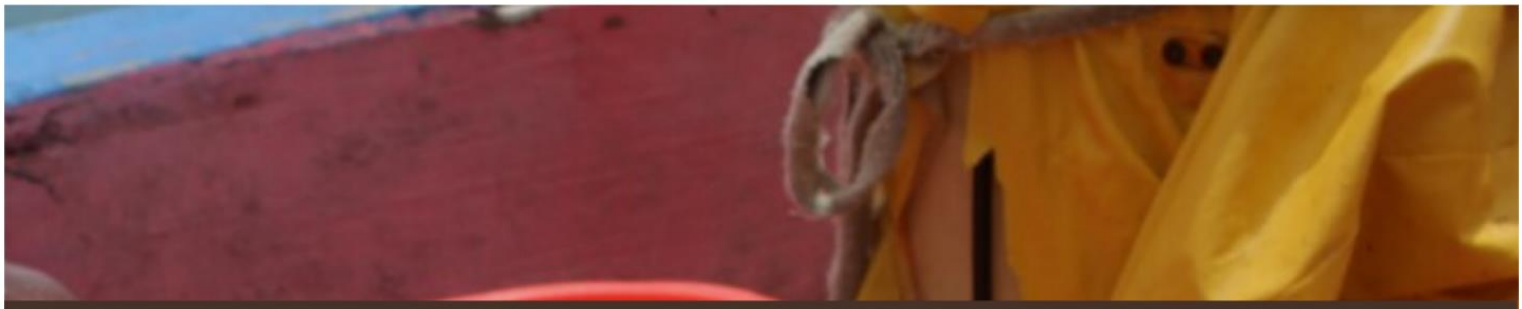

CANARI

ST. VINCENT AND THE GRENADINES QUEEN CONCH VALUE CHAIN ANALYSIS REPORT

MARCH 2021

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CARIBBEAN NATURAL RESOURCES INSTITUTE

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Prepared by

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March 2021

Required citation: Hutchinson, S.D., & Girvan, A.S.T. (2021). St. Vincent and the Grenadines Queen Conch Value Chain Analysis Report. Barataria, Trinidad: CANARI.

Acknowledgements

This report is an output of the **Developing Organisational Capacity for Ecosystem Stewardship and Livelihoods in Caribbean Small-Scale Fisheries (StewardFish)** project which is being implemented by the Food and Agriculture Organization of the United Nations (FAO) and executed by the Caribbean ICT Research Programme of the University of the West Indies (UWI-CIRP), Caribbean Natural Resources Institute (CANARI), Caribbean Network of Fisherfolk Organisations (CNFO), Caribbean Regional Fisheries Mechanism (CRFM) and the Centre for Resource Management and Environmental Studies of the University of the West Indies (UWI-CERMES) with Fisheries Divisions/Departments in Antigua and Barbuda, Barbados, Belize, Guyana, Jamaica, Saint Lucia and St. Vincent and the Grenadines. StewardFish is funded by the Global Environmental Facility (GEF).

The authors would like to thank all the actors in the Value Chain who graciously spent time to answer our questions. We especially appreciate the efforts of Mr. Kris Isaacs of the St. Vincent and the Grenadines' Fisheries Division, who worked tirelessly with the authors to provide data and information on the conch fishery. We would also like to thank Ms. Melanie Andrews, Technical Officer at CANARI, who coordinated the stakeholder webinar that provided key information in developing the value chain and provided report review and editing. The authors also thank all the CANARI staff who supported the webinar. Thanks are also extended to Mr. Terrence Phillips, Regional Coordinator, StewardFish, FAO Subregional Office for the Caribbean, who provided invaluable technical peer review, suggested edits and comments on the draft report.

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Abbreviations

CNFO	Caribbean Network of Fisherfolk Organisations
FAO	Food and Agricultural Organization of the United Nations
GDP	Gross Domestic Product
HACCP	Hazard Analysis Critical Control Points
MT	Metric tonnes, tonnes
NEI	Not elsewhere indicated
SCUBA	Self-contained underwater breathing apparatus
SVG	St. Vincent and the Grenadines
SWOT	Strengths, weaknesses, opportunities and threats
VCA	Value Chain Analysis

Glossary

This glossary contains definitions of terms used within the Study. These definitions are not all-encompassing, but are useful 'working definitions' for the concepts outlined herein.

Actors

Persons (producers, wholesalers, processors, retailers) involved in getting the product from fishers to the final consumer

Aggregator

An intermediary who buys produce from many sources, pools it together and sells wholesale

Artisanal Processor

An individual or group of persons who informally engage in processing seafood for local sale

Business service provider

An organisation (policy/regulations, research, extension, credit, market information etc.) whose support enables products to flow from harvesting to the final consumer

Consumers

Individuals who use the final product at home. These are also referred to as households

Customers

Businesses that buy products from suppliers, and resell products to another business or to consumers

Exchange Rate

The exchange rate is referenced as 1 US dollar ($) = EC$2.72 (Easter Caribbean dollar)

Fish Market

A market at a fish landing site that sells varied seafood products, wholesale or retail

Industrial Processor

A processor registered as a seafood processing business who provides for the local and/or export market

Live weight

The weight of finfish and mammals is the un-gutted weight; the weight of lobsters and echinoderms is the weight of the whole animal.

Meat weight

The weight of the whole conch, without its shell

Restaurants

Formal or informal eating establishments that serve meals on a regular basis. This includes sit-down eateries and food trucks.

Value Chain Analysis (VCA)

An assessment of each part of the value chain to identify constraints/opportunities for all actors

Vendor

A person who sells fish, retail, at markets or at landing sites

Wholesaler

An intermediary who sells a large amount of produce to one or more buyer. The wholesaler may or may not have a single supplier. If they have multiple suppliers, they are considered aggregators.

Executive Summary

The Queen Conch (*Strombus gigas*) fishery in St. Vincent and the Grenadines (SVG), which previously had declining landings, is now showing rapidly increasing landings and associated exports from 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. Demand for fresh or frozen conch is low among locals, even though food items such as samosas, conch fritters, and conch and callaloo are available and even exported in small quantities. The ex-vessel prices are showing an overall decline. This is occurring even as the unit export value for conch increased significantly from 2017. This suggests that exporters are receiving an increasing share of the consumer dollar, and that fishers are getting a shrinking share of the foreign consumer dollar.

Queen Conch is primarily consumed by tourists locally, as it is relatively more expensive than fish, which is in high demand by locals. The potential for market growth locally will therefore be heavily dependent on conch fishers strengthening links with these buyers to ensure that conch dishes are prominent on their menus. This market potential is also based on tourism growth in St. Vincent. The Fisheries Division provided Hazard Analysis Critical Control Points (HACCP) training to local producers of conch value-added products (e.g. fritters, samosas), however, government does not provide any direct financial or other support to these processors.

As a result, key recommendations are suggested below:

Production

1. The Fisheries Division should set catch limits for conch, while increasing monitoring and enforcement.
2. The Fisheries Division should implement more monitoring of the catch of juvenile conch, as this was seen as a widespread problem.
3. Fishers should be offered more training opportunities in safety practices at sea, especially in the proper use of self-contained underwater breathing apparatus (SCUBA) gear, to reduce incidences of the bends.

Securing markets

4. Fishers should enhance existing cooperatives to negotiate better prices and contractual arrangements with exporters.
5. There should be much greater emphasis on getting value for premium markets in a sustainable way, such as the market for conch trimmings.
6. Assist craftsmen in the development of jewellery-making and decorations using conch shells, especially whole, polished shells
7. Provide targeted market support for the identification and penetration of markets for conch opercula
8. Fishers should be trained in collecting and trading conch pearls, which have a significant price premium.
9. Support the business links of craftsmen to hotels, guest houses and restaurants to feature jewelry and craft items made from the conch shell
10. Promote the adoption of conch as a bigger part of the local menu for tourists

11. Promote the use of conch festivals to market the use of conchs to tourists and locals
12. Provide additional training in food health and safety standards, to allow value-added products' processors to meet new international markets

1 Introduction

Fisheries in the Caribbean are considered small-scale and are largely artisanal, with limited motorised technology. In addition, many of these fisheries are largely open-access, multi-species complexes with varied regulations, enforcement and data collection. However, the Caribbean region relies on the fisheries sub-sector either directly or indirectly as a source of protein, employment and income.

In 2013, countries bordering or located within the Caribbean and North Brazil Shelf Large Marine Ecosystems (CLME+ region) adopted a 10-year Strategic Action Programme for the Sustainable Management of the Shared Living Marine Resources of the Caribbean and North Brazil Shelf Large Marine Ecosystems (CLME+ SAP). The CLME+ SAP aims to contribute to the achievement of the regionally-adopted long-term vision of 'a healthy marine environment in the CLME+ that provides benefits and livelihoods for the well-being of the people of the region.'

In support of this vision, the United Nations Food and Agriculture Organization (FAO) is implementing the Global Environment Facility (GEF) funded 'Developing Organizational Capacity for Ecosystem Stewardship and Livelihoods in Caribbean Small-Scale Fisheries (StewardFish)' project. StewardFish is aimed at implementing the CLME+ SAP within seven Caribbean Regional Fisheries Mechanism (CRFM) Member States (Antigua and Barbuda, Barbados, Belize, Guyana, Jamaica, Saint Lucia, SVG) by empowering fisherfolk throughout fisheries value-chains to engage in resource management, decision-making processes and sustainable livelihoods with strengthened institutional support at all levels.

