport [Online]. Available at: https://www.flightradar24.com/data/airports/uvf/routes (Accessed 16 May 2023).

Table A2: Example of Direct Flight Connections for Maurice Bishop International Airport (GND)(cont'd)

To GND from:	Airline	MON	TUE	WED	THU	FRI	SAT	SUN
Vieux Fort, UVF	British Airways	-	-	1 B772	-	-	1 B772	1 B772
Castries, SLU	Mountain Air Cargo	-	1 DHC6	-	-	-	-	-
(FedEx Feeder)	1 C208	1 C208	1 C208	1 C208	1 C208	-	-	
Kingstown, SVD	InterCaribbean Airways	1 AT4	2 AT4, EM2	1 AT4	2 AT4	1 AT4	1 AT4	1 AT4
	Kingfisher Air (DHL)	1 C208	1 C208	1 C208	1 C208	1 C208	-	-
	LIAT	1 AT4	-	-	-	-	-	1 AT4
Carriacou, CRU	SVG Air	-	3 DHT	-	-	3 DHT	3 DHT	3 DHT

Source: International Consultant, using data from Flightradar24 (2023)[144] .

[144]Flightradar24 (2023) Grenada Maurice Bishop International Airport [Online]. Available at: https://www.flightradar24.com/data/airports/gnd/routes (Accessed 16 May 2023).

ANNEX 3

WORKSHOP HANDOUTS USED FOR GRENADA

Handout 1: Rate the Strengths of Grenada for Logistics Performance

Scoring metric
5 – Major strength! Requires immediate action to capitalise upon!
4 – Important strength. Should build on this over the next 3-5 years.
3 – Seen as a strength. Can build on this over the next 6-10 years.
2 – Slight advantage held but easily nullified by competitors. Let's not waste time on this.
1 – Not a strength at all.

No.	Attributes	Score
1	Low cost of operations for businesses	
2	Concentration of cargo consolidation and distribution centre in St. George's	
3	Stable business environment and tax regime	
4	Stable currency (XCD)	
5	Stable political environment	
6	Competitive and high-quality freight forwarding sector and services	
7	Competitive and high-quality land transport sector and services	
8	Competitive and high-quality port sector and services	
9	Competitive and high-quality sea transport sector and services	
10	Competitive and high-quality airport sector and services	
11	Competitive and high-quality air transport sector and services	
12	Competitive manufacturing sector	
13	Efficient customs and border processes	
14	Government's proactive efforts to develop and grow the export sector	
15	High level of safety and security	
16	Competitive tax regime (corporate tax rate of 28%)	
17	Competitive tourism cluster generating demand for logistics services	
18	Competitive exports of food and beverages (spices, wheat, cocoa, fish etc.)	
19	Competitive exports of electronic components	

Handout 2: Rate the Weaknesses of Grenada for Logistics Performance

Scoring metric
5 – Major strength! Requires immediate action to capitalise upon!
4 – Important strength. Should build on this over the next 3-5 years.
3 – Seen as a strength. Can build on this over the next 6-10 years.
2 – Slight advantage held but easily nullified by competitors. Let's not waste time on this.
1 – Not a strength at all.

No.	Attributes	Score
1	Limited cargo volumes	
2	Limited investment opportunities with export potential	
3	Poor security for cargo	
4	Inadequate road network and poor road conditions	
5	Lack of skilled logistics professional (e.g., management, supervisory, operational levels)	
6	Lack of visibility to cargo in the supply chain	
7	Lack of cold storage facilities	
8	Poor shipping connectivity	
9	Port prioritising cruise traffic	
10	Limited berths for vessels	
11	Ageing port infrastructure	
12	Shortage of containers	
13	Unreliable port equipment	
14	Inefficient customs and border processes	
15	Inefficient labour practices at the port	
16	Long dwell time for containers at the port	
17	Truck traffic congestion at the port	
18	Poor air connectivity	
19	Insufficient capacity at the airport to serve logistics needs of users	
20	Truck traffic congestion at the airport	
21	Poor service by customs brokers	
22	Insufficient electric power supply	
23	Unreliable internet connection	
24	Absence of a single window for border procedures	
25	Limited coordination and cooperation between private and public sector	
26	Bribery and corruption	

