



Blue BioTrade in Saint Lucia: Developing value for the sustainable trade and production of queen conch in the Eastern Caribbean **COUNTRY CASE STUDY**



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in cooperation with CITES

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Explanatory notes

References to “dollars” and “\$” indicate United States dollars, unless otherwise stated.

References to “EC\$” indicate Eastern Caribbean dollars.

Use of a dash (–) between dates representing years, e.g., 2015–2018, signifies the full period involved, including the initial and final years.

Reference to metres is represented by “m” centimetres by “cm” and hectares by “ha”.

Reference to kilogrammes is represented by “kg” and pounds by “lbs”.

To reflect the closest estimate for data, decimals and percentages are rounded off. Numbers in money are rounded to the nearest dollar, unless otherwise stated.

Decimals and percentages in this publication do not necessarily add to totals because of rounding.

Acronyms and abbreviations

CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPUE	catch per unit effort
CRFM	Caribbean Regional Fisheries Mechanism
EEZ	exclusive economic zone
FAO	Food and Agriculture Organization of the United Nations
HACCP	Hazard Analysis and Critical Control Point
ITC	International Trade Centre
IUU	illegal, unreported and unregulated (fishing)
OECS	Organisation of Eastern Caribbean States
UEBT	Union for Ethical BioTrade
UNCTAD	United Nations Conference on Trade and Development
WECAFC	Western Central Atlantic Fishery Commission

Executive summary

The queen conch (*Strombus gigas*) is a highly appreciated seafood delicacy with important non-food uses, including therapeutical products and handicrafts. While global demand is booming, small-scale coastal producers in the Eastern Caribbean do not fully seize the opportunities offered by sustainable conch markets. In 2020, the United Nations Conference on Trade and Development (UNCTAD), the Organisation of Eastern Caribbean States (OECS) – with the support of the European Union and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) – joined forces to design a pilot project to test the application of the revised UNCTAD BioTrade¹ Principles and Criteria (UNCTAD, 2020)² to the marine environment, focusing on the queen conch value chain in the countries of Grenada, Saint Lucia, and Saint Vincent and the Grenadines.

This case study presents the value chain analysis of queen conch production in Saint Lucia. It builds on a stakeholder map of the queen conch value chain of Saint Lucia, Grenada, and Saint Vincent and the Grenadines, produced as part of the Blue BioTrade project.³ It is the first of three country case studies to be produced under the Blue BioTrade Project, together with forthcoming studies of queen conch production in Grenada and Saint Vincent and the Grenadines. These case studies, in addition to a regional workshop, will contribute towards the development of a regional Blue BioTrade Action Plan in 2022.

This report is divided into eight chapters. Chapter I provides an introduction and overview of the approach taken by the case study. Chapter II analyses the regulatory frameworks, management plans and institutional frameworks in Saint Lucia as they relate to the queen conch. Chapter III provides a product assessment, looking at Saint Lucian queen conch biology and stock location. Chapter IV analyses the value chain, examining its economic features during the pre-harvest, harvest and post-harvest stages. Chapter V presents an initial assessment of current market access and potential entry points to various potential markets of queen conch products. Chapter VI outlines the main challenges faced by the value chain. It is followed by chapter VII, which outlines opportunities to address these challenges using the BioTrade Principles and Criteria as a guideline. Finally, the report ends by providing recommendations and conclusions in chapter VIII.

The main findings, opportunities, challenges and recommendations reflected in this report include the following:

(a) Main findings:

- (i) **Overview:** Saint Lucia currently has approximately 40 fishers participating in conch fishing. Over the past decade, the fishery has harvested an average of 74 metric tons of “dirty”⁴ conch meat annually. This represents a 73 per cent increase in average landings from the previous decade (2000–2010), when an average of 41 metric tons were harvested, and a 121 per cent increase in landings from the period 1993–1999, when 32 metric tons were harvested.
- (ii) **Domestic market value:** Considering both domestic production and imports, the market for unprocessed conch meat is estimated to be worth approximately \$1.35 million (or EC\$3,663,178) per year in Saint Lucia.⁵

¹ The UNCTAD BioTrade Initiative aims to contribute to the conservation and sustainable use of biodiversity through the promotion of trade and investment in BioTrade products and services. BioTrade is understood as activities related to the collection or production, transformation and commercialization of goods and services derived from biodiversity (genetic resources, species and ecosystems) under environmental, social and economic sustainability criteria, called “BioTrade Principles and Criteria” (UNCTAD, 2020).

² Since their inception in 2007, the BioTrade Principles and Criteria have been the core foundation that guides the implementation of activities of the UNCTAD BioTrade Initiative, the BioTrade programmes and other related activities. In 2020, the BioTrade Principles and Criteria were revised, complementing the evolving legal and policy framework of BioTrade (UNCTAD, 2020).

³ For more information, see UNCTAD, “Stakeholder maps of the conch value chains of Grenada, Saint Lucia, and Saint Vincent and the Grenadines”, available at <https://unctad.org/webflyer/stakeholder-maps-conch-value-chains-grenada-saint-lucia-and-saint-vincent-and-grenadines>.

⁴ “Dirty” conch meat refers to conch meat directly removed from the shell with no further processing.

⁵ Authors’ own calculations. A summing of the average total value of conch landed in Saint Lucia is combined with the estimated value of imported conch using price data provided by the Saint Lucia Department of Fisheries.

This estimate of the value of the market for conch meat does not represent the total contribution of queen conch to the economy of Saint Lucia, as prepared value added conch products play a significant role in Saint Lucian food tourism and restaurants.

- (iii) **Domestic demand:** According to the CITES trade database records, Saint Lucia is a net importer of conch. It imported a total of 235 metric tons from 2015 to 2020, averaging 39 metric tons of conch meat per year, according to according to CITES permits issued by exporting countries. Conch is imported from Saint Vincent and the Grenadines, and Saint Kitts and Nevis, to satisfy internal demand. Increases in demand have been driven by internal consumption and food tourism, driven by increasing international arrivals, playing an increasingly important role in Saint Lucian tourism, a trend that is likely to continue in the long term, regardless of the impacts of the coronavirus disease (COVID-19) pandemic.
- (iv) **Gender:** Female participation is highest towards the end of the value chain, with women specializing in the preparation and sale of value added conch products at fish fries, in the form of fritters, soups, grilled meat and sausages.
- (v) **CITES compliance:** Saint Lucia has submitted CITES annual reports every year for 2010–2016, but reports for 2017–2019 have not yet been received. Saint Lucia has never published export quotas for queen conch. The urgent submission of CITES annual reports is needed to prevent a recommendation to suspend trade.
- (vi) **Need for stock assessments:** Stock assessments of queen conch in Saint Lucia are not routinely undertaken, due to the high cost associated with these activities, and resource limitations in the relevant government agencies. The latest stock assessment was conducted in 2008. Despite this, stakeholders in Saint Lucia expressed a strong desire for a comprehensive stock assessment of queen conch in their territorial waters and within their exclusive economic zone (EEZ). Stakeholders also expressed interest in the further regulation of the fishery through closed seasons, provided these enabled export market access. Notably, Saint Lucian conch fishing grounds are typically deeper, with poorer visibility than traditional conch fishing grounds, making fishing and stock assessments a more resource-intensive activity.

(b) Main opportunities:

- (i) **Forming an economic cluster to share costs and improving external market access:** Clustering with other project countries and other OECS producers would also enable Saint Lucia to overcome the challenge of limited access to external markets, while leveraging its comparative advantage of proximity to high-value export markets. Many opportunities exist to grow the strength of the Saint Lucia conch industry as part of an OECS conch economic cluster. Firstly, the costs of stock assessments could be shared across project countries. Due to the close geographic proximity of project countries and high costs associated with stock assessments, project countries – in association with other queen conch-producing OECS countries – could establish an OECS multispecies stock assessment unit, to share costs. This unit could rotate a small pool of competent officers in stock assessments across OECS geographies.
- (ii) **Geographically proximate export markets:** Focusing on geographically proximate export markets and local value added goods would significantly increase total income earned at all levels in this value chain. Conch fishers participating in serving the United States of America export market receive \$2.5–\$4 per pound, while prices as high as \$8.5 per pound are paid in Martinique (UNCTAD, 2021).
- (iii) **Reducing waste and adding value through centralization of processing:** Commercializing by-products of conch processing represents an opportunity to increase income. This would require the centralization of processing efforts in Saint Lucia, in a Hazard Analysis Critical Control Point (HACCP)-certified facility. Lucian Blue Ocean Seafoods,⁶ a large seafood processor, represents a potential facility for the centralization of processing efforts in the country, but also at the regional level. In this context, the following by-products could be considered to expand the value chain:

⁶ Available at <https://lucianblueoceanseafoods.com/>.

- (a) **Conch meat trimmings:** Conch trimmings have demonstrated potential for value addition, yet are not fully utilized across the value chain; best practice processing methods for conch sausages, burgers, stewing meat and other products should be identified and shared.
- (b) **Conch operculum:** Caribbean conch operculum⁷ carries a price premium in East Asian markets, yet is typically discarded during processing in Saint Lucia.
- (iv) **Formalizing trade with Martinique:** Formalizing trade with the French Caribbean presents a significant opportunity to increase income, not only for Saint Lucia, but for the entire OECS. However, regulatory challenges exist, as there are currently no seafood facilities that have HACCP certification or meet the requirements for legal export to the European Union market. Meeting the Legal Acquisition Findings⁸ and non-detriment findings⁹ requirements under CITES is necessary to be able to legally trade internationally, including between neighbouring countries in the region.

(c) Main challenges:

- (i) **HACCP-certified facilities:** While large processing facilities (such as Blue Ocean Seafoods), along with processing capacity, exist in Saint Lucia, no facilities are currently HACCP certified, which is a critical requirement to enable access to export markets.
- (ii) **Stock assessments and biological data collection:** Data collection of landings of conchs at the various landing sites across Saint Lucia has been maintained for at least the last six years, and is continuous. However, there is a lack of sustained independent queen conch data collection on species location and abundance, partially due to the lack of resources, but also due to the difficulties associated with diving in the deep turbid waters of Saint Lucia. The data collection on landings collected by the Saint Lucian Department of Fisheries¹⁰ can act as the foundation for the development of additional biological data collection systems. These data are essential for the effective management of the fishery, but also for compliance with European Union legislation to enable access to this lucrative market.¹¹
- (iii) **Health costs of fishery:** Unsafe diving practices can have serious health impacts on divers in the fishery, resulting in paralysis, blindness and – in extreme cases – death. The long-term social and economic costs of these impacts are likely significant. Investment in health and safety practices would likely yield a positive social and economic return, and contribute to the long-term economic sustainability of the fishery.
- (iv) **Strong price incentive for unrecorded trade with Martinique:** As noted above, the price for conch per pound is much higher in Martinique than in the United States market. The price and foreign exchange incentives threaten the environmental and economic sustainability of the fishery by encouraging unrecorded trade in conch. Efforts must be taken to regularize and document this trade, to ensure it does not threaten the environmental sustainability of the fishery.

(d) Recommendations

- (i) **Submission of historical CITES annual trade reports from 2017 to 2020 to align current efforts with compliance under CITES requirements, as Saint Lucia currently risks facing a recommendation of trade suspension:** Urgent efforts must be taken to verify imported amounts through the submission of trade data to the CITES secretariat in a timely manner.

⁷ A hard, sickle-shaped structure at the tip of the foot used for locomotion. Also known as “claw” and “foot” (Stoner et al., 2013).

⁸ “A Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora.”

⁹ “A Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species.”

¹⁰ Available at www.govt.lc/ministries/agriculture-food-production-fisheries-and-rural-development/fisheries-department.

¹¹ The legal basis for the listing of third country (non-European Union country) establishments is provided by article 127 of Regulation (EU) 2017/625 and by Commission Delegated Regulation (EU) 2019/625. For more information, see European Commission, “Non-EU countries authorised establishments”, available at https://ec.europa.eu/food/safety/biological-safety/food-hygiene/non-eu-countries-authorised-establishments_en.

- (ii) **Formalization of trade with the European Union through Martinique:** The establishment of a national queen conch export task force with a focus on formalizing current trade with the European Union through Martinique could assist in the formalization of trade to satisfy this existing demand. The formation of a multi-stakeholder task force could focus on enumerating and outlining the steps necessary to regularize current active unrecorded trade with Martinique. This queen conch export task force may focus on establishing a bilateral trade facilitation agreement with Martinique that would allow for a single export window for the monitoring of exports and landings. Furthermore, the fact that OECS members are also members of the 2008 European Union–Caribbean Forum (CARIFORUM) Economic Partnership Agreement¹² can provide opportunities for a bilateral commercial dialogue on all fisheries products to enable specific trade and sanitary facilitation processes.
- (iii) **Exploration of cost-saving economic cluster approaches:** The governments and fisheries divisions of participating project countries should explore working closely together to capitalize on geographic proximity through cost-sharing schemes. It is recommended that these schemes first focus on data collection, stock assessments and sanitary compliance, and then potentially be expanded to include cost-sharing of certification to access external markets, marketing costs, monitoring and enforcement costs, and even potentially resource-sharing through vessel day schemes.¹³ The strong connection of Saint Lucia with the French Caribbean should be capitalized upon through exploring the role of Saint Lucia as a subregional processing centre for accessing the European Union market.
- (iv) **Apply the BioTrade Self-Assessment Tool as a part of stakeholder engagement activities:** The application of the BioTrade Self-Assessment Tool¹⁴ by fisheries cooperatives and processors, such as Lucian Blue Ocean Seafoods, would allow value chain actors to gain a deeper understanding of their sustainability practices and their level of convergence towards the UNCTAD BioTrade Principles and Criteria¹⁵ in a transparent, neutral and independent manner. This could represent an important first step in identifying important actions that would ultimately make the queen conch value chain more sustainable and more competitive in the global markets, and more productive in value addition, which could provide more income and livelihood opportunities for local actors in the queen conch value chain.
- (v) **Enhancement of current data collection structures:** Saint Lucia has good data collection of landing volumes and values across national landing sites by the extension offers of the Department of Fisheries, providing a foundation for the expansion of data collection at low cost. Data collection efforts should be focused on:
 - (a) The fact that fishing effort is a key variable, particularly because most models use catch per unit effort (CPUE) as a measure of abundance: Saint Lucia could consider establishing a data collection programme to collect CPUE and biological data at its main landing sites.
 - (b) Consideration of the establishment of an at-sea spot check system to provide a credible deterrent to the harvest of juvenile conchs: The deshelling of conchs at sea means that opportunities to illegally harvest juvenile conchs exist, presenting a potential threat to long-term sustainability.
 - (c) Generation of habitat maps at the scale necessary for better fisheries management: The identification of current queen conch fishing grounds – through the participation of fishers with their local knowledge, biologists, researchers and others – is very important for the proper implementation of underwater surveys that produce queen conch density and abundance estimates for the calculation of total allowable

¹² See European Commission, “The EU-CARIFORUM Economic Partnership Agreement”, available at <https://trade.ec.europa.eu/access-to-markets/en/content/eu-cariforum-economic-partnership-agreement>.

¹³ A vessel day scheme is one in which boat owners can purchase and trade days of fishing at sea within a specific area. A limited number of trade days are allocated based on stock assessment information on target species to minimize ecological impacts and maximize economic returns. For further information, see <https://www.ffa.int/vds>.

¹⁴ See UNCTAD, “BioTrade Knowledge Sharing & Self-Assessment Tool”, available at https://sustainabilitymap.org/biotrade_unctad.

¹⁵ Since their inception in 2007, the BioTrade Principles and Criteria have been the core foundation that guides the implementation of activities of the UNCTAD BioTrade Initiative, the BioTrade programmes and other related activities. In 2020, the BioTrade Principles and Criteria were revised, complementing the evolving legal and policy framework of BioTrade (UNCTAD, 2020).

catch limits, which currently do not exist. Saint Lucia should develop these habitat maps to improve the management of the fishery.

- (vi) **Collective identification of traceability solutions appropriate for fishery scale and fisher capacity:** Traceability is the ability to access information about a seafood product through the value chain. It is increasingly important for addressing sustainability requirements; combating illegal, unreported and unregulated (IUU) fishing; combating seafood fraud; and accessing external markets such as the European Union (Lewis and Boyle, 2017). As a plethora of seafood traceability solutions exists, using various hardware and software (Hosch and Blaha, 2017), actors in the queen conch value chain should work together to identify the most appropriate traceability solution for the current scale and desired end markets for the Saint Lucian queen conch value chain.
- (vii) **Maximizing value addition through promotion of BioTrade conch as a culinary tourism attraction:** Queen conch serves an important role within the Saint Lucian cultural and culinary tourism product. Implementation of the sustainability guidelines embodied in the BioTrade Principles and Criteria and/or compliance with voluntary sustainability standards such as the Union for Ethical BioTrade (UEBT)¹⁶ could create a higher perceived value for the queen conch product. The application of the BioTrade Principles and Criteria and the implementation of improved traceability protocols can enable the further marketing of conch products to tourists. “BioTrade conchs” play an even greater role in the promotion and marketing of Saint Lucian tourism, and provide greater recognition for this product as well as in the OECS culinary arts.
- (viii) **Further implementation of the Regional Queen Conch Fishers Management and Conservation Plan of the Food and Agriculture Organization of the United Nations (FAO):** The Regional Queen Conch Fisheries Management and Conservation Plan of FAO outlines management measures for the sustainability and conservation of queen conch (FAO, 2017). While some of these measures – such as education and outreach to fishers – are implemented by Saint Lucia, further implementation of the FAO plan at the national/(sub)regional level could complement the implementation of the BioTrade Principles and Criteria at the grassroots level of the sustainable trade of queen conch in Saint Lucia.
- (ix) **Retaining value of legally discovered conch pearls:** While rare, conch pearls are found by fishers and processors of conch in Saint Lucia. These pearls are often sold to foreign buyers, who eventually auction pearls in end markets for a significant markup. Introducing basic pearl appraisal techniques, in addition to the legal requirements for export to the fishers and processors, could enhance the value retained within Saint Lucia of this by product. Additionally, OECS level training in advance pearl appraisal, and centralizing the sale of conch pearls discovered legally in the OECS market through regionally organized auctions, could improve the position of OECS stakeholders in the pearl value chain.
- (x) **Seek innovative finance and support small and medium-sized enterprises in both the harvest and post-harvest sectors:** Financial support is necessary for small and medium-sized enterprises focused on improving harvest and post-harvest safety and efficiency:
 - (a) In the harvest sector, investment is needed in cold storage, cold chain management and dive safety gear. Technical support and small credit lines could also be provided by the Caribbean Development Bank or Caribbean Export to improve the cold storage and the cold chain management of specific exporters or processors.
 - (b) Investment in health-related dive insurance is also needed. An example of a positive and potential best practice case that could be adapted to health-related dive insurance is the Caribbean Oceans and Aquaculture Sustainability Facility (COAST), a parametric insurance project launched in Grenada and Saint Lucia, which is being implemented by the Caribbean Catastrophe Risk Insurance Facility and the World Bank. Under this parametric insurance facility, purchased by the national Government, payouts are made to fishers based on the occurrence of a predefined level of hazard and impact. Once the predefined level of hazard (such as wind speed or storm surge level) has occurred, payouts are made to fishers,

¹⁶ Available at www.ethicalbiotrade.org/.

depending on the level of modelled loss up to a predefined limit. The implementation of similar insurance facilities at a smaller scale should be explored for conch fishers, due to the unique health risks associated with scuba fishing.

