

Blue BioTrade in Saint Vincent and the Grenadines: Developing value for the sustainable trade and production of Queen conch in the Eastern Caribbean

DRAFT Country case study for comments

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Notes

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Explanatory notes

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

Reference to “\$EC” indicates the Eastern Caribbean dollar.

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”.
Reference to nautical miles is represented by “NM”.

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

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



Contents

Executive summary.....	vi
I. Introduction and overview.....	1
A. Background	1
B. Blue BioTrade Principles and Criteria.....	2
C. Method	3
II Product assessment	4
A. Local product assessment.....	5
III Analysis of regulatory frameworks and management plans	6
A. National regulations and management plans.....	6
B. Institutional Actors.....	11
IV Value chain analysis.....	13
A. Overview	13
B. Geography of the value chain	13
C. Updated Value chain diagram-	16
D. Pre-harvest.....	16
E. Harvest.....	17
F. Post-harvest.....	17
G. Processing	20
H. Retailing	21
I. Other conch products - Conch trimmings, shells, operculum, and pearls.....	23
J. Pricing.....	25
K. Gender in the queen conch value chain	26
V. Export and market access potential	27
A. Conch meat.....	27
B. Value added conch products	28
C. Conch trimmings.....	28
D. Conch Operculum	29
E. Health standards and export requirements.....	29
VI Challenges in the Saint Vincent and the Grenadines queen conch value chain.....	31
A. Environmental challenges.....	31
B. Socio-economic challenges.....	33
C. Regulatory and institutional challenges.....	35
VII. Opportunities, as they relate to the BioTrade Principles and Criteria.....	36

D. Towards an effective application of BioTrade Principles and Criteria to the queen conch value chain in OECS	36
E. Key opportunities under the implementation of UNCTAD’s BioTrade Principles and Criteria	47
VIII Recommendations and conclusions	50
References	52

Figures

Figure 1 Map of St. Vincent and the Grenadines (Source: Worldatlas.com)	1
Figure 3 Mustique fishing camp (Source: Alexander Girvan, 2021)	14
Figure 4 Mustique fishing camp (Source: Alexander Girvan, 2019)	15
Figure 5 Main steps of queen conch processing, and price of main products sold from the queen conch (Source: Authors own elaboration)	20
Figure 6 Anatomy of an adult female queen conch. Male is similar except has verge.	21
Figure 7 Menu from Coco’s Place restaurant, Bequia, showing prices for a variety of conch dishes.	22
Figure 8 Villamar Ltd. 16 fluid ounces pre-packaged, frozen callaloo and conch soup sold at Bonadie Ltd. supermarket in Saint Vincent. (Source: Bonadie Ltd. supermarket’s Facebook page)	23
Figure 9 Various Tones of Conch Pearl (Source: emeraldsinternational.com)	24
Figure 10 Conch landing prices and export prices for the period 2015-2019	26
Figure 11 Description of gender roles in Saint Vincent and the Grenadines’ queen conch fishery value chain	27
Figure 12 Conch landings versus exports by weight for Saint Vincent and the Grenadines, 2015-2019 (Source: Fisheries Division, 2022)	28

Tables

Table 1 Level of implementation of WECAFC recommended management measures taken by Saint Vincent and the Grenadines to date	7
Table 2 Roles of institutional actors in the queen conch value chain of Saint Vincent and the Grenadines	11
Table 3 Diagram describing the Queen conch value chain of Saint Vincent and the Grenadines (Authors own elaboration)	16
Table 4 Main input costs and concessions provided by the government of Saint Vincent and the Grenadines	17
Table 5 Description of conch processing grades (Source: Hutchinson and Girvan, 2021)	20
Table 6 Estimates of conch landed and marketed in Saint Vincent and the Grenadines, 2015-2019	25
Table 7 Value of Exports (US\$) for Value-added conch products 2018-202 (Source: Saint Vincent and the Grenadines Fisheries Division, 2022)	28

Table 8 Volume and Values of Conch Trimming exports From Saint Vincent and the Grenadines from 2019-2021 (Source: Saint Vincent and the Grenadines Fisheries Division, 2022) 29

Table 9 Assessment of queen conch value chain in Saint Vincent and the Grenadines according to the BioTrade Principles and Criteria..... 37

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
FAO	Food and Agriculture Organization of the United Nations
HACCP	Hazard Analysis Critical Control Point
IUU	Illegal, unreported and unregulated (fishing)
NBSAP	National Biodiversity Strategy and Action Plan
OECS	Organisation of Eastern Caribbean States
TCMP	Tobago Cays Marine Park
UNCTAD	United Nations Conference on Trade and Development
WECAFC	Western Central Atlantic Fishery Commission

Executive summary

Saint Vincent and the Grenadines is a multi-island state comprised of the mainland (Saint Vincent) and seven inhabited islands of the Grenadines, Bequia, Mustique, Union Island, Canouan, Petit Saint Vincent, Palm Island and Mayreau (see Figure 1). As an archipelagic state in the Caribbean, with an Economic Exclusive Zone (EEZ) 79 times larger than its land area, its economy has strong connections and reliance on ocean products and industries. The queen conch fishery is currently one of the most important fisheries in Saint Vincent and the Grenadines accounting for 62.7 per cent of total fisheries exports in 2020 bringing in \$3,329,937 (EC\$8,990,832¹).

Within the Eastern Caribbean, Saint Vincent and the Grenadines has the fastest growing queen conch industry of the past five years in terms of production, and investment in production capacity. In 2020 Saint Vincent and the Grenadines was the second largest producer of queen conch in the Organisation of Eastern Caribbean States (OECS) region after Antigua and Barbuda.

While these increases in queen conch production have had notable and positive socio-economic impacts in Saint Vincent and the Grenadines, they bring potential challenges in the areas of stock sustainability, the equity of socio-economic impacts and potential opportunities in terms of value addition and improving access to high value export markets. Further, due to geographic proximity to other queen conch producers, which face similar challenges and have unique comparative advantages, there are opportunities for enhanced associativity.

In response to these challenges and opportunities, the United Nations Conference on Trade and Development (UNCTAD), the 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 BioTrade² Principles and Criteria (2020)³ to the marine environment, focusing on the queen conch value chain in the countries of Grenada, Saint Lucia, and Saint Vincent and the Grenadines, launched in October 2020.

This case study presents the value chain analysis of the queen conch production in Saint Vincent and the Grenadines. It builds on a 2021 stakeholder map of the queen conch value chain of Grenada, Saint Lucia and Saint Vincent and the Grenadines⁴. It is the final of three (country case studies) to be produced under the Blue BioTrade Project. These case studies will contribute to the development of a regional Blue BioTrade Action Plan at a regional workshop to be held in mid-2022.

¹ Exchange rate US\$1 = EC\$2.70; April 19, 2022

² UNCTAD BioTrade 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'. See UNCTAD BioTrade Principles and Criteria (2020).

³ The BioTrade Principles and Criteria (P&C) have been the core foundation that guide the implementation of activities of the UNCTAD BioTrade Initiative, the BioTrade programmes and other related activities since their inception in 2007. In 2020, the P&C were revised complementing the evolving legal and policy framework of BioTrade. See [UNCTAD BioTrade Principles and Criteria \(2020\)](#).

⁴ Stakeholder maps of the conch value chains of Grenada, Saint Lucia and Saint Vincent and the Grenadines https://unctad.org/system/files/official-document/ditctedinf2021d4_en.pdf

This report is divided into eight chapters. Chapter I provides an introduction and overview of the approach taken by the case study. Chapter II provides a product assessment, looking at the biology and location of the Saint Vincent and the Grenadines queen conch stock. Chapter III analyses the regulatory, management and institutional frameworks in Saint Vincent and the Grenadines as they relate to the queen conch fishery. 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 sustainably 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.** Queen conch is the main seafood product landed in Saint Vincent and the Grenadines by total value accounting for 25 per cent of total value of all seafood landed in 2020 and 70 per cent of total fisheries exports in 2019. The queen conch fishery has expanded significantly in the past five years creating some potential sustainability concerns that may be considered at the next meeting of the CITES Animals Committee under the Review of Significant Trade process.
- ii. **Trade.** Queen conch is largely harvested for commercial export of its meat. Annual exports of queen conch meat averaged approximately 18,600 kg from 2010-2016 and increased since 2016 to a peak of 334,855 kg in 2019. According to CITES export certificates, the primary markets for queen conch from Saint Vincent and the Grenadines are the United States of America (47 per cent), Dominica (31 per cent), and Saint Lucia (18 per cent).
- iii. **Gender.** Like many fisheries value chains in the Caribbean, men are predominantly involved in the pre-harvest and harvest stages of the queen conch value chain in Saint Vincent and the Grenadines. In the post-harvest stage, both men and women are involved in the processing of queen conch in Saint Vincent and the Grenadines. Women are also involved in the sale of prepared queen conch, but this is not a major channel of product use in this value chain.
- iv. **CITES compliance.** Saint Vincent and the Grenadines acceded to CITES on 30 November 1988. CITES annual reports were submitted by Saint Vincent and the Grenadines every year 2010-2019. Export quotas for queen conch have never been published by Saint Vincent and the Grenadines.
- v. **Stock assessments.** Aware of the risks associated with increasing production, the Marine Foundation project, funded by the Saint Vincent and the Grenadines Environment Fund in partnership with the Ministry of Agriculture and Fisheries has begun a stock assessment exercise for the queen conch and lobster fisheries. This stock assessment, which began in February 2022, is to be used to inform management plans for these fisheries.
- vi. **Investment.** Since the \$4.6 million Project for Improvement of Fishery Equipment and Machinery in Saint Vincent and the Grenadines,⁵ and the subsequent improved access to external markets through construction of the Argyle International Airport, the fishery has produced an additional

⁵ For more information see: <https://www.tt.emb-japan.go.jp/SVG%20Fisheries%20%20Industrial%20Products%20Press%20Release.pdf>

\$8.3 million in production value when compared to average pre-2017 levels of conch trade, demonstrating the potential returns to fisheries investment.

- vii. **Health certifications.** Based on stakeholder interviews, individual capacity in operating healthy processing facilities using HACCP principles and approaches is high. Unfortunately, while many facilities have HACCP trained individuals, none of the approximately **five processing facilities currently have official HACCP certification.**

(b) Main opportunities

- i. **Establishment of a queen conch nursery for conch aquaculture.** Due to its central location amongst project countries and large amounts of suitable queen conch habitats, the cost effectiveness of establishing a conch nursery in Saint Vincent and the Grenadines should be further investigated. Sufficient demonstrated science of conch aquaculture exists in the region. Collaboration with research institutions should be further explored. A nursery, located in the country could provide benefits for all OECS countries due to the reproduction and migratory patterns of conch in the Caribbean basin. Such a project could be approached from a regional perspective. Importance of the potential role of a queen conch nursery as a contributor to environmental and economic sustainability of the industry, and the socio-economic resilience of fishers should be emphasized prior to exploration of this avenue as an avenue for commercial production and trade. Involving local communities in data collection, collection of egg masses, and enforcement of potential no-take zones and closed seasons should all be considered in future consultations that discuss a queen conch nursery.
- ii. **Domestic investment in data collection on queen conch stocks.** In February 2022, the Saint Vincent and the Grenadines Environment Fund in collaboration with the Ministry of Agriculture and Fisheries engaged the Blue Marine Foundation to examine the general biodiversity of fish in the waters of the country, with the main focus being on conch and lobsters.
- iii. **Distributed landing site infrastructure.** Queen conch landing sites are distributed across the islands of Saint Vincent and the Grenadines, allowing for the distribution of harvest efforts and benefits derived from queen conch resources.
- iv. **Shell stockpiling.** The stockpiling of queen conch shells across Saint Vincent and the Grenadines presents both a challenge and an opportunity, as large volumes of shells may have eventual value for climate change ecosystem-based adaptation projects in coastal areas e.g., discarded conch shells can be marketed as a natural construction material for coastal engineering and for coral reef restoration.

(c) Main challenges

- i. **Water scarcity in the face of climate change.** The processing of queen conch requires freshwater for the washing and cleaning of the conch prior to sale and packaging. In the Grenadine islands, almost no natural watercourses exist, and residents rely on rainwater or desalinated water for general purposes. Additionally, climate change is expected to increase rainfall variability, putting further pressure on water resources and potentially presenting a challenge to conch processing in the Grenadine Islands.
- ii. **Shell stockpiling.** Processing of queen conch produces large volumes of shells that were historically dumped nearshore in conch piles. While this practice has largely been discontinued, historical conch piles are considered an eyesore on islands where tourism activities play an important role in the local economy, such as Canouan and Mustique. It is also considered an eyesore on Union Island, where the tourism industry is growing. While currently a challenge, this resource has a potential value as a by-product as discussed in the opportunities section above.

- iii. **Health challenges.** Despite having many fishers involved in dive fishing, Saint Vincent and the Grenadines does not have a hyperbaric chamber. Additionally, the recent increases in harvest have been associated with an increased entry of younger fishers, and fishers entering deeper waters to target queen conch. Stakeholder interviews indicated increases in dive related health incidents associated with conch fishing in the past three years. The injury or death of a fisher from diving can have detrimental effects on a fishing household, especially where the injured or deceased party is the main income earner. These types of incidents are further exacerbated by the self-employed nature of most fishers who may fall through the gaps of social security systems.
- iv. **Potentially decreasing conch stocks.** Anecdotal evidence suggests that queen conch stocks in Saint Vincent and the Grenadines could be decreasing. Stakeholders interviewed noted that shallow water conch stocks have reduced significantly over the years, resulting in fishers having to go to much deeper depths to harvest. The recently announced conch resource assessment to be conducted by the Blue Marine Foundation in collaboration with the Saint Vincent and the Grenadines Environment Fund and the Ministry of Agriculture and Fisheries is an important first step in assessing the impacts of recent harvesting increases on conch stocks.
- v. **Transportation challenges.** Due to limited frequency of air freight connectivity with major export markets, and limited cold storage at export airports, risks of spoilage of queen conch and fisheries products for export does exist. The majority of conch in Saint Vincent and the Grenadines is exported to the United States by air. Consistent and reliable air transport is therefore an important part of the national queen conch value chain. Presently, conch is exported to the United States via Amerijet International Airlines from the Argyle International Airport. However, during interviews it was noted that flight schedules were sometimes unreliable with short notice cancellation of flights resulting in exporters incurring additional costs for refrigerated ground transport when shipments have to be returned to their facilities.
- vi. **Reports of unauthorized and unreported trade of unprocessed conch.** Interviewed stakeholders reported that unprocessed conch is traded between the northern islands of Grenada and the southern islands of Saint Vincent and the Grenadines. There is also trade of unprocessed conch meat between Saint Vincent and the Grenadines to Saint Lucia, and subsequently to Martinique. In addition to being illegal and unreported, this trade limits the value captured by producers in Saint Vincent and the Grenadines, as income earned from processing and value addition to queen conch is not captured by local traders.
- vii. **Inadequate availability of skilled processors.** While processing of fish and other living marine resources is often considered a low-skill job, particular aspects of conch processing require key skills to avoid wastage of the high value conch meat. One such aspect of conch processing is the step referred to as “skinning”. Skinning involves the removal of the firm outer skin attached to the conch meat and is often considered tedious. As such, persons skilled enough and willing to do this job are often difficult to find and retain (pers. Comm., March 2022).

(d) Recommendations

- i. **Enhance cooperation with neighboring OECS queen conch producers and consumers.** Saint Vincent and the Grenadines shares neighboring fishing stocks with Grenada, and trades significant volumes of queen conch products with neighboring Saint Lucia. The connections between project countries’ value chains presents unique challenges related to the illegal and unreported trade of conch products, but more importantly presents opportunities to improve associativity and explore shared management arrangements. In this regard it is recommended to:
 - Establish a shared management plan for the queen conch stocks of the countries participating in this project with the possibility of expansion to other OECS countries.