Handout 3: Rate the Threats to Grenada for Logistics Performance

Scoring metric
5 – Situation critical! Requires immediate action!
4 – Important threat. Should be addressed over the next 3-5 years.
3 – Seen as a threat. Can be addressed over the next 6-10 years.
2 – Minor threat. Can live with it.
1 – Not a threat at all.

No.	Attributes	Score
1	Insufficient cargo volumes to grow transport connectivity to overseas markets	
2	Heavy reliance on the US market	
3	Lack of skilled logistics professional (e.g., management, supervisory, operational levels)	
4	Low rate of technology adoption (e.g., e-invoicing)	
5	Lack of accreditation for companies (e.g., GDP, GSP, ISO 9000, ISO 14000, ISO50001)	
6	Inefficient customs and border processes	
7	Poor security for cargo	
8	Shortage of containers	
9	Limited or lack of sufficient cargo-handling capacity and facilities for seaport sector	
10	Limited or lack of sufficient cold-chain handling capacity and facilities	
11	Limited or lack of sufficient cargo-handling capacity and facilities for airport sector	
12	Gridlock for truck traffic accessing and leaving the port	
13	Gridlock for truck traffic accessing and leaving the airport	
14	Failure to develop an export-oriented economy	
15	Uncompetitive seaport sector	
16	Uncompetitive trucking sector	
17	Uncompetitive airport sector	
18	Uncompetitive freight forwarding sector	
19	Stagnating or slow economic growth in key export markets of US and Canada	
20	Stagnating or slow economic growth in key export market of Europe	
21	Stagnating or slow economic growth in key export market of the Caribbean	
22	Failure to coordinate, manage and bring much needed changes to the logistics sector	
23	Bribery and corruption	
24	Political or social instability	
25	Economic instability (e.g., high inflation, unstable currency)	
26	Climate change impacting on customer demand	
27	Climate change impacting on growing season	

Handout 4: Rate the Opportunities for Saint Lucia for Logistics Performance

Scoring metric
5 – Excellent opportunity! Requires immediate action!
4 – Important opportunity. Should be addressed over the next 3-5 years.
3 – Seen as an opportunity. Can be addressed over the next 6-10 years.
2 – Limited opportunity. Can live without it.
1 – Not an opportunity at all.

No.	Attributes	Score
1	Positioning as the container transhipment hub for the Caribbean	
2	Develop the airport to become an e-fulfilment hub for the Caribbean	
3	Set up free trade zone with proximity to the main cargo centre which is Castries	
4	Promote digitalisation for integrated supply chain management (e.g., WMS, TMS, ERP)	
5	Develop and grow the e-commerce sector	
6	Develop National Single Window for customs and border processes	
7	Training and education to develop logistics and supply chain management skills	
8	Upgrade and develop cargo-handling capacity and facilities for seaport sector	
9	Upgrade and develop cargo-handling capacity and facilities for airport sector	
10	Upgrade and develop cold-chain handling capacity and facilities	
11	Develop a new port	
12	Adopt technology such as use of data analytics for data processing and management	
13	Adopt technology such as use of IoT devices for tracking and tracing shipments	
14	Adopt blockchain technology for trade facilitation (e.g., e-bill of lading, smart contracts)	
15	Adopt technology for material handling such as automated warehouse management	
16	Promote research and development for logistics and supply chain management	
17	Improve logistics performance in the area of cost for greater competitiveness	
18	Adopt green initiatives for logistics and supply chain management	
19	Galvanise the logistics community through regular dialogues and sharing sessions	
20	Whole-of-Government approach to advance competitiveness of the logistics ecosystem	

Export industries Saint Lucia should develop competitiveness for:	
Areas of assistance for SMEs to improve their supply chain performance:	

Handout 5: Moving Forward for the Grenada Logistics Sector

Area of opportunity:_____

Recommendations on specific actions:	
What **specific actions or initiatives** are needed?	
Who should **take lead to drive** these actions or initiatives?	