- (c) In the post-harvest sector, investment is needed in processing facilities, techniques, HACCP and sanitary and phytosanitary certification at the national and regional levels. Innovative financial mechanisms focused on enhancing safety and improving sustainability for export access could offer attractive investment options to those interested in environmentally and socially responsible investments (for example, via blue bonds and blended investment schemes). Such investments could be structured so that payouts to investors are contingent on achieving certain minimum sustainability requirements, via BioTrade's Self-Assessment Tool.¹⁷ Further, investments could be built to capitalize on accessing high-value export markets, where payouts to investors are not required until export market access is achieved.
- (d) Investment is needed in renewable energy solutions to combat high energy and operation costs associated with cold storage. Large processors, such as Lucian Blue Ocean Seafoods and Francis Fish and Seafoods, would benefit significantly from investments in renewable energy, and both have expressed an interest in using these solutions.

Figure 1. Fishing boats in Saint Lucia



Source: Alexander Girvan (2019).

¹⁷ See UNCTAD, "BioTrade Knowledge Sharing & Self-Assessment Tool", available at https://sustainabilitymap.org/biotrade_unctad.

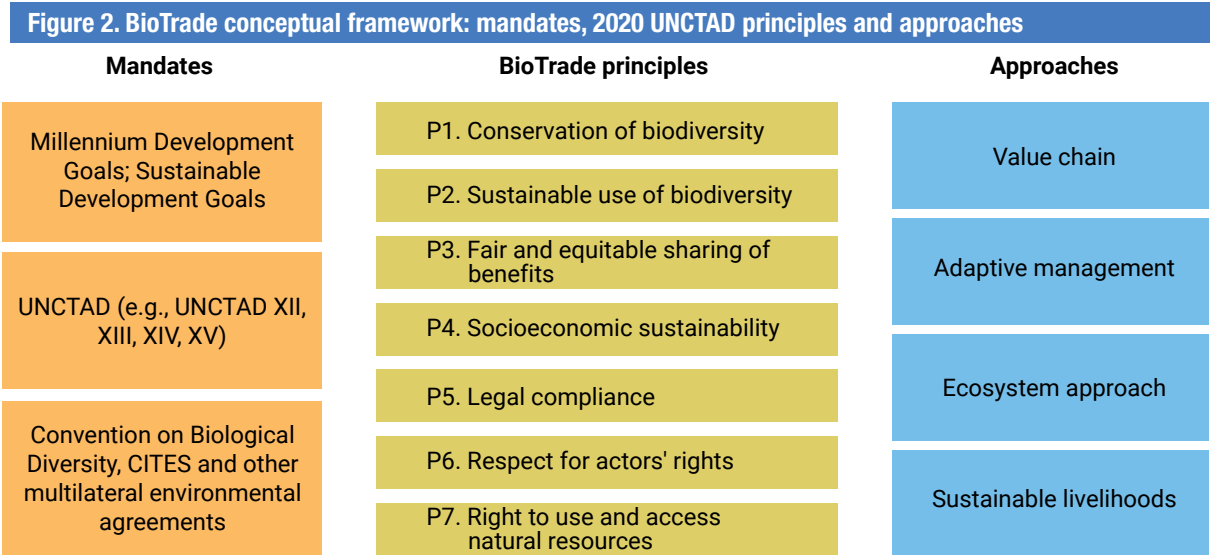
1. INTRODUCTION

Queen conch (*Strombus gigas*), known as “*lambi*” in Saint Lucia, is an appreciated seafood delicacy with non-food uses, including therapeutical products and handicrafts. While global demand for queen conch meat is booming, small-scale coastal producers in the Eastern Caribbean could further improve the income earned by this resource through exploring sustainable conch markets, as well as methods of reducing costs and adding value to conch by-products. Unfortunately, in many locations, early uncontrolled harvesting has resulted in overfishing, illegal landings and a rapid deterioration of conch populations.

Regional supply-side issues include the absence of traceability systems, limited landing and trade data, limited understanding and use of CITES processes and permits, lack of common handling practices and sanitary standards, and a low level of associativity of fishers. From a trade perspective, limited access to markets, international buyers and the absence of certification schemes for producers pose major challenges to maximizing income earned from this iconic species.

In 2020, UNCTAD, OECS (with the support of the European Union) and CITES joined forces to design a pilot project to test the application of the revised UNCTAD BioTrade Principles and Criteria (UNCTAD, 2020) to the marine environment, focusing on the queen conch value chain in the countries of Grenada, Saint Lucia, and Saint Vincent and the Grenadines.

Blue BioTrade aims to promote trade and investment in marine biological resources in line with social, economic and environmental sustainability criteria, known as the BioTrade Principles and Criteria¹⁸ (2007, revised in 2020). Integrating BioTrade Principles and Criteria (figure 2) into the marine environment can promote the sustainable use of scarce and vital oceanic living resources (at the genetic, species and ecosystem levels), and can lessen the negative impacts of human and economic activity over marine ecosystems. Blue BioTrade is a spinoff of the UNCTAD Oceans Economy and Fisheries Programme¹⁹ and the BioTrade Initiative.²⁰



Source: UNCTAD (2020).

¹⁸ See UNCTAD (2020).
¹⁹ For more information, see UNCTAD, “Oceans Economy and Fisheries”, available at <https://unctad.org/topic/trade-and-environment/oceans-economy>.
²⁰ For more information, see UNCTAD, “BioTrade”, available at <https://unctad.org/topic/trade-and-environment/biotrade>.

1.1 Background

Saint Lucia is in the Lesser Antilles of the Caribbean, between Martinique to the north and the mainland of Saint Vincent and the Grenadines to the south (figure 3). With 182,000 people (United Nations Department of Economic and Social Affairs, 2019), it has the largest population of the three project countries, and also has the largest economy, with a 2020 gross domestic product of \$1.703 billion. As in most Caribbean islands, the queen conch has been consumed and fished in this country since the time of the Amerindians (Price, 1966). In modern times, queen conch is known to Saint Lucians by its French name “*lamb*”, and continues to be a major part of the island’s culture and cuisine, due to the country’s strong historic French influence and close cultural relations with neighbouring islands. Conch is harvested throughout the year and across the island, primarily to meet domestic demand by consumers, local restaurants and hotels, and unrecorded export demand driven by the French Caribbean (UNCTAD, 2021). In the past 30 years, Saint Lucia has seen increasing landings of queen conch, largely as a response to higher demand by food vendors and restaurants. This demand stems from a growing international tourism industry, and increased export demand due to declining queen conch stocks in neighbouring Martinique (King-Joseph et al., 2008).

Figure 3. Map of the Eastern Caribbean



Source: Adobe Stock.

1.2 Methodology

The project considers three consecutive and complementary phases:

- (a) Phase 1: The elaboration of queen conch product assessments and value chains in Saint Vincent and the Grenadines, Grenada and Saint Lucia
- (b) Phase 2: The elaboration of a Regional Blue BioTrade Action Plan, based on findings of the country studies and
- (c) Phase 3: Elaboration and delivery of technical assistance activities on selected areas.

This report is the first of three country case studies to be completed as part of phase 1 of this project. The primary objective of this study is to assess the potential of Saint Lucia for the production of queen conch and conch-based products. To achieve this objective, the report is guided by the methodology to support value chains for BioTrade products.²¹ The value chain is an “interdependent system or network of productive activities that exists both within and between firms”, which when analysed can provide insights as to opportunities to improve sustainability, value addition, employment, income generation and benefit-sharing (Porter, 1990; UNCTAD, 2018).

This country case study is meant to provide details on the reality of queen conch production in project countries, and identify challenges and BioTrade opportunities considering the development of the local value chain. The study is also meant to help local stakeholders better understand the potential of sustainable production and utilization of conch products, as well as their market potential, through the implementation of sustainability guidelines such as the BioTrade Principles and Criteria. This study is also intended to support local stakeholders in understanding legal export requirements.

This case study builds on the regional stakeholder webinar on Blue BioTrade and BioTrade Principles and Criteria, including CITES requirements,²² where invaluable insights were provided by key actors from the fisheries divisions of participating project countries through their presentations at this webinar. This report also builds on the on the prior publication, *Stakeholder Maps of the Conch Value Chains of Grenada, Saint Lucia and Saint Vincent and the Grenadines* (UNCTAD, 2021).

For this publication, the authors conducted a desk review of available information on the Saint Lucia conch fishery, and conducted interviews with key national stakeholders within the industry. Interviews were conducted with 20 stakeholders playing various roles in the conch industry. Stakeholders from the Saint Lucia Department of Fisheries, fisherfolk cooperatives, conch distributors, conch processors, conch fishers and government actors were interviewed. In addition to interviews, a semi-structured survey was implemented with 12 fishers across the value chain. For an outline of this survey, please see Annex I, Interview of key informant in the conch value chain.

Figure 4. Map of Saint Lucia



Source: Adobe stock.

²¹ For further information on this methodology, see UNCTAD, “BioTrade”, available at www.biotrade.org/ResourcesPublications/unctad_ditc_bcc_2008_1_Eng.pdf.

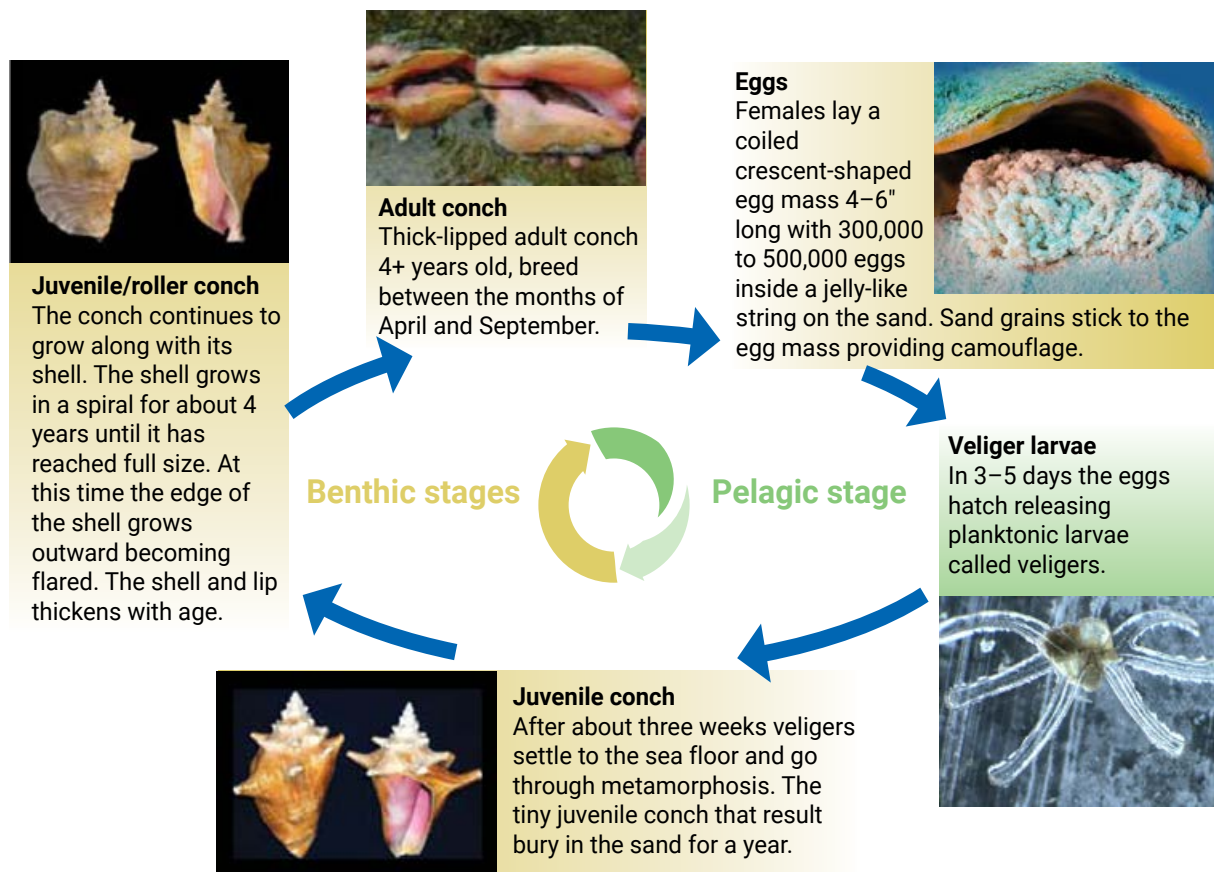
²² For further information, see UNCTAD, “Regional stakeholder webinar on Blue BioTrade and BioTrade principles and criteria including CITES requirements” available at <https://unctad.org/meeting/regional-stakeholder-webinar-blue-biotrade-and-biotrade-principles-and-criteria-including>.

2. PRODUCT ASSESSMENT

This chapter provides information on the queen conch's biological characteristics, a description of the field location of its stock, and an assessment of its various by-products. It is intended to provide details that will allow for a better understanding of the nature of the queen conch and the different by-products that can potentially generate additional revenue to fishers and other stakeholders.

The Caribbean queen conch (*Strombus gigas*, or *S. gigas*) is a gastropod belonging to the Strombidae family. *S. gigas* is found throughout the Caribbean Sea, from the Bolivarian Republic of Venezuela to Mexico, southern Florida, the Bahamas, and the Lesser and Greater Antilles. Conch depend on a variety of habitats during their life cycle. For example, conch larvae are planktonic – they float on water currents until they settle to the bottom in a suitable habitat. Juvenile conch are found in the shallow waters of coastal wetlands and sea grass beds. Adult conch live in sea grass beds and on sand flats in depths of 2–30 m, where they feed on algae, detritus and diatoms (unicellular algae) found on the blades of sea grass. Conch is a shallow water species because these animals are herbivores. The algae they eat require sunlight for growth (Bahamas Reef Environment Educational Foundation, 2020).

Figure 5. Life cycle of the queen conch



Source: Bahamas Reef Environment and Educational Foundation (2020).

Figure 5 shows the life cycle of the queen conch. After mating, the female conch lays a coiled crescent-shaped egg mass four to six inches long, with 300,000 to 500,000 eggs inside a jelly-like string on the sand. Sand grains stick to the egg mass, providing camouflage. In three to five days, the eggs hatch, releasing planktonic larvae called veligers. After about three weeks, veligers settle to the sea floor and go through metamorphosis. The tiny juvenile conchs that develop bury into the sand for a year. The conch continues to grow along with its shell. The

shell grows in a spiral for about four years, until it has reached full size. At this time, the edge of the shell grows outward, becoming flared. The shell and lip thicken with age. Thick-lipped adult conch four years old and older breed between the months of April and September.²³

Figure 6. Mature queen conch with a thick flared shell lip



Source: Toledo Institute for Development and Environment, Belize (2015).

2.1 Biology of Saint Lucian stock

In Saint Lucia, queen conch is harvested throughout the continental shelf, but there are two distinct populations targeted: one in the north and one in the south. The population in the northern tip of the island is thought to be more heavily exploited than the southern population.

In 1996, a conch biological data collection initiative commenced and was extended for a period of two years. The main aim of that initiative, conducted by the Saint Lucia Department of Fisheries (FAO, 2007), was to gather information to assess the status of the conch resources of the island, to guide management decisions. Previous to this data collection exercise, the fishery was severely undermonitored, and information required to conduct basic monitoring of the resources was unavailable and in some cases had never been collected. In that study, queen conch was harvested by commercial fishers from fishing areas in the north and south. Fishers involved in the study were asked to land all sizes of conch. Harvesting was done using scuba gear only. A total of 4,390

²³ Bahamas Reef Environment Educational Foundation, 2020.

conchs were sampled, 3,114 of which were from the northern fishing ground and 1,276 from the southern fishing ground. Less than 8 per cent (7.4 per cent) of the sampled conchs were immature: that is, they did not have a flared lip. Sex was determined for a total of 317 conch, of which just over 45 per cent were female. For both areas, lip thickness showed a predominance of conch in the 15–27 mm size classes, with the greatest percentage in the 24–26 mm size classes. Very few conchs with lip thickness less than 5 mm were landed. The mean shell length, lip thickness, total weight and meat weight were larger in the south compared with the north. For both fishing areas, the majority of conchs were found in the 200–280 mm size classes. But peaks were obtained in the 260–279 mm range for the south, and the 220–239 mm range for the north. The majority of conchs found in the south were of a larger total shell length compared with those from the north. Over 99 per cent of the total conchs harvested had shell lengths greater than 180 mm, the minimum size limit. Analyses revealed that, although less than 10 per cent of the conchs sampled were immature (without a flared lip), less than 0.5 per cent were less than 180 mm total length, meaning that the majority of conchs landed were above the minimum size limit (FAO, 2007).²⁴

There are no recent queen conch population studies that provide an updated status of the queen conch population in Saint Lucia.

A 1996 study (Saint Lucia Queen Conch Report by Susanna Scott in FAO Fisheries Report No. 832) is outdated but is one of the few sources of information available. That study found that monitoring of previous landings by examining stockpiles of discarded conch shells indicated that the fishery was targeting mainly adults, since juvenile landings were negligible. At the time, the stocks were thought to be sustaining the level of fishing effort, although shallow water stocks were overexploited.

The most up-to-date information on the queen conch indicates that CPUE (1996–2007) was declining, and the estimated queen conch average density was 242 inches per hectare (2008). The majority of fishers interviewed reported no change in abundance. The total allowable catch was estimated at 30 tons per year in 2009. There were concerns with data reliability, estimates of fishing ground areas and conch density. Morphological differences between stock in the north and south-west of Saint Lucia suggest the existence of two distinct populations, which poses challenges for the application of management measures.²⁵

For this report, fishers were interviewed to gather information to assess the current status of the queen conch population. The fishers reported that fishing effort has not increased significantly in the last few years, and landings have remained stable. This indicates that the queen conch population in Saint Lucia could be stable at this time, and there is no immediate risk of overfishing with the current fishing effort. However, a stock assessment of the queen conch in the fishing areas is recommended in order to estimate and establish a total allowable catch limit as soon as possible.