StewardFish is being executed by five regional partner organisations—the Caribbean Natural Resources Institute (CANARI), Caribbean ICT Programme of the University of the West Indies (UWI-CIRP), Centre for Resource Management and Environmental Studies of the University of the West (UWI-CERMES), the Caribbean Network of Fisherfolk Organisations (CNFO), the Caribbean Regional Fisheries Mechanism (CRFM) - and fisheries authorities (national executing partners) and fisherfolk leaders from the seven project countries.

Food and nutrition security is addressed throughout StewardFish, but it is tackled directly in Component 3 of the project which, in part, focuses on the enhancement of fisheries value chains. This incorporates getting better quality seafood to a wider cross-section of the population in each country in the region, through school feeding programmes and other initiatives.

One of the key activities under CANARI's work for StewardFish is to undertake a participatory analysis of fisheries value-chains to map opportunities for additional marketing and distribution of current and new seafood products, especially consistent with childhood nutrition. These analyses were conducted in Barbados, Jamaica and St. Vincent and the Grenadines for the following fisheries: Mahi mahi (Dolphinfish), Caribbean Spiny Lobster and Queen Conch, respectively (Refer to methodological framework at Appendix 1 to see how the three value chains were selected). The value chain analyses will contribute to achieving Output 3.1.2 of StewardFish, which is 'Use of local fish in healthy diets promoted through public policies and private enterprises'.

This report presents the key findings and recommendations of the participatory value chain analysis (VCA) that was conducted for the Queen Conch fishery in St. Vincent and the Grenadines.

1.1 Objectives of the value chain analysis

Fisheries value chains are the full range of activities in commercial capture fisheries. They start from harvesting fish, through adding value by processing and marketing, to delivering seafood to consumers. Value chain analysis can guide both environmental management and fishery development within the context of the ecosystems approach to fisheries (EAF). In this regard, a participatory value-chain analysis should consider the institutional environment in which fisheries value chains operate (**Figure 1**) and may consequently be enabled or constrained; gender dimensions, particularly the role of women and youth in all levels of fish value chains; and regional and global challenges which are likely to have or are having direct and indirect impacts on developing climate-resilient and sustainable fisheries value chains and on food and nutrition security in the Caribbean.

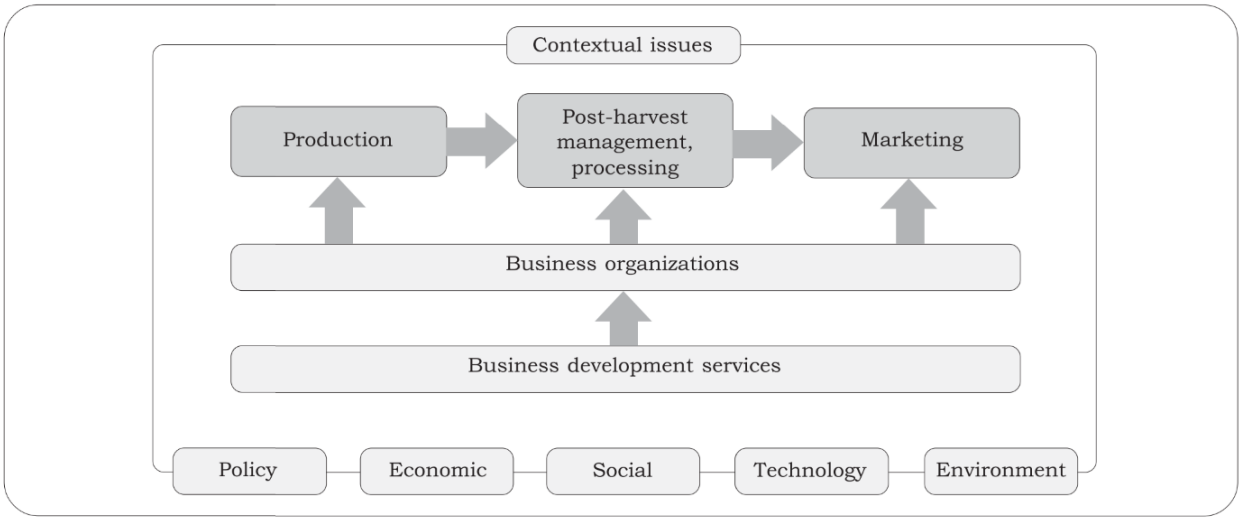


FIGURE 1: VALUE CHAIN AND BROAD INSTITUTIONAL SUPPORT

The ***specific objectives*** of the VCA for SVG's Queen Conch fishery were as follows**:**

- To conduct a situational analysis of the Queen Conch Fishery in SVG
- To determine the impact of the conch fishery on artisanal fishers in terms of the level of employment and income potential
- To identify opportunities for increased value added of conch, via the creation of new products or new markets
- Provide an overview of the stakeholder perception of the environmental sustainability of the fishery
- Assess the level of private sector involvement
- Assess the socio-economic frameworks that exist in the fishery, especially in terms of the network and role of actor groups
- To provide policy recommendation to the government, donor agencies and local and regional technical/aid agencies on how the conch VC can become more sustainable for all actors

2 Methodology

This study used a rapid assessment approach. Following the selection of the Queen Conch value chain for SVG (refer to Appendix 1 for the detailed methodological framework describing the selection process), the authors conducted a preliminary VCA webinar with key fishing industry stakeholders on August 27, 2020 (refer to Appendix 2 for list of webinar participants). Webinar participants included representatives of fisheries-related state agencies, fisherfolk organisations, and private sector (especially manufacturers of fishery value chain products), each with a role or interest in sustainable fisheries value chain development in SVG. The specific objectives of the webinar were to

- outline the core concepts of a fishery value chain and how actors can benefit from using a participatory VCA;
- identify common goals for key actors in the Queen Conch value chain in SVG;
- review a preliminary value chain for the Queen Conch fishery to verify main actors, links and product flow in this chain;
- identify gaps in the preliminary value chain and suggest new links and actors;
- identify existing and potential value-added products that can be developed for the Queen Conch fishery in SVG; and
- discuss and agree on key market limitations and solutions, in achieving common fishery goals.

Following the webinar, additional desk study research, including interviews with some of the webinar participants and other stakeholders, was conducted (refer to Appendix 2 for list of interviewees). Stakeholder interviews were conducted via telephone to get gain a deeper insight into how conch is harvested and sold, together with the marketing routes, marketing arrangements and emerging trends.

The interviews sought to

- identify the actors at each step of the value chain, their task (harvest, trade, processing etc.), product flow and links to other actors;
- assess the resources, skills and capacities of fishery actors related to procurement of inputs and the key outputs produced;
- assess current coordination and institutional arrangements among actors,
- identify the local production and marketing linkages for conch and assess their relevance, adequacy, strengths and challenges and
- undertake sub-system characterization:
    - analyse market access and the type of markets for each type of producer and intermediary;
    - analyse the market channels and how the channel choices are determined;
    - analyse which products or services will be delivered to which market;
    - analyse the key characteristics of the product or service that influences purchase behaviour;
    - analyse the number of stages in the channel (for example a fisher can deliver directly to final consumers or through intermediary partners, such as wholesalers or processors).

Due to time and financial constraints, key actor surveys for consumers and fishers could not be conducted to review consumer preferences for Queen Conch (*hereafter referred to as Conch*) and other fish products.

2.1 Value chain analysis

The VCA should show, at each level, the detailed key productive processes around the main products from the provision of inputs to harvest, harvesting, fish landing, marketing via wholesale, transportation, processing and retailing to final consumption. This involves the following:

- Estimating income and net margin for each stage of the value chains characterised
- Characterising the nature of value added in the value chain—safety and quality of the product; branding and labelling; social and environment norms, or sustainability standards
- Identifying the key requirements for market access through the value chain, such as bargaining power, market knowledge, technological proficiencies, infrastructure availability, and market orientation
- Identifying opportunities for increased value by forming new relationships, enhancing existing relationships, creating new products or by finding new markets for existing products
- Analysing possible risks fishers and other fishery actors may face in market and suggesting possible ways to reduce or eliminate these risks

The value chain approach is orientated toward what customers and consumers want (**Figure 2**). By analysing the value chain, information is obtained that should lead to better decision making by both those involved (including fishers and traders) and those wanting to support the value chain (such as policy makers and donors). This information is expected to result in higher and more sustainable livelihoods for those participating in the chain. Properly identifying the value share and risks of each actor in the chain allows these actors and policy makers to better coordinate activities along the chain, enhance weak links, and create links that may be missing. The VCA would allow actors in the value chain to focus their activities on products and services which will reduce costs, increase their income, use their limited resources (skill, money and capital) more effectively and hence provide more sustainable livelihoods. The VCA also allows the actors to better understand the needs of their suppliers and clients in the chain.