- Establish shared data collection procedures, in particular the sharing of data collection best practices from Saint Vincent and the Grenadines with other project countries, including CITES reporting procedures.
 - Simplify the import and export of products to facilitate the regularisation and regulation of current cross border illegal and unreported trade.
- ii. **Introduce mechanisms to prevent unsustainable harvest levels.** Due to the opening of the international airport and privatisation of the operation of a number of government owned fish processing facilities, export of queen conch has expanded significantly. This expansion in exports has created significant demand which increased harvest efforts and landings. While resource assessments are currently being done to assess the effect of this expansion on stock health, stakeholders expressed concern about the impacts of current harvest levels and their effect on long term sustainability. For this reason, the precautionary principle should be applied and a number of mechanisms to control harvest levels should be explored including:
- a. Establishment of a closed season based on local spawning season. This recommendation has been articulated in previous case studies. Based on the most recent available science, a closed season, where no conch harvesting is allowed should be established with the local spawning season for queen conch.
 - b. Establishment of a quota system, based on scientifically determined maximum sustainable yield, that should be regularly monitored and adapted as necessary.
 - c. Establishment of no-catch zones.
 - d. Establishment of a monitoring programme and adaptive management.
- iii. **Develop social insurance schemes for conch fishers and processors.** As noted throughout this report, fishing for conch requires specialized diving skills and comes with health risks associated with commercial diving. In principle, divers need specific health and social insurance schemes to provide benefits to contributing fishers in the form of health care and sickness compensations and benefits to dependents of fishers. Further, the processing of conch is also a relatively specialised skill, while with less risk of injury, (as with all fish processing) some risks exist. Thus, social protection schemes for those involved in processing should also be explored to secure this important labor market.
- iv. **Build a sub-regional queen conch aquaculture nursery.** As discussed in earlier publications from this project⁶, the development of a queen conch nursery in Saint Vincent and the Grenadines should be considered a priority. The Grenadine Bank, most of which falls under the jurisdiction of Saint Vincent and the Grenadines, is a significant natural habitat for the queen conch, and likely plays an important role in the lifecycle of queen conch and queen conch production well beyond its borders, through spillover effects. This nursery could promote not only the production and rearing of conch to production levels but also the release of juvenile conch into the wild to restock wild populations. While this is not without concerns related to cost and genetic diversity of the feedstock for aquaculture, collaboration with neighboring countries that would also benefit from this facility would facilitate its effective functioning.
- v. **Further invest in socio-economic data collection.** While significant investment has been made in data collection in Saint Vincent and the Grenadines, further investment in socio-economic data collection as it relates to fisheries is particularly necessary. Processing of queen conch, particularly, the development of value-added products such as processed meat, trimmings and

⁶ For more information see: https://unctad.org/system/files/official-document/ditctedinf2021d4_en.pdf and https://unctad.org/system/files/official-document/tcsditcinf2022d2_en.pdf

value-added food products provide significant employment across Saint Vincent and the Grenadines. Unfortunately, limited data on employment numbers, and gender considerations exist in this regard. Subject to adequate resources further data on the socio-economic factors, gender considerations, and health impacts of the fishery are necessary to fully understand its benefits and costs to Saint Vincent and the Grenadines

- vi. **Use e-commerce to expand the trade of queen conch crafts and other products.** E-commerce platforms and social media can be used to expand the current markets for queen conch craft products. Also, to further integrate queen conch shell craft products as inputs into the fashion industry, queen conch shells can be made into beads and mother of pearl shapes that can be used in the manufacture of high value fashion products. A strong business case exists for these products, when gender, youth and vulnerable groups can be integrated into production process due to increasing consumer awareness of social and environmental concerns when purchasing.
- vii. **Match investments in production capacity with investments in sustainability.** Fisheries in Saint Vincent and the Grenadines have seen significant investment in the past five years, with the development of joint ventures with United States based firms, and entrance and investment of EC\$20 million⁷ by regional seafood conglomerate Rainforest Seafoods. While these investments in production capacity will likely yield short term economic benefits, without matching investments in long term sustainability, the profitability of these businesses will be compromised.
- viii. **Develop a tool for rapid field measurement of queen conch to enhance adherence to size limits and limit juvenile take.** Due to the entry of new fishers to the market, increased education and awareness about size restrictions need to be conducted. Furthermore, the issuance of tools for rapid field measurement of queen conch size could enable stronger adherence to size limits. Such tools called a 'lobster gauge' are used in best practice lobster fisheries.

⁷ \$7,400,418.12 (exchange rate US\$1 = EC\$2.70; April 19, 2022)

I. Introduction and overview

A. Background

Saint Vincent and the Grenadines is a multi-island country within the Lesser Antilles, in the eastern Caribbean Sea. It is situated near Barbados to the east, Saint Lucia to the north, and Grenada to the south. The country consists of the main island of Saint Vincent and the northern two-thirds of the Grenadines - a chain of small islands stretching south from Saint Vincent to Grenada. There are 32 islands and cays that make up Saint Vincent and the Grenadines of which nine are inhabited, including the mainland Saint Vincent, and the Grenadines islands: Young Island, Bequia, Canouan, Union Island, Mayreau, Mustique, Petit Saint Vincent and Palm Island. The latter three islands are privately owned (see Figure 1).



Figure 1 Map of St. Vincent and the Grenadines (Source: Worldatlas.com)

Saint Vincent and the Grenadines has a population of 110,784 people (2021 estimate) (most of the population resides on the mainland) and a gross domestic product (GDP) of approximately \$0.804 billion

(World Bank Databank, 2021). GDP per capita was estimated at \$7, 278 in 2020 (World Bank Databank, 2021). The country's economy, similar to that of most other Caribbean nations, is highly dependent on tourism and travel, which represented over 28.6 per cent of economic activity and accounted for 20,000 jobs (45 per cent of total employment), either directly or indirectly in 2019.⁸ However, because of the COVID-19 pandemic, tourism and travel activity decreased markedly in 2020.

According to the Eastern Caribbean Central Bank, Saint Vincent and the Grenadines' fishing industry accounted for 0.63 per cent of GDP in 2020 (CRFM, 2021). Unlike Grenada and Saint Lucia, whose contributions from fisheries to GDP have been declining since 2012,⁹ Saint Vincent and the Grenadines' has risen steadily between 2012-2020 (CRFM, 2021). There are 4,568 persons employed in Saint Vincent and the Grenadines' fishing sector (2019 estimate), this includes 1,142 persons employed in direct production in the marine commercial capture fisheries and 3,426 persons employed in other fisheries dependent activities (CRFM, 2021).

Several fisheries are exploited in Saint Vincent and the Grenadines including small coastal pelagics (e.g., jacks, scads, herrings, ballyhoo), large offshore pelagics (e.g., yellow-fin tunas, billfishes, black-fin tuna, dolphinfish, wahoo), shallow shelf and reef finfish (e.g., snappers, red hind and butterfish), lobster fishery, shelf and deep slope fishery (e.g., deep water snappers) and conch fishery (e.g., queen conch). In 2017, production (meat in weight in tonnes) of the marine capture fishery for Saint Vincent and the Grenadines was 811 tonnes. Queen conch production represented approximately 28 per cent of this total (CRFM, 2021). Historically, the conch fishery has been and continues to be very important to Saint Vincent and the Grenadines. It is generally fished in the Grenadines along the Grenada bank, which is a shallow platform (about 3000 km²) extending from Bequia to Grenada. Driven in part by strong demand in Trinidad and Grenada, conch fishing became an important activity on Union Island; the resource was rare in the northern Grenadines (Bequia and Mustique) (Mohammed et. al, 2003). Throughout most of the 1950s and 1960s conch caught at Union Island was sold to Grenada and Trinidad. However, by the early 1970s virtually all conch was sold to Martinique (France) (Mohammed et. al, 2003).

Within the OECS region, Saint Vincent and the Grenadines has the fastest growing queen conch industry of the past five years in terms of production, and investment in production capacity. In 2020 Saint Vincent and the Grenadines was the second largest producer of queen conch in the OECS region after Antigua and Barbuda.

While these increases in queen conch production have had notable and positive socio-economic impacts in Saint Vincent and the Grenadines, they bring potential challenges in the areas of stock sustainability, the equity of socioeconomic impacts and potential opportunities in terms of value addition and improving access to high value export markets. Further, due to geographic proximity to other queen conch producers which face similar challenges and have unique comparative advantages and opportunities for enhanced associativity.

B. Blue BioTrade Principles and Criteria

In response to these challenges and opportunities, UNCTAD, the 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 (2020) to the marine environment, focusing on the queen conch value

⁸ St. Vincent and the Grenadines Annual Credit Analysis [http://finance.gov.vc/finance/images/PDF/Issuer In-Depth - Government-of-St-Vincent-the-Grenadines-B3-stable - 31Mar21.pdf](http://finance.gov.vc/finance/images/PDF/Issuer%20In-Depth%20-%20Government-of-St-Vincent-the-Grenadines-B3-stable%20-%2031Mar21.pdf)

⁹ See Table 22 CRFM Statistics and Information Report – 2020

chain in the countries of Grenada, Saint Lucia, and Saint Vincent and the Grenadines. The pilot project was launched in October 2020.

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 Criteria¹⁰ (2007, revised in 2020). Integrating BioTrade Principles and Criteria (see 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 Programme¹¹ and the BioTrade Initiative.¹²

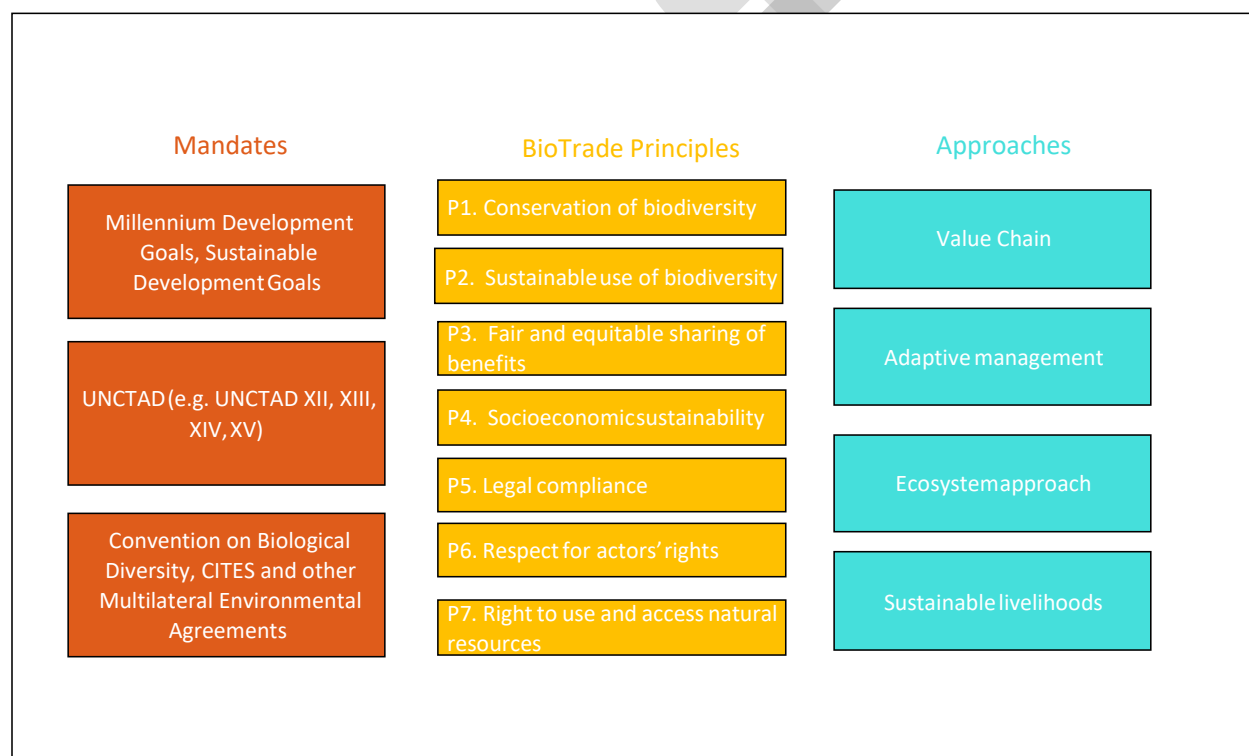


Figure 2 BioTrade conceptual framework: mandates, 2020 UNCTAD principles and approaches (Source: UNCTAD, 2020).

C. Method

The project considers three consecutive and complementary phases:

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

¹⁰ See UNCTAD (2020).

¹¹ For more information, see UNCTAD, "Oceans Economy and Fisheries", available at <https://unctad.org/topic/trade-and-environment/oceans-economy>.

¹² For more information, see UNCTAD, "BioTrade", available at <https://unctad.org/topic/trade-and-environment/biotrade>.

This report is the final of three country case studies to be completed as part of Phase 1 of this project. The primary objective of this country case study is to identify opportunities to improve the sustainability and governance of the queen conch industry in Saint Vincent and the Grenadines which participates actively in global and regional queen conch markets. To achieve this objective, the report is guided by the methodology to support value chains for BioTrade products.¹³ BioTrade is understood as the 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. Using the value-chain approach, BioTrade seeks to strengthen value chains as a critical element in facilitating good practices related to the sustainable use and conservation of biodiversity and in promoting the equitable sharing of environmental, social and economic benefits among value-chain participants (UNCTAD, 2007).

Considering the recent expansion in landings and trade of queen conch, this study seeks to support the long term environmental and social sustainability of this importance resource. The study is also meant to help local stakeholders better understand the potential of sustainable and legal production and utilisation of conch products, as well as their market potential, through the implementation of sustainability guidelines such as the BioTrade Principles and Criteria.

For this publication, the authors conducted an extensive review of available data on the queen conch trade provided by the Fisheries Division, a desk review of published and grey literature and interviews with key national stakeholders across the industry. Interviews were conducted with stakeholders from the Fisheries Division's Quality Assurance and Production Development Unit, private fishers, managers of fisheries centres and representatives of relevant non-governmental organisations.¹⁴

This case study builds on the regional stakeholder webinar on Blue BioTrade and BioTrade Principles and Criteria, including CITES requirements,¹⁵ where invaluable insights were provided by key actors from the fisheries divisions of participating project countries through their presentations. This report also builds on the prior publication, *Stakeholder Maps of the Conch Value Chains of Grenada, Saint Lucia and Saint Vincent and the Grenadines* (UNCTAD, 2021).

II Product assessment

The most recent partial queen conch assessment in Saint Vincent and the Grenadines was done in 2013 under the project titled, "Training in Underwater Visual Survey Methods for Evaluating the Status of *Strombus gigas*, Queen Conch Stocks".¹⁶ The assessment was funded by the ACP Fish II Program-European Union and implemented by the consultancy firm SOFRECO. The key findings from the assessment report, as prepared by Prada and Glazer (2013) are summarized in this section.

As part of the project, a mock queen conch field survey was conducted in a section of the southern Grenadine Islands, covering an area of approximately 23,679 ha. The survey areas comprised of locations immediately surrounding Union Island and Mayreau and included the Tobago Cays Marine Park. The area

¹³ For further information on this methodology, see UNCTAD, "BioTrade", available at www.biotrade.org/ResourcesPublications/unctad_dtc_bcc_2008_1_Eng.pdf.

¹⁴ See Annex 1 for an outline of questions asked in these semi-structured interviews.

¹⁵ 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>.

¹⁶ Project ref. N° CAR/3.2/B.14 "Assessment of the Queen Conch Population in the Southern Grenadines from Underwater Visual Surveys".

was selected because it traditionally supported an artisanal fishery; encompasses a broad variety of benthic habitats; and has sufficient diving infrastructure to complete surveys using SCUBA.

The study was carried out in 51 stations during seven days of diving and 36 of the stations surveyed contained conch (70 per cent). A total of 328 conchs were counted and measured. Dive stations averaged 12.3m in depth and ranged from 1.8 to 21.0m (6ft to 69ft). Survey times averaged 28 minutes. The majority of conch were found on various types of sandy habitats (with corals, algae, grass, gravel), followed by various types of gravel habitats (with algae, corals, grass), seagrass habitats, and to a lesser extent, in coral-dominated habitats.

The size distribution of sampled conch was with individuals ranging from 5.5 to 26.7cm in siphonal or total length. The largest number of individuals were in the size classes of 13.5cm and 15.5cm. The largest conch densities were found in deeper surveys (12m to 20m in depth) and in sites along channels exposed to strong currents. In comparison, sites with no conch were generally found in shallow water (8.9m mean water depth) and on protected environments around Union Island and on the west side of Mayreau. Given that fishermen use SCUBA gear for commercial fishing, it appears that depth is not serving as a refugia for conch, at least in the depths and areas that were surveyed.

In this study, total density was estimated again at 227 ind/ha (this density is higher than the 88 individuals/hectare as recommended by CITES), with juveniles having on average 189 ind/ha and adults accounted for 37 ind/ha. Once total conch density was calculated, it was possible to estimate the population size for the selected area (23,679 ha). When the status of protection was applied, the queen conch population size was approximately 7.27 million individuals. Juveniles accounted for up to 83% of the estimate. When the fishing intensity was the stratum, the population size was estimated at 5.29 million, with juveniles comprising 84% of the estimate. The large percentage of juvenile queen conch found in the survey area is characteristic of the shallow water fishing grounds and harvesting can be done sustainably once the fishery targets legal size individuals and a catch quota system is put in place and adhered to, then the long-term sustainability of the queen conch fishery has a good future.

Combining the size frequency distribution with the queen conch population size, total conch biomass was then estimated to be 1,605,219 pounds using the protection stratum and 1,169,854 pounds for the fishing stratum. The application of the 8% harvest control rule estimated the maximum exploitable biomass to be around 128,418 to 93,588 pounds depending on the strata. This amount is further reduced to 107,485 to 78,333 pounds for 100% clean meat conversion factor (16.3% recommended by Aspra et al 2009). The 100% clean meat is achieved when only white meat remains, and it is the most common export product. Further reductions to account for illegal fishing (arbitrarily assumed to be 20%) resulted in a final recommendation of 85,988 to 62,667 pounds (31.3 to 28.5 mt) for the overall total allowable catch.

It is noted however, that the 2013 study was not a full stock assessment of the queen conch because it did not cover all fishing areas of Saint Vincent and the Grenadines.

A. Local product assessment

The queen conch is found and fished primarily along the banks of the Grenadines islands extending from Bequia to Grenada. Juvenile queen conchs are abundant in the shallow areas while adult individuals are primarily found in deeper waters and therefore fishers currently use SCUBA gear to collect the queen conch. The shell lip of the queen conch begins to thicken as the animal becomes older and sexually mature at around 3.5 to 4 years of age. There is no closed fishing season but the current queen conch regulations (minimum 7 inches or 18 cm in shell length, presence of a "flared lip" and a total meat weight of not less than 8 oz or 225 g after removal of the digestive gland).

There is no recent queen conch stock assessment work that would allow for a determination on the status of the stock and establishment of a Total Allowable Catch limit.