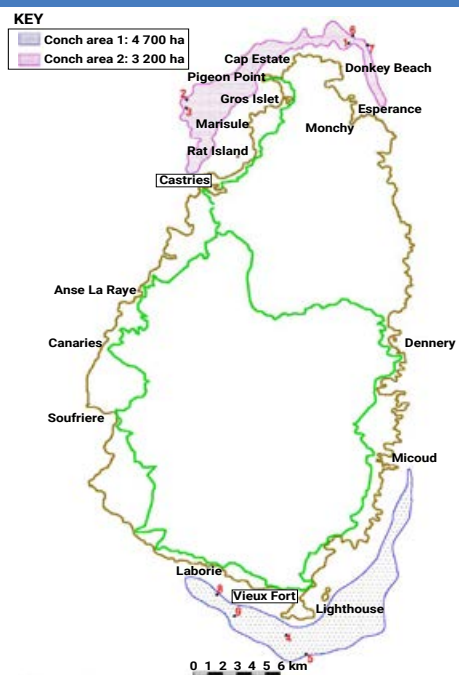
2.2 Location of stock

A study completed in 2008 by the Department of Fisheries indicated that the bulk of the queen conch fishing grounds in Saint Lucia are located on the northern (est. 4,700 ha) and southern (est. 3,200 ha) tips of the island (King-Joseph et al., 2008). Gros Islet in the North and Laborie in the South are the two most important queen conch fishing communities. Some fishers, however, report that queen conch is found throughout the island at depths of 80 feet (24 m) or more. This information was confirmed by commercial small-scale fishers who were interviewed for this study. Figure 7 shows a map of Saint Lucia, with the primary fishing areas in the northern and southern tips of the island.

²⁴ Susanna Scott, Senior Fisheries Biologist, Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries Castries, Saint Lucia, published in 2007 in the FAO Fisheries Report No. 832.

²⁵ Sarita Williams-Peter, Chief Fisheries Officer, Department of Agriculture, Fisheries, Natural Resources and Cooperatives. Saint Lucia Regional stakeholder webinar on Blue BioTrade and BioTrade Principles and Criteria, including CITES requirements, 22–23 March 2021.

Figure 7. Map of Saint Lucia showing the principal queen conch fishing grounds in the northern and southern tips of the island



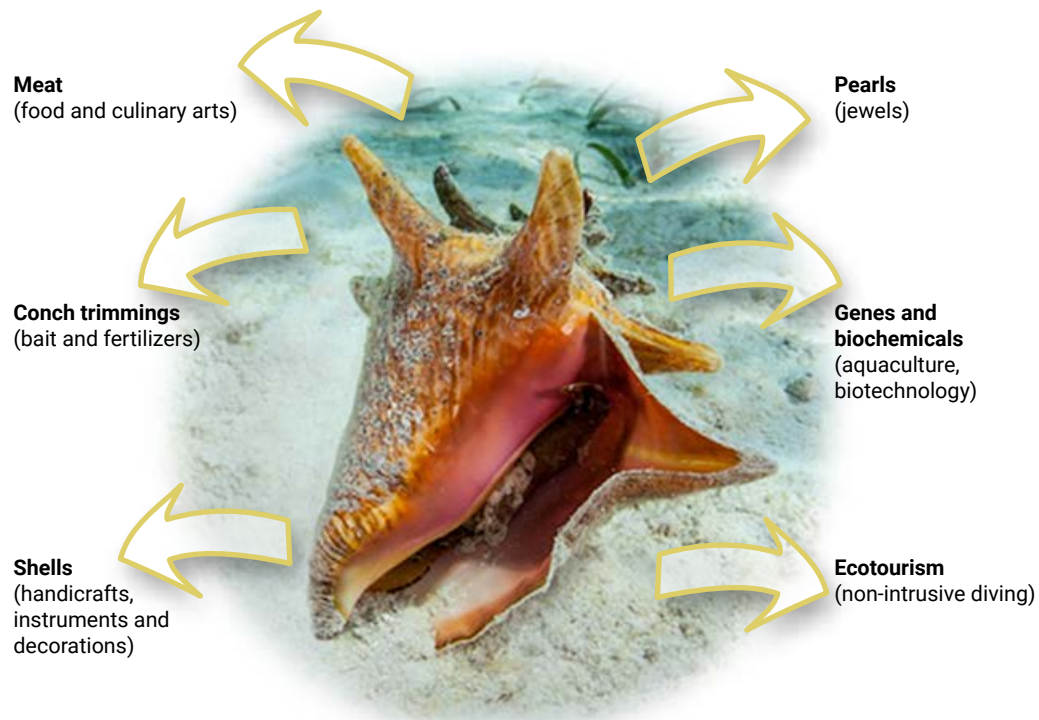
Source: King-Joseph et al. (2008).

Although biological data have been collected in the past for this species, the collection of such data has not been sustained after the termination of externally funded projects. Morphological differences among various conch populations in Saint Lucia have implications for management measures, especially for those relating to shell length and weight. Information on stocks is still scarce, especially information on density, abundance and distribution. This scarcity of information limits informed management decisions. Recent reports suggest that the depths at which the conch are now found are becoming an even greater limiting factor on the number of dives that are being conducted. In general, fisheries management and enforcement agencies have limited surveillance and enforcement capacities.

2.3 Products derived from queen conch

Figure 8 summarizes the products that can be derived from queen conch. The main commercial product of the queen conch is the white meat that comprises the foot of the animal, and is primarily used in the making of excellent seafood dishes in the culinary arts. The meat is used to prepare a variety of food dishes, such as conch soup or chowder, conch fritters and conch salad or “ceviche”. The conch meat is the product that primarily drives queen conch harvesting in Saint Lucia. Some stakeholders interviewed in the context of this project expressed that there was additional variety of meat quality within the queen conch species, with some claiming that Eastern Caribbean conch, which occupy deeper waters of Saint Lucia, were of higher quality. Additionally, some of those interviewed indicated a consumer preference for mature conch, due to higher quality.

Figure 8. Primary uses and products derived from the queen conch



Source: Vivas Eugui (2021).

The conch trimmings, which consist of the intestines and part of the mantle, are used traditionally by fishers as fish bait and, in some cases, farmers cook it and use it as feed for pigs or as fertilizer for agricultural crops in Saint Lucia.

The conch pearl is occasionally found attached to the mantle of the conch, and is the most valued by-product on a unit basis. Its price is highly dependent on the colour, size and shape of the pearl. Pearls are used for making jewellery, including earrings, necklaces and others. The most beautiful and biggest pearls can fetch up to \$7,500 each. While a number of patents exist for the creation of cultured conch pearls,²⁶ commercial success in this area has so far been limited. Due to the current lack of technical capacity to farm queen conch pearls within Saint Lucia, this by-product is not considered a major potential resource development avenue for the country, at least in the short term.

The queen conch shell is also used for making local handicrafts and other household decorations that are generally sold to tourists. Queen conch shells are also currently being explored as a material for the creation of artificial reefs and artificial fish habitats in Saint Lucia.

Queen conch has historically acted as a source of ecotourism revenue and conch farms have historically acted as tourist attractions in the Turks and Caicos Islands.²⁷ Tours of these farms are offered, showing visitors the process of conch aquaculture. The Caicos Conch Farm was open from the 1980s to 2018. It was closed due to a combination of economic challenges and damages sustained due to hurricanes Irma and Maria (Turks and Caicos Sun, 2018). While this offers a tangible example of queen conch being used for ecotourism, there is no active queen conch ecotourism activity in Saint Lucia.

²⁶ For more information, see https://patentscope.wipo.int/search/en/result.jsf?_vid=P10-KT7P8A-44298.

²⁷ For more information, see www.myturksandcaicos.com/activities/conch-farm/.

3. ANALYSIS OF REGULATORY AND GOVERNANCE FRAMEWORKS AND MANAGEMENT PLANS

3.1 National level

In 1987, the Saint Lucia Department of Fisheries introduced the Fisheries (Turtle, Lobster and Fish Protection) Regulations (Saint Lucia, 1987) to prevent overexploitation of queen conch stocks. The regulations included a minimum total weight (including the shell) of 1 kg and a minimum weight (after removal of the digestive gland) of 280 g. The regulations also prohibited the taking of conchs without a flared lip and allowed for a closed season to be established in the future, if necessary. At that time, the exploitation rate seemed not to pose a serious threat to the sustainability of the local populations.

In 1994, the Fisheries Regulations – Section 39 (Statutory Instrument No. 9 of 1994) (Saint Lucia, 1994) was introduced, providing the legal framework for management, monitoring, control and enforcement in the queen conch fishery. This regulation maintained the minimum size and weight definition of the 1987 fisheries regulations and added a provision to enable the enactment of a closed season by the Minister. This is specifically stated as:

- (a) No person shall (a). take from the fishery waters, sell, purchase, or at any time have in his possession any immature conch; or (b). take from the fishery waters, expose for sale, purchase or at any time have in his possession any conch during the closed season for conch as specified by the Minister by notice published in the Gazette and in a newspaper which is printed or circulated in the State.

In 2000, the Department of Fisheries, with assistance from FAO, embarked on an initiative to revise the fisheries legislation. The following were proposed amendments for the new fisheries legislation as they pertain to conch: (a) inclusion of lip thickness in the definition of an immature conch (less than 5 mm); (b) removal of the stipulated shell length limit; (c) provision for closed areas; and (d) provision for a national permit system for harvesting conch. Saint Lucia is currently in the process of finalizing and institutionalizing national CITES enabling legislation (CITES, 2020). The legislation has made it through three readings in Parliament and has also been submitted to the Senate. It has been submitted to the Governor General and is in the process of publication. However, a date for commencement has not been issued, due to the need for some administrative elements to be established.²⁸

In 2001, the revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001) was introduced. This act is a consolidation of the Fisheries Regulations – section 39 (Statutory Instrument No. 9 of 1994) and the Fisheries (Snorkelling License) Regulations (Statutory Instrument 223/2000) (Government of Saint Lucia, 2001). This act is the main legislation managing fisheries in Saint Lucia, and is still in effect today. Part 7 section 35 subsection 1 of this act states that a person shall not take from the fishery waters, expose for sale, purchase or at any time have in his or her possession any immature conch during the closed season. Currently, no closed season has been enacted in Saint Lucia. Subsection 2 defines an immature conch as one with a total weight less than 1 kg, meat weight of less than 280 g after removal of the digestive gland, a shell that is smaller than 18 cm in length or which does not have a flared lip. The fisheries regulations do not define a closed season for the queen conch. Queen conchs can potentially reproduce all year round, but high-water temperature (28–29 °C) is associated with peaks in queen conch reproduction and gametogenesis. In general, the warmest months in the Caribbean are July through September (FAO, 2017).

In regard to sport fishing vessels, Fisheries Regulation 27 (f)²⁹ of the Fisheries Act Revised Edition states that a vessel shall not have on board more than 10 queen conch per person at any time.

Draft queen conch management plan for Saint Lucia

Although Saint Lucia does not have a queen conch management plan, in 2006 a draft management plan was developed by Susanna Scott, a Senior Fisheries Biologist in the Department of Fisheries. The draft queen conch

²⁸ CITES, “Notification No. 2005/035” available at <https://cites.org/sites/default/files/reports/07-08SaintLucia.pdf>.

²⁹ Revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001), Section 39.

management plan (FAO, 2007) was published in 2007 by FAO, but it is unclear if it was officially endorsed or adopted by the Department of Fisheries. To date, this plan has not been implemented in Saint Lucia.³⁰ The draft queen conch management plan states the operational objectives, indicators and reference points as follows:

- (a) The operational objectives for the queen conch fishery are as follows:
 - (i) to maintain conch stocks at or above an acceptable level (to be defined)
 - (ii) to maintain effort at current levels
 - (iii) to maintain or increase current levels of income to fishers from this fishery
 - (iv) to contribute to the maintenance of conch habitat and nursery grounds in a productive state.
- (b) The indicators that are or could be used to measure the performance of fishery management relative to the objectives are as follows:
 - (i) biomass (stock densities, abundance, distribution and catch/effort)
 - (ii) fishing effort (catch effort, fishermen's registration and licensing)
 - (iii) spawning stock status (catch composition [e.g., lip thickness] and stock structure)
 - (iv) health of mangrove, coral and seagrass areas (e.g., detail indicators).
- (c) The reference points that are or could be used to define acceptable and unacceptable performance of the fishery are as follows:
 - (i) effort (number of fishers) at current levels (licensing or a permit system)
 - (ii) lip thickness of all conchs in catch at or above legal size limit (flared lip thickness-size limit)
 - (iii) conch stocks at or above an acceptable level (to be determined), e.g., vessel value of fishery at or above current value per trip
 - (iv) area of all marine reserves at or above current levels
 - (v) marine reserves not specific to conch but that may provide some support to this resource
 - (vi) level of cooperation with relevant agencies (regarding land management, agriculture, environmental management, physical development, etc.) at or above current levels.

3.2 Regional level

At the regional level, Saint Lucia is a member of the Western Central Atlantic Fishery Commission (WECAFC) of FAO. As a member of WECAFC, Saint Lucia is encouraged to comply with the management measures recommended in the Regional Queen Conch Fisheries Management and Conservation³¹ (FAO, 2017). Based on the interviews with fishers and other stakeholders during the period of 4 May to 21 July 2021, a rapid assessment of the implementation of the queen conch management measures that were compiled under this project shows the recommended management measures, the level of implementation by the Division of Fisheries, and recommendations made in this study by the fisheries expert (table 1).

³⁰ Stakeholder interviews between 4 May and 21 July 2021.

³¹ Sarita Williams-Peter, Chief Fisheries Officer, Department of Agriculture, Fisheries, Natural Resources and Co operatives Saint Lucia Regional stakeholder webinar on Blue BioTrade and BioTrade Principles and Criteria, including CITES requirements, 22–23 March 2021.

Table 1. Level of implementation of WECAFC-recommended queen conch management measures

WECAFC-recommended management measure	Level of implementation by Division of Fisheries	Recommendations made by Blue BioTrade study
a. Establish harmonized and simplified categories of queen conch	Processing categories for queen conch meat have not been established	There is a need to establish queen conch processing categories that will align catch data reporting to FAO requirements
b. Establish meat conversion factors	Queen conch meat conversion factors have not been established	There is need to establish queen conch meat conversion factors to ensure that catch landings and number of animals harvested are accurately reported to FAO
c. Improve catch and effort monitoring programmes	Catch landings and fishing effort data are being collected in some locations where queen conch meat landings occur	Monitoring of catch per unit effort data collection should continue and be strengthened to determine trends in catches and effort over time, which could serve as a proxy for conch abundance in the sea
d. Implement a synchronized regional closed season (1 June–30 September)	There is no closed fishing season for queen conch	While regulations enable the enactment of a closed season by the Minister, provided publication of close season dates in the national gazette, there is a need to establish a closed season for queen conch
e. Develop non-detriment findings for export of queen conch meat and its by-products	No non-detriment findings has been prepared for the export of queen conch meat	Non-detriment findings for queen conch should be developed as soon as possible if export of conch meat is to be realized
f. License all queen conch fishers, processors and exporters	Processors of queen conch meat are not licensed by the Division of Fisheries. Fishers are required to be registered with the Division of Fisheries to receive any government support provided to fishers	The licensing of all fishers, processors and exporters should be done as soon as possible. The revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001) – section 39 subsection 19 requires the licensing of a fishing vessel and the registration of fishers only
g. Adopt stricter regulations on autonomous diving techniques	The use of autonomous diving is used for harvesting of queen conch, but there is no mandatory requirement that fishers should undergo professional training for use of this equipment to conduct fishing for queen conch	Training on proper use of scuba gear should be done by every diver to avoid accidents and deaths
h. Organize patrolling	No patrolling for enforcement of queen conch regulations is done	Coastal patrolling to monitor importation of queen conch as illegal trade is active. However, subregional (OECS) patrolling to reduce IUU fishing should be done in collaboration with neighbouring countries.
i. Extend use of satellite-based vessel monitoring systems for boats with a length exceeding 10 m	There is no legal requirement for use of satellite-based vessel monitoring systems in fishing vessels	The installation of vessel monitoring systems on fishing boats larger than 10 m should be made mandatory by law
j. Develop continuous education and outreach programmes for stakeholders	Queen conch educational and outreach programmes for fishers and other stakeholders are limited and sporadic	Queen conch education and outreach should be done continuously in primary schools and fishers' organizations

WECAFC-recommended management measure	Level of implementation by Division of Fisheries	Recommendations made by Blue BioTrade study
k. Develop national level queen conch conservation and management plan	No national queen conch management plan exists at present	A queen conch management plan should be developed as soon as possible. A draft management plan was prepared in 2006 by Susanna Scott, Senior Fisheries Biologist, Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries Castries, Saint Lucia, published in 2007 through FAO Fisheries Report No. 832, but has not been officially endorsed or adopted by the Fisheries Division
l. Improve traceability of queen conch throughout the value chain	No traceability programme is in place for queen conch	Traceability of the queen conch value chain should be done as soon as possible
m. Develop collaborative arrangements to generate habitat maps at the scale needed for better fisheries management	There are no queen conch habitat maps developed for the fishery	The development of habitat maps should be done to assist in the implementation of queen conch surveys
n. Adopt subregional mechanisms to evaluate the fishery potential of queen conch using fishery dependent and independent factors	There is no subregional mechanism in place to assess the status of queen conch	The development of a subregional arrangement to conduct scientific queen conch assessments is very important for the sustainable use and conservation of queen conch and therefore should be pursued as a regional priority
o. Progressively include of co-management strategies	No co-management agreements with non-governmental organizations have been developed for the management of queen conch	Co-management arrangements with non-governmental organizations can potentially identify and secure resources to assist in the management efforts for queen conch, and therefore should be encouraged and supported by countries

3.3 Relationship with the Convention on International Trade in Endangered Species of Wild Fauna and Flora

Saint Lucia joined CITES in December 1982 and the provisions of CITES came into force for Saint Lucia on 15 March 1983. In 1992, the queen conch was added to the list of species under Appendix II.³² In 1994, the queen conch was selected as a species for Review of Significant Trade at the 10th meeting of the Animals Committee (Beijing, 1994).³³ A Review of Significant Trade procedure (defined in CITES resolution Conf. 12.8 Rev. CoP17) was designed to identify species that may be subject to unsustainable levels of international trade, and to identify problems and solutions concerning effective implementation of the Convention. In 1999, at its 41st meeting, the Standing Committee of CITES (CITES, 1999) recommended that parties should not accept export permits for specimens of *Strombus gigas* from the following range States: Antigua and Barbuda, Barbados, Dominica, Mexico, Saint Lucia, and Trinidad and Tobago. These range States were advised to comply with several recommendations before the recommendation to suspend trade could be lifted.³⁴

Since being listed in Appendix II in 1992, the queen conch was selected for the Review of Significant Trade process in 1995 and 2001, and as a result many countries ceased to export it legally. In 2002, at the 46th meeting of the Standing Committee (Geneva, 2002), after Saint Lucia provided a response to the recommendations³⁵

³² Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival. Source: <https://cites.org/eng/disc/how.php>.

³³ For more information, see https://cites.org/eng/prog/queen_conch/Review_of_Significant_Trade_in_Queen_Conch/1995_phase_iii.

³⁴ For more information, see CITES, "Forty-first meeting of the Standing Committee Geneva (Switzerland), 8–12 February 1999", available at <https://cites.org/sites/default/files/eng/com/sc/41/E41-09.pdf>.

³⁵ For more information, see CITES, "Forty-sixth meeting of the Standing Committee Geneva (Switzerland), 12–15 March 2002", available at <https://cites.org/sites/default/files/eng/com/sc/46/46-16-2.pdf>.