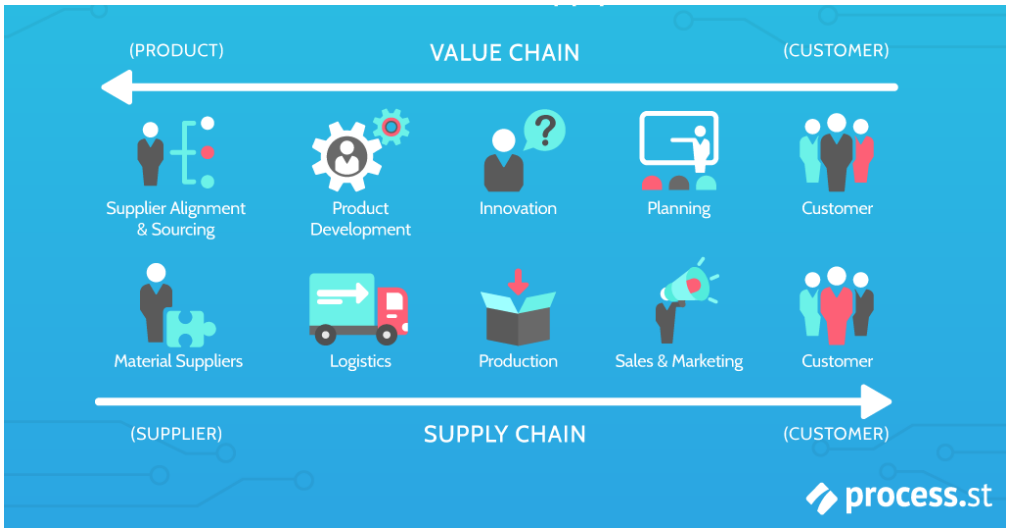


FIGURE 2: VALUE CHAIN VERSUS SUPPLY CHAIN (SOURCE: PETERSON , 2019)

Livelihoods in the value chain can only thrive and be sustained when the links to consumer wants are clearly established. Effective information flows from the market back to the various value chain actors would allow consumer 'wants' to better match what is supplied by the value chain. Consumers are usually willing to pay more for the added value (product, place, time, convenience) and this increases

profitability along the chain. Porter's value chain below (**Figure 3**) shows the division of activities between primary and secondary activities. The strength of each type of activity, together with its interaction with the other activities, helps to determine the size of value that firms can create or sustain.

FIGURE 3: PORTER'S VALUE CHAIN (SOURCE: PETERSON , 2019)

One key way to look at the fishery sector is as a flow of commodities from production (**Figure 4)** to final consumers. The first stage provides production technologies, inputs, management and information flows for sustained fish production and capture.

FIGURE 4: THE SUSTAINABLE FOOD VALUE CHAIN FRAMEWORK (SOURCE: FAO, 2014)

Four core functions (links) are distinguished in the chain: production (e.g. farming or fishing), aggregation, processing and distribution (wholesale and retail). 'Governance' refers to the nature of the

linkages both between actors at particular stages in the chain (horizontal linkages) and within the overall chain (vertical linkages). The value chain requires understanding their complex environment and contains elements such as information exchange, price determination, standards, payment mechanisms, contracts with or without embedded services, market power, lead firms, and wholesale market systems (FAO, 2014).

Promoting value added production also leads to (Russell and Hanoomanjee, 2012):

- higher and more stable profits
- less consumer price fluctuations and product risk
- job creation
- diversification of products and markets
- more harmonious business operations via the targeted involvement of more secondary actors
- a strategic position to maximise overall fishery value

The key activities in the VCA for SVG's Conch fishery included:

1. **Mapping the Conch value chain**. This included identifying all the stages and links in the value chain to identify the flow of products, services, information and money. It also identifies volumes and value, how the catch is utilised, as well as existing value-added products.
2. **Identifying the value chain actors**. This includes the main actors and the supporting actors and the composition of livelihoods that actors have in the chain.
3. **Identifying the services provided** by each actor in the value chain.
4. **Quantification of the value chain.** This involves providing information such as how many persons are involved at each stage, product logistics, pricing, and losses or wastage. The cost of activities (quantitative assessment) is outside the scope of this study.
5. **Qualitative assessment of the contribution** (including the share of value added) and the risks faced by each actor involved.
6. **Analysis of strengths, weaknesses, opportunities and threats (SWOT)**. The SWOT analysis identifies strengths and weaknesses of the actors or relationships in the value chain. It also identifies opportunities to add value in the chain from the participation of new actors, the development of new products, new markets and/or new institutional arrangements or governance systems to support the activities in the chain. The SWOT analysis also identifies existing, emerging or potential threats to the operation of the value chain over the short, medium and long-term.
7. **Market analysis.** This would focus on levels and trends in conch exports, export destinations and global market participation and growth.
8. **Providing recommendations** to improve the value chain**.**

3 Situational analysis

For the commercial capture fishery, SVG was estimated to have had 900 fishing vessels in 2018 (provisional estimates) (CRFM, 2020), up from 790 in 2013. In 2013, 1,142 persons were estimated to have been employed in the direct production in the marine commercial capture fisheries (CRFM, 2020 p. 43), with a further 3,426 employed in other fisheries dependent activities, based on a 2013 estimate (CRFM, 2020, p. 43) Therefore 4,568 are estimated to be employed in the fishing sector. In 2018, the fishing sector contributed 0.60 percent to gross domestic product (GDP), which was the highest contribution since 2010, which stood at 0.50 percent (CRFM, 2020, p. 47).

The conch fishery is artisanal, and this seafood is the main type exported. In 2018, conch exports were 308 tonnes, followed by other finfish at 61 tonnes and then by lobster at 58 tonnes. All seafood exports for SVG totalled 464 tonnes, which means that conch accounted for 66.4 percent of all seafood export volumes in that year with a total export value of US$1.564 mil (CRFM, 2020 p. 73). This export amount in 2018 for SVG accounted for 27.6 percent of the total 1,116 conch exported for all CRFM member states (CRFM, 2020, p. 75). Relative to other CRFM member states, in 2017, marine capture production in SVG was fifth after Jamaica, Belize, the Bahamas, and Antigua and Barbuda (see **Table 1**).

TABLE 1: PRODUCTION (MEAT WEIGHT IN TONNES) OF THE MARINE CAPTURE FISHERY FOR 2017 FOR CRFM MEMBER STATES

AN	A&B	BAH	BEL	GRE	HAI	JAM	SKN	SLU	SVG	TCI
80.00	233.83	438.53	444.25	23.74	200.00	500.00	59.00	98.58	227.68	96.8

Source: Extracted and modified from Table 17, CRFM (2020)

Conch capture is legal year-round and managed by the Fisheries Division under the Ministry of Agriculture, Forestry and Fisheries, St. Vincent and the Grenadines. The key export markets were identified as the United States (Miami), followed by Saint Lucia, Dominica, and Trinidad and Tobago. The conch habitats are mainly on the transboundary Grenada bank, hence the fishery is based mainly in the Grenadine Islands. In 2008, the fishery had approximately 17 vessels with 45 fishers (see **Table 2**) (FAO, 2016).

TABLE 2: HISTORICAL SNAPSHOT OF SVG CONCH FISHERY CHARACTERISTICS

Type	Measure	Value	Unit	Time period
Nominal Effort	Number of vessels	~17	vessels	2008
Employment	Number of fishermen	45	Persons	2008
Production	Landed Volume	~22 (MT/year)	MT	1990–2011
	Landed Volume	54	MT	2014
	Landed Value	68 500	USD/year	2014

Source: FAO Firms (2016)

3.1 Conch biology

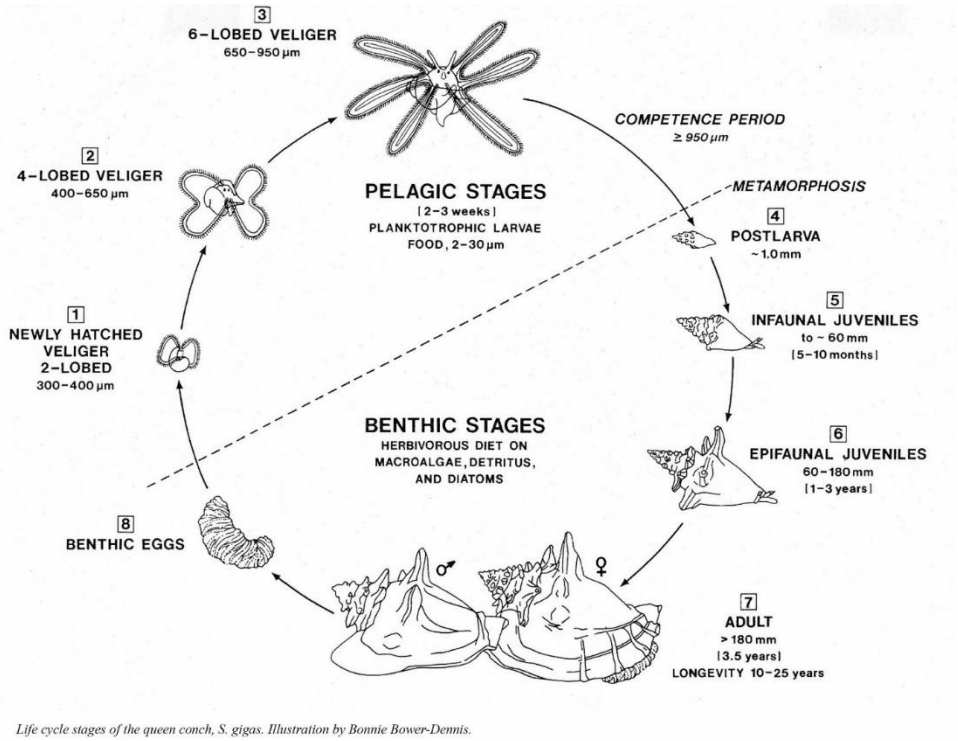
The geographic distribution of conch is bound by Bermuda to the north, Panama to the south, Barbados to the east, and the Gulf Coast of Mexico to the west (NOAA, 2014, p. 10). This is highlighted in **Figure 5**.