Divers in Saint Vincent and the Grenadines usually fish for 3 to 4 hours at depths ranging from 12 – 40m and can catch an average of 80 – 100 pounds of conch per trip. This translates into a conservative estimate of CPUE of 27 pounds (80 pounds/3 hours fishing) of conch meat per hour per fisher diver. This catch level is considered high with important economic benefits to fishers and is an indicator of the good health of the local queen conch population. Also, this estimate of CPUE is similar to the estimated CPUE as stated in the previous section. The main threats to the queen conch population of Saint Vincent and the Grenadines¹⁷ include:

- (a) Over-exploitation and unsustainable harvesting, illegal and unreported trade, habitat degradation and climate change.
- (b) Due to its high global demand, the queen conch fishery is particularly vulnerable to poaching and illegal trade.
- (c) With a small range (Tropical Atlantic), slow growth rate, and over three years to mature the fishery is highly susceptible to unsustainable harvesting.
- (d) Degradation of shallow water nursery habitats from sedimentation, coastal development and water pollution (specifically high concentrations of zinc and copper) reduces juvenile recruitment and causes reproductive failure in the species.
- (e) More frequent and extreme weather events due to climate change also cause disruptions to the conch grounds and hamper aggregations of the species necessary for reproduction to take place.
- (f) Ocean acidification and rise in ocean temperatures also due to climate change affect the growth and construction of the queen conch's shell and has also been shown to affect larval dispersal in the species (Oxenford and Monnereau, 2017).

III Analysis of regulatory frameworks and management plans

A. National regulations and management plans

The principal legislation that governs the management and conservation of the queen conch are enshrined in the laws of Saint Vincent and the Grenadines Fisheries (1986). The Fisheries Regulations (1987)¹⁸ under Part VI Section 4 establish the main management regulations for the queen conch fishery, which are as follows:

- (1.) *No person shall take, sell or purchase or have in his possession any immature conch*
- (2.) *The Minister may by notice published in the Gazette declare any period as closed season for conch*
- (3.) *No person shall fish for conch during the closed season of conch*
- (4.) *In this regulation immature conch means:*
 - (a.) *a conch shell of which is smaller than 7 inches /18 cm in length*
 - (b.) *a conch shell which does not have a "flared lip"*
 - (c.) *a conch with a total meat weight of less than 8 oz / 225 g after removal of the digestive gland*

¹⁷ For more information, please see <https://www.fao.org/3/i7818e/i7818e.pdf>.

¹⁸ <http://extwprlegs1.fao.org/docs/pdf/stv2111.pdf>

The Fisheries Division of Saint Vincent and the Grenadines has stated that improvements in the management of queen conch can be achieved with more rigorous enforcement of existing regulations, mapping of critical habitats for conch to refine estimates of potential yield and expansion of marine protected areas.¹⁹ It is also known that a draft management plan was completed in October 2008, based on FAO’s “Revised Manual for the Monitoring and Management of Queen Conch”²⁰ but its full implementation is yet to be carried out. A field assessment of queen conch populations throughout Saint Vincent and the Grenadines is currently being executed by the Blue Marine Foundation funded by the St Vincent and the Grenadines Environment Fund (SVGEF) in partnership with the Ministry of Agriculture and Fisheries²¹. This will provide the country with information on the status of the resource and support management of the resource.

The Fisheries Act (1986)²² and Fisheries Regulations (1987)²³ give the Fisheries Division the legal authority to issue fishing license to local and foreign fishers and to enforce the terms of these agreements. The issuing of local fishing licenses has not been implemented, especially for local fishers and fishing vessels. The licensing of fishers and vessels should be addressed soon to allow for effective implementation of the fisheries regulations and for improved reporting of catch landings and for good estimate of fishing effort. On the other hand, foreign fishing vessels are required and are issued fishing licenses by the Fisheries Division.

Over the years, Saint Vincent and the Grenadines has been assisted by and actively participated in national and regional events geared towards the management and conservation of queen conch that have been organised by the OECS Commission, Caribbean Regional Fisheries Mechanism (CRFM) and the Western Central Atlantic Fishery Commission (WECAFC) of the Food and Agriculture Organization of the United Nations (FAO).

In 2017, a “Regional Queen Conch Fishery Management and Conservation Plan”²⁴ was published by the FAO following the recommendations of the first meeting of the WECAFC/CFMC/OSPESCA/CRFM Working Group, held in Panama from 23-25 October 2012. Table 2 shows the level of implementation of the management measures taken by Saint Vincent and the Grenadines to date and makes observations and further implementation efforts.

Table 1 Level of implementation of WECAFC recommended management measures taken by Saint Vincent and the Grenadines to date

WECAFC recommended management measures	Level of implementation by Saint Vincent and the Grenadines	Observations and further implementation efforts
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¹⁹ Jennifer Cruickshank-Howard, Chief Fisheries Officer (Ag), Fisheries Division, Ministry of Agriculture, Rural Transformation, Forestry, Fisheries, and Industry. Kingstown, Saint Vincent and the Grenadines. Presentation made at the Saint Lucia Regional stakeholder webinar on Blue BioTrade and BioTrade Principles and Criteria, including CITES requirements, 22–23 March 2021.

²⁰ <https://www.fao.org/3/a0184e/a0184e00.htm>

²¹ For more information see: <https://www.searchlight.vc/news/2022/02/15/baseline-assessment-launched-to-help-assess-the-general-biodiversity-of-fisheries-in-svg/>

²² <http://extwprlegs1.fao.org/docs/pdf/stv2112.pdf>

²³ <http://extwprlegs1.fao.org/docs/pdf/stv2111.pdf>

²⁴ <https://www.fao.org/3/i7818e/i7818e.pdf>

<p>a. Establish harmonised and simplified categories of queen conch</p>	<p>Saint Vincent and the Grenadines has adopted harmonised and simplified categories for queen conch for “dirty meat” and 100% clean meat (white fillet) in conformity with the Regional Queen Conch Fishery Management and Conservation Plan.</p>	<p>No further recommendations.</p>
<p>b. Establish meat conversion factors</p>	<p>Conversion factors established for 100% clean queen conch meat</p>	<p>The Saint Vincent and the Grenadines queen conch meat conversion factor of 5.3 for “dirty meat” is consistent with the conversion factor recommended in the Regional Queen Conch Fishery Management and Conservation Plan. Annual reporting of catch landings and number of animals harvested to FAO should continue.</p>
<p>c. Improve catch and effort monitoring programmes</p>	<p>Some catch landing data is being collected in some locations where queen conch landings occur.</p>	<p>Improve catch landings and start of collection of fishing effort data to determine trends in catch per unit effort over time.</p>
<p>d. Establish a synchronised regional closed season (1 June to 30 September)</p>	<p>There is no closed fishing season for queen conch.</p>	<p>Establish a closed season for queen conch in consideration of the proposed regional closed season period to protect adult individuals at least during the peak spawning season (field research is needed to determine this period in Saint Vincent and the Grenadines).</p>
<p>e. Develop Non-Detriment Finding (NDF) for export of queen conch meat and its by-products</p>	<p>No NDF has been prepared for the export of queen conch meat.</p>	<p>Prepare NDF for queen conch as soon as possible and submit to CITES to comply with this member state requirement. Another option is to establish and publish an export quota that Saint Vincent and the Grenadines can show to be sustainable.</p>
<p>f. License all queen conch fishers, processors and exporters</p>	<p>Processors and exporters of queen conch meat are licensed by the Fisheries Division.</p>	<p>Section 11 of the Fisheries Act (1986) and the Fisheries Regulation (S.R.O. No. 1 of 1987) give the Chief Fisheries Officer the legal authority to issue fishing license to local -fishers and to enforce the terms of these agreements. The licensing of fishers</p>

		and fishing vessels should be carried out and enforced effectively.
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.	Certification of professional training on proper use of SCUBA gear should be done by every diver to avoid accidents and deaths. SCUBA certification is expensive and therefore collaborative efforts of the Fisheries Division; queen conch processors and exporters and non-governmental organizations must be sought.
h. Conduct organised patrolling	Fisheries law enforcement is being done in selected queen conch fishing areas and landing sites only.	Strengthen coastal patrolling and enforcement of fisheries to reduce illegal fishing and exports of queen conch to neighbouring islands. Sub-regional (OECS) patrolling to reduce IUU fishing should be done in collaboration with neighbouring countries to reduce and eliminate the illegal harvesting and trading of immature conch.
i. Extended use of satellite-based VMS systems for boats with a length exceeding 10 meters	Fishing vessels used for queen conch harvesting do not exceed 10 meters in overall length	No further recommendations.
j. Conduct continuous education and outreach programmes for stakeholders	Outreach and educational programs for fishers, fish cleaners, processors and exporters is ongoing.	Expand queen conch education and outreach to expand to students, communities, and fishers organizations.
k. Develop national level queen conch conservation and management plans	A draft national queen conch management plan was prepared in 2008 with the assistance of the FAO.	Finalise and implement a national queen conch management plan as soon as possible. The Blue BioTrade project will develop a regional queen conch action plan that aims to provide useful recommendations in this regard.

l. Strengthen traceability of queen conch throughout the value chain	No traceability programme is currently in place for queen conch.	Establish a traceability programme for the queen conch value chain as soon as possible.
m. Develop collaborative arrangements needed to generate habitat maps at the scale needed for better fisheries management	There are no queen conch habitat maps developed for the fishery.	Develop habitat maps to assist in the implementation of queen conch surveys, which will provide field information on queen conch abundance for the establishment of a national catch quota.
n. Adopt sub-regional mechanisms to evaluate the fishery potential of queen conch using fishery dependent and independent factors	No sub-regional mechanism in place to assess the status of queen conch.	The development of a sub-regional arrangement to conduct scientific conch 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. Progressive inclusion of co-management strategies	Co-management agreements do not currently exist for management of the existing 10 marine conservation areas ²⁵	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 Saint Vincent and the Grenadines.

The international agreements relevant to fisheries in Saint Vincent and the Grenadines include the International Whaling Commission (22 July, 1981), International Convention on the Conservation of Atlantic Tunas (20 November, 2006), CITES (28 February, 1989), United Nations Fish Stocks Agreement (29 October, 2010), FAO Code of Conduct for Responsible Fisheries (1995), FAO Agreement to promote compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (24 April, 2003) and the International Convention for the Prevention of Pollution from Ships (1981).

Many of these agreements have reporting requirements that the country is required to comply with. For this to be effective, the Fisheries Division must monitor and track all relevant activities in the exclusive economic zone. This is a challenge for the Fisheries Division given the size of the exclusive economic zone and the resources provided to the Division. For this reason, there are some gaps and shortcomings in meeting these reporting requirements.

The following legislations are in place to assist with the management and development of the fisheries sector:²⁶

²⁵ <https://www.fao.org/3/i6175e/i6175e.pdf>

²⁶ Source: Fishery and Aquaculture Country Profile: Saint Vincent/Grenadines. For more information: <https://www.fao.org/fishery/en/facp/vct?lang=en>.

- (a) **The Maritime Areas Act, 1983²⁷** (Act No. 15), declares and establishes the marine area of St. Vincent and the Grenadines. This enables the State to define the following areas (1) Internal waters (2) Archipelagic waters (3) Territorial Sea. (4) Contiguous Zone (5) Exclusive Economic Zone and (6) Continental Shelf
- (b) **The Fisheries Act, 1986 (Cap.52)** and the **Fisheries Regulations (S.R.O. No. 1 of 1987)**, which form part of the OECS harmonized legislation, covers, fisheries access agreements, local and foreign fishing licensing, fish processing establishments, fisheries research, fisheries enforcement, and the registration of fishing vessels. The legislation also specifies conservation measures such as prohibiting the use of any explosive, poison and other noxious substance for the purpose of killing, stunning, disabling, or catching fish, closed seasons, gear restriction, and creation of marine reserves. The legislation gives the Minister responsible for fisheries, the authority to create new regulations for the management of fisheries when necessary.
- (c) **The Fish Processing Regulations (2001)** was drafted in response to international requirement for monitoring and controlling the quality of fish and fish products leaving and entering Saint Vincent and the Grenadines. The legislation makes provisions for the control of marketing, handling, transporting and storage of fish and the operation of fish processing establishments. **To be clarified by FD - Is this different from this: The Fish (Fish and Fish Products) Regulations 2006? To clarify with FD.**
- (d) **The High Seas Fishing Act (2001)**, which provides the legal basis for the effective control of St. Vincent and the Grenadines registered vessels fishing on the High Seas. The act provides for constant monitoring of these fishing vessels to produce accurate information, which under provisions of the act is mandatory in order to be compliant to the International Convention for the Conservation of Atlantic Tunas.
- (e) Other fisheries related legislation includes the Town and Country Planning Act (1992) that addresses coastal zone management; Forestry Act (1945) that addresses mangrove protection; and the Mustique Conservation Act (1989) that addresses management of conservation areas on and around Mustique.

B. Institutional Actors

Table 2 Roles of institutional actors in the queen conch value chain of Saint Vincent and the Grenadines

Actor	Role in queen conch fishery
Government	

²⁷ For more information see here:<http://extwprlegs1.fao.org/docs/pdf/stv2109.pdf>

Ministry of Agriculture, Forestry, Fisheries, Rural Transformation, Industry and Labour	<ul style="list-style-type: none"> ● CITES national focal point responsible for the submission of CITES reports and liaising with the CITES Secretariat.
Fisheries Division - Ministry of Agriculture, Forestry, Fisheries, Rural Transformation, Industry and Labour	<ul style="list-style-type: none"> ● Boat registration and licensing (Both?) ● Catch and export data collection ● Enforcement of fisheries regulations at landing sites, on board vessels, and at processing facilities in particular size regulations ● Competent Authority for the official control of fish and fishery products, including those destined for export ● Inspects, tests and monitors fish and fish products for local consumption as well as for export ● Issues both the CITES permit and the health certificate, after conch shipments have been inspected by an authorised officer ● Education and outreach to fishers ● Policy development and management planning ● Conducts biological and ecological assessments of all utilised marine species to help determine sustainable levels of exploitation ● Conducts microbiological and histamine laboratory testing on fish ● Provides training in value added product development ● Provides training in HACCP and other hygiene procedures to fish processing facilities
Coast Guard – Police Force	<ul style="list-style-type: none"> ● Monitoring of illegal conch importation and exportation at sea ● Enforcement of fisheries regulations at sea ● Conducts biophysical monitoring
Department of Trade – Ministry of Foreign Affairs and Foreign Trade	<ul style="list-style-type: none"> ● Issues licences for export of conch
Customs and Excise Department	<ul style="list-style-type: none"> ● Issues export certificates
Non-governmental organisations	
Sustainable Grenadines Inc.	<ul style="list-style-type: none"> ● Supports conservation of the coastal and marine environment and sustainable livelihoods for the people in the Grenadine Islands between Grenada and St. Vincent and the Grenadines ● Conducts education, outreach, and capacity building activities targeted at fishers ● Conducts biophysical monitoring
Tobago Cays Marine Park	<ul style="list-style-type: none"> ● Facilitates protection of conch nurseries within the marine park ● Conducts biophysical monitoring

IV Value chain analysis

A. Overview

Of the countries of this project, Saint Vincent and the Grenadines is the largest producer and exporter of queen conch, and the fourth largest producer in the CRFM region in 2017 (CRFM, 2020). The queen conch fishery is currently one of the most important fisheries in Saint Vincent and the Grenadines with approximately 130 active fishers. The fishery accounted for 62.7 per cent of total fisheries exports in 2020, bringing in over EC\$8,988,93250 (\$326,285.05) (Saint Vincent and Grenadines Fisheries Division).

An analysis of the performance of the queen conch fishery shows that landings declined significantly from 287 tonnes in 2001 to 27 tonnes of meat in 2006. From 2008, the conch industry began to grow again and showed a generally upward path, but still with significant variability in the quantity of conch landed between 2000 to 2016. Queen conch meat landings increased significantly since 2017 to 2019. This is largely due to increased market access with direct airlift to Miami, as the new Argyle International Airport was opened in 2017.

Conch harvesting in Saint Vincent and the Grenadines is spread across its islands, with fishers participating across the islands of Union, Bequia, Mustique, Canouan, and at Owia port on Saint Vincent mainland. Below is a description of the main landing sites and geographies important to the queen conch value chain in Saint Vincent and the Grenadines.

B. Geography of the value chain

Diagram of value chain to be added.

(e) Calliaqua

Calliaqua is located on the southern tip of mainland Saint Vincent. While fishers based at this site do not leave this site to target queen conch, its proximity to the Argyle international airport, and to the southern Grenadine islands (and thus the closest point to the Grenadines) make it a major site for preparing queen conch for export and onward trade. Rainforest Seafood²⁸ operates a processing plant in Calliaqua that is discussed further below.

(f) Owia

Owia is located on the northern tip of mainland Saint Vincent. The Ocean Marine Shipping Agency Ltd. operates from Owia and actively participates in international conch trade, exporting primarily to Dominica the United States, and occasionally Saint Lucia.

(g) Bequia

With a land area of 18.1 km², Bequia is the largest of the Grenadine Islands and the closest to mainland Saint Vincent. It has the largest population (approximately 5, 500 people). Bequia plays a significant role in the local and regional ocean economy considering its size.

Bequia is home to 40 fishers who target conch; the Bequia Fisheries Center, operated by Bequia Seafoods; and several ships that transport seafood products regionally (to Trinidad and Tobago, and Saint Lucia). Bequia does not have significant conch fishing grounds, so fishers from Bequia target fishing grounds around neighboring Mustique and Canouan. Typically, fishers will target the waters around Mustique

²⁸ Rainforest Caribbean <https://rainforestcaribbean.com/>

during day trips, stopping there to fill their dive tanks. Fishers from Bequia also seasonally relocate to fishing camps on Mustique, Canouan and offshore islands during periods of high fishing intensity.

Due to its role as a regional transportation hub, Bequia also receives conch harvested in Union Island, for onward transportation of conch meat to mainland Saint Vincent, or directly to regional export markets.