(SC46 Doc. 16.2 and its annex), the Standing Committee decided to remove the suspension of imports of conch from Saint Lucia. In that same year, at the CITES Conference of the Parties, it was agreed that shells of the queen conch would qualify as exempt from the provision of articles III, IV and V of the Convention³⁶ under the category of personal and household effects.³⁷ During the 17th Conference of the Parties, Resolution Conf. 13.7 was adopted, under which it was agreed that “queen conch shells – up to three per person do not require export or import permits, or re-export certificates, for personal or household effects for the dead specimens, parts and derivatives”. Before 2002, the number of shells leaving the island was monitored by the provision of CITES permits. However, this avenue for recording trade at a maximum of three per person no longer exists.

Queen conch was selected for phase V of the Review of Significant Trade (following previous selection and review in phase III of the Review of Significant Trade) at the seventeenth session of the Animals Committee (AC17) (August 2001) (AC17 Summary Record) “owing to continuing concern regarding the implementation of Article IV” (AC19 Doc. 8.3 [Rev. 1]). At AC19 (August 2003), queen conch was categorized as being of “urgent concern” for three range States, and of “possible concern” for 13 range States, including Saint Lucia (AC19 Summary Record), and recommendations were formulated (table 2). The secretariat, in consultation with the Chair of the Animals Committee, determined after the last deadline in 2005 that 14 range States, including Saint Lucia, had implemented the recommendations, and notified parties in May 2006 that queen conch had been removed from the process for these range States (Notification No. 2006/034).

Table 2. Recommendations formulated by the CITES Animals Committee (AC19) and outcome

Taxonomy	Recommendations and deadlines resulting from AC19 (August 2003)	Status
<i>Strombus gigas</i>	Within 12 months:	Completed (Notification No. 2006/034)
	(a) Establish cautious catch and export quotas, communicate these to the secretariat and provide information for the basis of these quotas.	
	(b) Establish a standardized minimum meat weight that corresponds to adult specimens of unprocessed and processed meat.	
	(c) Design and implement a fishery data collection programme. This programme is designed to collect catch and effort data, and shall include 1.) a system of permits and licenses for commercial harvesters and exporters, and 2.) regular reporting of landing and export data.	
	(d) Design and implement a long-term population monitoring programme for the designated commercial fishing areas. This programme should provide reliable estimates of adult and juvenile densities within commercial fishing areas, at a minimum.	
	Within 24 months:	
	(a) Apply adaptive management procedures to ensure that further decisions about harvesting and management of the species concerned will be based on the monitoring of the impact of previous harvesting and other factors.	
	(b) Give serious consideration to the recommendations of the June 2003 International Queen Conch Initiative meeting and commit specifically to those recommendations on:	
	(i) Development of a regional management regime, including cooperative quota setting;	
	(ii) Law enforcement capacity and effectiveness;	
(iii) Population assessments and other research relating to the management of queen conch.		

CITES Decisions 18.275–18.280,³⁸ inter alia, direct range States to implement regional and national plans for queen conch management, and continue developing national and regional conversion factors.

In October 2012, a Caribbean Fishery Management Council (CFMC)/Organización del Sector Pesquero y

³⁶ For more information, see <https://cites.org/eng/disc/text.php>.

³⁷ Ibid.

³⁸ For more information, see <https://cites.org/eng/taxonomy/term/42100>.

Acuícola del Istmo Centroamericano (OSPESCA)/WECAFC/Caribbean Regional Fisheries Mechanism (CRFM) Working Group on Queen Conch was established to further improve management and conservation of the queen conch resource in the wider Caribbean region. At its second meeting, in 2014,³⁹ a revision was made of a draft Regional Queen Conch Management and Conservation Plan, with 26 potential fisheries management measures, and the working group determined which measures would contribute most to the sustainability of the stocks and livelihoods of those involved in queen conch fisheries in the region. From its third meeting, in 2018,⁴⁰ the recommendations included adoption of conversion factors at either national or regional levels, as well as reporting future catch figures as live weight equivalents.

At the national level, the Ministry of Agriculture, Forestry and Fisheries is the management authority for CITES, with the office of the Permanent Secretary serving as focal point. The Forestry Department and the Department of Fisheries function as the scientific authorities, focusing on relevant terrestrial and aquatic issues, respectively. More recently, the Ministry put in place an ad hoc CITES Committee, comprising representatives from the Fisheries and Forestry departments, the Veterinary and Phyto-Sanitary Divisions, the Biodiversity Office, the Customs and Excise Department and the Ministry of Commerce. To date, this committee has spearheaded the development of draft CITES national legislation (CITES, 2020) that will enable more effective implementation and enforcement of the Convention at the national level. This draft regulation is not currently enacted.

Saint Lucia has submitted CITES annual reports for all years from 2010 to 2016, but reports for 2017–2019 have not yet been received. Saint Lucia has never published any export quotas for queen conch. Urgent efforts must be taken to verify imported amounts through the submission of trade data to the CITES secretariat in a timely manner.

3.4 Institutional actors

The conch sector in Saint Lucia is managed primarily by the Department of Fisheries under the Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operatives. The Department of Fisheries⁴¹ is staffed by approximately 20 people, and includes the Fisheries extension unit with seven extension officers, a marine resource management unit, a marine and aquaculture unit, and a data collection unit.

Conch is managed by the revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001),⁴² which manages fisheries within the EEZ of Saint Lucia. This legislation outlines fisheries management and development, marine reserves and conservation methods, enforcement and general provisions. The legislation is based on the FAO–OECS draft Harmonized Fisheries Regulations for OECS member States (FAO, 1989), and as such has similar features with other project countries.⁴³

Other guiding policies related to fisheries include the Government of Saint Lucia Sectoral Adaptation Strategy and Action Plan for the Fisheries Sector (Fisheries SASAP 2018–2028).⁴⁴ There is also a proposed Fisheries Policy 2020 that is currently in draft stage.⁴⁵

Regarding conch importation to Saint Lucia, the Royal Saint Lucia Police Force–Marine Police Unit; the Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operatives; the Veterinary and Livestock Services Division–Unit of Veterinary Public Health; and Ministry of Health and Wellness–Environmental Health Unit

³⁹ For more information, see www.fao.org/3/i5587t/i5587t.pdf.

⁴⁰ For more information, see www.fao.org/fi/static-media/MeetingDocuments/WECAFC/WECAFC2018/FinalProspectusEN.pdf.

⁴¹ For more information, see www.doaslu.govt.lc/fisheries/?playlist=693f003&video=566d0c4.

⁴² This is a revised edition of the law as at 31 December 2001, and contains a consolidation of the following laws: (a) Fisheries Act (Act 10 of 1984); (b) Fisheries Regulations; and (c) Fisheries (Snorkelling Licence) Regulations. See revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001), available at www.govt.lc/legislation/saint-lucia-fisheries-act-cap-7-15-.

⁴³ For more details, see chapter III, “Analysis of regulatory and governance frameworks and management plans”.

⁴⁴ See Government of Saint Lucia NAP Global Network (2018), “Saint Lucia’s Sectoral Adaptation Strategy and Action Plan for the Fisheries Sector (Fisheries SASAP) 2018–2028”, available at <https://www4.unfccc.int/sites/NAPC/Documents/Parties/SLU-Fisheries-SASAP-May-2018.pdf>.

⁴⁵ Stakeholder interviews between 4 May and 21 July 2021.

all play important roles in the conch value chain.

As most of the conch imported to Saint Lucia arrives from Saint Vincent and the Grenadines by boat, the Royal Saint Lucia Police Force–Marine Police Unit is responsible for intercepting imports at sea to confirm that importers have the relevant CITES, customs and health certificates from Saint Vincent and the Grenadines. The Marine Police Unit also has the responsibility for monitoring illegal incursions⁴⁶ of fishing vessels into Saint Lucian waters.

Once a conch import enters Saint Lucia at one of the designated ports of entry, it enters the customs process. Importation documents are entered into the Automated System for Customs Data (ASYCUDA system). Once the product is identified as conch meat, it is reviewed in this system by the Department of Fisheries for the relevant CITES certificates.

Once approved, the conch is inspected by the Veterinary and Livestock Services Division–Unit of Veterinary Public Health at the port of entry. This unit has jurisdiction over sanitary and phytosanitary measures related to animal products, while the Ministry of Health and Wellness–Environmental Health Unit have jurisdiction over food safety issues. For this reason, both units cooperate closely; however, inspections of imported conch meat are led by Unit of Veterinary Public Health officers.

Unit of Veterinary Public Health officers conduct organoleptic tests of all conch meat imports, inspecting the conch meat visually, checking its smell and temperature to ensure it is fit for consumption. Conch meat is typically put in large, insulated containers with ice, and not imported fully frozen, making these inspections important for ensuring shipments have retained quality and are safe for consumption. The Ministry of Health and Wellness–Environmental Health Unit do not typically inspect conch meat imports, as they coordinate closely with Unit of Veterinary Public Health officers.

Once inspected and approved by Unit of Veterinary Public Health officers, importation documents are sent to the Department of Commerce for the final approval of the importation license and formally released by Customs. The Ministry of Health and Wellness–Environmental Health Unit also randomly inspects conch that is for sale at retail sites across the country.⁴⁷

⁴⁶ While not typical, some harvesting of conch within Saint Lucian waters by fishers from neighbouring countries occurs. Additionally, some exportation of conch from Saint Vincent and the Grenadines is thought to transit through Saint Lucian waters.

⁴⁷ Stakeholder interviews between 4 May and 21 July 2021.

4. VALUE CHAIN ANALYSIS

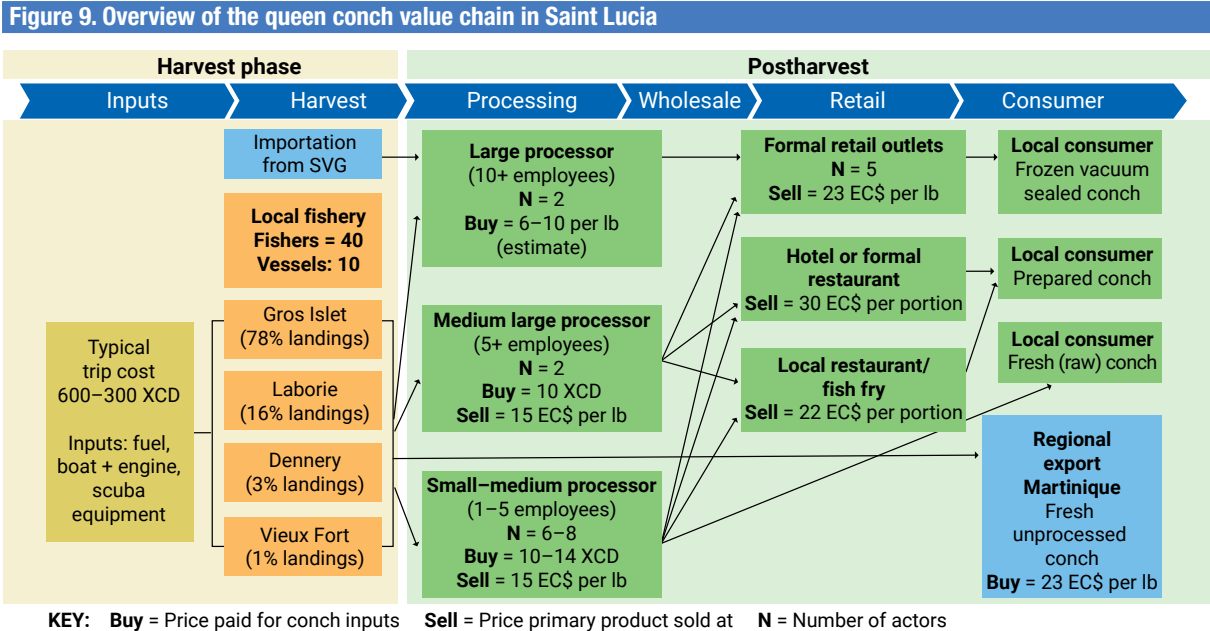
4.1 Overview

Saint Lucia has approximately 40 fishers participating in conch fishing. From 2010 to 2020, the fishery harvested an average of 74 metric tons of “dirty” conch meat annually. This represents a 73 per cent increase in average landings from the previous decade (2000–2010), when an average of 41 metric tons were harvested; and a 121 per cent increase from the landings in the period 1993–1999, or 32 metric tons (UNCTAD, 2021). Over the past decade, the value of conch landed has averaged \$920,591.98 (EC\$2,485,598), peaking at \$1.18 million (EC\$ 3.2 million) in 2017, with a low of \$338,370.74 (EC\$913,601) in 2020, largely due to bans of fishing during the COVID 19 pandemic.⁴⁸

According to the CITES export database (UNEP and WCMC, 2021), Saint Lucia is thought to be a net importer of conch, as other countries reported issuing export permits totalling 235 metric tons of conch meat to Saint Lucia between 2015 and 2020, with an average of 39 metric tons of conch meat per year. It is important to note that these export permits may not reflect the actual volume of conch imported to Saint Lucia, as export permits need to be reconciled by the importing country, and Saint Lucia has not submitted annual reports indicating the actual imported volumes. Assuming export permits to Saint Lucia were fully used, this implies that about 45 per cent of all conch consumed in Saint Lucia was from imports.

Considering both domestic production and imports, the market for unprocessed conch meat is estimated to be worth approximately \$1.35 million (EC\$3.66 million) per year in Saint Lucia.⁴⁹ This estimate of the value of the conch meat market does not represent the total contribution of conch to the economy in Saint Lucia, as prepared value added conch products play a significant role in Saint Lucian food tourism and domestic restaurants.

Figure 9 provides a detailed overview of the key relationships that exist in the Saint Lucian queen conch value chain, from key inputs until final consumption.



Source: Authors’ own elaboration: \$1 = EC\$2.7 as of 15 July 2021 (xe.com) (UNCTAD, 2021).

⁴⁸ Data provided by Saint Lucia Fisheries Division on 15 May 2021.

⁴⁹ Authors’ own calculations. A summing of the average total value of conch landed in Saint Lucia combined with the estimated value of imported conch, using price data provided by the Saint Lucia Department of Fisheries.

4.2 Pre-harvest phase

Fishing gear needed for conch harvesting includes a fibreglass pirogue boat, outboard motor, fuel, scuba gear and water. The majority of fishers harvest conch using scuba diver gear. Fishers do one-day fishing trips with fibreglass pirogues ranging in length from 7.02 to 8.45 m, and powered by outboard engines of 115–250 hp.

Fuel costs per trip can vary from EC\$214⁵⁰ up to EC\$650 for longer trips, and are the largest component of input costs. Boats are built in Saint Lucia, but also purchased from other islands in Saint Vincent and the Grenadines with more developed boat-building industries. Scuba gear is not manufactured in Saint Lucia, and must be imported, purchased or rented from a dive shop locally. Imported dive gear faces a 10 per cent import duty and a 15 per cent value added tax.⁵¹

Divers in Saint Lucia typically do not use buoyancy compensation devices, partially due to the cost of these devices, but also because they consider this equipment to limit their underwater mobility. Furthermore, most fishers are not formally scuba certified for the depths at which they operate, due to the costs associated with dive certification. Key aspects of dive safety – such as taking diving breaks, staging ascent and performing safety stops – are not currently followed by conch divers, as they are considered to significantly reduce time available for conch harvesting and require equipment that is considered costly. Interviewed fishers and divers do not currently have insurance for their work. Interviewed fishers indicate that the cost of dive gear and its maintenance present a challenge within the industry, and that the lifting of duties on these items would support industry growth.

While safety was not mentioned as a reason for improving access to dive gear, the lifting of taxes and duties on these items may enhance access of safe dive gear to reduce health costs associated with the fishery. However, it should be noted that training in safe diving techniques, scuba certification and active practice of safe diving techniques is imperative, and should be considered a priority. Reducing the costs associated with diving gear must be coupled with a robust system of ensuring registered conch fishers are scuba certified and practice safe diving techniques.

Unsafe diving practices have resulted in costly health impacts for some fishers, with reports of decompression illness having negative impacts on diver health, with some fishers/divers being paralysed from the waist down, suffering permanent deafness or blindness, or becoming bedridden. Decompression illness has several economic costs to the fishery. Direct costs include recompression treatment (use of a hyperbolic chamber), hospitalization costs and physical therapy costs (Huchim-Lara et al., 2018). Indirect costs include travel costs for treatment, temporary loss of income and permanent loss of income.

Up until recently, Saint Lucia did not have its own hyperbolic chamber, and divers suffering decompression illness had to be airlifted to neighbouring islands (Barbados or Martinique) for treatment. Considering the small scale of the fishery, the costs of even one decompression-related injury are quite significant.

Fishers also noted the limited availability of inputs for conch net fishing locally, and that government support to enable imports of materials for net construction and repair would be beneficial. However, it should be noted that using nets for conch fishing is a much less selective method than using diving techniques, and thus increases by-catch and coral reef damage risk.

4.3 Harvest phase

The majority of conchs are harvested offshore by a three-person crew, comprised of a boat captain/navigator, a diver and a crew member. In some cases, boats will operate with a four-person crew, with an additional diver. The approximately 40 fishers⁵² of this resource can be divided into part-time and full-time. Full-time fishers conduct dives on an average of four times each week, alternating harvesting and rest days, while part-time fishers operate

⁵⁰ \$1 = EC\$2.7 as of 26 July 2021 ([xe.com](https://www.xe.com/)).

⁵¹ For more information, see <https://dluxedivegear.de/en/import-duties-and-taxes/>.

⁵² For the purposes of this study, all crew members are considered fishers. As noted above, a conch fishing crew consists of a boat captain, diver and a deckhand who assists with general duties.

twice each week. Most fishers identified and interviewed for this study reported that they engaged in conch fishing year-round. The average age of fishers interviewed was 44 years old.

Once fishers arrive at the dive location, the diver descends to the sea floor, with a net and discarded flour bags to be used as float bags (figure 10). Conch is collected on the sea floor by the diver. Once the net is deemed full, it is connected to a flour bag, which is filled with air from the diver’s dive tank, which floats for further collection by the boat crew (as shown in figures 11 and 12).

Once the conch has been floated, it is typically deshelled at sea on the boat by crew members prior to return to port (figure 13). This is largely due to costs, as conch shells can weigh up to 3 lbs and have a volume that is an order of magnitude more significant than the conch meat. This significantly increases the space requirement and transportation costs associated with returning conch to shore for deshelling. In some cases, conch is deshelled at the port of landing.

Meat is removed by cutting a small hole in the shell and severing the spinal column to allow the conch to slip out. Once the entire body of the conch has been removed from the shell, this is considered “dirty” conch meat and requires additional processing prior to consumption. This whole conch meat is then placed in storage boxes or buckets on the boat.

Income from conch harvest is divided among boat actors, depending on their role in harvesting and ownership of input capital, based on a “shares” system, with the owner of the boat and the diver receiving the largest proportion of income from sales. Some crew members can act in multiple roles with boat owners also acting as divers, and divers rotating roles to reduce dive frequency and associated risks. table 3 summarizes the division of income among actors in Saint Lucia.