FIGURE 5: CONCH GEOGRAPHIC RANGE
Source: BREEF n.d, 3

The average home range size for an individual conch is variable and has been measured at 5.98 ha in Florida (Glazer et al., 2003 cited in NOAA, 2014a, p.11), 0.6 to 1.2 ha in Barbados (Phillips et al., 2011), and 0.15 to 0.5 ha in the Turks and Caicos Islands (Hesse, 1979, cited in NOAA, 2014a, p.11). The Conch reaches maturity at three and a half to four years, at which time the edge of the shell lip turns outward to form the flared lip (Stoner, Davis and Booker, 2012a, p.103). Once the shell lip is formed, the shell does not increase in length (Appeldoorn, 1997; Tewfik et al., 1998, cited in NOAA, 2014a, p.13). After this point, most of the shell growth is in the thickening of the shell lip (Appeldoorn, 1988b, cited in NOAA, 2014a, p. 13).

The life span of conch is about 30 years (McCarthy 2007). With the onset of sexual maturity, tissue growth decreases and switches from primarily thickening of the meat to increasing the weight of the gonads. Eventually, the room inside the shell can no longer accommodate the tissue, and the conch starts to decrease its tissue weight (CFMC, 1999; NOAA, 2014b, p. 14).

For some locations, such as near Lee Stocking Island, Bahamas, conch has seasonal movements from deep to shallower waters, usually associated with summer spawning (NOAA, 2014b, 15). This behaviour is not consistent across countries and is not confirmed for SVG. Harvesting conch is also enhanced by the occurrence of conch breeding aggregations, where sexually-mature conch move together. These aggregations of varied amounts (150 to 200 were found in Columbia and 90–120 conch were found at Alacranes Reef in Mexico) usually occur in the same locations annually (NOAA 2014 16). The conch life cycle is shown in **Figure 6** below, and highlights the complexity of its development.



Life cycle stages of the queen conch, S. gigas. Illustration by Bonnie Bower-Dennis.

FIGURE 6: CONCH LIFE CYCLE
Source: Queen Conch Lab (2021)

Queen Conch (*Strombus gigas*) is a herbivorous mollusk. Juveniles feed primarily on seagrass detritus while adults feed mainly on filamentous alga (NOAA 2014 16). The shell lip begins to flare with sexual maturity (3.5 to 4 years) and it can reach a thickness of 17–18 mm within one year. This is one of the defining characteristics of this species (Appeldoorn, 1988b, cited in NOAA, 2014a, p. 13). Characteristics used to distinguish Queen Conch from other related conch include: (1) large, heavy shell; (2) short, sharp spires; (3) brown and horny operculum; and (4) bright pink interior of the shell (Prada et al. 2008 cited in NOAA, 2014a, p. 9).

Biological characteristics such as slow growth, late maturation, limited mobility, occurrence in shallow waters, and tendency to aggregate result in conch being particularly vulnerable to overharvesting. Queen Conch is in decline throughout the Caribbean and is listed on Appendix II of the Convention on International Trade in Endangered Species (CITES) as commercially threatened (BREEF, n.d., p.6).

3.2 Conch harvesting

Conch fishing coincides with the lobster closed season, so that is an important livelihood option for these fishers. The fishery is artisanal, with fishers collecting conch in shallow waters, usually from 2 to 30 m, but this may go up to 50 m in depth (FAO FIRMS, 2016).

The vessels are flat transom-type vessels with a pointed bow and flat stern, which are commonly called bow stern or dories. These open boats are 3–6 m (11–27 ft) in length with a beam of 0.9–2.1 m. They are constructed from wood or marine plywood, usually covered by fibreglass. They are powered by one or two outboard gasoline engines ranging from 14 to 115 hp (FAO FIRMS, 2016).

Trips usually have three crew members—a diver, a floater, and a boat operator who take three to four-hour trips (Cruickshank-Howard, 2020). The diver collects conchs in a mesh bag using SCUBA gear while

the floater remains on the surface free-diving (no breathing equipment is used) and watching over the diver, acting as the intermediary in the harvesting operation (Kris Isaacs, Fisheries Division, personal communication). The floater periodically lowers a basket or canvas bag to the diver and the conch is then hauled up by the driver of the boat.

Queen Conch threats can be considered under four key factors:

1. current or threatened habitat destruction or modification or curtailment of habitat or range;
2. overutilisation for commercial purposes;
3. inadequacy of existing regulatory mechanisms; and
4. other natural or man-made factors affecting the species' continued existence (NOAA, 2014, p. 7).

SVG currently faces threats in each of these four areas. One such issue is a reported decline in habitat quality, according to some fishers, in areas where conch shells are discarded, if this occurred near harvest grounds.

In 2002, FAO listed the Conch fishery in SVG as overexploited, with a minimum size restriction of 7 inches. Fishery policy also allowed the Minister of Agriculture to be able to declare a closed season for conch at any time in the year. At that time, the thrust of conch management was to have sustainable stocks and prevent declining resources by controlling the fishing effort (Staskiewicz and Mahon ,2007). Based on the study by Staskiewicz and Mahon (2007), conch was targeted by approximately 10 percent of Bequia fishers, 15 percent of Canouan fishers and 20 percent of Union fishers. These target proportions, relative for other species is shown in **Figure 7**.

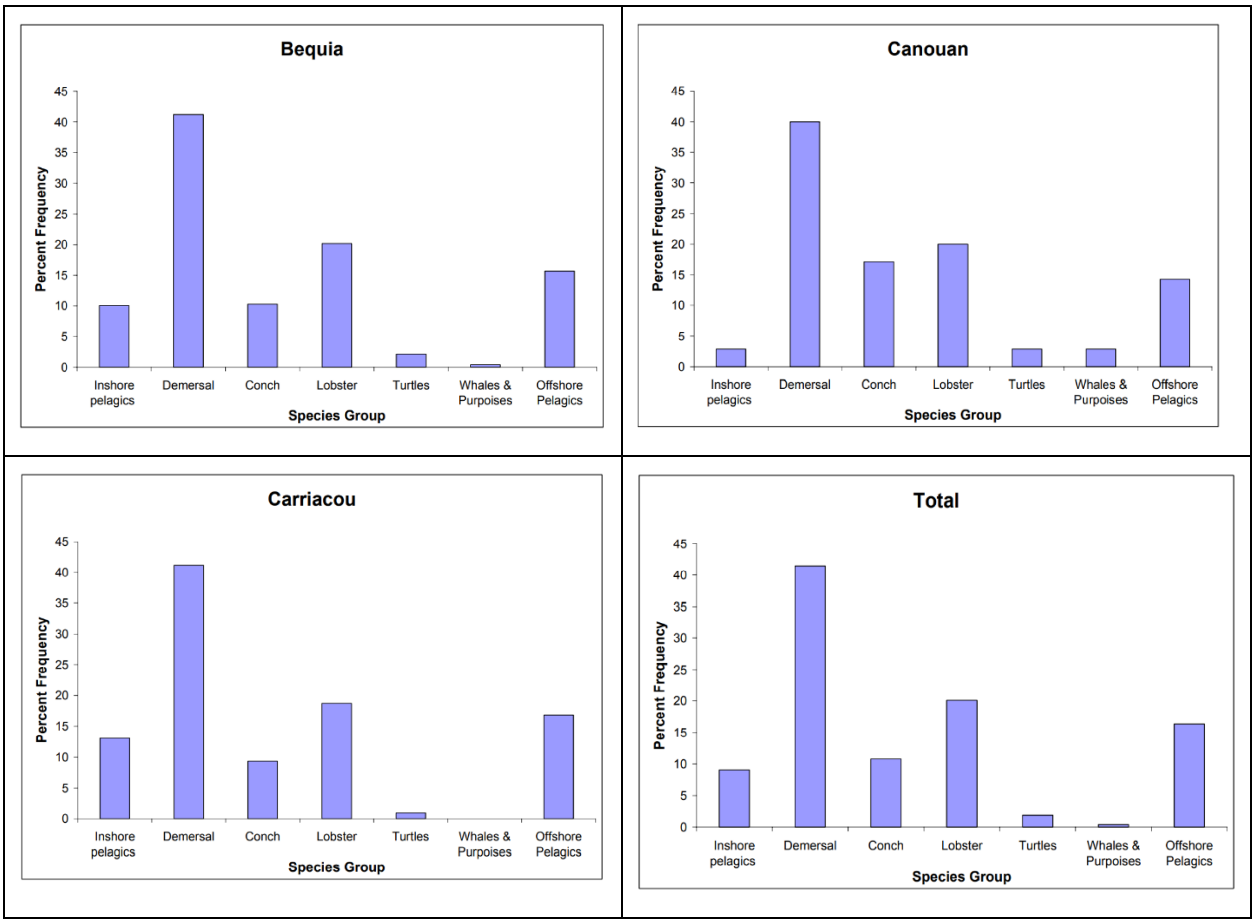
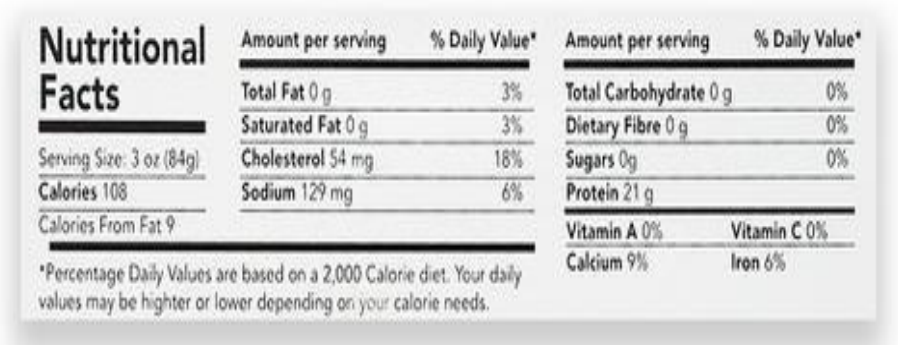