(h) Mustique

Mustique is the second of the occupied Grenadine Islands, with a land area of 5.2 km². Mustique is a private island, focused on tourism. Mustique is home to a small fishing ‘camp’ (see Figures 3 and 4) that is owned by the Mustique Island Company²⁹ which manages the island. This fishing camp consists of a small open air processing facility, storage lockers for fishers and overnight stay facilities that allow fishers from Bequia to temporarily reside at Mustique. The Mustique fishing camp also provides tank filling services for fishers from outside islands at a cost of EC\$10³⁰ per tank. Mustique is not a major landing point of queen conch currently. However, fishers do report harvesting queen conch in the waters surrounding Mustique (outside of the protected area). Additionally, fishers access medical services at the Mustique medical clinic for dive related injuries, which is free of cost.



Figure 3 Mustique fishing camp (Source: Alexander Girvan, 2021)

²⁹ Mustique Island Company <https://www.mustique-island.com/about/the-company/>

³⁰ \$3.70 (exchange rate US\$1 = EC\$2.70; April 19, 2022)



Figure 4 Mustique fishing camp (Source: Alexander Girvan, 2019)

(i) Canouan

Canouan is the next island heading south from Mustique, with a land area of 12.9 km² and a population of approximately 12,000 people. A small number of conch fishers (approximately 10) are based in Canouan as this island's economy is dominated by tourism. Of the fishers located on Canouan, many are originally from Bequia or live in between these two islands. The shallow sandy bottoms of the waters surrounding Canouan are home to several fishing grounds targeted by local fishers and those who come from Bequia.

Some landed conch is used locally to supply the tourism market, but most landed conch is sent directly to Bequia, for processing. In some cases, conch is sent to Union Island or Owia.

(j) Union Island

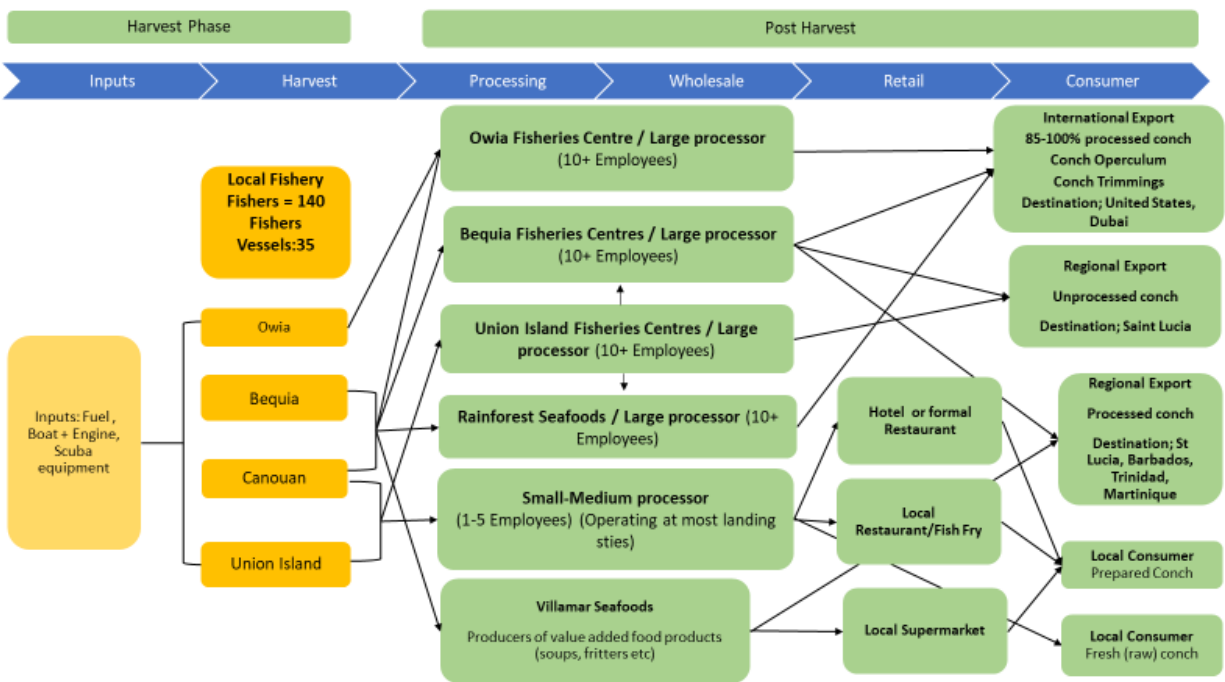
Union Island is the southernmost of the Grenadine Islands, with a land area of 7.8 km² and a population of approximately 3,000 people. Union Island is a major centre of conch harvest and processing in Saint Vincent and the Grenadines. Union Island is home to approximately 30 fishers and 10 conch fishing boats, operated by fishers known locally as 'conch men' who fish 5 days a week. Union Island is close to the major conch fishing grounds in the waters surrounding the Tobago Cays.

Conch landed in Union Island is generally sold at a lower price due to its distance from major export centres of Owia and Bequia, and the costs associated with transporting conch to these locations. Some conch is exported directly from Union Island primarily to Dominica and Saint Lucia via sea freight.

While conch fishing is important nationally, it plays a particularly important role in the history, culture and economy of Union Island.

C. Value chain diagram-

Table 3 Diagram describing the Queen conch value chain of Saint Vincent and the Grenadines (Authors own elaboration 2022)



D. Pre-harvest

Conch fishing in Saint Vincent and the Grenadines uses similar inputs to conch fishing in other Eastern Caribbean islands. The key harvest inputs are boats, engines, SCUBA gear (tanks, flippers and masks), fuel, motor oil, ice, baskets or bags to haul the conch and containers to store the conch (sacks or ice coolers).

Saint Vincent and the Grenadines has a robust domestic boat construction industry, including the construction of the three to six meters (11-27 feet) marine ply and fiberglass boats used in conch fishing. These boats are powered by outboard motors between 75-150 Hp. Historically, freediving was a frequently used method of conch fishing in the nearshore areas of the Grenadine Islands, but this practice has been replaced using scuba gear in the past decade, and particularly as the fishery has become more commercial.

The scuba gear used by commercial fishers is sometimes owned by the fishers, or sometimes owned by an operator who maintains the gear and charges a fee for their filling and use. This model is practiced in Mustique, where fishers from Mustique and Bequia come to Mustique to rent filled dive tanks.

The Government of Saint Vincent and the Grenadines provides a number of concessions to minimise the input costs associated with fishing and support development of the fishing industry that can be accessed by conch fishers. **Details to be added after discussion with Fisheries Division.**

Recently, increases in global fuel prices have had a negative effect on fishers including conch fishers in SVG as this is the main input cost to conch fishing.

Table 4 Main input costs and concessions provided by the government of Saint Vincent and the Grenadines

Input	Typical Cost	Current Government Concession
Outboard Motor 75-100Hp		
Outboard Motor 100HP+		
Dive equipment?		

E. Harvest

Approximately 35 vessels and 130 artisanal fishers, including divers, boat captains and boat hands, are involved in the harvesting of conch. However, with the recent involvement of Rainforest Seafood in the local seafood market, one interviewee noted that more fishers were starting to enter the conch fishery.

Conch harvesters are mainly men between the ages of 17 and 45. Conch is typically harvested by a three-to-four-person crew consisting of the boat driver/basketman; a diver who collects the conch from the seafloor and loads them into a “basket”; and a floater, who monitors the movement of the diver from the surface of the water and supports the surfacing of collected conch by the driver/basketman in the boat. The floater may also function as an alternate diver. In the case of four-person crews, two divers will operate on the seafloor collecting conch simultaneously. Typically, divers will use four tanks during one trip, surfacing to change tanks or having tanks sent down to them from the boat. Diving is done using scuba gear at depths ranging from 12 – 40m.

There is no closed season for conch in the Saint Vincent and the Grenadines, so conch is harvested year-round. The main conch fishing grounds are distributed around Union Island, Mayreau, Canouan and Mustique. A typical conch fishing trip is between 4 -6 hours, with fishers going out in the early morning and returning around noon. While volumes landed vary significantly, a typical landing for commercial conch fishers is between 80-200 pounds per trip. Reports of one boat landing up to 398 pounds were indicated by interviewed stakeholders. In most cases, harvested conch is deshelled at sea near uninhabited offshore islands and away from fishing grounds. Customarily, conch was deshelled at landing sites or near to shore on the inhabited islands, however this practice has been discontinued, as it is considered an eyesore by tourism industry stakeholders. In the islands of Union Island, Mustique and Canouan, historical conch piles remain from this discontinued practice. Deshelling allows the fishers to harvest more meat per dive trip and reduces the weight of the boat and cost of transportation.

F. Post-harvest

(a) Local processing facilities

There are six facilities involved in the processing of conch in Saint Vincent and the Grenadines. These are:

- i. Union Island Seafood Ltd. (located on Union Island)
- ii. Bequia Seafood Company Ltd. (located on Bequia)
- iii. Agricultural Input Warehouse Ltd. (located in Kingstown on mainland Saint Vincent)
- iv. Ocean Marine Shipping Agency Ltd. (located in Owia on mainland Saint Vincent)
- v. Villamar Ltd. (located on mainland Saint Vincent)
- vi. Rainforest Seafoods Ltd. (located in Calliaqua on mainland Saint Vincent)

Union Island Seafood, Bequia Seafood Company and Ocean Marine Shipping Agency are privately owned companies that operate from government-owned fisheries centres i.e., the companies lease the fisheries centers from the government. Villamar and Rainforest Seafoods own and operate their own facilities.

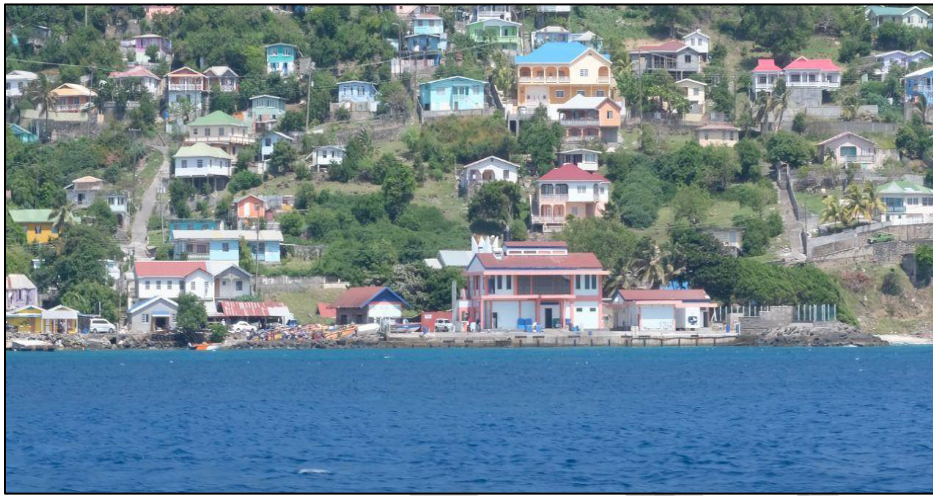


Figure 5 Bequia Seafood Company's processing facility (UPTATE)

Rainforest Seafoods opened their seafood processing facility in Calliaqua in December 2021 (see Figure 5). The facility, which is the largest of its kind in the country, includes features such as 250,000 lbs of cold storage capacity, blast freezers and processing rooms, and state-of-the-art equipment that will allow for at-source retail packaging — ensuring that product presentation appeals to international markets³¹. The Rainforest Seafoods plant can process up to one million pounds of seafood per year and is seeking to purchase EC\$20 million³² worth of fish, conch and lobster annually from local fisherfolk. Rainforest Seafoods is the Caribbean's leading seafood supplier, with headquarters in Jamaica and satellite operations in Belize and Saint Lucia.

The processing facility operated by the Agricultural Input Warehouse Ltd. is a state-owned enterprise. At the time of this study the processing facility at the Agricultural Input Warehouse Ltd. was being leased by Ocean Marine Shipping Agency Ltd., since the latter's facility was being renovated.

(b) Landing and distribution within Saint Vincent and the Grenadines

The amount of conch landed in Saint Vincent and the Grenadines has been generally increasing over the last 10 years (see Figure 7). A marked increase in landings occurred in 2017, which coincided with the opening of the new Argyle International Airport and a subsequent increased capacity for international export of seafood and seafood products.

³¹Rainforest Seafoods invests in new facility in Saint Vincent <https://rainforestcaribbean.com/rainforest-seafoods-invests-new-facility-st-vincent/>

³² \$7,400,418.12 (exchange rate US\$1 = EC\$2.70; April 19, 2022)

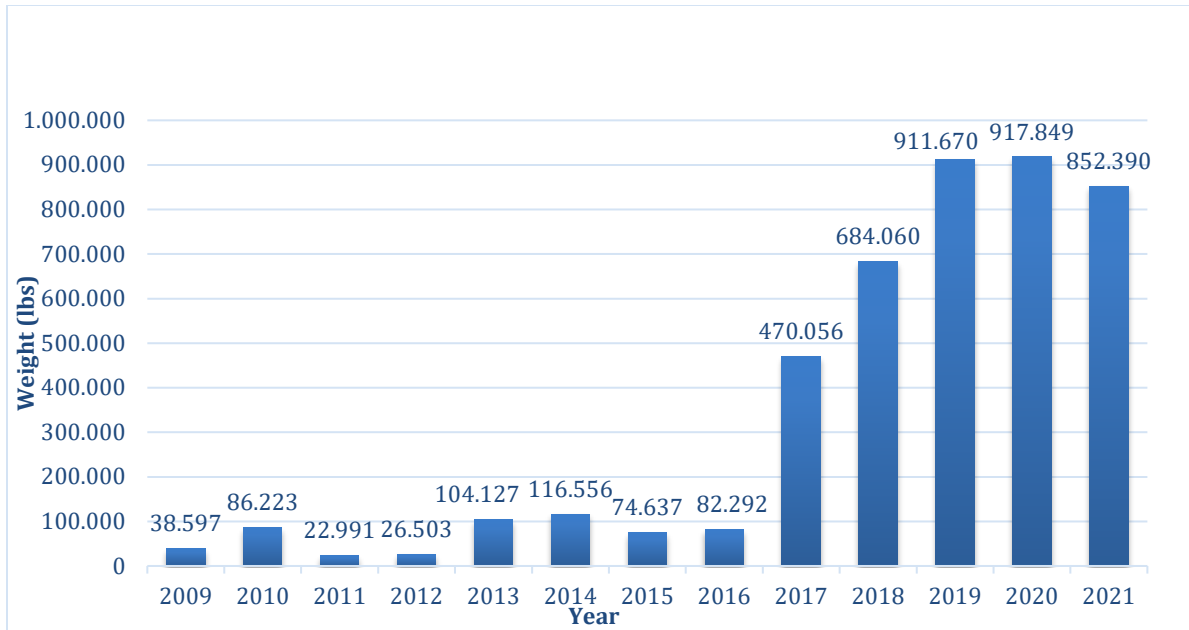


Figure 7 Queen conch landings by weight, Saint Vincent and the Grenadines 2009-2021 (Source: Fisheries Division, 2022)

Much of the conch harvested in Saint Vincent and the Grenadines is landed in Union Island and Bequia. Fishers who land queen conch on Union Island typically sell their conch directly to Union Island Seafoods which has strong connections with exporters on mainland Saint Vincent. The fisheries center at Union Island therefore operates as a central distribution point, as it mainly focuses on washing (optional) and packing the conch it receives to be sent to the larger processing facilities on Bequia and mainland Saint Vincent. The cold chain normally starts when the conch reaches the Union Island fisheries centre and is placed in ice boxes.

The processing companies on the mainland that receive conch from Union Island are the Ocean Marine Shipping Agency and, as of January 2022, Rainforest Seafoods. Villamar purchases smaller quantities of conch directly from fishers.

Fishers based on Bequia, Canouan and Mustique primarily sell their conch directly to processors on Bequia. These processors then send conch packaged in 5lb boxes via refrigerated truck and ferry to mainland Saint Vincent for export to the United States via air freight.

G. Processing

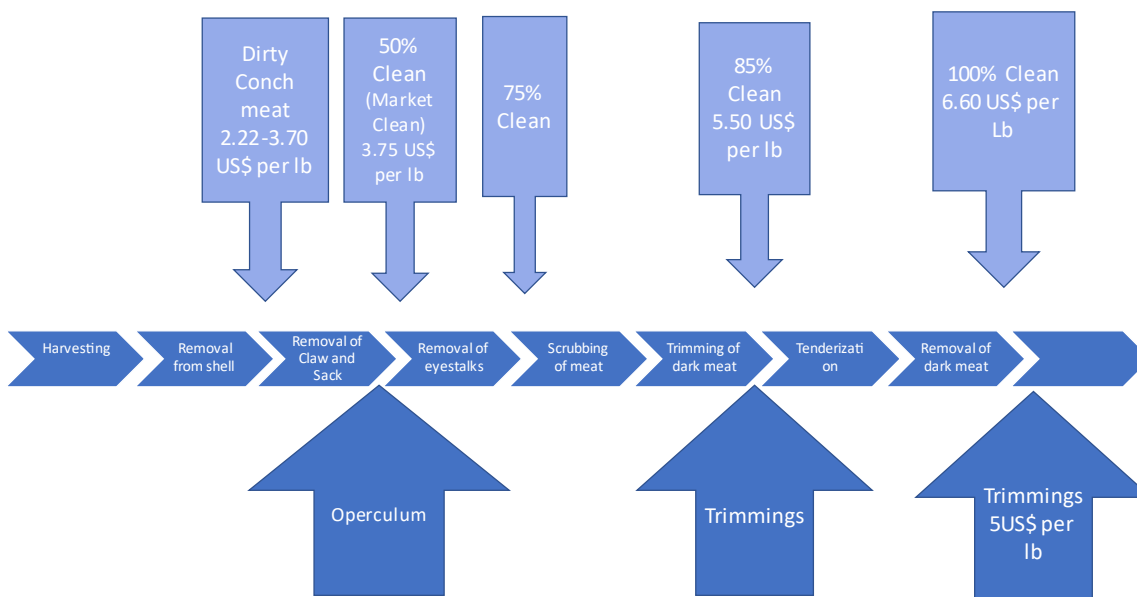


Figure 5 Main steps of queen conch processing, and price of main products sold from the queen conch (Source: Authors own elaboration)

(a) Conch meat

At the fisheries centers, conch meat is processed (or cleaned) at different grades (refer to Table 6 and Figure 6 for a description of the processing grades and anatomy of a conch). In general, the different processing grades refer to the level of tissue loss that occurs with cleaning. Conch is not cleaned at the fisheries centre in Union Island before being transported to the Bequia and mainland processing facilities.