Table 3. Division of income from conch harvest among actors		
Actor	Shares	Percentage of income from sales
Boat (boat + engine)	2	33.33
Captain	1	16.67
Diver	2	33.33
Crew (Matleo)	1	16.67
Total	6	100.00

Source: (UNCTAD, 2021).

Figure 10. Conch diver preparing to descend to collect conchs – recycled flour bags are filled with air and used to bring harvested conchs to the surface



Source: Makeba Felix (2021).

Figure 11. Crew member about to hoist float bag for conch harvest



Source: Makeba Felix (2021).

Figure 12. Crew member hoisting floated conchs out of the sea



Source: Makeba Felix (2021).

Figure 13. The first stage of conch processing, removal of the conch from the shell, typically begins at sea, with shells also being discarded at sea



Source: Makeba Felix (2021).

4.4 Landing data⁵³

The landing site of Gros Islet in the north represents one of the most important fishing communities for the conch fishery by landing volume and value, accounting for 78 per cent of the total value and volume of all conch landings in Saint Lucia caught between 2015 and 2020 (Saint Lucia Department of Fisheries, 2021). Approximately six boats at this port focus on conch fishing, with approximately 25 active fishers. Fishers from this landing site focus their efforts on the Atlantic side of the fishing ground.

The southern population of queen conch, located from Laborie to Micoud, is less exploited than the northern population, and is served primarily by the landing sites of Laborie and Vieux Fort, which accounted for 16 per cent and 1 per cent, respectively, of the total value of all conch landings between 2015 and 2020 (Saint Lucia Department of Fisheries, 2021).

Along the east coast of Saint Lucia, the landing site of Dennerly also has recorded consistent catches of queen conchs, although in quite limited quantities, representing 3 per cent of total harvest by value between 2015 and 2020. It is one of the only remaining sites where conchs are caught using gill nets. Historical reports indicate small harvests of 10–15 conchs per net (King Joseph et al., 2008).

⁵³ This section of the report is based on the previously published Stakeholder mapping of the Queen conch value chains of Grenada, Saint Lucia, and Saint Vincent and The Grenadines. For more information, see UNCTAD (2021), “Stakeholder Maps of the Conch Value Chains of Grenada, Saint Lucia and Saint Vincent and the Grenadines”, available at https://unctad.org/system/files/official-document/ditctedinf2021d4_en.pdf.

Table 4. Average annual landings of queen conch in Saint Lucia (2015–2020)

Site		Average value conch landings (ex vessel value in EC\$)	Average value conch landings in (ex vessel value in \$)
North	Gros Islet	EC\$ 1 932 358	\$ 715 687.96
	Castries	EC\$ 21	\$ 7.72
West	Dennerly	EC\$ 65 072	\$ 24 100.62
South	Micoud	EC\$ 4 667	\$ 1 728.64
	Laborie	EC\$ 397 091	\$ 147 070.74
	Vieux Fort	EC\$ 31 866	\$ 11 802.16
	Savannes Bay	EC\$ 262	\$ 97.04
Other	Choiseul	EC\$ 0	\$ 0.00
	Soufriere	EC\$ 0	\$ 0.00
	Anse La Raye	EC\$ 10	\$ 3.52
	Other sites	EC\$ 54 296	\$ 20 109.76
Total		EC\$ 2 485 598	\$ 920 591.98

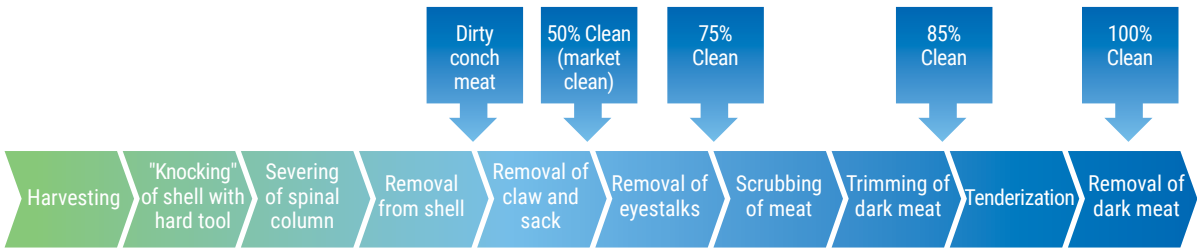
Source: Saint Lucia Fisheries Division (2021). Exchange rate: \$1 = EC\$2.7 as of 10 June 2021 (xe.com).

4.5 Post-harvest phase

Once the harvested conch is landed at the port, the post-harvest phase of the value chain begins in several ways. When the conch meat is removed from the shell, it is weighed unprocessed at port by fishers for further sale to a variety of wholesalers and processors. For wholesale of conch to processors and wholesalers, fishers typically weigh conch into 10 lb bags, as shown in figure 15. Processors and wholesalers operate at a variety of scales in Saint Lucia. For the purposes of this report, they are divided into small-medium (fewer than five employees) and large processors (more than five employees). Processing conch meat prior to cooking for consumption requires from five to nine steps, depending on the final buyer, as elaborated in figure 14.

Small-medium processors typically target local consumers at fish markets, online (Facebook marketplace and WhatsApp) and informal networks for sale of 2–5 lb bags of 75 per cent clean conch meat. Processing of conch by small-medium processors happens both at landing sites (targeting foot traffic) and at private informal facilities (for online sales and sales through informal networks). The level of processing that occurs upon landing depends on the final buyer. For small and medium wholesalers, the “pounding” or tenderization of conch meat prior to sale is not typical, but is done for certain buyers on request and at extra cost. Small-medium operators are typical in southern and eastern landing sites. Most processing done at this scale is done by men.

Figure 14. Value chain mapping of core processes in conch production, and conch meat grades



Source: Authors’ own elaboration (UNCTAD, 2021).

If being sold to larger wholesalers (those with more than five employees), conch is sold directly from the boat

as “dirty” meat, through direct purchase agreements. This “dirty” meat is cleaned by a team of processors to the 75–85 per cent level, typically leaving some of the remaining pink and orange meat. These wholesalers also typically will pound (tenderize) the conch as a part of processing. This meat is then sold to restaurants, hotel restaurants and consumers, typically in 2–5 lb plastic bags.

Figure 15. Unprocessed conch meat being weighed and bagged by fishers at port for further wholesale to processors



Source: Makeba Felix (2021).

4.5.1 Conch retail

Small-medium and large wholesalers also sell processed conchs to supermarkets and retailers such as Massy Stores⁵⁴ (a supermarket chain), which then vacuum pack the conchs for retail sale. This sector is one of the most complex stages of the value chain, as actors will frequently shift from wholesale to large retailers, to selling their product directly to customers, depending on product availability from fishers, and on demand.

The coronavirus disease 2019 (COVID-19) pandemic has accelerated the use of online tools such as Facebook marketplace⁵⁵ to market and sell conch by medium-sized processors.⁵⁶ For instance, there is evidence of medium-sized conch processors using social media to advertise bagged 50 per cent processed conch for sale in 5 lb and 10 lb unit bags. The pandemic has also accelerated the use of online tools for sale of prepared conch products by restaurants and local fast-food outlets. Products such as conch wraps, grilled conch portions, and

⁵⁴ Available at <https://massystoresslu.com>.

⁵⁵ See, for example, <https://tinyurl.com/6bkpxf8e>.

⁵⁶ Stakeholder interviews between 4 May and 21 July 2021.

conch and fries are all currently offered for sale by selected outlets that have expanded delivery options as a response to the pandemic.⁵⁷

Small amounts of conchs are sold by fish vendors directly to consumers at any number of the landing sites/fish markets in Saint Lucia. Anse La Raye, Canaries, Soufriere, Choisel, Laborie and Vieux Fort all have local fish markets where vendors operate. This is not considered to be a major market channel in the value chain, as most sale arrangements for conchs are made directly to wholesalers (UNCTAD, 2021).

Figure 16. Grilled conchs being prepared at a local restaurant



Source: Makeba Felix (2021).

4.5.2 Local restaurants and food tourism

Tourism is one of the primary drivers of the economy and economic growth in Saint Lucia, accounting for 81 per cent of all exports in 2018 (World Bank, 2018). Saint Lucia has seen sustained growth in tourism arrivals, with a 38 per cent increase in international tourism arrivals between 2010 and 2019 (Central Statistical Office of Saint Lucia, 2020). Conch consumption is a major part of Saint Lucian local restaurant culture, which has become an increasingly important element of the overall Saint Lucian tourism product. The Gros Islet Friday night street party⁵⁸ is a centre of domestic sale of value added conch by restaurants: conch is sold curried, fried, in soups, and as fritters and sausage. Local street parties also take place weekly in three other major communities: Dennerly, Anse La Raye and Vieux Fort. Local restaurants are typically owned and operated by women and operate with one to three employees. These restaurants represent one of the most significant buyers of conch in the value chain.

Value addition of landed conch by these restaurants is high, with conch typically being sold as a part of a meal costing \$11–\$17 (EC\$30–EC\$45) or as meat-only portions for \$5.55–\$7.4 (EC\$15–EC\$20). Conch meals typically contain one filleted conch cut up, which would be approximately 200–250 grams prior to preparation.

The importance of conch as a part of the food tourism product should be highlighted within this value chain. Conch is both a food product and part of a cultural experience in this regard.

⁵⁷ See for example, <https://tinyurl.com/5asuw3nk>.

⁵⁸ The Gros Islet night street party takes place every Friday night year-round in Saint Lucia.

Figure 17. Typical conch meal sold by local restaurants in Saint Lucia



Source: Makeba Felix (2021).

4.6 Other conch products

4.6.1 Conch pearls

Conch pearls are recognized as one of the most valuable products by weight produced by the queen conch. Conch pearls are a rare by-product of conch production, typically found during the cleaning stage of conch production, after it has been removed from the shell. Conch pearls are found in Saint Lucia, typically by fishers or cleaners of the conch as a by-product. Due to the small size, high value and rare nature of this product, no information on export volumes is currently available.

4.6.2 Conch shells

Conch shells do not represent a significant export by-product of conch from Saint Lucia. In 2016 and 2018, a total of seven conch shells were exported from Saint Lucia to the United States. Most conch shells are discarded when the conch meat is removed at sea. Small quantities of conch shells are polished and sold locally as souvenirs to tourists, but they are not considered to be a major source of revenue from the conch.

Currently, the use of conch shells as a biogenic construction material for artificial reefs, beaches and other coastal protection structures is being explored in Saint Lucia. The COAST-fish project, funded by the Japan International Cooperation Agency (JICA), has been exploring the use of gabion baskets filled with conch shells as a coastal protection mechanism.⁵⁹ Discarded conch shell agglomerations have been shown to provide good habitats for small fish, particularly in areas of low habitat complexity. Considering the global declaration of a decade of ecosystem restoration (United Nations General Assembly, resolution 73/284), and the likely increasing need for coastal protection structures in Saint Lucia due to climate change, discarded conch shells represent a potentially valuable by-product that should be collected and preserved for future use.

⁵⁹ Stakeholder interviews between 4 May and 21 July 2021.

Figure 18. Conch baskets being constructed for coastal protection in Soufriere, Saint Lucia



Source: Hiroaki Terashima (2021).

Figure 19. Conch baskets being constructed for coastal protection in Soufriere, Saint Lucia



Source: Hiroaki Terashima (2021).

4.6.3 Conch trimmings

Conch processing involves multiple steps and trimming of darker inedible parts of the conch. For Saint Lucian markets, conch is typically not cleaned to the 100 per cent level where no dark meat remains. This means that most of the conch meat is unutilized by local producers, and a limited amount of conch meat trimmings are produced. Despite this, scope exists for the maximization of limited trimmings produced through the production of value added products, such as conch sausages and samosas, silage (animal feed) and fertilizer. Efforts should be focused on encouraging processors to save trimmings in areas of processing concentration, in association with producers with the capacity to produce value added products as mentioned.

4.6.4 Conch operculum

As noted by UNCTAD (2021) in the stakeholder mapping publication, Caribbean conch operculum command a price premium in Middle Eastern and East Asian markets. However, this by-product is not currently collected by Saint Lucian producers/processors, for a variety of reasons. Firstly, processors are not aware of the export demand for this product and the price premium in potential destination markets. Secondly, processors are unfamiliar with the techniques required to dry conch operculum, the basic level of processing required for export. Finally, the operculum is a small product in weight and volume, which requires large amounts of conch to be harvested over time in order to produce a tradeable weight of product that is worth exporting. Recommendations on how Saint Lucian producers can maximize the value of this potential bioproduct are elaborated in chapter VIII (Recommendations and conclusions) of this report.

Figure 20. Cleaning of conch involves the removal of the dark cycle/hook-shaped structure know as conch operculum – This valuable by-product is typically discarded at the processing stage



Source: Makeba Felix (2021).

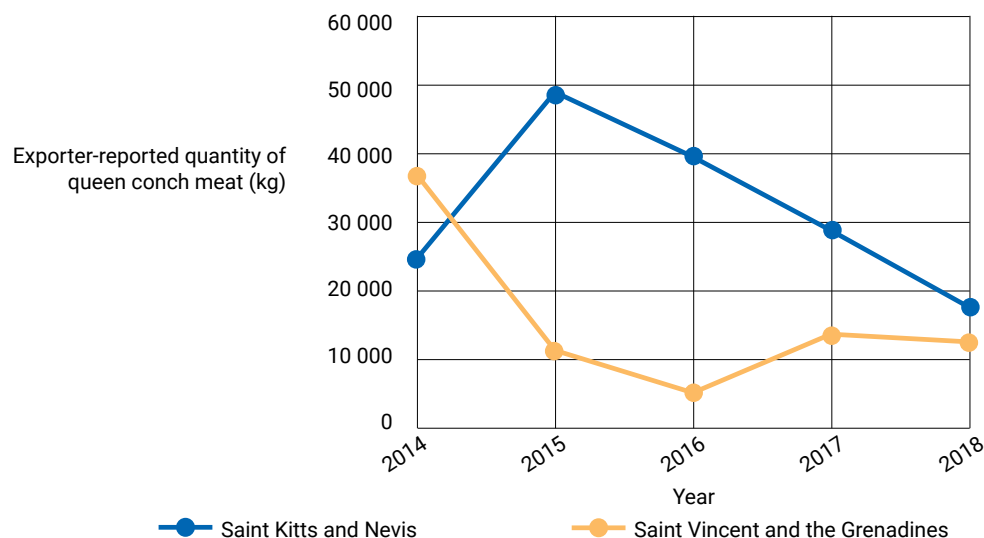
4.7 International conch trade

4.7.1 Conch importation

Due to high levels of domestic demand, and increasing demand from a growing tourism industry, Saint Lucia imports conch from neighbouring islands. Based on the CITES Trade database,⁶⁰ between 2015 and 2020, export certificates for an average of 39,025 kg of conch meat were issued for exports to Saint Lucia per year. Export certificates for a total of 234,154.32 kg of queen conch were issued for this period for Saint Lucia. As indicated earlier in this report, export certificates may not be an accurate reflection of the total volume of conch imported to Saint Lucia, because these export certificates were not confirmed as importer-reported quantities by Saint Lucian authorities. For this reason, numbers reported in this section can be considered to be an upper limit of conch imports to Saint Lucia for the period.

According to the export certificates registered in the CITES database, Saint Lucia imports conch meat from both Saint Vincent and the Grenadines and Saint Kitts and Nevis, with 63 per cent of reported conch imports in this period originating in Saint Kitts and Nevis. However, conch importation from Saint Kitts and Nevis was in steady decline from 2015 and 2020, and has been replaced by a corresponding increase in importation from Saint Vincent and the Grenadines, as shown in figure 21 (CITES, 2021). This increase in imports from Saint Vincent and the Grenadines is reflective of increasing production and export capacity in that country, due to the opening of fisheries centres' export processing capacity, and the ability to aggregate export-worthy volumes of conch (UNCTAD, 2021).

⁶⁰ Available at <https://trade.cites.org/>.

Figure 21. Exporter-reported quantities for queen conch to Saint Lucia

Source: CITES (2021).

4.7.2 Conch exportation

Saint Lucia has historically exported a nominal amount of conch shells and conch pearls. According to the CITES trade database, direct trade in queen conch from Saint Lucia in 2010–2019 predominantly consisted of 30 shells (53 per cent confiscated or seized and 47 per cent wild-sourced) reported by the United States for personal and commercial purposes (table 5). Exporter-reported data comprised two shells and 10 derivatives exported to Canada for personal purposes, and one pearl exported to Switzerland for commercial purposes, all of which were wild-sourced. Indirect trade in queen conch originating from Saint Lucia in 2010–2019 consisted entirely of one derivative and one pearl re-exported by the United States to Japan, and one item of jewellery and one shell re-exported by Japan to the United States; all trade was wild sourced for commercial purposes in 2017. The volumes of these non-meat products traded are not considered to be economically significant.

Table 5. Trade in non-meat conch products from Saint Lucia

Term	Purpose	Source	Reported by	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Derivatives	P	W	Exporter	10							-	-	-	10
			Importer											
Pearl	T	W	Exporter					1			-	-	-	1
			Importer											
Shells	P	W	Exporter		2						-	-	-	
			Importer											
	P	I	Exporter								-	-	-	
			Importer		2		7							
T	I	I	Exporter								-	-	-	
			Importer							7				
	W	I	Exporter								-	-	-	
			Importer							7		7		

P, personal; T, commercial; W, wild; I, confiscations/seizures.

Source: UNEP and WCMC (2021).

Saint Lucia currently does not export any conch meat based on available global trade data from CITES, UN Comtrade or the International Trade Centre (ITC). However, Saint Lucia has an active unrecorded trade (unknown source) of conch products with the European Union through its neighbouring island of Martinique, which is an overseas territory of France. At its closest point, the distance between southern Martinique and Saint Lucia is less than 80 km. In addition to this proximity, cultural relations between Martinique and Saint Lucia are very strong, with familial ties across the islands, and extensive interlinkages between the economies, particularly as they relate to seafood and ocean products. Martinique's invertebrate fisheries (sea urchins and conchs) are considered overfished (Martín, 2007); thus it must rely largely on imported supply and supply harvested outside of its waters to satisfy local demand and re-export demand in other Caribbean French-speaking nations and markets in mainland Europe.

Martinique is thus perceived as a key importer of conch for consumption, but also “re-exports” – for example, to European Union markets (though it is not accurate to call it “re-exporting” per se, as Martinique is an overseas territory of France and thus a part of the European Union). This role as re-exporter is due to the strong transportation links and well-established adherence to European Union sanitary and phytosanitary measures. It was noted that the well-equipped boats from Martinique can reach Saint Lucia fishing waters in as little as 25 minutes. Unfortunately, a strong price incentive exists for IUU fishing sales to Martinique, with wholesale values of €15⁶¹ per kg for dirty conch meat reported, which is 64 per cent more than that received per pound locally, and in the form of strongly desired foreign currency.

⁶¹ \$1 = €0.84 as of July 26 2021 ([xe.com](https://www.xe.com/)).