FIGURE 7: PROPORTION OF FISHERS TARGETING EACH FISH GROUP IN THE GRENADINES, 2007
Source: Taken from Figure 6.21, Staskiewicz and Mahon (2007)

3.3 Conch preparation and nutritional value

Conch meat is normally eaten raw in salads (in a ceviche), or cooked in fritters, chowders, curries and burgers. All parts of the conch meat are edible. Some consumers, however, find only the white meat appetising. Conch is the national dish in the Bahamas, where it is typically served as salads or fritters. In the Turks and Caicos Islands, the annual Conch Festival is held in November each year at the Three Queen's Bar/Restaurant in Blue Hills. Local restaurateurs, judged by international chefs, vie for prizes for the best and most original conch dishes (Ocean Delight, 2020). In Trinidad and Tobago, Grenada, Dominican Republic, and Haiti, conch is commonly eaten in curries or in a spicy soup. Conch is very low fat, has no carbohydrate or sugars and is very high in protein, as shown in the nutritional label (**Figure 8**).



Nutritional Facts	Amount per serving	% Daily Value*	Amount per serving	% Daily Value*
Serving Size: 3 oz (84g)	Total Fat 0 g	3%	Total Carbohydrate 0 g	0%
Calories 108	Saturated Fat 0 g	3%	Dietary Fibre 0 g	0%
Calories From Fat 9	Cholesterol 54 mg	18%	Sugars 0g	0%
	Sodium 129 mg	6%	Protein 21 g	
			Vitamin A 0%	Vitamin C 0%
			Calcium 9%	Iron 6%

*Percentage Daily Values are based on a 2,000 Calorie diet. Your daily values may be higher or lower depending on your calorie needs.

FIGURE 8: CONCH NUTRITIONAL VALUE – SEA PEARL FROZEN LAMBIE
Source: PriceSmart (2020)

3.4 Conch products

Conch meat

Conch meat fetches a very high price on the international market. It is usually sold either frozen or chilled. For frozen conch meat**,** online sellers such as Amazon sell the product by a few retailers (see **Figure 9**). The product in Figure 9, from the Charleston Seafood brand, was being sold at US$149.00/5lb equivalent to US$29.80/lb.

Other online specialty seafood sellers such as Wholey sold a similar product form, i.e. frozen, cleaned 5-pound package, for US$95, which is equivalent to US$19/lb (see **Figure 10**). Both products shown below are wild-caught conch and originate from Nicaragua. Other sellers, such as Carolina Meat and Fish Co. (CMF), have prices in this range for frozen conch (US$124.99 for a 5-pound package) (CMF, 2020).

FIGURE 9: PACK OF 5 LBS. CONCH MEAT, CLEANED ON AMAZON ONLINE WEBSITE
Source: Amazon (2020)

FIGURE 10: PACK OF 5 LBS. CONCH MEAT, CLEANED AND FILLETED ON WHOLEY ONLINE WEBSITE
Source: Wholey (2020)

Conch is also sold online via overnight delivery as a chilled product. This is shown in **Figure 11**, as done by the Eaton Street Seafood Market, based in Key West, Florida, which sells the Conch meat at US$15.50/lb.

FIGURE 11: EATON STREET SEAFOOD MARKET CHILLED CONCH, SOLD PER POUND
Source: Eaton Street Seafood Market (2020)

Conch pearls

Conch is demanded for its meat, as well as for its pearls, which are not technically pearls, but are calcareous forms (Conchpearl, 2020). These conch pearls as shown in **Figure 12** and **Figure 13** are exceedingly rare and are used in high-end jewelry. One is usually found in every 10,000–20,000 shells harvested. According to the Jewelry Editor (2021), *'Excellent pearls today can cost as much as US$15,000 per carat and more, but those are the exceptionally rare ones. Top-grade conch pearls are more typically around $4,000-$7,000 per carat and nice, but not necessarily perfect, pearls around $2,000–$3,000.'*

FIGURE 12: CONCH PEARL
Source: Conchpearl (2020)

FIGURE 13: CONCH PEARL NECKLACE
Source: Sotheby's (2020)

Conch operculum

The conch is also prized for its operculum (or nail) (see **Figure 14**) which is a part of the foot that acts like a claw to help juveniles burrow into the sand to escape from predators. It is a hard, sickle-shaped structure at the tip of the foot used for locomotion. It also serves as a trap door to protect the animal. The operculum is very high-priced and sought after. Prices vary depending on the quality of the product, but online sale at the popular Alibaba.com marketplace provided a price range of US$31.00/kg to US$38/kg (see **Figure 15**). There is one opercula exporter in SVG at this time. This market can be significantly developed with arrangements for collecting the opercula during processing.

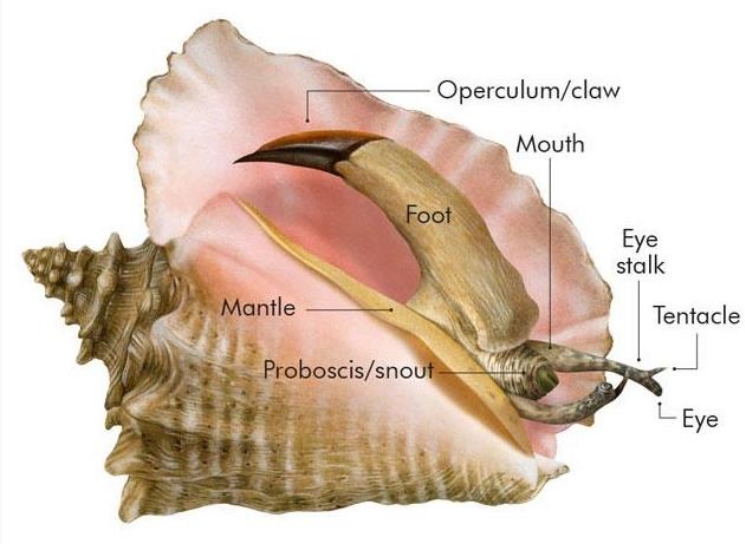


FIGURE 14: CONCH OPERCULUM
Source: Drawn by Dawn (2021)

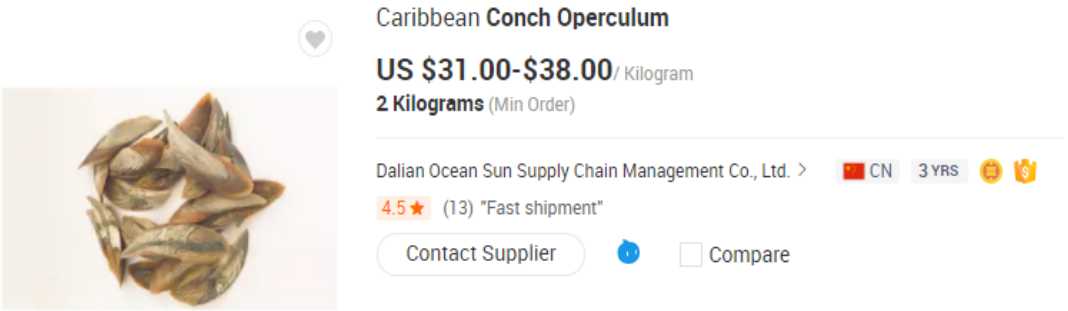


FIGURE 15: OPERCULUM ONLINE SALE
Source: Alibaba.com (2020)

Conch shell

Conch shells are generally sold for home decoration. Large, undamaged conch shells with sizes ranging from approximately 7 ¼ inches to 9 ¾ inches are sold online for US$12–US$14 each (Atlantic Coral