Cleaning of the conch usually happens at the Bequia and mainland processing facilities. The level of processing done at these facilities depends on the marketing system and the destination. For example, the majority of exported conch (47 per cent) is destined for the United States and is primarily aggregated at the Owia and Bequia fisheries centres and processed at these centres to 75 per cent or 100 per cent clean if being transported by air. Once cleaned, conch is packaged and frozen for export.

As the conch fishery is mainly export driven, only about 10-20 per cent of the conch landed is consumed locally. Locally consumed conch is processed by fishers or other artisanal processors at the landing sites to the 50 per cent level, bagged and sold directly to vendors who then sell to consumers or restaurants.

Villamar Ltd. is the only processing company that uses conch harvested in the Grenadines to produce ready to serve convenience products, such as conch samosas, soups and chowders.

Table 5 Description of conch processing grades (Source: Hutchinson and Girvan, 2021)

Processing grade	Description
Live weight	Complete animal, including shell

Without processing (dirty)	Complete animal extracted from the shell, meat with skin, viscera, sex organs, digestive organs and operculum/nail
50% clean*	Operculum and visceral bag are removed
75% clean**	White meat, with some pink, orange meat only
85% clean	White meat, with some pink, orange meat only, skin on
100% clean	Fillet of white meat only

* This is sometimes identified locally as 35 percent cleaned. The foot is also removed in Saint Vincent and the Grenadines at this grade; **Identified by local stakeholders, but no clear distinction provided relative to 85 per cent clean.

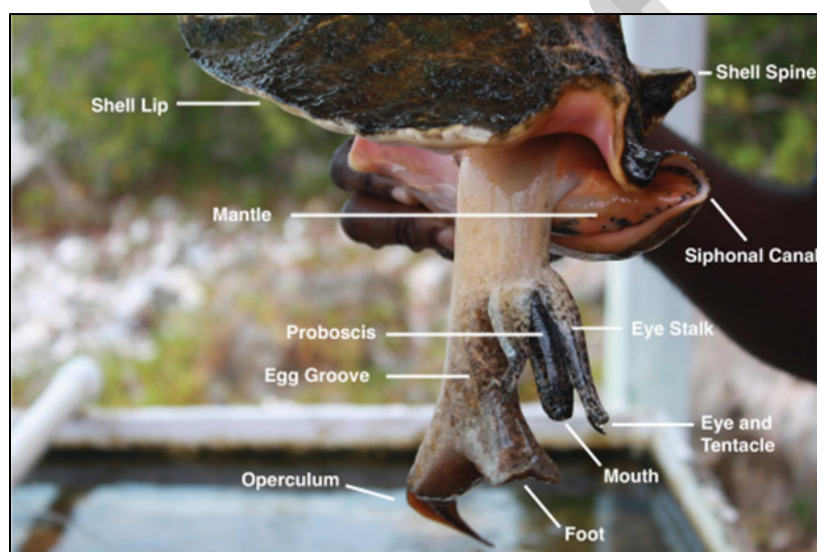


Figure 6 Anatomy of an adult female queen conch. Male is similar except has verge. (Source: M Davis, V Cassar - Journal of Shellfish Research, 2020 – BioOne)³³

H. Retailing

Locally, raw conch can be purchased by consumers from fish market vendors or fishers for around EC\$10³⁴ per pound. While conch meat is only occasionally sold at mainland fish markets, conch can be regularly purchased by consumers or restaurants at landing sites in the Grenadines.

³³ For more details see: <https://bioone.org/journals/journal-of-shellfish-research/volume-39/issue-3/035.039.0319/Queen-Conch-Aquaculture-Hatchery-and-Nursery-Phases/10.2983/035.039.0319.full>.

³⁴ \$3.70 (exchange rate US\$1 = EC\$2.70; April 19, 2022)

Conch dishes (e.g., curried conch, conch fritters, conch samosas etc.) can be purchased from hotels and restaurants in the Grenadines and on the mainland and are usually available year-round. Although more expensive than fish dishes, conch dishes are less expensive than lobster and can range between EC\$20 - EC\$65³⁵, depending on the dish (see Figure 7).



Figure 7 Menu from Coco's Place restaurant, Bequia, showing prices for a variety of conch dishes.

(Source: Coco's Place restaurant's Facebook page.)

Pre-packaged and frozen conch dishes produced by Villamar Ltd. are also available in some local groceries. The product pictured in Figure 10 retails for around EC\$11³⁶.

³⁵ \$7.40 - \$24.07 (exchange rate US\$1 = EC\$2.70; April 19, 2022)

³⁶ \$4.07 (exchange rate US\$1 = EC\$2.70; April 19, 2022)



Figure 8 Villamar Ltd. 16 fluid ounces pre-packaged, frozen callaloo and conch soup sold at Bonadie Ltd. supermarket in Saint Vincent. (Source: Bonadie Ltd. supermarket's Facebook page)

I. Other conch products - Conch trimmings, shells, operculum, and pearls

In addition to the conch meat, there are other parts of the conch that have value. These include the trimmings from the conch meat (which are produced during the various levels of cleaning), shell, operculum/nail and pearls. They are largely considered to be by-products of the conch fishery and are rarely the result of a direct harvest. In Saint Vincent and the Grenadines, these by-products are traded infrequently and in much smaller quantities compared to the conch meat.

(a) Conch trimmings

Queen conch trimmings, which can be either pink or black, are a protein rich byproduct of the conch meat production process. In Saint Vincent and the Grenadines, conch trimmings are usually discarded or sold at meagre prices (Cruickshank-Howard, 2021). However, some processors, for example Bequia Seafoods and Ocean Marine Shipping Agency Ltd, collect and package the trimmings into five-pound packages for export to the United States. Data received from the Fisheries Division showed that in 2019, the Bequia Seafood Company exported a total of four-thousand pounds of frozen conch trimmings to the United States valued at EC\$54,000³⁷ (this works out to be roughly EC\$13.50³⁸ per pound). It normally takes quite some time to accumulate this amount of trimmings. Trimmings are not used locally, but the Quality Assurance and Production Development Unit of the Fisheries Division, which also supports product development, is seeking to promote the use of trimmings locally for conch burger patties, fritters and fish cakes. Further, use of conch trimmings would contribute to reduce food waste.

(b) Conch shells

Queen conch shells are valued for their bright colours and attractiveness and are used for decorative purposes and to manufacture jewelry in many Caribbean countries. In Saint Vincent and the Grenadines, the majority of conch shells are discarded at sea during the harvest phase. However, a small amount of

³⁷ \$20,000 (exchange rate US\$1 = EC\$2.70; April 19, 2022)

³⁸ \$5 (exchange rate US\$1 = EC\$2.70; April 19, 2022)

shells are kept for the craft sector and sold directly to tourists in local markets and souvenir shops as curios and jewelry.

It has been acknowledged that queen conch shells can support livelihoods through the creation of income, especially for artisanal crafts makers and efforts have been made to build capacity to utilise conch shells locally. For example, through interviews, it was noted that training in jewelry making, using conch shells, was provided to local craft makers in the Grenadines in 2020, however because of the COVID-19 pandemic and the subsequent decline in tourist arrivals in the Grenadines, little financial benefit has been realised from this activity.

(c) Conch operculum

In some countries the conch is also prized for its operculum (or nail), which is a hard, sickle-shaped structure that forms part of its foot. As noted by UNCTAD (2021), in its conch value chain stakeholder mapping publication,³⁹ Caribbean conch opercula command a price premium in middle eastern and east Asian markets. Currently, only the Bequia Seafood Company collects conch opercula for export to Dubai, with 1,980 pounds exported to the United Arab Emirates in 2020 and 924 pounds exported in 2021. The operculum, like conch trimmings, is a small product in weight and volume, which requires large amounts of conch to be harvested over time to produce a tradeable weight of product to export.

(d) Conch pearls

Conch pearls are recognised as one of the most valuable (by weight) products produced by the queen conch. They occur in various tones of pink, yellow, brown and white (see Figure 9). Conch pearls are a rare by-product of conch production, typically found during the cleaning stage when the conch has been removed from its shell. As such pearls are normally found by fishers or cleaners of the conch. The frequency with which pearls are encountered is not known. However, it was noted during a stakeholder interview that on the rare occasion when pearls are found they are sometimes sold directly to yachties in the Grenadines. Yachties may purchase pearls for up to \$2,000 per pearl. According to CITES export data base, Saint Vincent and the Grenadines exported 10 queen conch pearls in 2019.



Figure 9 Various Tones of Conch Pearl (Source: emeraldsinternational.com)

Recommendations on how producers can potentially maximise the value of these by-products are elaborated in the recommendations section of this report.

³⁹ See <https://unctad.org/es/node/34585>.

J. Pricing⁴⁰

In 2019, it was estimated that 911,670 pounds of conch meat, valued at EC\$5,876,335, were landed in Saint Vincent and the Grenadines. Table 7 provides a breakdown of the average weight of conch landed and marketed in Saint Vincent and the Grenadines between 2015-2019.

Table 6 Estimates of conch landed and marketed in Saint Vincent and the Grenadines, 2015-2019

		Landings			Exports		
Type	Year	Weight (lbs)	Value (EC\$)	Average ex-vessel price (EC\$/lb)	Weight (lbs)	Value (EC\$)	Average export price (EC\$/lb)
Queen conch (<i>Strombus gigas</i>)	2015	74,637	490,696	6.57	38,668	212,164	5.49
	2016	96,986	544,395	5.61	51,205	324,310	6.33
	2017	470,056	2,820,336	6.00	275,575	1,858,775	6.75
	2018	684,060	6,848,773	10.01	612,545	6,652,644	10.86
	2019	911,670	5,876,335	6.45	722,893	7,990,169	11.05

Ex-vessel prices for deshelled, 'dirty' conch range between EC\$6-10 per pound with higher prices often offered on the mainland. Despite these higher price offerings, fishers rarely sell directly to the mainland due to the additional time it takes to travel there from the Grenadines and the associated fuel costs. It is estimated that Bequia and mainland processors currently purchase conch from the Union Island fisheries centre for around EC\$8.50 -9 per pound (*pers comm, 2022*).

After processing, packaging and freezing, Bequia, Union Island and mainland processors export conch to the United States, Dominica, Saint Lucia and other countries for between EC\$7 -\$13.50 per pound. Average export prices for the period 2015-2019 are shown in Table 7. Figure 10 shows the difference in conch landing prices versus conch export prices for the period 2015-2019.

Export prices for conch products (e.g., conch and callaloo soup, conch fritters and conch samosas) exported by Villamar Ltd. range between EC\$11- 20 depending on the product.⁴¹

⁴⁰ Exchange rate US\$1 = EC\$2.70

⁴¹ Based on 2019 export figures

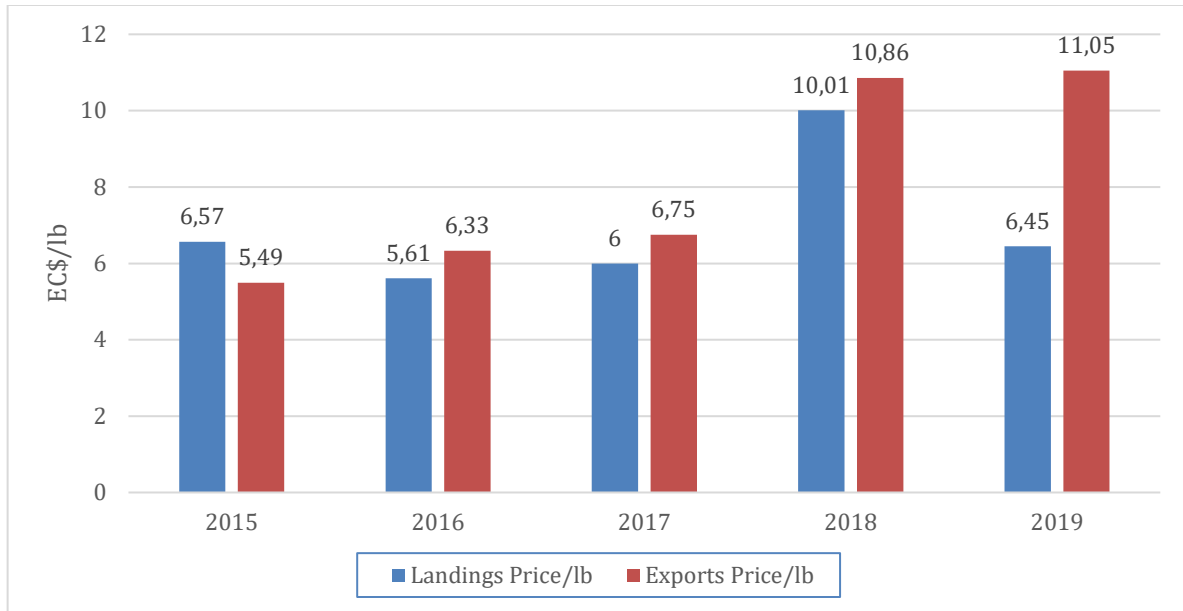


Figure 10 Conch landing prices and export prices for the period 2015-2019

K. Gender in the queen conch value chain

Both men and women are involved in the queen conch value chain in Saint Vincent and the Grenadines. Like many other Caribbean fisheries, men predominate in the pre-harvest and harvest stages of the conch fishery. However, women along with men participate in post-harvest activities. Women tend to be more involved in conch processing activities which include washing, cleaning, packaging and freezing of conch. They are also involved in retailing at fish markets. Figure 11 below provides a description of the roles of men and women in different activities along the queen conch value chain.

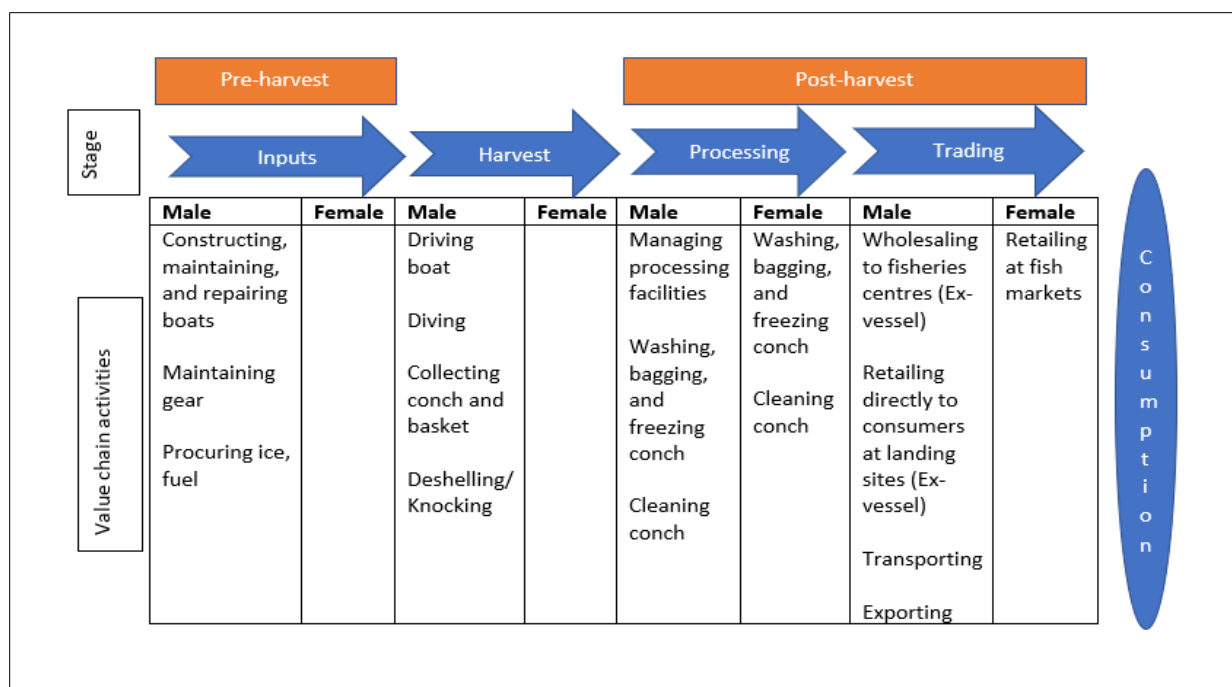


Figure 11 Description of gender roles in Saint Vincent and the Grenadines' queen conch fishery value chain⁴²

V. Export and market access potential

A. Conch meat

The majority (approximately <85 per cent by value) of conch exports from Saint Vincent and the Grenadines are frozen, raw conch meat. The main countries to which the conch meat and its products are exported are Barbados, British Virgin Islands, Curacao, Dominica, Saint Lucia, Saint Maarten, Trinidad and Tobago, the United States Virgin Islands and the United States of America (Cruikshank-Howard, 2021). However, the majority of exports go to the United States. Dominica and Saint Lucia are also significant export markets. For example, according to data provided by the Fisheries Division, in 2019, approximately 70 per cent of conch meat exports from Saint Vincent and the Grenadines went to the United States and 21 per cent and 8 per cent went to Dominica and Saint Lucia respectively.