5. ASSESSMENT OF MARKET ACCESS POTENTIAL

Saint Lucia does not currently have an active legal export trade of queen conch, partially due to the high domestic demand outstripping local production, but also because of the absence of HACCP-certified processing facilities and the absence of a nationally designated authority for seafood export to the European Union. However, there are currently no export trade bans on conch from Saint Lucia from CITES; therefore, the export of conch from Saint Lucia is theoretically possible. In this chapter, we explore the potential markets to which Saint Lucia could export queen conch, either as a centre of processing and export, or through redirecting domestic production to high-value export markets.

5.1 European Union

The regularization of queen conch trade between Martinique and Saint Lucia is critical for securing the full value of conch harvested in OECS waters, and was routinely expressed as a matter of priority by interviewed stakeholders across the value chain.

Currently, Saint Lucia is not authorized to export conch products to the European Union (including Martinique as an overseas territory of France), as it is not an approved export country, and has no listed national competent authority for the export of seafood products.⁶²

To export queen conch legally to the European Union, the Saint Lucia conch fishery would need to comply with a number of basic requirements, including:⁶³

- (a) The recognition of a competent health authority responsible for performing official controls throughout the production chain. This authority is recognized by the European Commission through inspections and bilateral negotiations with relevant national authorities. There is currently no European Union-recognized competent health authority in Saint Lucia. The Office of the Chief Veterinarian of Saint Lucia is a potential competent health authority based on its current role and capacity within the Saint Lucian conch value chain.
- (b) The competent authority must guarantee that relevant hygiene and public health requirements are met, as the European Union hygiene legislation has specific requirements regarding landing sites, processing establishments and processing operations, including freezing and storage.
- (c) For marine gastropods, including conch, these products must come from production areas that have been approved by the competent authority. The competent authority is responsible for providing guarantees that the sites of production are closely monitored to exclude contamination with certain marine biotoxins that cause shellfish poisoning.
- (d) The authorization of approved vessels for harvesting and approved establishments for processing must be inspected by the competent authority and found to meet European Union requirements. These vessels will be required to record data on where the conch was harvested, and the amount of conch harvested.

Despite not currently having a competent health authority recognized by the European Union in Saint Lucia, the current existence of unrecorded trade between Saint Lucia and Martinique justifies further exploration of this as a priority market for the legal export of BioTrade queen conch. It is recommended that multilateral discussions be initiated that involve the Government of Saint Lucia, OECS, the Regional Council of Martinique and the European Commission. This process should apply not only to queen conch, but perhaps to all marine fisheries, in order to also promote other alternative marine products.

⁶² For more information on export-approved countries, see https://webgate.ec.europa.eu/sanco/traces/output/non_eu_listsPerCountry_en.htm.

⁶³ The legal basis for the listing of third country (non-European Union country) establishments is provided by Article 127 of Regulation (EU) 2017/625, and by Commission Delegated Regulation (EU) 2019/625. For more information, see European Commission, "Non-EU countries authorised establishments", available at https://ec.europa.eu/food/safety/biological-safety/food-hygiene/non-eu-countries-authorised-establishments_en.

Export of queen conch to Martinique will require the submission of the names and specimen signatures of the competent national authorities responsible for fisheries and seafood health and sanitary certification to the Directorate General of Maritime Affairs and Fisheries of the European Commission. One possibility is that authorized exporting entities from Saint Lucia can use the simplified catch certificate⁶⁴ and reporting system to allow for the export of queen conch meat to Martinique.

The simplified catch certificate and reporting system involves the collection of individual fishing vessels stating the date, area fished, fish species and quantity fished. This information will be accompanied by the regular export-permitting procedures that have been established by the country. Experience in developing and implementing a simplified catch certificate system exists in other CRFM countries, such as Belize – thus, the potential exists to build this capacity in Saint Lucia through South–South cooperation.

5.2 United States of America

The United States is also not currently an export market of Saint Lucia, despite being the largest export market for queen conch (CITES, 2021). While some interest in the United States market was expressed by stakeholders (albeit less than the European Union), competing in price⁶⁵ with Central American producers and exporters from Nicaragua and Honduras was deemed a significant challenge to enter this market.

Exporting to the United States market also requires export processing facilities to meet seafood HACCP regulations set under the Food and Drug Administration of the United States. As mentioned above, there are no HACCP-certified facilities in Saint Lucia. In addition, to enable the exportation of queen conch, Saint Lucia would need to comply with the following requirements:

- (a) Designate a national authority for health and sanitary certification, which would have to be registered with the Food and Drug Administration of the United States.
- (b) Develop a seafood HACCP plan for export processing facilities, and audit these facilities under the seven principles of HACCP. Notably, under the Fish and Fishery Products Hazards and Controls Guidance,⁶⁶ *Strombus* conch are considered to have pathogen and natural toxin hazards, and measures to control these hazards must be incorporated into the HACCP plan for exporters (CITES, 2021).
- (c) Data should be collected by the CITES scientific authority and total allowable catch should be established. Additionally, certificates by the CITES administrative authority should be issued.

In both cases, enabling export would require significant collaboration between all stakeholders in the conch industry. Initially, efforts by government regulatory agencies to support relevant certification of processing facilities for health and sanitary requirements, and production areas for sustainability, would be priorities. Further investments in staffing, particularly regarding providing administrative support to the conch value chain, would be needed to enable active export of conch products.

5.3 Regional markets

Demand for conch remains robust across markets in the Caribbean, but it should be recognized that Saint Lucia is the seventh largest producer of queen conch by weight within the CRFM region, and a net importer of queen conch. Further, due to its location Saint Lucia is not proximate to any major Caribbean nation that imports queen conch. For this reason, we do not consider regional (English-speaking Caribbean) markets to have major potential as an export market for Saint Lucian queen conch.

⁶⁴ For more information, see https://webgate.ec.europa.eu/cfcas3/tracesnt-webhelp/Content/Q_CATCH/7.Create%20a%20Simplified%20catch%20certificate.htm.

⁶⁵ Conch fishers participating in serving the United States export market receive \$2.5–\$4 per pound, while prices as high as \$8.5 per pound are paid in Martinique (UNCTAD, 2021).

⁶⁶ For more information, see United States Department of Health and Human Services, Food and Drug Administration, Center for Food Safety and Applied Nutrition (2021).

6. CHALLENGES IN THE SAINT LUCIAN QUEEN CONCH VALUE CHAIN

Here we highlight challenges faced across the Saint Lucian queen conch value chain, including environmental, regulatory and socioeconomic challenges. We work to identify the challenges to see how the BioTrade Principles and Criteria can be used as a framework to address these challenges.

6.1 Environmental challenges

In general, there are major data and information limitations, including habitat maps for both fished and non-fished areas. There is no sustainable catch and effort data with depth estimates, and conch behaviour limits the ability to fine-tune queen conch assessments. Land-based sources of pollution impact on health and availability of suitable habitat, particularly issues of siltation of sea floor and loss of seagrass associated with coastal development. The depth and topography of the sea floor within the Saint Lucia EEZ is also a limiting factor to conduct surveys, and presents a challenge in determining the true status of the stock.

The morphological differences among various queen conch populations in Saint Lucia have implications for management measures. The information on the status of the stocks is still scarce, especially information on density, abundance and distribution. Scarcity of this information limits the reliability of current stock assessments.

Tropical disturbances such as storms and hurricanes that either pass through Saint Lucia or pass close to the island pose a great threat to queen conch recruitment in the seagrass beds, since the strong winds and associated strong wave action and powerful underwater currents completely rip off seagrass from the sea floor, which leaves the juvenile conch exposed to the natural elements, contributing to the high mortality of these animals.

6.2 Regulatory challenges

There is a lack of sustained independent queen conch data collection on species location and abundance, partially due to a lack of resources, but also due to the difficulties associated with diving in deep, turbid Saint Lucian waters. Catch data and some biological data have been collected in the past (last collected in 2008), but the collection of such data has not been sustained after the termination of externally-funded projects. These data are essential for the effective management of the fishery, and also compliance with European Union legislation, to enable access to this lucrative market.

There is queen conch trading by fishers from neighbouring islands who have established business partnerships in Saint Lucia, and so this contributes to cross-border trading of queen conch meat without proper documentation or a CITES certificate. From a management standpoint, there are concerns that the overall value of the fishery may be less than investments to enhance monitoring and data collection. Therefore, there is limited capacity to sustain effective monitoring and evaluation assessments. Information gathered from fishers' interviews indicate that exports of queen conch meat to French territories such as Martinique are done informally, as fishers would sell their catch at sea to middle buyers from Martinique. The extent of the unrecorded catch is undetermined, but this practice poses a difficulty in determining total catch landings from Saint Lucia, so there is also limited opportunity to monitor the value chain.

There is no closed season nor minimum shell length, as there are currently no management measures being implemented. While further research on stock sustainability is needed, further regulation and enforcement may be necessary to ensure long-term sustainability if fishing pressure were to increase.

6.3 Socioeconomic challenges

The use of scuba gear and the depth and time spent underwater for harvesting of queen conch pose a threat to the fishers' health, and is a limiting factor on the number of dives that can be done daily by divers. Another

challenge for divers is the speed of ascent to the surface of the sea after diving for queen conch. If the diver ascends too fast without making the required safety stop, then he may suffer from decompression sickness, which is the main reason fishers leave the fishery. In fact, some divers have reported that they would not encourage close relatives to enter the queen conch fishery, due to the related high risk. Conch divers do not have medical insurance coverage to support treatment for decompression sickness and other medical and hazard risks related to the occupation.

The national infrastructure for processing and marketing of queen conch meat is poor; therefore, fishers generally sell their catch to buyers at the beach/landing site, or they do personal delivery to buyers. In addition, there are no licensed seafood processing plants to process and export queen conch meat in Saint Lucia, due to the lack of certified HACCP facilities.



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7. OPPORTUNITIES AS THEY RELATE TO THE BIOTRADE PRINCIPLES AND CRITERIA⁶⁷

7.1 Towards an effective application of BioTrade Principles and Criteria to the queen conch value chain in the Organisation of Eastern Caribbean States

Recognizing the desire of stakeholders to improve income earned and sustainability of the queen conch value chain in Saint Lucia, this chapter presents opportunities to address the challenges articulated above, using the BioTrade Principles and Criteria as a guide.

In 1996, UNCTAD created the concept “BioTrade”, with a view to highlight the use of biodiversity as a strategy for sustainable development based on the three key objectives of the Convention on Biological Diversity (CBD): conservation of biodiversity, the sustainable use of the components of biodiversity, and the fair and equitable sharing of benefits arising out of this utilization.⁶⁸ “Biotrade” as a concept is defined by UNCTAD as, “activities related to the collection or production, transformation, and commercialization of goods and services derived from native biodiversity (genetic resources, species, and ecosystems) according to environmental, social and economic sustainability criteria called ‘BioTrade Principles and Criteria’” (UNCTAD, 2020).

This set of guidelines is used by businesses, governments and civil society to support conservation and sustainable use of biodiversity, as well as the fair and equitable sharing of benefits through trade. Over the years, the BioTrade Principles and Criteria have been reviewed and updated so that they also build on key principles and objectives of CITES, the Nagoya Protocol on Access and Benefit Sharing, the Ramsar Convention on Wetlands,⁶⁹ the Paris Agreement and other multilateral environmental agreements. Moreover, the BioTrade Principles and Criteria are also aligned and supportive of UNCTAD mandates, including the Nairobi Maafikiano, and aim to contribute to the new post-2020 global biodiversity framework and Bridgetown Covenant, adopted at the fifteenth session of the United Nations Conference on Trade and Development (UNCTAD-15) quadrennial Conference in October 2021.⁷⁰

Currently, the BioTrade Principles and Criteria are promoted and implemented by government organizations, business associations, non-governmental organizations and companies in over 80 countries globally.

The BioTrade Principles and Criteria are applied in different contexts, from assessing social, economic and environmental impacts of a project and guiding elements to be included in a policy, to evaluating supply chains for financial or market initiatives and verifying good practices. As a result, the BioTrade Principles and Criteria lay out the general guidance that can be and has been adapted for specific applications. They can also be applied both at the institutional (such as national or regional programmes) and supply-chain actors’ level (such as business or producer associations). Nowadays, various biodiversity-based value chains can benchmark their sustainability practices against BioTrade Principles and Criteria via the UNCTAD/ITC BioTrade Self-Assessment Tool⁷¹ in a transparent, neutral and independent manner. This service is free of charge.

This chapter seeks to undertake a first analysis of the status of the sustainability and equitability of the Saint Lucia queen conch value chain vis-à-vis the BioTrade Principles and Criteria, and is based on the findings of the report and interviews undertaken. Stakeholders could get a more customized analysis by applying the BioTrade Self-Assessment Tool to obtain a more precise and complete assessment. The chapter introduces the current status

⁶⁷ Since their inception in 2007, the BioTrade Principles and Criteria have been the core foundation that guides the implementation of activities of the UNCTAD BioTrade Initiative, the BioTrade programmes and other related activities. In 2020, the BioTrade Principles and Criteria were revised, complementing the evolving legal and policy framework of BioTrade (UNCTAD, 2020).

⁶⁸ The objectives under art. 1 of the Convention include the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. For more details, see www.cbd.int/convention/text/.

⁶⁹ The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat.

⁷⁰ For more information, see TD/L.435, available at https://unctad.org/system/files/official-document/td-l-435_en.pdf.

⁷¹ See UNCTAD, “BioTrade Knowledge Sharing & Self-Assessment Tool”, available at https://sustainabilitymap.org/biotrade_unctad.

of the queen conch value chain in Saint Lucia, potential application of sustainability and equity guidelines under the BioTrade Principles and Criteria, and presents recommendations to improve its performance.

This benchmarking exercise – coupled with supportive policies and regulations that comply with CITES' required range of actions to legally and sustainably trade queen conch nationally, regionally and internationally – is the first concrete step towards achieving sustainability of the queen conch value chain and related sectors in Saint Lucia. Where such conditions are met and subject to further steps taken to develop/improve this value chain, competitive advantage, conch brand value recognition (for example, through premium pricing and market differentiation), and access to key international markets/customers – while reducing illegal fishing and overfishing, and maintaining healthy fish stocks – could be achievable.

Table 6. Assessment of queen conch value chain in Saint Lucia according to the BioTrade Principles and Criteria

Relevant BioTrade criteria	Status of the queen conch value chain in Saint Lucia	Recommendations for the implementation of relevant BioTrade Principles and Criteria
<p>Principle 1: Conservation of biodiversity</p> <p>1.1 1.3</p>	<p>Government:</p> <ul style="list-style-type: none"> • Saint Lucia has submitted its Revised Second National Biodiversity Strategy and Action Plan (2018–2025). It indicates that conch represents about 8.1 per cent of all fisheries landings (2018) and that there are concerns about declining stocks of conch. • Saint Lucia has a Sectoral Adaptation Strategy and Action Plan for the Fisheries Sector (2018–2028). It mentioned that changes in conch availability will impact on harvesters (both small-scale and semi-industrial). It also indicated that there is an absence of species-specific studies of increasing sea surface temperatures and ocean acidification on queen conch. • Saint Lucia has about 25 marine protected areas that also can serve as nursery sites for conch and other species. It also has at least two local fisheries management areas (revised Fisheries Act; Chapter 7.15 [Saint Lucia, 2001]). • No clarity on the status of the stocks. The latest conch stock assessment was conducted in 2008. There are important data and information limitations to undertaking stock assessments (also related to principle 2). • Although biological data have been collected in the past for this species, the collection of such data has not been sustained after the termination of externally funded projects. • Saint Lucia has regulations against pollution of the aquatic environment (revised Fisheries Act; Chapter 7.15 [Saint Lucia, 2001]). <p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> • There is no record of protocols or practices for conservation or adaptive management by fishers or processors. 	<p>It is recommended that Saint Lucia urgently present missing annual trade reports for the period 2017–2020 in order to align its efforts with compliance requirements under CITES.</p> <p>There is also a pressing need to undertake an up-to-date stock assessment. This is fundamental to be able to set total allowable catch and subsequent conservation and adaptive measures.</p> <p>There is a need to establish a continuous monitoring system for the stock assessments.</p> <p>It will be important to map whether current marine reserves are sufficient to ensure queen conch life cycle in order to maintain stocks or ensure they are below maximum sustainable yield.</p> <p>Interdepartmental/ministerial cooperation and coordination will be needed (supported by stakeholder participation) to implement conservation activities, such as a closed season for queen conch. Information regarding such activities should be compiled and disseminated effectively to maximize efforts.</p>

Source: D. Vivas-Eugui, C. Conteras and M. Dureva (2021).