ANNEX 4

SCORES FOR VIEWS ON SWOT FOR LOGISTICS SECTOR IN GRENADA

Average scores obtained for views on **strengths**:

Aspects*	Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
Low cost of operations for business-es	**4.67**	**4.25**	**3.82**
Concentration of cargo consolidation and distribution centre in St. George's	3.67	**3.75**	3.00
Stable business environment and tax regime	3.33	3.25	3.45
Stable currency (XCD)	**4.00**	**3.50**	**3.82**
Stable political environment	3.67	3.00	2.91
Competitive and high-quality freight forwarding sector and services	3.33	**3.50**	3.73
Competitive and high-quality land transport sector and services	2.67	3.00	3.18
Competitive and high-quality port sec-tor and services	3.00	2.75	3.64
Competitive and high-quality sea transport sector and services	3.33	3.00	3.73
Competitive and high-quality airport sector and services	**4.33**	**3.75**	**3.91**
Competitive and high-quality air transport sector and services	3.33	3.25	3.73
Competitive manufacturing sector	**4.33**	2.75	2.64
Efficient customs and border pro-cesses	2.67	1.75	3.55
Government's proactive efforts to de-velop and grow the export sector	3.00	2.50	**4.00**
High level of safety and security	3.33	**3.75**	3.45
Competitive tax regime (corporate tax rate of 28%)	3.67	2.50	3.55
Competitive tourism cluster generat-ing demand for logistics services	3.67	3.25	3.36
Competitive exports of food and bev-erages (spices, wheat, cocoa, fish etc.)	**4.67**	3.25	**3.91**
Competitive exports of electronic components	2.33	1.25	1.64

** Highlighted in bold are scores for attributes which are ranked in the top five positions.*

Average scores obtained for views on **weaknesses**:

Aspects*	Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
Limited cargo volumes	3.67	2.75	3.55
Limited investment opportunities with export potential	4.00	3.75	**4.36**
Poor security for cargo	4.33	2.50	2.27
Inadequate road network and poor road conditions	**5.00**	**4.00**	**4.00**
Lack of skilled logistics professional (e.g., management, supervisory, operational levels)	3.67	3.00	2.73
Lack of visibility to cargo in the supply chain	4.33	3.00	3.27
Lack of cold storage facilities	**5.00**	**4.25**	**4.18**
Poor shipping connectivity	4.33	2.50	3.55
Port prioritising cruise traffic	4.33	3.00	2.27
Limited berths for vessels	4.33	3.75	3.09
Ageing port infrastructure	4.67	**4.00**	3.91
Shortage of containers	4.33	2.25	3.55
Unreliable port equipment	3.67	3.50	3.00
Inefficient customs and border pro-cesses	**5.00**	**4.00**	3.09
Inefficient labour practices at the port	**5.00**	**4.25**	3.64
Long dwell time for containers at the port	4.67	3.50	373

Aspects*	Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
Truck traffic congestion at the port	4.67	3.25	3.45
Poor air connectivity	3.67	2.50	3.82
Insufficient capacity at the airport to serve logistics needs of users	**5.00**	**4.00**	**4.00**
Truck traffic congestion at the airport	2.33	2.25	1.64
Poor service by customs brokers	4.00	2.75	2.91
Insufficient electric power supply	2.33	2.25	2.18
Unreliable internet connection	4.33	2.75	2.82
Absence of a single window for border procedures	4.67	3.75	**4.00**
Limited coordination and cooperation between private and public sector	4.33	3.25	3.73
Bribery and corruption	4.67	3.50	3.45