Rainforest Seafoods started exporting from its new processing facility in March 2022. The first shipment of conch was sent to Florida in the United States. The shipment filled a 20-foot container and was sourced entirely from Vincentian artisanal fisherfolk and processed and packed by Rainforest's team of 80 employees.⁴³

Conch landings and exports started increasing significantly from 2017 (refer to Figure 14); this period coincides with the opening of the new Argyle International Airport in February 2017. The new

⁴² Figure adapted from WINFISH. 2017. Gender Analysis in the Fisheries Sector: General Santos Area, Philippines. National Network on Women in Fisheries in the Philippines, Inc., Iloilo City, Philippines.

⁴³ Rainforest celebrates milestone of first export shipment from Saint Vincent and the Grenadines <https://www.stvincenttimes.com/first-export-rainforest-stvincent-grenadines/>

international airport increased the capacity, including providing improved cold storage, for export of conch and other seafood to the United States.

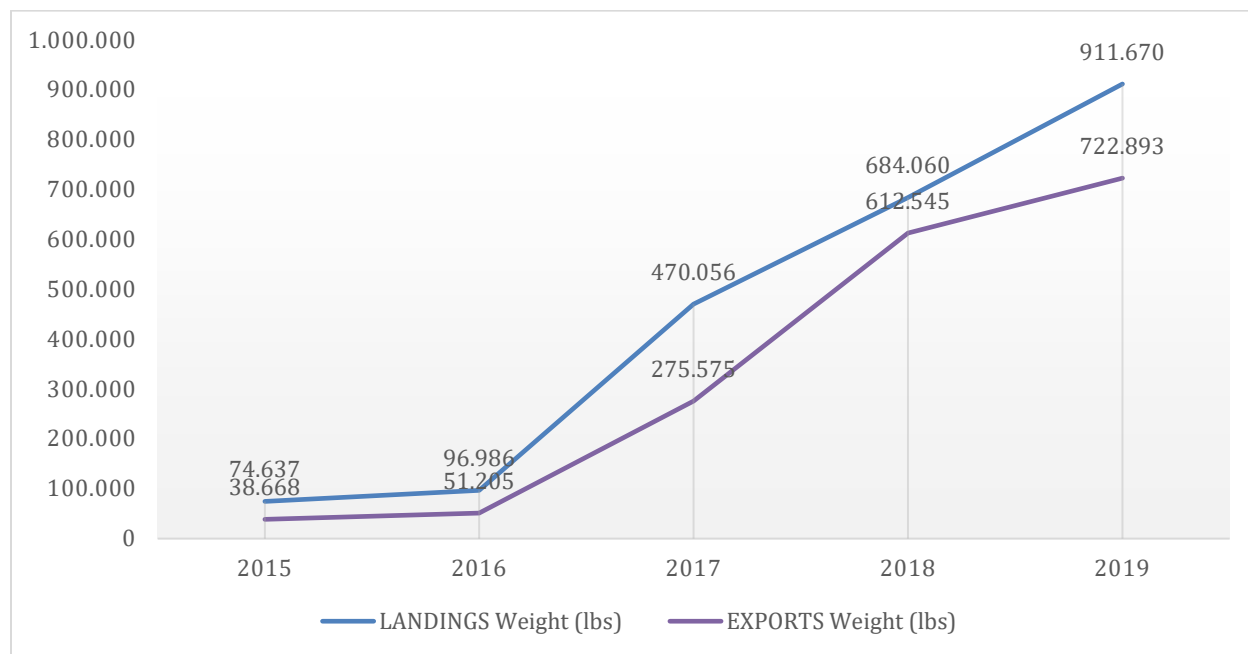


Figure 12 Conch landings versus exports by weight for Saint Vincent and the Grenadines, 2015-2019 (Source: Fisheries Division, 2022)

B. Value added conch products

While representing a small proportion of conch exports by value and volume (see Table 8), value added conch products are still an important aspect of this value chain that could potentially be expanded. Villamar Ltd. is the primary exporter of value-added queen conch products and Barbados is the main export market for these products. These products are primarily transported by sea freight.

Table 7 Value of Exports (US\$) for Value-added conch products 2018-202 (Source: Saint Vincent and the Grenadines Fisheries Division, 2022)

Product	Value of Exports (US\$) per Year		
	2018	2019	2020
Conch curry	\$0	\$0	\$306
Conch fritters	\$6,893	\$136	\$952
Conch samosas	\$2,036	\$5,248	\$966
Conch & callaloo	\$889	\$1,079	\$667
Total	\$9,818	\$6,463	\$2,891

This represents a segment of the value chain that should be explored for further expansion.

C. Conch trimmings

Conch trimmings are a by-product produced from the cleaning of conch to various export grades. The trimmings are cuts of conch meat that can be used as inputs into value added conch products described in the previous section and others. Conch trimmings are primarily produced in Bequia by the Bequia

Seafood company and exported to the United States frozen, via air freight. Volumes of trimmings exported vary significantly. Conch trimmings are sold in two formats, pink trimmings and black trimmings. Pink trimmings are typically used in conch soups and chowders in the United States restaurant market and black trimmings in conch fritters and other restaurants. Pink trimmings command a higher price than black. The price of this product was negatively affected by the decline in restaurant sales due to the COVID-19 pandemic but is expected to rebound in the near future. Opportunities to expand the use of this by-product in local value restaurant culture and other food products exist.

Table 8 Volume and Values of Conch Trimming exports From Saint Vincent and the Grenadines from 2019-2021 (Source: Saint Vincent and the Grenadines Fisheries Division, 2022)

Conch Trimmings	Year		
	2019	2020	2021
Volume (lbs)	4000	44500	4550
Value (EC\$)	\$5,400	\$222,500	\$22,750
Value (US\$)	\$2,000	\$82,407	\$8,426
Price Per Lbs/USD	\$0.50	\$1.85	\$1.85

D. Conch Operculum

As noted in the previous section, only the Bequia Seafood Company currently collects conch opercula for export to Dubai, United Arab Emirates with 1,980 pounds exported in 2020 and 924 pounds in 2021. While not significant in volume, conch operculum is exported to the United Arab Emirates and to Trinidad and Tobago (likely with onward transportation to the United Arab Emirates). As this is not a frequently traded product, data on prices is not considered reliable. For this reason, further research is necessary on the prices received for these products and if adequate value is received by producers in Saint Vincent and the Grenadines.

E. Health standards and export requirements

Fish and fishery products for export and local consumption are required to meet specific animal, hygiene and public health requirements. The Fisheries Division's Quality Assurance and Production Development Unit and Ministry of Health in Saint Vincent and the Grenadines play key roles in ensuring that these requirements are met.

The Fisheries Regulations (1987), require fish processing establishments to be licensed to operate. They are also required to be maintained and operated in a sanitary manner and maintain records of their operations such as the temperature of the conch, who the conch is purchased from, the quantity, and where the conch was harvested (Hutchinson and Girvan, 2021). **At the time of writing this report, none of the facilities noted were Licensed.**

Saint Vincent and the Grenadines has specific regulations on the handling and processing of fish and fish products set out in its Fisheries (Fish and Fish Products) Regulations (2006)⁴⁴. These regulations set out the standards and requirements for hygiene on board fishing vessels; handling of fishery products during and after landing; hygiene for fish processing establishments; health control and monitoring production

⁴⁴ Fisheries (Fish and Fish Products) Regulations (S.R.O. No. 12 of 2006) <http://extwprlegs1.fao.org/docs/pdf/stv77974.pdf>

conditions; packaging; labelling; storage and transport; and Hazard Analysis Critical Control Point (HACCP). The HACCP system focuses on identifying and preventing hazards that could cause food-borne illnesses, rather than relying on spot-checks of manufacturing processes of finished seafood products. The Fisheries Division functions as the Competent Authority with responsibility for establishing and implementing the standards specified in these regulations.

Fish processing facilities are inspected annually by the Ministry of Health and the Quality Assurance and Production Development Unit conducts periodic checks of these facilities to ensure that they are operating in a sanitary manner. Fish processing establishments are also required to comply with an own-checks system which requires them to do their own regular testing of their fish products by an appropriately certified laboratory. These laboratory tests are to be done in addition to the ones conducted periodically by the Quality Assurance and Production Development Unit.

All major seafood receiving countries also have their own requirements to ensure the safety of the seafood they import. The lead authority for seafood safety in the United States is the United States Food and Drug Administration (USFDA). The USFDA operates a mandatory safety programme for all fish and fishery products under the provisions of the Federal Food, Drug and Cosmetic Act, the Public Health Service Act, and related regulations. Under the seafood HACCP regulation, HACCP controls are required for both domestic and foreign processors of fish and fishery products (Koonse, 2016).

United States importers are required to verify that their foreign suppliers meet the requirements of the regulation (Koonse, 2016). Verification steps taken by importers include maintaining a current copy of the foreign processor's HACCP plan and obtaining certifications from an appropriate foreign government inspection authority certifying that the products were processed in compliance with the seafood HACCP regulation (Koonse, 2016).

To meet export requirements, harvested conch must be alive when it is landed. In addition, it must not have an off-smell or soft flesh (Hutchinson and Girvan, 2021). To ensure this, officers of the Quality Assurance and Production Development Unit inspect conch at landing sites. Fisheries data collectors may also conduct these inspections when officers of the Quality Assurance and Production Development Unit are unavailable. Queen conchs are also inspected to ensure that they are not immature. The Saint Vincent and the Grenadines' Fisheries Regulations (1987)⁴⁵ prohibits the sale, purchase or possession of immature conch, which, in terms of meat weight, is described as a conch with a total meat weight of less than 8 ounces (0.5 pounds) after removal of the digestive gland.

Inspections are also conducted before processed conch is exported. Firms that export conch must apply for inspection of the export product at least forty-eight hours prior. The export product is inspected to verify its weight and ensure that it is thoroughly frozen and does not have an unpleasant fishy smell. A CITES permit and health certificate are issued by the Fisheries Division following a satisfactory inspection of conch shipments.

Currently, none of the fish processing facilities in Saint Vincent and the Grenadines are HACCP certified. However, the facilities do have HACCP plans and efforts are made to comply with HACCP standards. The Quality Assurance and Production Development Unit conducts periodic audits of fish processing establishments to ensure compliance with HACCP standards. The Unit also supports capacity building by providing training to the staff at fish processing establishments in HACCP standards, Good Manufacturing Practices and Sanitation Standard Operating Procedures. During the conducting of this case study one facility was inspected by the Ministry of Health and Fisheries Division.

⁴⁵ Fisheries Act, 1986 (Cap. 52). <http://extwprlegs1.fao.org/docs/pdf/stv2112.pdf>

Bequia Seafoods, which currently exports to the United States, operates using a temporary approval to export obtained by its joint venture partner in the United States. This facility is due for an inspection by the USDA, however this has been delayed by Covid-19 pandemic. Currently no facilities in the Saint Vincent and the Grenadines have approval for export to the European Union.

VI Challenges in the Saint Vincent and the Grenadines queen conch value chain

A. Environmental challenges

(a) Decreasing conch stocks

Anecdotal evidence suggests that queen conch stocks in Saint Vincent and the Grenadines are decreasing. Stakeholders interviewed noted that shallow water conch stocks have reduced significantly over the years, resulting in fishers having to go to much deeper depths to harvest.

Additionally, with the recent entry of regional seafood giant Rainforest Seafoods into the Saint Vincent and the Grenadines conch industry, fishers are likely to experience economic benefits (i.e., higher ex-vessel prices) due to improved marketing of conch and conch products. Such benefits will likely lead to an intensification of fishing effort with potential for over-exploitation if appropriate controls are not implemented and enforced to ensure sustainable harvesting.

The last survey of queen conch stocks in the Grenadines was conducted in 2013. This survey was undertaken as part of a training exercise in underwater visual survey methods and focused specifically on the southern Grenadine islands at locations immediately surrounding Union Island, Mayreau, and the Tobago Cays Marine Park. The 2013 survey found that queen conch stocks in the southern Grenadines had relatively high density; however very few adults were found. It further noted that higher adult conch densities were found only in locations influenced by extreme environmental conditions (e.g., strong currents, high swells, deeper sites) (Prada and Glazer, 2013). The survey also highlighted the important role of marine protected areas, such as the Tobago Cays Marine Park, in supporting juveniles to mature and reproduce (Prada and Glazer, 2013).

Understanding the status of the queen conch stock is of critical importance for Saint Vincent and the Grenadines, especially in light of an expanding industry. In February 2022, the Saint Vincent and the Grenadines Environment Fund in collaboration with the Ministry of Agriculture and Fisheries engaged the Blue Marine Foundation to conduct a baseline study to examine the general biodiversity of fish in the waters of the country, with the main focus being on conchs and lobsters. Current conch surveys will be compared against the 2013 findings.

(b) Climate change

As climate change continues to impact the Caribbean region, storms and hurricanes are likely to become more intense and destructive causing long lasting disruptions to national queen conch value chains resulting from damaged fishing vessels, fishing communities, processing facilities and ecosystems important to the conch fishery (e.g., seagrass beds). Additionally, studies on Caribbean fisheries have highlighted that increased sea surface temperatures and ocean acidification will have negative impacts on the reproductive capacity of shellfish fisheries such as the queen conch (Oxenford and Monnereau, 2017). These changes in availability of high-value shellfish species such as conch will have impact on harvesters and could negatively affect export trade volumes and foreign currency revenue generation (Oxenford and Monnereau, 2017).

(c) Water availability

Another possible challenge to consider as the conch industry grows, is the availability of fresh water for processing higher volumes of harvested conch. This is of particular concern in Bequia and on Union Island, since most water there is provided by rainwater catchment and storage tanks. The increasing length of the dry season and increasingly erratic rainfall in the Grenadines are exacerbating water stress and scarcity (Boyd, 2021). While there is a large desalination plant at Paget Farm in Bequia, this is an expensive solution that can create additional environmental challenges (Boyd, 2021).

(d) Conch stockpiles

Due to the long history of conch harvesting in the Grenadines, and due to recent increases in production, the use of specific offshore and nearshore geographies for the deshelling of queen conch presents both an opportunity and a challenge. In areas with high tourism presence, conch stockpiles are considered an eyesore, particularly in the geographies of Canouan and Mustique (see

Figure 15 Discarded conch shells from historical harvests in Mustique (Source: Nakita Poon Kong, 2022

) which both host high end tourism. Conch stockpiles are also considered an eyesore in certain areas around Union Island and Bequia. Some stakeholders have indicated that this has increased the deshelling of conch near conch fishing grounds which is thought to cause migration of conch and reduce conch density in these areas. Limited scientific research has been conducted on the impacts of dumping conch shells on the ecology of marine environments. However, as will be noted in the recommendations section, queen conch shells have been used in construction of offshore islands in the Grenadines and have significant potential as a coral and ecosystem-based construction material and source of material for ecosystem based coastal adaptation projects. Large volumes of discarded conch shells can be marketed as a natural construction material for coastal engineering.



Figure 15 Discarded conch shells from historical harvests in Mustique (Source: Nakita Poon Kong, 2022

B. Socio-economic challenges

(a) Increasing incidence of diving-related injuries

In Saint Vincent and the Grenadines, conch is harvested by artisanal fishers using scuba gear. Previously, free diving was the preferred method to harvest conch, but due to a decline in shallow water stocks, fishers must now go to deeper depths (up to 45m in some instances) to get conch. Diving with scuba gear at deeper depths has increased the frequency with which conch divers in the Grenadines experience decompression sickness or get the 'bends', especially since divers are rarely formally trained or certified. Additionally, the entrance of young divers into the industry with limited experience, means the risk of health-related incidences is high. The injury or death of a fisher from diving can have detrimental effects on a fishing household, especially where the injured or deceased party is a main income earner. These types of incidents are further exacerbated by the self-employed nature of most fishers who may fall through the gaps of social security systems.

Stakeholder interviews with personnel on Mustique indicated that the island's medical clinic has seen an increase in conch diving related admittances in the past two years. Personnel estimated that there have been at least 20 incidents related to conch diving in the past two years with at least one resulting in death. In one case, a 16-year-old conch diver was admitted for decompression sickness. This was noted as a marked increase in incidents for the conch fishery as prior to 2019 most dive related admittances were for lobster fishers.

(b) Lack of hyperbaric chamber

Unfortunately, there is currently no hyperbaric chamber across the islands of Saint Vincent and the Grenadines. Considering the importance of dive-based fisheries such as conch and lobster, the large number of individuals participating in these fisheries and the risks associated with them, the absence of this essential piece of medical equipment is a substantial social challenge to the fishery. Hyperbaric chambers are essential pieces of equipment for the treatment of decompression sickness which presents a significant risk to divers. Currently treatment is provided within the regular healthcare system, using artificial oxygen. Additional treatment is given at the Mustique medical clinic.

(c) Absence of fisherfolk organisations in the Grenadines

The queen conch value chain includes a variety of actors with varying levels of power and influence to make decisions in the fisheries sector. In the Caribbean, small-scale fisherfolk are often under-represented in formal fisheries management decision-making processes. While a number of institutional factors contribute to this, one has been the limited ability of fisherfolk to establish and sustain fisherfolk organisations that can function as a collective representative voice for the fishing community. Fisherfolk organisations (whether they be as cooperatives, associations etc.) can play a role in determining the socio-economic conditions of fisherfolk to some extent.