	Relevant BioTrade criteria	Status of the queen conch value chain in Saint Lucia	Recommendations for the implementation of relevant BioTrade Principles and Criteria
<p>Principle 2: Sustainable use of biodiversity</p>	<p>2.1 2.2 2.3</p>	<p>Government:</p> <ul style="list-style-type: none"> Conch is managed by the revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001). This legislation outlines fisheries management and development, marine reserves and conservation methods, and enforcement. It also contains provisions of minimum criteria to harvest conch (such as sizes and level of maturity), prohibited fishing methods and gear. There is a Regional Queen Conch Fisheries Management and Conservation Plan (FAO, 2017). There is not a national implementing conch management plan in place yet. There is a draft queen conch management plan (2007) with objectives, indicators and reference points. <p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> There is no record of protocols or practices for sustainable use by fishers or processors. 	<p>Based on an up-to-date queen conch stock assessment, there will be a need to undertake the CITES-required non-detriment findings exercise, as well as to put in place a monitoring programme with relevant conservation and sustainable use measures, in case the stocks show signs of deterioration or depletion.</p> <p>Recommendations under the Regional Queen Conch Management Plan have to be implemented nationally.</p> <p>Additional sustainable use, adaptive and ecosystem-based measures besides those already in place could include the setting of seasons, establishment of conch nursery areas, and a simple compilation of best fishing and other practices (use of all parts for bait, fertilizers or handicrafts, etc.) for small-scale and subsistence fishers.</p>
<p>Principle 3: Fair and equitable sharing of benefits</p>	<p>3.1 3.2 3.3 3.4 3.5</p>	<p>Government:</p> <ul style="list-style-type: none"> The main benefit-sharing mechanism is the “market price” in internal and international markets. As there are not clearly established sustainable value chain practices (e.g., BioTrade), there is no chance yet to get recognition from buyers. Saint Lucia is a party to the CBD but not to the Nagoya Protocol. No policies or regulations on access and benefit-sharing of biodiversity were found in Saint Lucia. <p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> There are interesting prices in the United States, Europe and Asian markets, not only for the meat, but also for other parts of the conch. There is no coordinated effort by private actors to list and comply with export market requirements. Fisheries research requires a permit by the Chief Fisheries Officer based on research plans submitted. No reference is made to benefit or results-sharing (revised Fisheries Act, Chapter 7.15 [Saint Lucia, 2001]). 	<p>There is a need to encourage buyers to give a “prime” price for responsible fishers. This could start with restaurants and hotels. For that, a set of best practices needs to be compiled under the BioTrade approach.</p> <p>Establishing long-term mutually beneficial partnerships along the queen conch value chain based on transparency and mutual dialogues (assessment of the actual value of the queen conch as a BioTrade product) could provide opportunities to explore fair sharing of benefits.</p> <p>Non-monetary benefits that could be shared among the stakeholders in the queen conch value chain could be transfer of know-how (e.g., trainings on sanitary practices), capacity-building and information-sharing on studies conducted by the government and/or projects such as the Blue BioTrade project.</p> <p>It is recommended that Saint Lucia become a party to the Nagoya Protocol on Access and Benefit Sharing.</p> <p>The Fisheries Department could consider implementing a set of incentives to private actors to formalize their international trading activities, and to list and comply with export market requirements.</p>

Relevant BioTrade criteria	Status of the queen conch value chain in Saint Lucia	Recommendations for the implementation of relevant BioTrade Principles and Criteria
<p>Principle 4: socioeconomic sustainability</p> <p>4.1 4.2 4.3</p>	<p>Government:</p> <ul style="list-style-type: none"> There is a new Fisheries Policy (draft) 2020 under discussion to enable economic, social and environmental sustainability of the sector. Understanding of BioTrade Principles and Criteria is moderate, but government officials have participated in UNCTAD and OECS capacity-building activities. The revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001) includes regulations on permits and sanitary measures for processing establishments (also related to principle 5). There is limited national infrastructure for processing and marketing queen conch meat. Therefore, fishers generally sell their catch to buyers at the beach/landing site, or they do personal delivery to buyers. The lack of suitable landing sites for the sale of queen conch meat and meat processing poses a challenge to fishers and therefore they would usually sell their catch from the beach or at landing sites for processing. <p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> Despite the higher value and diversification opportunities offered by pearls and alternative use of shells and other parts of animals discarded (viscera, claw, operculum, tips of proboscis, eye stalk and verge), there are limited efforts for further use of them. Understanding of BioTrade Principles and Criteria is very low in the value chain. So far, two specific workshops have been organized by UNCTAD and OECS, but both have been online due to the COVID-19 pandemic. There is little or no evidence that fishers strictly implement and are required to comply with a quality control system. Fish processors are required by law to maintain processing establishments in a clean and sanitary manner, and to keep records of species and quality. They can be subject to inspection (revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001)). There is no system for catch certificates or subsequent traceability systems among fishers or processors. The value chain is not yet ready for any sustainability certification. In this regard, the BioTrade Principles and Criteria offer a first and significant step towards sustainability. 	<p>Awareness-raising at the grass-roots level is important for this new Fisheries Policy (draft) 2020 to have real benefits, and be inclusive and effective. It is recommended to expand and conduct more training activities for a better understanding of the content, application and benefits of BioTrade Principles and Criteria.</p> <p>Simple and visual guidance on best sanitary practices for queen conch harvesting and handling until market needs to be produced and shared with fishers.</p> <p>Fisher cooperatives, once mobilized, may also provide effective platforms for awareness-raising. Per principle 3, these activities should provide incentives to fishers (economic and social as required).</p> <p>Development of a seafood HACCP plan for export processing facilities, and audit of these facilities under the seven principles of HACCP, could improve opportunities for export and increase value added of products.</p> <p>There is a need to explore options for accessible low-cost, simple and small-scale fishers' targeted catch certification and traceability systems for the queen conch value chain. The effort could be led initially by processors, as they can train and support the application by the small-scale fishers on what type of raw material they need.</p> <p>The European Union has simplified systems for catch certificates for imports. That should be explored for use by fishers and producers in Saint Lucia.</p> <p>Support is needed to enable associativity, and to create a queen conch fisherfolk association/cooperative in Saint Lucia, or at the OECS level, to define and consistently apply sound handling, cleaning and sanitary standards.</p> <p>Once BioTrade Principles and Criteria are better understood and applied across the value chain, sharing costs associated with certification of export facilities, through partnerships with producers from Saint Vincent and the Grenadines, could be an advantage to all.</p> <p>In addition, and as a first step, interested stakeholders may also undertake the UNCTAD-ITC BioTrade Self-Assessment Tool⁷² to benchmark their sustainability practices against private, public and international (voluntary) standards.</p>

⁷² Available at www.sustainabilitymap.org/biotrade_unctad.

	Relevant BioTrade criteria	Status of the queen conch value chain in Saint Lucia	Recommendations for the implementation of relevant BioTrade Principles and Criteria
<p>Principle 5: Legal compliance</p>	<p>5.1 5.2 5.3 5.4</p>	<p>Government:</p> <ul style="list-style-type: none"> • Saint Lucia has ratified and is a party to the United Nations Convention on the Law of the Sea, the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, CBD, CITES, the Paris Agreement, and the Ramsar and Cartagena conventions. • Saint Lucia fisheries legislation considers and builds on the FAO Code of Conduct for Responsible Fisheries (revised Fisheries Act, Chapter 7.15 [Saint Lucia, 2001]). • Saint Lucia is member of CBD and CITES. In principle, it complies with CITES requirements in the case of queen conch trade. However, Saint Lucia has not presented annual reports on the review of significant trade since 2016. This is a risk for Saint Lucia as the country may be subject to a trade ban due to lack of responsiveness. • All local fishing vessels must be licensed and special conditions are applied (e.g., permission to use various gear types such as scuba). • The revised Fisheries Act, Chapter 7.15 (Saint Lucia, 2001) contains enforcement and compliance measures. <p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> • There are reports of unauthorized transactions of conch to neighbouring countries and territories, particularly to Martinique. 	<p>CITES export and import permits could be issued electronically to reduce transaction costs, particularly in post COVID-19 circumstances.</p> <p>Digitalization of information on supply chain, fishery management and upgrading of human resources skills could assist in traceability, monitoring and surveillance to mitigate the negative environmental impact of the queen conch fishery (also related to principles 2 and 4).</p>

⁷³ See <https://cites.org/eng/parties/country-profiles/lc/compliance-status>.

	Relevant BioTrade criteria	Status of the queen conch value chain in Saint Lucia	Recommendations for the implementation of relevant BioTrade Principles and Criteria
Principle 6: Respect for actors' rights	6.1	<p>Government:</p> <ul style="list-style-type: none"> Saint Lucia respects fundamental human rights, has a rule of law and Labour Code of 2006.⁷⁴ 	<p>Social protection may need to be extended for fishers, farmers and other informal and vulnerable workers of the value chain. Associativity and/or high-level (at policymaker/regulator level) cooperation/coordination are essential to ensure this happens.</p> <p>Formalization of queen conch fisherfolk harvesting and trade may address the issues of provision of social protection and inclusion. If formalization is considered, this process should be straightforward and accessible, so it does not become a barrier for participation.</p> <p>Special insurance schemes could be developed with the private sector and processors for fishers and other risky professions.</p> <p>Awareness-raising at the grass-roots level is as important as establishing these rights. Saint Lucia could assess the importance of ratifying the International Labour Organization Work in Fishing Convention, 2007 (No. 188).</p> <p>Consultations to validate the findings of this report should be shared and consulted with fishers in an understandable and accessible manner.</p>
	6.2 6.3		
Principle 7: Right to use and access natural resources	7.1	<p>Government:</p> <ul style="list-style-type: none"> Access to the resource is based on a permit system and on a system of local fisheries management, as well as on fishing priority areas (revised Fisheries Act, Chapter 7.15 [Saint Lucia, 2001]). <p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> In principle, fishers comply with legislation, and access to the resource exists without quotas or taking seasons, but cases of IUU fishing have been reported. In the case of conch, transshipment with neighbouring countries such as Martinique is a concern. Fishers apply traditional practices and knowledge that could be beneficial for the fisheries of conch, but they have not been compiled. 	<p>Compilation of traditional practices and knowledge that could be beneficial for the conch fisheries should be compiled and recorded.</p> <p>Management of the queen conch species and its ecosystems should be transparent and inclusive with coastal, local and indigenous communities, the private sector, and the government working collaboratively to respect and enforce tenure rights equitably.</p>
	7.2 7.4		

⁷⁴ Available at www.govt.lc/media.govt.lc/www/resources/legislation/SaintLucialabourCode2006.pdf.

7.2 Key opportunities

As noted above, the queen conch value chain of Saint Lucia has the potential to be developed as Blue BioTrade product. While numerous sustainability guidelines and certifications exist, the application of the BioTrade Principles and Criteria to this value chain should be considered, as it could provide conditions for enhancing environmental, social and economic sustainability in this value chain for all actors. As shown in table 7, the Saint Lucia conch value chain meets several minimum eligibility requirements for marine or Blue BioTrade activities.

The Blue BioTrade concept could be an opportunity for the queen conch value chain stakeholders to (a) demonstrate their commitment to sustainability and equitable sharing of benefits derived from the use of marine resources, while (b) also pursuing value creation and competitive advantage in the global market. Implementation of the BioTrade Principles and Criteria in this regard promotes the advancement of Sustainable Development Goals 2, 12 and 14 on sustainable production and consumption practices.

BioTrade fully supports voluntary standards, including various labelling and certification schemes. While non-compliance with voluntary standards does not necessarily restrict production or exports, complying with certain standards or labelling may facilitate access to coveted consumer segments or distribution chains (UNCTAD, 2018). The BioTrade Self-Assessment Tool⁷⁵ allows companies, cooperatives, producers, projects and institutions to benchmark their current practices against the BioTrade Principles and Criteria in a confidential and independent manner. Actors of the Saint Lucia conch value chain can identify priorities for improvement in environmental social and economic sustainability, and ultimately develop a road map towards achieving these priorities.

In the case of Saint Lucia, verification/certification is envisaged to be mainly used to export to sourcing companies that would like to ensure ethical and responsible sourcing and providers. While BioTrade verification/certification under the UEBT standard, for example, is possible and could be important for accessing higher value end markets, it can also be used to enhance the existing value of one of the primary channels of conch value addition in Saint Lucia, which is culinary tourism. This opportunity, coupled with the international visitors' awareness and willingness to pay a premium for sustainably sourced queen conch products, could be promoted by the Saint Lucia tourism authorities as positive marketing relating to the government's commitment to promote environmental and socially responsible products and practices in the face of growing global concerns about the impacts of unsustainable fishing practices and consumption.

⁷⁵ For further information on this tool that enables BioTrade value chain actors to connect, access information and benchmark their sustainability performance, see UNCTAD, "BioTrade Knowledge Sharing & Self-Assessment Tool", available at https://sustainabilitymap.org/biotrade_unctad. Also, for a quick step-by-step tool on how to access the platform, see https://unctad.org/system/files/information-document/BT_Self-Assessment_Tool_Factsheet_v2-1-1.pdf.

Table 7. Marine/Blue BioTrade minimum eligibility requirements and the conch value chain in Saint Lucia

Minimum eligibility requirements for Marine or Blue BioTrade activities.	Does the Saint Lucia conch value chain meet these requirements?
The activity focuses on material derived from coastal and marine biodiversity (e.g., living coastal and marine species).	Yes, the current and potential products of the queen conch value chain in Saint Lucia are all derived from a living coastal marine species.
The activity does not include the extraction of minerals, such as sands, nor the extraction of metals, oil and gas, or the generation of energy.	Yes, the extraction of queen conch does not include mineral extraction.
The activity does not seek to use or develop genetically modified organisms.	Yes, queen conch is a wild, non-genetically modified marine species.
The activity does not introduce invasive species, and it does not use or foster the use of these species, unless to control the population or mitigate its negative impacts on local ecosystems.	Yes, queen conch harvesting does not introduce or encourage the growth of invasive species.
The activity does not harvest/catch, use, disrupt or otherwise threaten endangered species, including those covered in CITES appendix I and in national and regional endangered species lists.	Yes, while queen conch is listed in CITES Appendix II, Saint Lucia currently adheres to all CITES rules in relation to it, and has a robust system of monitoring CITES certificates, and faces no CITES export bans.
The activity does not contribute to the degradation or transformation of marine and coastal ecosystems, such as the draining of wetlands or the deforestation of coastal areas.	Yes, queen conch harvest methods using scuba are selective catch, producing no by-catch and having no damaging effect on ecosystems through harvest methods. Gill net methods and their impacts may need to be regulated.
The activity does not incorporate or directly support any form of IUU fishing or other illegal activity.	Area of concern. The current active unrecorded trade of conch between Saint Lucia and Martinique represents a potential source of unreported fishing and trading activity. This trade would need to be regularized and monitored, and rules prohibiting such trade should be enforced.
If the activities are done in protected or similar areas, they comply with the requirements defined in the regulations, plans, strategies or programmes applicable to these areas.	Yes, all protected areas are no-take zones in Saint Lucia and fisheries authorities indicate that conch fishing does not happen in the marine protected areas of Saint Lucia.
The organization ensures the respect for human rights and avoids immoral and illegal transactions in business.	Yes. No evidence currently exists of human rights violations or immoral business transactions within the value chain.

Source: Analysis by the authors.

Based on interviews conducted by experts in queen conch fisheries, available data on landings, information on the limited number of commercial divers, photographic evidence of catch and opinions provided by monitoring authorities, the queen conch fishery of Saint Lucia is a small-scale artisanal fishery with relatively low fishing effort.

While we recommend the implementation of several methods and approaches to enhance knowledge on long-term fishery sustainability, the small number of divers and relatively low fishing effort imply less pressure on the resource. However, detailed stock assessments are necessary to make conclusions about stock health.

7.2.1 Environmental opportunities

Principle 1: Conservation of biodiversity

Principle 2: Sustainable use of biodiversity

While current fishing practices do not go against the principle of conservation of biodiversity, opportunities exist to enhance the conservation of biodiversity through the application of the BioTrade Principles and Criteria, under principle 1.1: "Activities contribute to maintaining, restoring or enhancing biodiversity, including ecosystems, ecological processes, natural habitats and species, particularly threatened or endangered species."

There is an opportunity to enhance the population of queen conch through aquaculture and seeding approaches. Recent advances in queen conch aquaculture methods are evidenced in the publishing of a “Queen Conch Aquaculture: Hatchery and Nursery Phases User Manual” by Florida Atlantic University (Davis and Cassar, 2020). Efforts could be made to establish an OECS-wide conch nursery that participates in artificial propagation of young conchs. Artificial propagation refers to the act of artificially breeding or propagating seafood to increase the survival rate of offspring, for the eventual stocking or placement of offspring in the wild to grow to adulthood and commercially viable sizes.

Stock assessments and continuous monitoring need be undertaken on a more consistent basis to determine maximum sustainable yield or another reference point to allow for sustainable management, and to develop a national/regional management plan.

Current fisheries legislation has clear provisions for the enactment of a closed season for conch (even if one is not currently imposed). Enacting a closed season requires the publication of a notice by the minister responsible for fisheries in the National Gazette. This statute should be viewed as an opportunity to enhance the long-term sustainability of the fishery, as enacting a closed season does not require the development of new legislation. A closed season during the time of conch breeding and spawning in the months of July and September would be ideal.

Saint Lucia should be recognized for its robust collection of landing data from 11 landing sites across the island. Conch landing data are collected monthly at each site by extension officers, who note landed volumes and values. These monitoring data provide a sound foundation for the enhancement of data collection efforts to comply further with requirements for access to external export markets, especially the European Union, which are explained in more detailed below.

7.2.2 Regulatory opportunities

Principle 5: Compliance with national and international legislation

Principle 7: Clarity on right to use and access to natural resources

The Saint Lucia Department of Fisheries is the current CITES focal point and the body responsible for the issuance of CITES certificates. The submission of historical CITES reports from 2017 to 2020 is needed to align current efforts with compliance under CITES requirements, as Saint Lucia currently risks a recommendation to suspend trade if this is not urgently addressed. Efforts must be taken to verify imported amounts through the submission of trade data to the CITES secretariat in a timely manner. The BioTrade Principles and Criteria can assist in improving CITES compliance and enhance internal coordination for CITES reporting.

7.2.3 Socioeconomic opportunities

Principle 3: Fair and equitable sharing of benefits derived from the use of biodiversity

Principle 6: Respect for the rights of actors involved in BioTrade activities

Regarding the sharing of benefits derived from biodiversity, as indicated in the value chain map (figure 9), very few steps separate fishers harvesting from the final consumer in the Saint Lucia value chain. Local fishers receive between EC\$10 and EC\$15 per pound for their product, which is sold typically for EC\$23 per pound at retail outlets, and for EC\$20–EC\$25 per 200 g portion by local restaurants. This means that fishers receive between 21 and 43 per cent of the final sale value of the conch. Fishers in Saint Lucia also receive comparatively higher prices for their catch than do fishers of conch imported from Saint Vincent and the Grenadines. Female participation is highest towards the end of the value chain, where much of the value is added, suggesting fair and equitable sharing of benefits within Saint Lucia.

It is worth noting that stakeholders consistently expressed a desire to receive support to access export markets. Accessing external markets, particularly Martinique, was articulated by stakeholders (fishers, processors and private sector actors) as a priority for enhancing income earned by fishers, processors and retailers alike. Importantly, stakeholders recognized that this would require further regulation of the industry, including potentially

closed seasons and catch limits. Despite the need for further regulation, stakeholders expressed support for this, provided that it enabled access to high-value end markets. This collective interest across scale and actor type must not be undervalued as a strength of this value chain, and should be leveraged through further collaboration between national stakeholders, OECS, CITES and UNCTAD under this project.

Principle 4: Socioeconomic sustainability

Several opportunities exist to reduce costs, reduce waste and maximize value within this value chain, all of which would enhance the long-term socioeconomic sustainability using principle 4 of the BioTrade Principles and Criteria as a guide.

7.2.4 Improving processing efficiency

Processing of conch involves multiple steps, including deshelling (knocking of conch and severing of spinal cord), removal of the operculum, removal of the visceral bag, washing/scrubbing to remove sand and other residue, removal of proboscis tips, filleting and tenderization. An opportunity exists to improve processing efficiency through specialization in processing steps, and the introduction of mechanization in certain steps.

Also, in the seafood markets, fresh produce also tends to have higher prices, but there is a need to have meticulous temperature control systems, dependable cold storage units/facilities and effective HACCP systems. This would reduce losses through spoilage of product, and thus enhance socioeconomic sustainability of the fishery.

7.2.5 Maximizing value of the by-products of conch meat production

Improving the use of conch meat trimmings across all stages of the value chain must be capitalized upon to maximize the value of conch processed in Saint Lucia. Some interviewed stakeholders are producing value added products such as conch sausages in Saint Lucia. Techniques used to create these value added products represent an important resource that, if collectively shared across other processors and project countries, could enhance value added and use of all conch parts across the value chain.

As noted in the value chain analysis, conch operculum is neither collected nor traded by processors in Saint Lucia, due to a lack of recognition of the price premium paid for this by product and the disaggregated nature of processing operations preventing the collection of export-worthy volumes of this by-product. Caribbean conch operculum⁷⁶ carries a price premium in East Asian markets, yet is typically discarded during processing as a by-product in Saint Lucia. Conch operculum is not subject to CITES non-detriment findings and thus does not require CITES export certificates. Thus, the collection of this resource by processors in Saint Lucia and the organization of collective export presents a significant opportunity to increase income from current production without expanding harvest levels. The centralization of collection of the operculum by one exporter, such as Lucian Blue Ocean Seafoods, would allow for the collection of export-worthy volumes of this resource. This should be further discussed with Saint Lucian stakeholders in consultations, to identify the appropriate mechanism to commercialize this by-product in a fair and equitable way.