Enterprises, 2020) (see **Figure 16**). Other online sites were offering similar large conch shells at US$19 each (Nature Company, 2020; Michaels, 2020), but prices on other sites were found to be even higher at US$34.99 each (**Figure** 17)

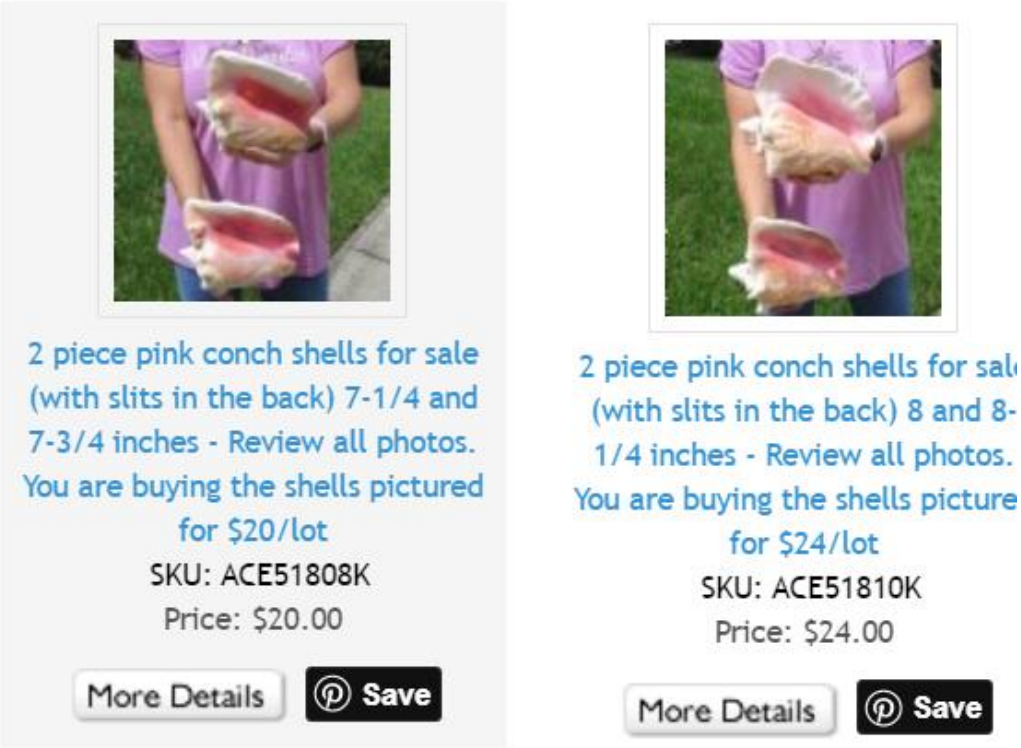


FIGURE 16: CONCH SHELLS FOR SALE ONLINE
Source: Atlantic Coral Enterprises (2020)

FIGURE 17: CONCH SHELLS FOR SALE ONLINE – HOME SPECIALTY STORE
Source: Etsy.com (2020)

4 Mapping SVG's Conch value chain

This section provides the details of the elements in the Conch value chain for SVG, and highlights new emerging trends.

4.1 Value chain map and actors

The value chain map (see **Figure 19**) shows distinct stages where value is added. Before the production phase or harvesting, fishers utilise inputs. The ex-vessel conch price (with shell removed, whole, uncleaned) is EC$9.10/lb (EC$20.02/kg). The Conch shell is usually discarded at sea. In 2018, 89.5 percent of all conch landed were exported with a range of grades depending on buyer needs, from 50 percent cleaned to 100 percent cleaned. On the artisanal side of the market, the fishers are the actors who also clean the conch for sale in the local market, so they act as artisanal processors. Supermarkets sell conch for an average of EC$15.50/lb in frozen packages. It is stocked in supermarkets based on market demand and is not always available through this retailer, even when conch can be landed.

Inputs

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). These are shown in **Figure** 18 and **Figure** 20.

Box 1.
'Bow and Stern' Vessel or Dory (Cigarette/Speedboat)

Description:	Pointed bow and flat stern
Length range:	11 – 27 ft (4 – 9 m)
Width range:	3 – 7 ft (1- 3 m)
Horsepower range:	14 – 115 hp
Type of fishing:	*Multi-species fishing:* Including hand-lines, trolling, floating and sinking palang, traps, spear (using SCUBA and free-diving gears)

Adapted from Gill, D. (2006) and Staskiweicz, T. (2006).

FIGURE 18: TYPICAL VESSEL USED FOR HARVESTING CONCH
Source: Baldwin, Punnett and Chakalall (n.d.)

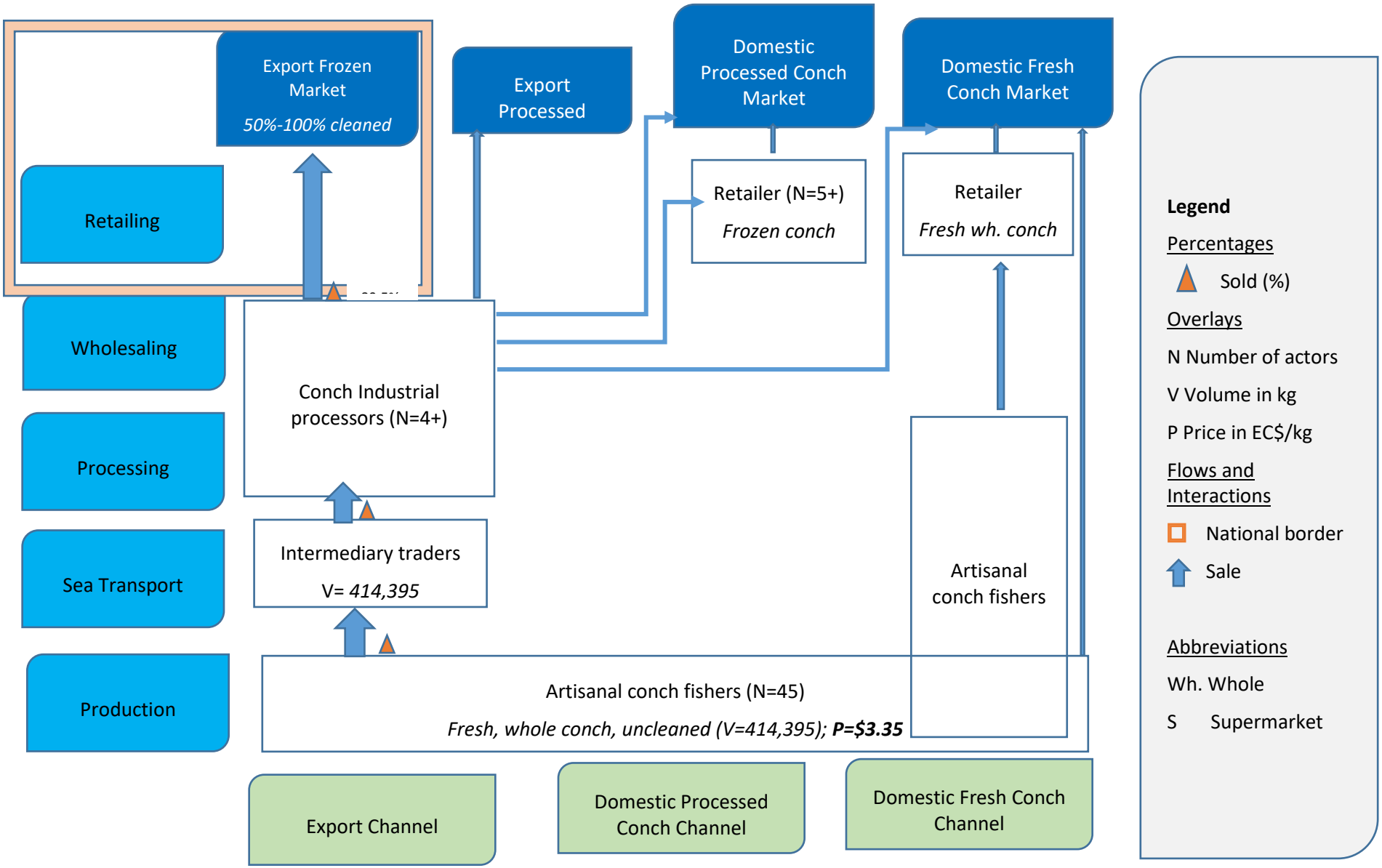


FIGURE 19: ST. VINCENT AND THE GRENADINES CONCH VALUE CHAIN MAP

FIGURE 20: THREE-MEMBER CONCH CREW: DIVER, FLOATER AND DRIVER
Source: Baldwin, Punnett and Chakalall (n.d.)

Harvesting

Conch is harvested year-round, mainly in the Grenadines islands of Union Island, Canouan, Bequia and Owia on mainland St. Vincent. Fishers indicated that the divers are going into deeper waters to harvest the conch. In fact, some fishers are now getting the bends, which occurs when fishers go to the surface too quickly after being deep underwater. Pricing appears to have a large impact on how the product flows geographically after it is harvested. If the price on the mainland (St. Vincent) is higher on a given day, then fishers who harvest in Union Island may bypass Bequia and sell directly in the mainland. There is no closed season for conch in SVG, and fishers who were interviewed for this study, generally believe that a thorough stock assessment is needed to understand the health of the stock. SVG has 10 Marine Conservation Areas, nine of which are in the Grenadines, however, regionally, marine-protected areas do not appear to offer significant protection to the conch stock.