The majority of active fisherfolk organisations in the Saint Vincent and the Grenadines are based on the mainland of Saint Vincent. These include the Barrouallie Fisheries Development Cooperative Society, Calliaqua Fisherfolk Cooperative Society, Fish Aggregating Device Fishers Cooperative, Fish Vendors Cooperative and the Goodwill Fishermen Cooperative Society. The fishing cooperatives are legally registered with the Cooperatives Division under the Cooperative Societies Act, 2012, and are members of the umbrella fisherfolk organisation, Saint Vincent and the Grenadines National Fisherfolks Cooperatives Limited. There are currently no active fisherfolk organisations in the Grenadine islands.

Efforts by the national umbrella fisherfolk organisation and other partners such as the Sustainable Grenadines Inc. to support formation of new and/or reactivation of existing registered⁴⁶ fisherfolk organisations in the Grenadines have to date not been successful. One interviewee suggested that this has partly been due to a lack of trust arising from past conflicts, due to organisational governance and management issues, among previous members. Without a fisherfolk organisation to represent the voice of conch fishers in decision-making or participate in collaborative management, conch fishers are vulnerable to negative socio-economic outcomes.

(d) Socio-economic data for the fishery is not collected

Socio-economic information is of critical importance in fisheries management and for policy definitions. While efforts are made to determine the number of people engaged in the harvest of conch in Saint Vincent and the Grenadines, information on the number people involved in post-harvest activities (e.g., processing) are less readily available. Additionally, information on earnings of people (including on gender) in the harvest and post-harvest stages is not collected. Collection and analysis of such information would enable management discussions that include the economic contributions to society from the fishery as well as the motivation for people to act in the sector.

(e) Unreliable air cargo services

The majority of conch in Saint Vincent and the Grenadines is exported to the United States by air. Consistent and reliable air transport is therefore an important part of the national queen conch value chain. Presently, conch is exported to the United States via Amerijet International Airlines from the Argyle International Airport. However, during interviews it was noted that flight schedules were sometimes unreliable with short notice cancellation of flights resulting in exporters incurring additional costs for refrigerated ground transport when shipments have to be returned to their facilities.

(f) Inadequate availability of skilled processors

While processing of fish is often considered a low-skill job, particular aspects of conch processing require key skills to avoid wastage of the high value conch meat. One such aspect of conch processing is the step referred to as “skinning”. Skinning involves the removal of the firm outer skin attached to the conch meat and is often considered tedious and labor-intensive process, that requires high levels of skill so as to not waste meat, As such, persons skilled enough and willing to do this job are often difficult to find and retain (*pers. Comm., March 2022*). For the reasons noted, one processor reported a high turnover of skinners at his fishing facility (*pers. Comm., March 2022*).

(g) Limited processing and value addition to queen conch trimmings

While best practice examples of the collection and sale of queen conch trimmings exists in Saint Vincent and the Grenadines, further value could be extracted from this product through its integration into local value addition channels. Local producers of queen conch products could expand production by using queen conch trimmings and then export queen conch trimmings as valued added products to neighboring markets such as Barbados.

⁴⁶ Through stakeholders interviews it was noted that, although not currently active, the Union Island Fisherfolk Cooperative is legally registered with the Cooperatives Division and previously functioned between 2014-2016.

C. Regulatory and institutional challenges

(a) Inadequate management measures for a growing industry

There are very few regulations guiding the harvest of conch in Saint Vincent and the Grenadines beyond the minimum size restriction set out in the Fisheries Regulations (1987) and the no-take zone of the Tobago Cays Marine Park set out in the Marine Park Act (1997). Provisions to establish a closed season are also set out in the Fisheries Regulations (1987), however the fishery does not currently have a closed season. While these limited measures may have sufficed in the past, current evidence of overexploitation and the expected intensification of fishing effort due to increased international export market will likely require additional management measures.

(b) No management plan in place for the queen conch fishery

Saint Vincent and the Grenadines does not currently have an approved management plan for its queen conch fishery, nor does it have a national fisheries plan in which the conch fishery is included. A management plan for the conch fishery was drafted in October 2008, based on the United Nations Food and Agriculture Organization's (FAO) *Revised Manual for the Monitoring and Management of Queen Conch*, however it was never formally approved or implemented.

Without an approved fisheries management plan in place, goals to support human well-being outcomes and protect, restore and promote the long-term health and stability of the conch fishery are not defined or pursued in a systematic way.

(c) Ineffective monitoring of harvest of undersized (immature) conch

Catch data for conch is collected by the Fisheries Division at the various landing sites in the Grenadines. However, because of the pooling of catches before they are landed and the landing of the conch without the shell, it is difficult to monitor the harvest of immature conch.

(d) Inadequate biophysical monitoring

While there are a few institutional actors, such as the Fisheries Division, Sustainable Grenadines Inc. and the Tobago Cays Marine Park, that contribute to biophysical monitoring of the coastal ecosystems and habitats upon which the conch fishery depends, they often have limited capacity to conduct routine monitoring due to inadequate staff and financial resources (*pers comm*; Garcia 2016).

(e) Inadequate capacity for mandatory laboratory testing of fishery products

Saint Vincent and the Grenadines Fisheries (Fish and Fish Products) Regulations (2006) require fish processing establishments to conduct regular laboratory testing of their fish products. However, accredited laboratories for fish processing establishments to conduct this testing do not exist nationally (*pers. comm.*). In the past, efforts to utilise regional laboratories were explored but the high cost associated with this approach was a constraining factor. This poses limitations for the licensing of these establishments as well as accessing the European Union export market which also requires regular laboratory testing of fish products.

VII. Opportunities, as they relate to the BioTrade Principles and Criteria

A. Towards an effective application of BioTrade Principles and Criteria to the queen conch value chain in OECS

Recognising the importance of the queen conch value chain to stakeholders across Saint Vincent and the Grenadines, and the threats and challenges presented by the recent expansion of the queen conch fishery, this chapter presents opportunities to address these challenges, using UNCTAD's 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 utilisation.⁴⁷ "BioTrade" as a concept is defined by UNCTAD as, "activities related to the collection or production, transformation, and commercialisation 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,⁴⁸ 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 2021.⁴⁹

Currently, the BioTrade Principles and Criteria are promoted and implemented by government organisations, business associations, non-governmental organisations, 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 association). Nowadays, various biodiversity-based value chains can benchmark their sustainability practices against BioTrade Principles and Criteria via the UNCTAD/ITC

⁴⁷ 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/.

⁴⁸ The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat.

⁴⁹ For more information, see TD/L.435, available at https://unctad.org/system/files/official-document/td-l-435_en.pdf.

BioTrade Self-Assessment Tool⁵⁰ 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 Vincent and the Grenadines 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 customised analysis by applying the BioTrade Self-Assessment Tool to obtain a more precise and complete assessment. Table 10 summarises the status of the queen conch value chain in Saint Vincent and the Grenadines, 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 Vincent and the Grenadines. 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 9 Assessment of queen conch value chain in Saint Vincent and the Grenadines according to the BioTrade Principles and Criteria

BioTrade Principle	Relevant BioTrade criteria	Status of the queen conch value chain in Saint Vincent and the Grenadines	Recommendations for the implementation of relevant BioTrade Principles and Criteria
Principle 1: Conservation of biodiversity	1.1 1.3	<p>Government:</p> <ul style="list-style-type: none"> • Saint Vincent and the Grenadines has adopted its <u>National Biodiversity Strategy and Action Plan (NBSAP) 2015-2020</u>. Development of a queen conch fishery management plan was highlighted as a key goal in the NBSAP. The NBSAP notes queen conch stocks as “overexploited”. • Saint Vincent and the Grenadines does not currently have an approved national queen conch management plan. A management plan for the conch fishery was drafted in October 2008, based on the United Nations Food and Agriculture Organization’s (FAO) <i>Revised Manual for the Monitoring and Management of</i> 	<ul style="list-style-type: none"> • Update and implement the draft (2008) national fisheries management plan for the queen conch fishery, using a participatory approach. Such a plan should include a complementary monitoring and evaluation framework to facilitate regular review and revision. • Implement the relevant recommendations for the queen conch fishery outlined in the NBSAP.

⁵⁰ See UNCTAD, “BioTrade Knowledge Sharing & Self-Assessment Tool”, available at https://sustainabilitymap.org/biotrade_unctad.

		<p><i>Queen Conch</i>, however it was never formally approved or implemented.</p> <ul style="list-style-type: none"> • Saint Vincent and the Grenadines has an approved Fisheries and Aquaculture Policy and National Ocean Policy, both developed in 2018 that articulates the need for the sustainable management and protection of marine biodiversity and coastal ecosystems. The Fisheries and Aquaculture Policy specifically mentions utilising precautionary and ecosystem-based approaches along with species-specific management strategies. • Stock assessments for the queen conch fishery are not regularly conducted. A partial queen conch survey was conducted in the Grenadines in 2013 under a visual survey training project. In February 2022, the Saint Vincent and the Grenadines Environment Fund in collaboration with the Ministry of Agriculture and Fisheries engaged the Blue Marine Foundation to conduct a baseline study to examine the general biodiversity of fish in the waters of the country, with the main focus being on conchs and lobsters (also related to Principle 2). • Water quality monitoring of marine ecosystems is conducted regularly by the Fisheries Division, however, continuous biophysical monitoring of other parameters relevant to the queen conch fishery (e.g., number and weight of females) are limited and often dependent on external expertise and funding. • Nursery areas for conch are located within the Tobago Cays Marine Park (TCMP) – a no-take marine protected area. One of the TCMP’s goals is to “enhance conservation and management of biodiversity of the area.” However, management capacity of the TCMP may need to be built to 	<ul style="list-style-type: none"> • Complete survey of conch fisheries and use findings to determine appropriate conservation measures (e.g. this may include a closed season), in collaboration with relevant stakeholders, for the fishery. • Establish a continuous monitoring system for stock and biophysical assessments, using a collaborative management approach. • Build management capacity of TCMP to support queen conch conservation. • Conduct regular assessments to determine the effectiveness of the TCMP to support queen conch conservation. • Promote and communicate the principles and standards set out in the Regional Code of Conduct for Caribbean Fisheries among fisherfolk.
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		<p>improve the protected area’s contribution to queen conch conservation (<i>pers. comm</i>; Garcia 2016).</p>	
		<p>Private sector (fishers, processors, and other relevant actors):</p> <ul style="list-style-type: none"> • A five-year (2020-2025) regional code of conduct⁵¹ was formulated by the board members of the Caribbean Network of Fisherfolk Organisations (CNFO) with input from their membership, in an effort to increase participatory application of the ecosystem approach to fisheries. The Saint Vincent and the Grenadines National Fisherfolks Cooperatives Limited is a member of the CNFO. This code sets out principles and standards of behaviour to ensure the well-being of fisherfolk through sustainable use, management, and development of both marine and freshwater living aquatic resources in the Caribbean. • Fisherfolk are to be trained in... as part of the baseline study to examine the general biodiversity of fish in the waters of the country. • There are no records of protocols or practices for conservation or adaptative management by processors. 	
<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"> • Management of the queen conch fishery is guided by the Saint Vincent and the Grenadines Fisheries Act, (1986) and the Fisheries Regulations (1987). The latter contains provisions of minimum criteria to harvest queen conch (e.g., sizes and level of 	<ul style="list-style-type: none"> • In collaboration with relevant stakeholders, consider the application of additional and complementary sustainable use, adaptive and ecosystem-based measures to those

⁵¹ Regional Code of Conduct for Caribbean Fisheries 2020-2025
https://clmeplus.org/app/uploads/2021/03/CNFO-Regional-Code-of-Conduct-for-Caribbean-Fisheries_FINAL.pdf

		<p>maturity). The Regulations also note that the Minister may declare a closed season, however a closed season does not currently exist in Saint Vincent and the Grenadines.</p> <ul style="list-style-type: none"> • Saint Vincent and the Grenadines’ Fisheries and Aquaculture Policy includes the specific goal to “Reduce risks to the sector, and build climate resilience, and increase competitiveness for international trade, production of under-utilised species and value-added products”. Capacity building to conduct vulnerability and climate assessments for the fisheries sector was recently undertaken with key stakeholders in Saint Vincent and the Grenadines under the FAO funded Climate Change Adaptation in the Fisheries Sector of the Eastern Caribbean (CC4FISH) project.⁵² • Saint Vincent and the Grenadines established a Fisheries Advisory Committee in 2020 to advise the Minister on the sustainable management and development of fisheries in the fishery waters. The country also has a National Oceans Coordination Committee which is composed of the Fisheries Division and representatives from other Ministries and agencies with competence in ocean issues. • Saint Vincent and the Grenadines participates in the CFMC/OSPESCA/WECAFC/CRFM/CITES Working Group on Queen Conch. The 2019-2021 work plan for the Working Group included supporting national authorities and fisherfolk organisations to implement the 	<p>already in place. These may include the establishment of open and closed seasons, designation of conch nursery areas and/or a simple compilation of best fishing and other practices (e.g., for use of all parts for bait, fertilisers, or handicrafts, etc.) for small scale and subsistence fishers.</p> <ul style="list-style-type: none"> • Conduct research to understand the impacts of climate change and biodiversity loss on the queen conch fishery and actions that can be taken to improve resilience and adaptive capacity of the queen conch value-chain and its actors. • Conduct capacity and awareness building activities to facilitate application of sustainable use practices by harvesters and other value chain actors. • Based on an up-to-date queen conch stock assessment, establish a monitoring programme with relevant sustainable use indicators. • Implement recommendations under the Regional Queen Conch Management Plan nationally.
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⁵² Regional implementation of Climate Change Vulnerability and Capacity Assessments (VCAs) in the Eastern Caribbean fisheries sector https://canari.org/wp-content/uploads/2018/02/CC4FISH-VCA-Project-Brief_CANARI-8.10.19.pdf

		<p><i>Regional Queen Conch Management and Conservation Plan.</i></p>	<ul style="list-style-type: none"> Strengthen intersectoral cooperation and coordination to decide on and implement sustainable use activities for the queen conch fishery e.g., closed season. This can be achieved through creation of a working group for queen conch under existing multi-stakeholder coordination mechanisms such as the Fisheries Advisory Committee or the National Ocean Coordination Committee. Information regarding sustainable use activities should be communicated effectively through appropriate channels to maximise efforts. Promote and communicate the principles and standards set out in the Regional Code of Conduct for Caribbean Fisheries among fisherfolk.
		<p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> A five-year (2020-2025) regional code of conduct⁵³ was formulated by the board members of the Caribbean Network of Fisherfolk Organisations (CNFO) with input from their membership, in an effort to increase participatory application of the ecosystem Efforts by the national umbrella fisherfolk organisation and other partners such as the Sustainable Grenadines Inc. to support formation of new and/or reactivation of existing registered fisherfolk organisations in the Grenadines have to date not been successful. One interviewee suggested that this has partly been due to a lack of trust arising from past conflicts, due to organisational governance and management issues, among previous members. Without a fisherfolk organisation to represent the voice of conch fishers in decision-making or participate in collaborative management, conch fishers are vulnerable to negative socio-economic outcomes. stem approach to fisheries. The Saint Vincent and the Grenadines National Fisherfolks Cooperatives Limited is a member of the CNFO. This code sets out principles and standards of behaviour to ensure the well-being of fisherfolk through sustainable use, management, and development of 	

⁵³ Regional Code of Conduct for Caribbean Fisheries 2020-2025
https://clmeplus.org/app/uploads/2021/03/CNFO-Regional-Code-of-Conduct-for-Caribbean-Fisheries_FINAL.pdf

		<p>both marine and freshwater living aquatic resources in the Caribbean.</p> <ul style="list-style-type: none"> • There are no records of protocols or practices for sustainable use by processors. 	
<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 not chance yet to get recognition from buyers. • Saint Vincent and the Grenadines 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 Vincent and the Grenadines. 	<p>There is a need to encourage buyers to put a value sustainability e.g., give a “premium” price for responsible fishers. This could start with restaurants and hotels. For that, a set of best practices need to be compiled under the BioTrade approach.</p> <p>Explore shared and collective marketing of eastern Caribbean conch harvested by responsible fishers and in fair value chains through branding.</p>
		<p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> • There are additional potential markets for Saint Vincent and the Grenadines queen conch in Trinidad and Tobago the United States, Europe and Asian markets not only for the meat but for other parts of the conch (e.g., trimming, operculum and pearls). • 	<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 equitable and fair sharing of benefits.</p> <p>Non-monetary benefits that could be shared amongst 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 Vincent and the Grenadines becomes a Party to the Nagoya Protocol on Access and Benefit Sharing or in the meantime, comply with its obligations under art. 15 of the CBD regarding benefit-sharing.</p> <p>The Fisheries Department could consider implementing a set of incentives to private actors to formalise their international trading activities (particularly with Grenada and Saint Lucia) and to list and comply with export markets requirements.</p>
<p>Principle 4: Socioeconomic sustainability</p>	<p>4.1 4.2 4.3</p>	<p>Government:</p> <ul style="list-style-type: none"> • Awareness of BioTrade P&C is moderate, nevertheless government officials have participated in UNCTAD and OECS capacity building activities. • Saint Vincent and the Grenadines has specific regulations on the handling and processing of fish and fish products set out in its Fisheries (Fish and Fish Products) Regulations (2006). These regulations set out the standards and requirements for hygiene on board fishing vessels; handling of fishery products during and after landing; hygiene for fish processing establishments; health control and monitoring production conditions; packaging; labelling; storage and transport; and HACCP (also related to Principle 5). The Fisheries Division functions as the Competent Authority with responsibility for establishing and implementing the standards specified in these regulations. • Existing hygiene and food safety standards appear to be adequate to permit export of queen conch to Caribbean regional and North 	<ul style="list-style-type: none"> • Conduct more training activities for increased awareness of the content, application, and benefits of BioTrade P&C. In addition, and as a first step, interested business operators may also undertake UNCTAD-ITC's BioTrade Self-assessment Tool to benchmark their sustainability practices against private, public and international (voluntary) standards. • Explore options for an accessible simple, low-cost traceability system that includes a sustainability verification/certification component (related to Principles 1 and 2), for the queen conch value chain. Sustainability verification/certification information can be included in the marketing