** Highlighted in bold are scores for attributes which are ranked in the top five positions.*

Average scores obtained for views on **threats**:

Aspects*	Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
Insufficient cargo volumes to grow transport connectivity to overseas markets	**4.33**	**4.75**	**4.27**
Heavy reliance on the US market	3.33	3.75	3.91
Lack of skilled logistics professional (e.g., man-agement, supervisory, operational levels)	3.67	2.75	2.91
Low rate of technology adoption (e.g., e- invoic-ing)	**4.33**	**4.50**	**4.09**
Lack of accreditation for companies (e.g., GDP, GSP, ISO 9000, ISO 14000, ISO50001)	4.00	3.75	4.00
Inefficient customs and border processes	3.33	3.75	3.09
Poor security for cargo	4.00	2.25	2.27
Shortage of containers	3.33	3.00	3.18
Limited or lack of sufficient cargo-handling ca-pacity and facilities for seaport sector	**4.33**	**4.50**	3.64
Limited or lack of sufficient cold-chain han-dling capacity and facilities	**4.33**	**4.75**	**4.36**
Limited or lack of sufficient cargo-handling ca-pacity and facilities for airport sector	**4.67**	3.25	3.91
Gridlock for truck traffic accessing and leaving the port	3.67	3.25	2.73
Gridlock for truck traffic accessing and leaving the airport	3.00	2.50	2.18
Failure to develop an export-oriented economy	4.00	**4.50**	**4.36**
Uncompetitive seaport sector	3.67	3.25	3.27
Uncompetitive trucking sector	3.33	2.25	3.18
Uncompetitive airport sector	4.00	3.00	3.36
Uncompetitive freight forwarding sector	3.67	2.75	3.18
Stagnating or slow economic growth in key ex-port markets of US and Canada	3.67	4.25	4.00
Stagnating or slow economic growth in key ex-port market of Europe	3.33	**4.50**	**4.09**
Stagnating or slow economic growth in key ex-port market of the Caribbean	3.00	**4.50**	**4.09**
Failure to coordinate, manage and bring much needed changes to the logistics sector	**4.33**	4.00	3.73
Bribery and corruption	4.00	3.00	3.55
Political or social instability	4.00	2.50	1.73
Economic instability (e.g., high inflation, unstable currency)	4.00	4.00	3.09
Climate change impacting on customer demand	3.67	3.00	3.55
Climate change impacting on growing season	3.67	3.00	3.64

** Highlighted in bold are scores for attributes which are ranked in the top five positions.*

Average scores obtained for views on **opportunities**:

Aspects*	Manufacturers, Importers, Exporters	Logistics Service Providers	Government Sector
Positioning as the container transhipment hub for the Caribbean	2.67	3.25	2.82
Develop the airport to become an e- fulfil-ment hub for the Caribbean	2.67	3.25	2.82
Set up free trade zone with proximity to the main cargo centre which is St. George's	2.33	3.75	3.45
Promote digitalisation for integrated supply chain management (e.g., WMS, TMS, ERP)	3.67	4.50	4.36
Develop and grow the e-commerce sector	4.00	4.00	**4.45**
Develop National Single Window for cus-toms and border processes	**4.33**	**4.75**	**4.55**
Training and education to develop logistics and supply chain management skills	**4.67**	**4.75**	**4.45**
Upgrade and develop cargo-handling capaci-ty and facilities for seaport sector	**4.33**	4.50	4.36
Upgrade and develop cargo-handling capaci-ty and facilities for airport sector	4.00	4.25	4.36
Upgrade and develop cold-chain handling ca-pacity and facilities	4.00	4.25	4.36
Develop a new port	3.67	3.75	2.64
Adopt technology such as use of data analyt-ics for data processing and management	3.67	4.50	4.27
Adopt technology such as use of IoT de-vices for tracking and tracing shipments	**4.33**	**4.75**	**4.55**
Adopt blockchain technology for trade facili-tation (e.g., e-bill of lading, smart contracts)	3.67	**4.75**	4.36
Adopt technology for material handling such as automated warehouse management	3.67	4.50	4.09
Promote research and development for lo-gistics and supply chain management	3.67	3.75	4.00
Improve logistics performance in the area of cost for greater competitiveness	**4.33**	**4.75**	4.36
Adopt green initiatives for logistics and supply chain management	4.00	4.00	3.82
Galvanise the logistics community through regular dialogues and sharing sessions	4.00	**5.00**	4.36
Whole-of-Government approach to ad-vance competitiveness of the logistics eco-system	**4.33**	4.50	**4.45**