Union Island

Most of the harvesting occurs on Union Island, followed by Canouan and Bequia (see **Figure** 21). Union Island is located midway between mainland St. Vincent and Grenada and has an area of 7.8km^2. Although farming is an important means of survival, inhabitants are also known for their fishing and maritime skills, using their earnings to develop homes and the economy of the island. This dry 7.8 km^2 island is also a major attraction for visitors to the Grenadines hence the high concentration of water-taxi operators and dependency on tourism. The major town, Clifton, is the location of a fishing complex which was constructed by the Japanese in the 1990s (Staskiewicz and Mahon, 2007).

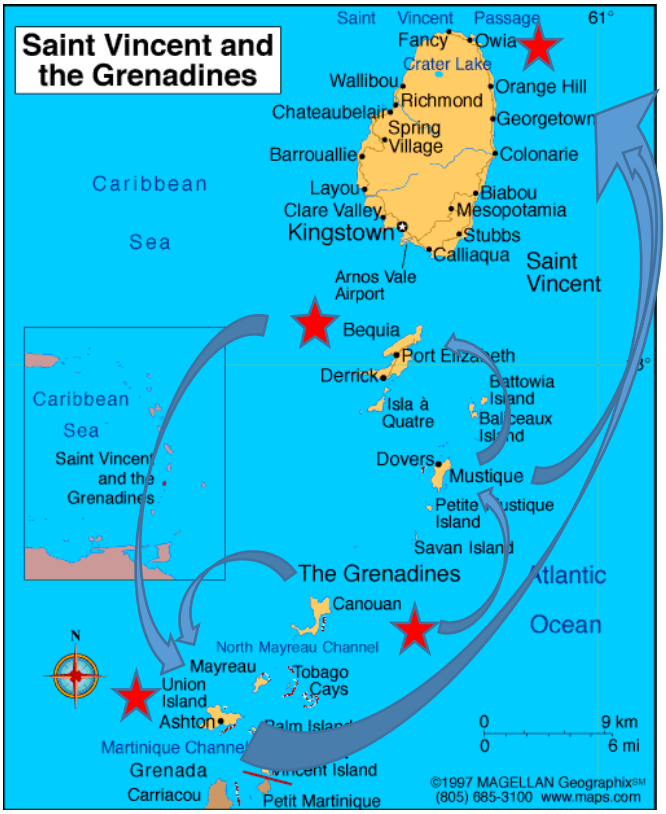


FIGURE 21: MAP OF MAIN QUEEN CONCH HARVESTING SITES IN SVG AND FLOW OF PRODUCT
Source: Modified from Infoplease (2020)

There are approximately 45 conch fishers (with local estimates as high as 60 fishers) who harvest in Union Island and they sell to Bequia and Owia on the mainland. Conch is harvested daily, and approximately 90 percent of the conch is brought to the Union Island Fisheries Centre. The trip is normally for 3–4 hours. Fishers typically go out early in the morning and return at lunch time. All divers use SCUBA now since they have to dive deeper now than in the past. Free diving to harvest conch is no longer practiced. The conch is brought to the Fisheries Centres in ice boxes.

Canouan

Canouan is heavily dependent on tourism. This 12.9 km^2 island is approximately 40.2km south of mainland St. Vincent. Another Japanese built fishing complex and camp is located in Friendship, Canouan and was operated by the St. Vincent Government (Staskiewicz and Mahon 2007) but was leased to a private entity who now manages the facility.

The Canouan fishers sometimes supply conch to the Union Island Fisheries Centre, but they mostly supply the Bequia and Owia Fisheries Centres directly. Many of the fishers in Canouan are from Bequia. Overall, Union Island is the main source for conch harvesting. Bequia receives supplies from Union Island and Canouan daily.

Bequia

The second largest Grenadine island, Bequia is 18.1 km^2. Conch processing is done mainly in the fishing complex built by the Japanese in 1994, in Paget Farm, the most active fishing village on the island (Staskiewicz and Mahon, 2007).

Most of the fishers from Bequia go to Canouan to dive because the conch is more abundant in Canouan, and the water there is shallower (less than 40 feet). Deeper water presents a greater risk to the divers (i.e. a greater risk of getting the bends).

When conch is harvested in Bequia, it is normally placed in bags or sacks. When the conch reaches Bequia, it is normally still alive. Before going to the mainland, the two main places conch is collected are in Bequia and Union Island. There are also some divers from Mustique who also supply the Bequia Fisheries Centre. Each fishing vessel has at least three people on the boat. In Bequia, there are typically five people on the boat, usually with one diver.

Aggregating

Aggregating occurs at the Union Island Fisheries Centre by Union Island Seafoods, the Owia Fisheries Centre by the Ocean Marine Company, and at the Bequia Fisheries Centre by the Bequia Seafood Company. In 2017, the Rainforest Seafood Company earned permission to establish processing operations in SVG. They are a vertically and horizontally-integrated seafood company based in Jamaica, with a long and strong track record in processing and exporting local and regional food items. Rainforest Seafood, diversified in Jamaica into ready-to-eat subsidiaries, mobile food trucks, specialty seafood imports, fast food establishments and now associated crops which can be used as sides in their food retail business. This company is constructing a 30,000 square foot-seafood processing plant in Calliaqua, which is expected to be completed in 2021. The plant is expected to have packaging facilities, a 250,000-pound cold-storage facility, along with blast freezers and processing rooms with state-of-the-art equipment (Scott, 2020). Rainforest Seafoods will be an additional aggregator. Local conch stakeholders, including fishers, are expressing concerns that the conch stocks will be depleted in a short time due to an increase in fishing pressure that is expected to occur with the introduction of Rainforest Seafoods. Some even suggest that the fishery would collapse in a few years with the rate of current exploitation.

Wholesaling

Wholesale marketing arrangements are varied. Some fishers take their conch only to Union Fisheries Centre because it is much closer and is therefore easier to sell to this closer market. Some fishers from Canouan only supply to the Bequia Fisheries Centre or the Owia Fisheries Centre. Union Island sometimes supplies Owia. However, the Conch is normally supplied to meet market demands, which may change from day-to-day.

There is a fairly consistent process of moving the conch via ferries that operate among the islands. Conch that is caught in one day in Union Island is normally transported on ice via the ferry the same afternoon or by the following morning. It is sent in an ice box and the price is usually consistent. There is typically no loss due to spoilage as the conch is processed as soon as it is landed. Usually, the whole conch, in its shell, is brought to the processing facility (i.e. the Fisheries Centres). The conch is typically processed the same day that it is harvested. At other times, fishers 'crawl' the conch, by putting the conch in very shallow, protected marine areas, in its live state, to 'store' it until it is time for processing and shipping. This 'crawling' of the conch may take place for a day or two to accumulate the stock for sale, especially if the harvest level is not economically feasible to transport low volumes. For example, it is cheaper per unit for the fisher to transport 3,000 or 4,000 pounds of conch at one time, instead of selling 400–800 pounds at a time, as there are economies of scale. The freight cost of the buyer in Bequia who has to ship the conch is also lowered.

Processing

Conch is normally cleaned at different grades (see **Table 3**). There is 50 percent cleaned, 85 percent cleaned and 100 percent cleaned.

TABLE 3: DESCRIPTION OF CONCH GRADES

Processing grade	Description	Local price to processors
Live weight	Complete animal, including the shell	
Without processing (dirty)	Complete animal extracted from the shell, meat with skin, viscera, sex organs, digestive organs and operculum/nail	EC$8-10/lb
50% clean*	Operculum and the visceral bag are removed	EC$10/lb
75% clean**	White meat, with some pink, orange meat only	EC$13.50/lb
85% clean	White meat, with some pink, orange meat only, skin on	EC$15/lb
100% clean	Fillet of white meat only	EC$18/lb

Source: Modified from Table 2, FAO WECAFC (2015); * This is sometimes identified locally as 35 percent cleaned. The foot (see Figure 14) is also removed in SVG at this grade; **Identified by local stakeholders, but no clear distinction provided relative to 85 percent clean.

Cleaning at 100 percent means that all the skin is removed: the black, brown and pink skin is removed. This is for the export market, especially in Miami. All grades are available for the local market. Bequia processes 100 percent cleaned conch. Union Island does not process 100 percent cleaned conch.

The skin is shipped separately, at up to 30,000 pounds at a time, for use in making conch fritters. There are black, white and pink skin trimmings. These are separate products that are used by restaurants. The price for the skin trimmings is not very high and more lucrative markets are being explored. Two industrial processors export trimmings.