⁷⁶ A hard, sickle-shaped structure at the tip of the foot used for locomotion. Also known as “claw” and “foot” (Stoner et al., 2013).

8. RECOMMENDATIONS AND CONCLUSIONS

While the queen conch fishery in Saint Lucia faces several challenges, the potential for the further development of the value chain with a focus on regional export (French Caribbean) and local culinary tourism markets, while enhancing sustainability, is strong. These recommendations should be presented to Saint Lucian stakeholders for validation and prioritization of actions to activate them through the regional plan of action.⁷⁷ While this report is specific to the Saint Lucian conch value chain, these recommendations are considered within the context of the Blue BioTrade in the OECS project.

National queen conch export task force: Development of a national queen conch export task force, with a focus on regularizing the current trade with the European Union through Martinique. This may be done through the formation of a multi-stakeholder task force to discuss the steps necessary to regularize the current active unrecorded trade with Martinique. This task force would include all stakeholders across the value chain, but would initially require significant government involvement, as it requires high-level international cooperation between the authorities in Martinique and Saint Lucia. Martinique is an associate member State of OECS; thus, raising these issues within this cooperation forum could be one entry point.

Explore cost-saving economic cluster approaches with other OECS members: It is recommended that the governments and fisheries divisions of participating project countries work closely together to capitalize on geographic proximity through cost-sharing schemes.

- (a) **Cost-sharing for data collection and stock assessments:** It is recommended that these cost-sharing schemes first focus on data collection and stock assessments. Specifically, it is recommended that biannual assessments of the queen conch stock should be conducted in all fishing grounds, across project countries. This field study will help to determine the population structure, abundance and distribution of the queen conch throughout the island. The structure of the population allows for the fishery managers to visualize trends in the composition of the variously sized classes over time. This information is especially important to understand the fishery recruitment patterns, and determine what proportion of the population is available to the fishery, based on established performance indicators such as size limits or lip thickness. The density information is important not only to ensure compliance with the CITES minimum density recommendation of 88 individuals per hectare, but the information generated is also used to determine a total allowable catch limit. This limit ensures that the fishery is not overfished, and that the survival of the species is not put at risk.
- (b) Provided success in cost-sharing for stock assessments, collaboration could potentially be expanded to include **cost-sharing of certification to access external markets**, marketing costs, monitoring and enforcement costs, and even resource-sharing, through vessel day schemes.

Seek innovative finance and support small and medium-sized enterprises in both the harvest and post-harvest sectors: Financial support is necessary for small and medium-sized enterprises focused on improving harvest and post-harvest safety and efficiency:

- (a) In the harvest sector, investment is needed in cold storage, cold chain management and dive safety gear. Technical support and small credit lines could also be provided by the Caribbean Development Bank or Caribbean Export to improve the cold storage and cold chain management of specific exporters or processors.
- (b) Investment in health-related dive insurance is also needed. An example of a positive and potential best practice case that could be adapted to health-related dive insurance is the Caribbean Oceans and Aquaculture Sustainability Facility (COAST), a parametric insurance project launched in Grenada and Saint Lucia that is being implemented by the Caribbean Catastrophe Risk Insurance Facility and the World Bank. Under this parametric insurance facility purchased by the national Government, payouts are made to fishers based on the occurrence of a predefined level of hazard and impact. Once the predefined level of hazard (such as wind speed or storm surge level) has occurred, payouts are made to fishers, depending on the level

⁷⁷ Under the Blue BioTrade Project, a regional plan of action is to be articulated in 2022.

of modelled loss up to a predefined limit. The implementation of similar insurance facilities at a smaller scale should be explored for conch fishers, due to the unique health risks associated with scuba fishing.

- (c) In the post-harvest sector, investment is needed in processing facilities, techniques, HACCP, and sanitary and phytosanitary certification at the national and regional levels. Innovative financial mechanisms focused on enhancing safety and improving sustainability for export access could offer attractive investment options to those interested in environmentally and socially responsible investments (such as via blue bonds and blended investment schemes). Such investments could be structured in such a way that payouts to investors are contingent on achieving certain minimum sustainability requirements, via the BioTrade Self-Assessment Tool.⁷⁸ Further, investments could be built to capitalize on accessing high-value export markets, where payouts to investors are not required until export market access is achieved.
- (d) Investment is needed in renewable energy solutions to combat high energy and operation costs associated with cold storage. Large processors – such as Lucian Blue Ocean Seafoods and Francis Fish and Seafoods – would benefit significantly from investments in renewable energy, and both have expressed interest in using these solutions.

Apply the BioTrade Self-Assessment Tool as a part of stakeholder engagement activities: The application of the BioTrade Self-Assessment Tool by fisheries cooperatives and processors, such as Lucian Blue Ocean Seafoods, would allow for deeper understanding of the level of implementation of the BioTrade Principles and Criteria by stakeholders involved in the various stages of the value chain:

- (a) The application of this self-assessment tool will enable the actors within the Saint Lucia queen conch value chain to understand the strengths and weaknesses of the value chain against important social, economic and sustainability criteria.
- (b) The collective implementation of this tool will allow actors to understand how far they are from important sustainability criteria and, in doing so, allow for the identification of important actions to improve the position of the value chain in the future of action for queen conch in OECS.
- (c) The self-assessment tool can also help in the development of a road map towards specific certification, such as UEBT certification.⁷⁹

Maximizing value addition through promotion of BioTrade conch as a culinary tourism attraction: Queen conch serves an important role within the Saint Lucian cultural and culinary tourism product. The application of the BioTrade Principles and Criteria and the implementation of improved traceability protocols can enable the further marketing of conch products to tourists. “BioTrade conch” can play an even greater role in the promotion and marketing of Saint Lucian tourism, and provide greater recognition for this product.

Pursuing HACCP certification for businesses such as Lucian Blue Ocean Seafoods as a key facility for national conch processing and for regional conch exports: Lucian Blue Ocean Seafoods is a private fish processing facility with 35 employees operating out of Castries. This facility has strong relationships with Saint Vincent and the Grenadines, purchasing conch directly from the fish processing facilities there as well as from Saint Lucian Fishers. Operators of this facility have expressed interest in accessing export markets which require HACCP certification. In the south of Saint Lucia, Francis Fish and Seafoods is a company with 13 employees which also has strong potential for HACCP certification. The possibility of one or both of these companies acting as the primary processing sites for conch in Saint Lucia for OECS should be further explored as a way of maximizing income earned by the resource through cost savings. This business should also pursue the application of the BioTrade Self-Assessment Tool, as a first step towards becoming a BioTrade business.

Reducing waste and adding value through centralization of processing and/or collection of by-products: Commercializing by-products of conch processing represents an opportunity to increase income, which requires the centralization of processing efforts in Saint Lucia, in a HACCP-certified facility. Lucian Blue

⁷⁸ See UNCTAD, “BioTrade Knowledge Sharing & Self-Assessment Tool”, available at https://sustainabilitymap.org/biotrade_unctad

⁷⁹ See www.ethicalbiotrade.org for more details.

Ocean Seafoods, a large seafood processor, represents a potential facility for centralization of processing efforts. In this context, the following by-products should be formally developed in this value chain:

- (a) **Conch meat trimmings:** Conch trimmings have demonstrated potential for value addition, yet are not fully utilized across the value chain; best practice processing methods for conch sausages, burgers, stewing meat and other products should be identified and shared.
- (b) **Conch operculum:** Caribbean conch operculum⁸⁰ carries a price premium in East Asian markets, yet is typically discarded during processing in Saint Lucia. Centralization of processing or the centralization of collection would allow for the accumulation of export-worthy volumes of this valuable by-product.

Implementation of low-cost traceability solutions: Traceability is the ability to access information about a seafood product through the value chain. It is increasingly important for addressing sustainability requirements, combating IUU fishing, combating seafood fraud and accessing external markets such as the European Union market (Lewis and Boyle, 2017). Several private and public sector solutions to seafood traceability exist, including unique software and hardware. Here we recommend a low-cost (and potentially multi-species) traceability solution using smartphones be implemented, which is compatible with export markets, and will be targeted by Saint Lucian stakeholders.

Revision and implementation of a draft national queen conch management plan: Saint Lucia should revise its draft national plan for queen conch management and establish queen conch meat conversion factors as recommended by CITES Decisions 18.275-18.280.⁸¹ A management plan is important to clearly define the strategy for the management of the fishery, including performance indicators such as maximum sustainable yield or other target reference points, and limit reference points for the fishery. The conversion factor to reverse-calculate queen conch meat to live weight (with the shell included) ensures that trade in comparable live weights of queen conch can be reported, and that weight estimates reflect the catch traded. In the FAO queen conch regional plan, the agreed processing grade conversion factors are recommended: dirty meat = $\times 5.3$, half clean = $\times 7.9$, and clean = $\times 13.2$ (FAO, 2017).

Enhancement of current data collection structures: Saint Lucia has good data collection of landing volumes and values across national landing sites by the extension offers of the Department of Fisheries, providing a foundation for the expansion of data collection at low cost. Data collection efforts should be focused on:

- (a) A data collection programme to collect CPUE and biological data at its main landing sites: Fishing effort is a key variable, particularly because most models use CPUE as a measure of abundance.
- (b) Generation of habitat maps at the scale necessary for better fisheries management: The identification of current queen conch fishing grounds through the participation of fishers' local knowledge, biologists, researchers and others is very important for the proper implementation of underwater surveys that produce queen conch density and abundance estimates for the calculation of total allowable catch limits, which currently do not exist. Saint Lucia should develop these habitat maps to improve the management of the fishery.

Retaining value of legally discovered conch pearls: While rare, conch pearls are found by fishers and processors of conch in Saint Lucia. These pearls are often sold to foreign buyers, who eventually auction pearls in end markets for significant markups. Introducing basic pearl appraisal techniques, in addition to the legal requirements for export to the fishers and processors, could enhance the value retained within Saint Lucia of this by-product. Additionally, OECS level training in advanced pearl appraisal, and centralizing the sale of conch pearls discovered legally in the OECS market through regionally organized auctions, could improve the position of Saint Lucian stakeholders in the pearl value chain.

⁸⁰ A hard, sickle-shaped structure at the tip of the foot used for locomotion. Also known as "claw" and "foot" (Stoner et al., 2013).

⁸¹ Available at <https://cites.org/eng/taxonomy/term/42100>.

ANNEX I.

INTERVIEW QUESTIONNAIRE FOR KEY INFORMANTS IN THE QUEEN CONCH VALUE CHAIN

Name:

Gender:

Location:

Age:

Introductory questions:

1. What is your name and role in the conch industry?
 - a. Are you a part-time or full-time conch fisher?
2. How long have you been in this role?
3. Do you own your own business or boat, and is it registered (government entity, private entity, community-based organization, other)?
4. How many people do you employ and/or work with you?
 - a. How many are women?

Production questions:

5. What are the total start-up costs for a conch diving operation?
6. What months do you fish conch?
7. How many fishing trips do you take per month during the conch season?
8. What is the average landing in weight per trip?
9. What are the geographic areas in which you fish?
10. Have you noticed any changes in the amount of conch available in the sea?
 - a. More
 - b. Less
 - c. Same
 - d. Comments:
11. To whom do you sell your products? At what average cost?

Challenges:

12. What are the main challenges you face in the conch industry?
 - a. Environmental:
 - b. Economic:
 - c. Regulations:

Opportunities:

13. What are the main opportunities to increase income in the conch industry?

Information flows and gender:

14. Do you employ women in your operations? What role do they play in the conch industry?
15. Is there any information/special knowledge that gives you an edge in this industry? What advantage do you have?
16. What information do you think would help you improve your income/position in the industry? What information can we provide?

Draft map validation and closing:

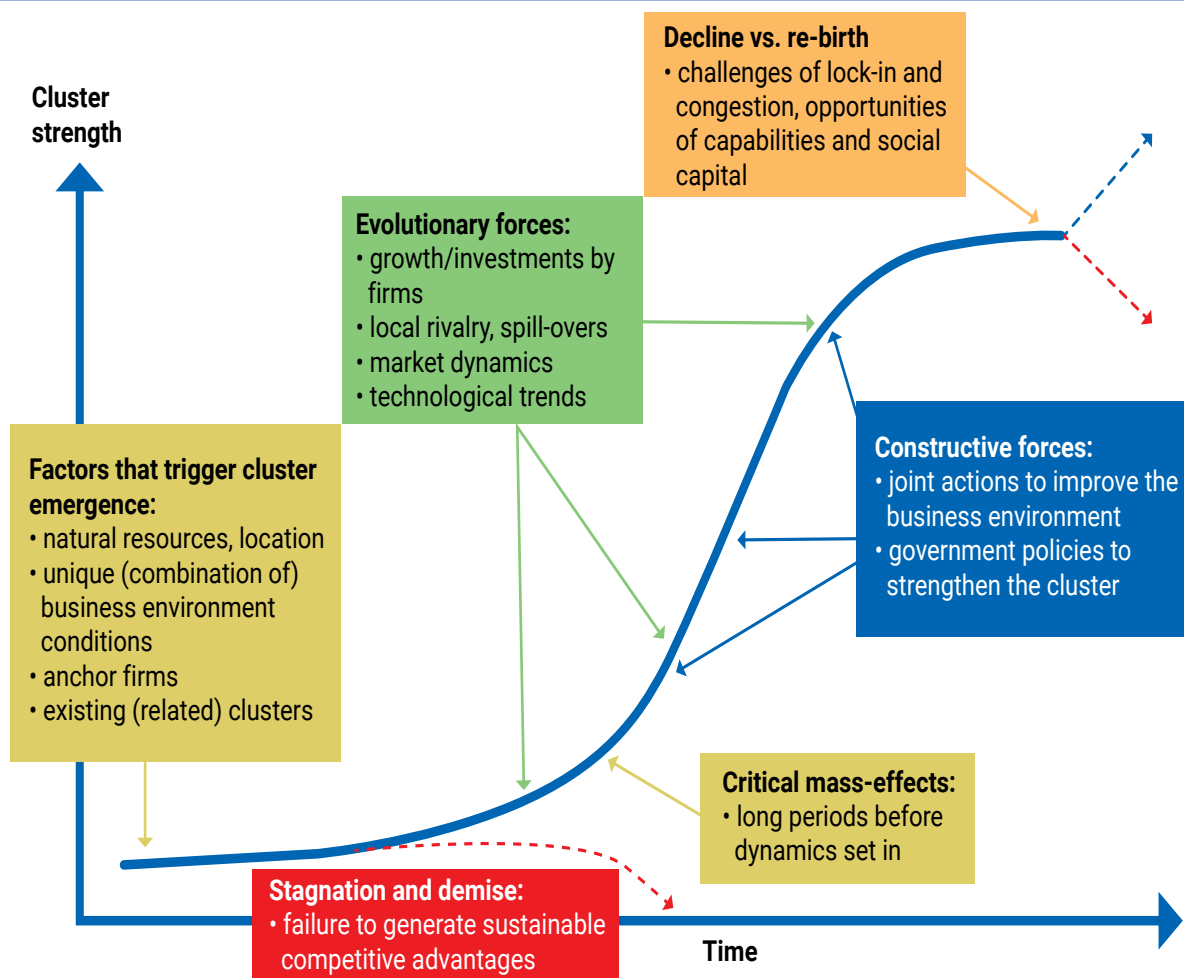
17. When you look at this diagram of the industry, do you think we are missing any key stakeholders?
18. For what other actors in the industry could you give us contacts?
19. Do you have any other data or information you would like to share about your role as a stakeholder in the conch industry?

ANNEX II. CREATING A CONCH ECONOMIC CLUSTER TO LEVERAGE COMPARATIVE ADVANTAGES OF PROJECT COUNTRIES

While this report is specific to the Saint Lucia conch value chain, it has been considered within the context of Blue BioTrade in the OECS project. The three project countries are geographically clustered, and share many similar strengths and opportunities that could be capitalized on if they act as a formal economic cluster. In the case of the conch industry, actors and countries could share costs associated with improving export access, marketing costs in new markets, and costs associated with data collection and management. Confronting challenges collectively represents one of the greatest opportunities for the Saint Lucia conch value chain.

Clustering with other project countries and other OECS producers would also enable Saint Lucia to overcome the challenge of limited access to external markets, while leveraging its comparative advantage of proximity to high-value export markets.

Figure 22. Evolution of clusters



Source: (Ketels, 2017). The queen conch fishery of Saint Lucia, combined with the fisheries of Saint Vincent and the Grenadines and Grenada, represent an emergent geographic cluster that could collaborate to share costs and maximize export earnings.

A. Cost-sharing opportunities

Many opportunities exist to grow the strength of the Saint Lucia conch industry as a part of an OECS conch economic cluster. Firstly, the costs of stock assessments could be shared across project countries. Due to the close geographic proximity of project countries and high costs associated with stock assessments, project countries, in association with other queen conch-producing OECS countries, should seek to establish an OECS stock assessment unit to share costs. This unit could rotate a small pool of competent officers in stock assessments, across geographies, reducing individual countries' permanent staffing needs.

B. Acting as a regional export centre to the French Caribbean

As noted in the Stakeholder Maps of the Conch Value Chains of Grenada, Saint Vincent and the Grenadines and Saint Lucia, "Saint Lucia's proximity to the important market of Martinique is an important opportunity for Saint Lucia's participation in the regional conch trade, even beyond conch caught in its own waters. Focusing on geographically proximate export markets and local value added goods would significantly increase total income earned at all levels in this value chain. Conch fishers serving the United States export market receive \$2.5–\$4 per lb., while prices as high as \$8.5 per lb. are paid in Martinique" (UNCTAD, 2021).

Sharing costs associated with HACCP certification of export facilities and certification for European Union export through partnerships with producers from Saint Vincent and the Grenadines could be advantageous to both countries. Saint Lucia can act as a major legal and processing centre for conch destined for Martinique and export, provided there is close collaboration with other OECS members and conch producers. The business relationships and cultural connections between Saint Lucia and the French Caribbean present an opportunity for all actors in this project. In an idealized formulation (which does not currently exist, but could be developed through further collaboration), conch imported to Saint Lucia from Saint Vincent and the Grenadines and Grenada can be processed in Saint Lucian European Union-authorized export facilities for export to the French Caribbean.

C. Expansion of production provided stock assessments through vessel day schemes

Further, if stock assessments (once completed) indicate the fishery can support additional harvest, fishers from Saint Vincent and the Grenadines could collaborate in the harvest of Saint Lucian conch through resource-sharing agreements and vessel day schemes such as for tuna in the Pacific Islands Forum Fishers Agency. In such a vessel day scheme, OECS-wide boat owners can purchase fishing rights from the government for specific areas and specific time periods, calculated in such a way that the number of vessel days does not exceed sustainable fishing pressure, based on stock assessments and regular data collection.

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