** Highlighted in bold are scores for attributes which are ranked in the top five positions*

ANNEX 5

PARTICIPANTS AT VALIDATION WORKSHOP HELD IN GRENADA ON 29 JUNE 2023

Government Stakeholders:

Name	Organisation	Designation	Email
Lorraine St. Louis-Nedd	Ministry of Infrastructure & Physical Development, Public Utilities, Civil Aviation and Transportation	Permanent Secretary (Ag)-Transportation	ps@transport.gov.gd
Eudine Thomas	Grenada Chamber of Industry and Commerce (GCIC)	Administrative As-sistant	ed@grenadachamber.org gcic@grenadachamber.org
Kim Frederick	Ministry of Economic Development, Planning, Tourism, ICT, Creative Economy, Agriculture and Lands, Fisheries & Coopera-tives	Permanent Secretary with responsibility for Economic Development, Planning, Tourism & Creative Economy	Ps@eda.gov.gd
Alwyn Clarke	Grenada Airports Authority	Airport Duty Manager	aclarke@gaa.gd
Anna Antoine	Customs and Excise Division	Grade F Officer	annaantoine@grenadacustoms.com
Portia Fraser	Ministry of Foreign Affairs, Trade and Export Development	Trade Officer	sto@trade.gov.gd
Jillian St Bernard	Ministry of Foreign Affairs, Trade and Export Development	Trade Officer	jillian.st.bernard-james@gov.gd
Andra Wickham	Grenada Airports Authority	Marketing Properties Manager (Ag)	awickham@gaa.gd
Marlon Clyne	Grenada Ports Authority	Manager – Administration	clyne97@hotmail.com
Lazarus Joseph	Grenada Ports Authority	Head of Marine Department	capellapop@gmail.com

Freight Forwarders and Other Logistics Service Providers:

Name	Organisation	Designation	Email
Tamikie Stephen	Marine Logistics and Solutions/Swift Pac	General Manager	tamikie.stephen@mlsgrenada.com tamikie.stephen@swiftpac.com
Devon La Touche	Jonas Browne and Hubbard Gda Ltd	Manager – Shipping Department	dltjbhship@spiceisle.com
Andia Wellington	Tropical Shipping	Sales Representative	awellington@tropical.com
Cheney Jospeh	Tropical Shipping	General Manager	sto@trade.gov.gd

Manufacturers, Importers and Exporters:

Name	Organisation	Designation	Email
Coslyn Williams	Bryden and Minors	Marketing Manager	Coslyn.Williams@brydens.gd
Trisha Celestine Nelson	Sissons Paints Grenada Ltd	Procurement Coordinator	trisha.celestine-nelson@ansamcal.com
Lyndon Pierre	Benmo Sales	General Manager	lyndon.e.pierre@gmail.com
Jason Dickson	Grenada Co-Operative Nutmeg Association (GCNA)	Shipping Officer	N/A
Christopher De Allie	Sissons Paints Grenada Ltd	Managing Director	chris.deallie@ansamcal.com
Deleon Walters	Unicomer	Marketing Manager	deleon_walters@unicomer.com

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