		<p>American markets, however these standards are not adequate to meet European Union trade requirements.</p> <ul style="list-style-type: none"> • National infrastructure appears to be adequate for processing and marketing of queen conch meat. • A simple, low-cost system is in place to allow supply chain traceability up to the place of collection and to a limited extent the place of harvesting. This system does not include a sustainability verification/certification component. 	<p>of fish to be able to command a premium price.</p> <ul style="list-style-type: none"> • Private sector actors should further explore options for expanding the marketing of conch by-products including the trimmings, opercula, shell and pearls. Regarding the pearls, capacity will have to be built to appraise and value this rare, high value by-product.
		<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 queen conch (viscera, claw, operculum, tips of proboscis, eye stalk, verge), should be first expanded as capacity within country and trade in these products already exists. • Understanding of BioTrade P&C is very limited in the value chain. So far only two online workshops have been organized by UNCTAD and OECS due to the COVID-19 pandemic. • There is little or no evidence that fishers strictly implement a quality control system. • There is no system for catch certificates for queen conch 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 & Criteria offer a first and significant step towards sustainability. 	<ul style="list-style-type: none"> • Build capacity of harvesters in quality control. This may include providing regular hygiene and handling training sessions as part of a licensing regime and/or producing and disseminating simple visual guidance and best sanitary practices for queen conch harvesting and handling for fishers.
<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 Vincent and the Grenadines has ratified and is a Party to the United Nations Convention on the Law of the Sea, United Nations Fish Stocks 	<ul style="list-style-type: none"> • Take necessary steps to upgrade to Category 1 status in terms of its national legislation and

		<p>Agreements, the CBD, CITES, the Paris Agreement and Cartagena Convention.</p> <ul style="list-style-type: none"> • Saint Vincent and the Grenadines' national compliance status is currently listed by CITES as "Category 2". A "Category 2" status means that <i>"legislation is believed generally not to meet all of the requirements for the implementation of CITES"</i>. However, a February 2020 update noted that CITES legislation was enacted and submitted for analysis by the CITES Secretariat. The annual report for 2021 is listed as missing. • All local fishing vessels must be registered, and licensed, and special conditions are applied. • The Saint Vincent and the Grenadines Fisheries Act (1986), Fisheries Regulations (1987) and Fisheries (Fish and Fish Products) Regulations (2006) contain enforcement and compliance measures. 	<p>continuously submit outstanding annual CITES reports to avoid trade suspension. Explore options to establish a nationally accredited laboratory for private sector actors to conduct regular testing on fishery products as required by the Fisheries (Fish and Fish Products) Regulations (2006).</p> <ul style="list-style-type: none"> • Support fish processing establishments to build their capacity to meet national licensing and European Union trade requirements <p>How does the fisheries Division believe that this could be improved?</p>
		<p>Private sector (fishers, processors and other relevant actors):</p> <ul style="list-style-type: none"> • Accredited laboratories for fish processing establishments to conduct regular testing on fishery products as required by law do not exist nationally. Efforts to utilise regional laboratories were explored but the high cost associated with this approach was a constraining factor. • Fish processing establishments have difficulties with consistently meeting annual licensing requirements. 	
<p>Principle 6: Respect for actors' rights</p>	<p>6.1 6.2 6.3</p>	<p>Government:</p> <ul style="list-style-type: none"> • Saint Vincent and the Grenadines respects fundamental human rights, has a rule of law and respects basic labour rights. • Saint Vincent and the Grenadines has ratified a number of ILO Conventions. <p>Private sector (fishers, processors and other relevant actors):</p>	<ul style="list-style-type: none"> • Extend social protection to 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. Formalisation

		<ul style="list-style-type: none"> • Fishers are usually autonomous and informal workers. • Conch fishers are not organised. Without a fisherfolk organisation to represent the voice of conch fishers in decision-making or participate in collaborative management, conch fishers are vulnerable to negative socio-economic outcomes. • Conch divers do not have medical insurance coverage to support treatment for decompression sickness and other work-related risks. • Saint Vincent and the Grenadines does not have a hyperbaric chamber to treat with decompression sickness/bends. 	<p>of queen conch fisherfolk harvesting, and trade may address the issues on provision of social protection and inclusion. If formalisation is considered, this process should be straightforward and accessible, so it does not become a barrier for participation.</p> <ul style="list-style-type: none"> • Develop special insurance schemes with the private sector and processors for fishers and other high-risk ocean-based sector professions. • Support the organisation of fisherfolk in the conch industry and facilitate their participation in decision-making processes. • Explore opportunities to establish a hyperbaric treatment facility in Saint Vincent and the Grenadines through public and private sector investment from the fisheries, health and tourism sectors. • Host consultations to share, discuss and validate the findings of this case study report with fisherfolk in an understandable and accessible manner.
<p>Principle 7: Right to use and access natural resources</p>	<p>7.1 7.2 7.4</p>	<p>Government:</p> <ul style="list-style-type: none"> • Access to the resource is based on a licensing and registration system and is enforced in accordance with Saint Vincent and the Grenadines Fisheries Act, (1986)C 	<ul style="list-style-type: none"> • Compile local/traditional best practices and knowledge that could be beneficial for the conch fisheries. • Management of the queen conch species and

		<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 interviewed stakeholders. • 	<p>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>
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B. Key opportunities under the implementation of UNCTAD’s BioTrade Principles and Criteria

Due to its marine geography that lends itself to queen conch production, active participation in regional and international queen conch markets, wide variety of queen conch value added and by products produced positions it well as a country to adopt a BioTrade approach to maximise long term sustainability and value earned and added from this important product.

(a) Environmental Opportunities

Principle 1: Conservation of Biodiversity

Principle 2: Sustainable use of Biodiversity

While stakeholder interviews and anecdotal evidence suggest increasing pressure on the queen conch resources of Saint Vincent and the Grenadines, recent investments by the Saint Vincent and the Grenadines Environment Fund present a significant opportunity to enhance the sustainable use of this resource.

As noted in earlier project publications⁵⁴ opportunities exist to enhance the population of queen conch resources through seeding and aquaculture approaches. Due to its archipelagic nature, and large shelf, Saint Vincent and the Grenadines is home to many suitable conch habitats. Saint Vincent and the Grenadines is also centrally located amongst conch producing OECS nations with Saint Lucia to the north and Grenada to the south. For these reasons Saint Vincent and the Grenadines poses significant potential as the location for a conch nursery facility that supports the artificial propagation of queen conch. 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.

The collection of queen conch by-products such as operculum, and shells presents a significant opportunity to improve the sustainable use of current harvest through value addition and maximisation. In particular, the collection of queen conch shells at centralised locations presents an opportunity to commercially market this by-product.

⁵⁴ Blue BioTrade in Saint Lucia: Developing Value for sustainable Trade and production of Queen Conch in the Eastern Caribbean and Stakeholder Maps of the Conch Value Chains of Grenada, Saint Lucia and Saint Vincent and the Grenadines

(b) Regulatory opportunities

Principle 5: Compliance with national and international legislation

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

Saint Vincent and the Grenadines currently faces no CITES recommendations to suspend trade. However, improvements need to be made in the way data on queen conch landing information is collected. Additionally, recent recommendations to suspend trade faced by its neighbours Saint Lucia and Grenada should serve to emphasise the need for continued and enhanced cooperation with the CITES Secretariat.

One major strength of this value chain is the Fisheries Division of Saint Vincent and the Grenadines. Despite limited resources, they collect and produce high quality data on exports and queen conch trade. Data is collected on landings across the major landing sites, and comprehensive trade data is collected, recording, outward shipper's details, receiver details, shipment weights, shipment values, shipment method, shipment format (frozen, chilled) amongst others. While further details are necessary as to how this is facilitated within the Fisheries Division, it represents potential best practice to be replicated in other islands.

(c) 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

- i. Strong interest from stakeholders for co-management approaches.** Interviewed stakeholders all reflected the risk of unsustainable harvest of queen conch and expressed interest in approaches to minimise the risk of this occurring. The opportunity to explore co-management and stewardship approaches of the queen conch resource exists and should be further explored. Stewardship, approaches require all of those involved in the value chain to take responsibility for and participate in the protection of the natural resource. Under such an approach, all stakeholders, primarily those involved in the harvest, production and export of queen conch are involved in the management of the resource. For example, fishers can actively participate in the monitoring and enforcement of closed seasons (once established), and work with fisheries authorities to collect data on stock health and production. Supporting the formation of fisherfolk organisations can help to strengthen the participation of fisherfolk as co-managers in this regard. Further, non-governmental organisations such as the Sustainable Grenadines Inc. can participate and implement information campaigns and support data collection on social aspects. Additionally, marine protected areas could actively participate in conch nursery activities.
- ii. Additional training and licensing requirements for divers participating in the conch industry, combined with social insurance schemes.** Due to the risks associated with conch diving mandatory training and licensing in commercial diving techniques should be required for conch divers and required to regularly updated in line with international standards. Mechanisms for reducing the costs associated with this training and certification as well as measures that incentivise formal training and licence should also be explored, to ensure these requirements do not have an unintended consequence of encouraging unlicensed diving due to costs being prohibitive and disincentivising.

Principle 4: Socioeconomic sustainability

Socio-economic sustainability of the queen conch fishery in Saint Vincent and the Grenadines could be enhanced in several ways without expanding current harvest levels.

- i. **Enhancing value addition of landed conch through increased domestic processing.** Currently, robust connections exist between various traders in Saint Vincent and the Grenadines and buyers regionally and internationally. However, queen conch is typically traded with minimal processing happening within Saint Vincent. While best practice use of queen conch trimmings does occur to some extent, significant room for expanding this exists. Greater processing of queen conch prior to trade could occur on Union Island, enhancing the position of actors in this geography in this value chain. The entrance of large processors such as Rainforest seafood will likely see a higher level of domestic processing prior to export occurring within Saint Vincent and the Grenadines, but this will now be concentrated at their facility, potentially displacing current small processors.
- ii. **Expanding collection and sale of non-meat by-products** - Conch operculum is collected by one operator in Saint Vincent and the Grenadines; however, its collection is not widespread. Collection of this by-product could be expanded across all locations where conch is landed with little additional effort. This represents a significant opportunity to increase income from current production levels without expanding harvest levels.
- iii. **Historical conch agglomerations** - The number of large agglomerations of queen conch shells from historical harvest across the islands of Saint Vincent and the Grenadines is significant. In some areas these agglomerations represent an eyesore and challenge in areas where tourism is present and in areas where tourism is expanding and becoming increasingly important to the local economy. However, these agglomerations represent a significant potential resource for building materials and as an input into artisanal products as articulated in other reports. Saint Vincent and the Grenadines role as a sub-regional transportation hub and local capacity in coastal transportation means these resources could easily be capitalised and sold with appropriate marketing and buyer sourcing.
- iv. **Improved value addition from existing conch trimmings** - Conch trimmings are produced by processors in facilities in Bequia and exported to the United States. The sale of this valuable by-product represents a good value addition of queen conch by these producers. However, value from this by-product could be further maximised. Queen conch trimmings can be used in pre-prepared conch products such as sausages, frozen conch burgers, frozen seasoned conch meat, conch samosas and packaged conch soup. Training at local facilities where queen conch is processed in these value addition methods, or the sale to other local producers such as Villamar Ltd. could mean queen conch trimmings are not exported as a raw material but as value added food products.

VIII Recommendations and conclusions

The queen conch value chain of Saint Vincent and the Grenadines has a number of notable strengths, that have been capitalised on by exporters and producers particularly in recent years putting pressure on the resource. For these reasons, the application of the BioTrade Principles and Criteria and the BioTrade approach to this value chain is particularly timely. Significant opportunities to improve the value earned and long-term sustainability could be actualised through the application of the BioTrade Principles and Criteria to this value chain, and the development of 'BioTrade' conch.

The recommendations presented below should be validated and prioritised by local stakeholders. Further they should be considered within the context of the upcoming BioTrade Action Plan.

- i. **Enhance cooperation with neighboring OECS queen conch producers and consumers.** Saint Vincent and the Grenadines shares neighboring fishing stocks with Grenada, and trades significant volumes of queen conch products with neighboring Saint Lucia. The connections between project countries' value chains presents unique challenges related to the illegal, unreported and or unregulated trade of conch products, but more importantly presents opportunities to improve associativity and explore shared management arrangements. In this regard it is recommended to:
 - Establish a shared management plan for the queen conch stocks of the countries participating in this project with the possibility of expansion to other OECS countries.
 - Establish shared data collection procedures, in particular the sharing of data collection best practices from Saint Vincent and the Grenadines with other project countries, including CITES reporting procedures.
 - Simplify the import and export of products to facilitate the regularisation of current cross border illegal, unreported and/or unregulated trade.
- ii. **Introduce mechanisms to prevent unsustainable harvest levels.** Due to the opening of the international airport and privatisation of the operation of several government-owned fish processing facilities, export of queen conch has expanded significantly. This expansion in export has created significant demand which increased harvest efforts and landings. While resource assessments are currently being done to assess the effect of this expansion on stock health, stakeholders expressed concern about the impacts of current harvest levels and their effect on long term sustainability. For this reason, the precautionary principle should be applied and a number of mechanisms to control harvest levels should be explored including:
 - a. Establishment and effective implementation of a closed season based on local spawning season. This recommendation has been articulated in previous case studies. Based on the most recent available science, a closed season, where no conch harvesting is allowed should be established with the local spawning season for queen conch.
 - b. Establishment and effective implementation of a quota system, based on scientifically determined maximum sustainable yield
 - c. Establishment and effective implementation of no catch areas particularly in habitats where queen conch spawn.
- iii. **Develop social insurance schemes for conch fishers and processors, combined with training in safe commercial diving techniques.** As noted throughout this report, fishing for conch requires specialized diving skills and comes with health risks associated with commercial diving. Divers need specific health and social insurance schemes to provide benefits to contributing fishers in the form of health care and sickness compensations and benefits to dependents of fishers.

Further, the processing of conch is also a relatively specialised skill, while with less risk of injury, as with all fish processing, some risks exist. Thus, schemes for those involved in processing should also be explored to improve the position of actors in this important segment of the value chain.

- iv. **Consider development of a sub-regional queen conch aquaculture nursery.** As discussed in earlier project publications⁵⁵, the development of a queen conch nursery in Saint Vincent and the Grenadines should be considered a priority. The Grenadine Bank, of which most falls under the jurisdiction of Saint Vincent and the Grenadines, is a significant natural habitat for the queen conch, and likely plays an important role in the lifecycle of queen conch and queen conch production well beyond its borders, through spillover effects. This nursery could promote not only the production and rearing of conch to production levels but also the release of juvenile conch into the wild to restock wild populations. While this is not without concerns related to cost and genetic diversity of the feedstock for aquaculture, collaboration with neighboring countries that would also benefit from this facility would facilitate its functioning.
- v. **Further invest in socio-economic data collection.** While significant investment has been made in data collection in Saint Vincent and the Grenadines, further investment in socio-economic data collection as it relates to fisheries is particularly necessary. Processing of conch, particularly the development of value-added products such as processed meat, trimmings and value-added food products provide significant employment across Saint Vincent and the Grenadines. Unfortunately, limited data on employment numbers, and gender considerations exist in this regard. Provided adequate resources further data on the socio-economic factors, gender considerations, and health impacts of the fishery are necessary to fully understand its benefits and costs to Saint Vincent and The Grenadines
- vi. **Use e-commerce to expand the trade of queen conch crafts and other products.** E-commerce platforms and social media can be used to expand the current markets for queen conch craft products. Also, to further integration of queen conch shell craft products as inputs into the fashion industry, queen conch shells can be made into beads and mother of pearl shapes that can be used in the manufacture of high value fashion products.
- vii. **Match investments in production capacity with investments in sustainability.** Fisheries in Saint Vincent and the Grenadines has seen significant investment in the past five years, with the development of joint ventures with United States based firms, and entrance and investment of EC\$ 20 million⁵⁶ by regional seafood conglomerate Rainforest Seafoods. While these investments in production capacity will likely yield short term economic benefits, without matching investments in long term sustainability, the profitability of these businesses will be compromised.
- viii. **Continue education of fishers on size limits and regulations due to entry of young divers to value chain.** Due to the entry of new fishers to the market, increased education and awareness about size restrictions need to be conducted. Further the issuance of tools for rapid field measurement of queen conch size could enable stronger adherence to size limits. Such tools are used in best practice lobster fisheries.

⁵⁵ Blue BioTrade in Saint Lucia: Developing Value for sustainable Trade and production of Queen Conch in the Eastern Caribbean and Stakeholder Maps of the Conch Value Chains of Grenada, Saint Lucia and Saint Vincent and the Grenadines

⁵⁶ \$7,400,418.12 (exchange rate US\$1 = EC\$2.70; April 19, 2022)

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