Exporting

From Union Island, conch is normally exported to Saint Lucia and Dominica. Conch from Union Island that is sent to Bequia is also usually exported to the United States and Trinidad and Tobago. Conch from Union Island that is sent to Owia is also exported. Most of the conch exports leave SVG from Owia. Canouan does not export conch but will send to Owia, Bequia and Union Island. Overall, Owia is the main source of exports from SVG. Firms that export must apply for inspection of the export product at least 48 hours prior. The exporter is required to inform the Fisheries Division of landed conch that is intended for export. This product is inspected at the landing site by a member of the Quality Unit or a data collector if staff from the Quality Unit are not available. The meat must be a minimum of 8 ounces after the digestive glands are removed (or 0.5 lb weight landed). The conch must be alive when it is landed, and must have no off-smell or soft flesh. There are very rare instances of dead conch being landed.

The cold chain normally starts when the conch reaches the Fisheries Centres, and the processors at these centres keep mandatory records on the temperature, who the conch is purchased from, the quantity, and where the conch was harvested.

4.2 Value chain actors

The roles of main and supporting actors are presented in **Table 4** and **Table 5**. The 'Main Actors' are those that actually own the conch at some point along the value chain. So, for example, if someone provided storage facilities for the conch, that actor would be a service provider or a 'Supporting Actor' because they do not actually own the conch.

TABLE 4: ROLES OF MAIN ACTORS

Stage	Main actors	Role
Harvesting	Fishers – artisanal	Catch and land conch, maintain conch quality, bring conch to the market
Wholesaling	Market-based wholesalers	Intermediaries between fishers and retailers
	Traders	Transfer product
Processing	Commercial processors	Processing conch mostly for export
	Artisanal processors	Cleaning conch for the fisher/vendor
Retailing	Supermarkets	Selling to households
	Market retailers	Selling to households at the Kingston Fishing Complex
	Speciality shops	Selling a range of local and imported seafood
	Restaurants; Hotels	Budget/moderate/upscale
Consumption	Households; Yachties	End buyers in the value chain

TABLE 5: ROLE OF SUPPORTING ACTORS

Stage	Supporting actors	Role
Input supply	Fishing materials, machinery and equipment importers	Supply equipment/parts for boat building, engines, SCUBA repair, ice, baskets, bags, fuel
Harvesting	Institutional support –	Data collectors, market managers
	Institutional support – Fisheries Division	Market manager; sets regulations for gear, minimum sizes and fishing areas; export inspections
	Non-governmental organisations; Training Institutions	Provide capacity building in operating vessels, safety at sea, fish handling and fish processing
	Financial institutions	Provide loans
Wholesaling	Packaging suppliers	
Processing	Fisheries Division	Advocate for foreign market access
	Regional Corporation	Local government bodies responsible for managing markets
Transporting	Inter-island ferries	Transfer of conch among islands to facilitate export and local consumption

Households

Households normally purchase conch directly from fishers and the remainder from the processing plants (i.e. Fisheries Centres). Households also purchase conch from vendors directly (fresh conch—cleaned or uncleaned), and from the supermarket in its frozen form. Households also consume conch from local restaurants, but this is not a very popular local menu item.

Fisheries Division

Fishers are required to submit all the landings that come into the processing plants. There is also a Fisheries Officer on site who collects the data. Also, when the conch is exported, the Fisheries Division inspects the conch and gives a Convention on International Trade in Endangered Species (CITES) permit. The Fisheries Division also collects data on the export quantities. A key actor is the Fisheries Division's Quality Assurance and Products Development Unit.

Value-added products

Conch shell processing is extremely limited. A small amount of the shells is kept for the craft sector, where the shells are polished and sold directly to tourists.

4.3 Value chain overview

Based on the value chain map**,** several value chains are identified:

1. Channel I: Fisher → Industrial Processor → Wholesaler/Exporter
2. Channel II: Fisher → Industrial Processor → Household/Consumer
3. Channel III: Fisher → Vendor → Household/Consumer
4. Channel IV: Fisher → Artisanal Processor → Household/Consumer
5. Channel V: Fisher → Restaurants → Household/Consumer
6. Channel VI: Fisher → Restaurants → Household/Consumer
7. Channel VII: Fisher → Industrial Processor → Supermarket → Consumer
8. Channel VIII: Fisher → Hotel → Consumer
9. Channel IX: Fisher → Consumer
10. Channel X: Fisher → Vendor →Hotel → Household/Consumer

4.4 Stakeholder perspectives

Individual goals

Individual goals of participating in the conch fishery is an important consideration in understanding the perspectives of the various stakeholders. Key stakeholder goals are as follows:

1. Maximisation of exports
2. Increased local consumption (as the local consumption is very low)
3. More profits for craft persons and fishers
4. Effective conch marketing to increase the visibility of the product and increase customers' knowledge of the product
5. To supply more regional markets and provide meaningful employment for Vincentians
6. Creation of new income streams, for example, wasted conch shells can be used to create a new income stream by way of using the conch in the culinary sector

7. Consistent market with contractual arrangements, especially to support the provision of loans and secure credit
8. Effective management of landing sites to ensure sustainability of the fishery

Even though each stakeholder has their own goals, we have to ensure that the individual activities and goals are also beneficial to the conch fishery as a whole. It is possible, for example, that increased harvesting may be beneficial to fishers and other stakeholders in the short term, but overharvesting can lead to the Tragedy of the Commons which would lead to the resource being depleted and fishers having to find new conch fishing grounds. Alternatively, if all the readily-accessible grounds are over harvested, the fishery cannot be sustained, and fishers will have to shift to a new fishery and lose potential revenue from the conch fishery.

Group goals

Based on feedback from key stakeholders, the key group goals—goals that should be commonly held by the fishery actors—were ranked by the webinar participants as

1. Sustainable conch fishery
2. Increased employment
3. Fair distribution of benefits
4. More involvement of fishers in decision making
5. High value/price for conch

The identification of these group goals is very important because once key stakeholders have the same outlook in terms of what is most important to be achieved in the fishery, then individual actors can better tailor their short, medium- and long-term activities to ensure that these activities are contributing to the group goals. Otherwise, it is possible to have individual, short-run gains, which can undermine the fishery's value.

5 National, regional and international trade and trends

5.1 SVG trade in seafood

The total seafood landings for SVG almost quadrupled between 2000 and 2011 (FAO, 2011-2020). However, since then, total landings were highly variable with unexplained low volumes in 2012 and 2016. Most of the recent landings were due to Jack and Horse Mackerels nei., followed by Atlantic Chub Mackerel. Together, these two species groups accounted for approximately two-thirds of the 2017 landings (**Figure** 22).

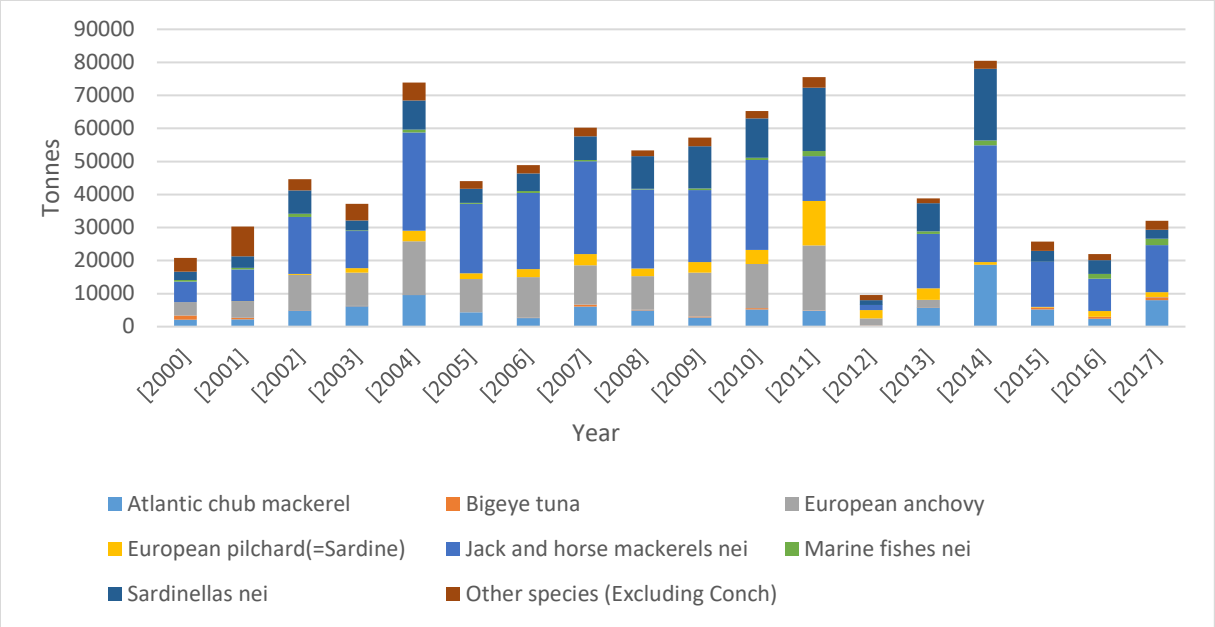


FIGURE 22: SEAFOOD HARVEST FOR SVG, 2000–2017 (TONNES)
Source: FAO (2011–2020)

While the total seafood landings were increasing from 2000 to 2011, conch landings declined significantly from a high of 287 tonnes in 2001 down to a low of 27 tonnes in 2006 (**Figure 23**).

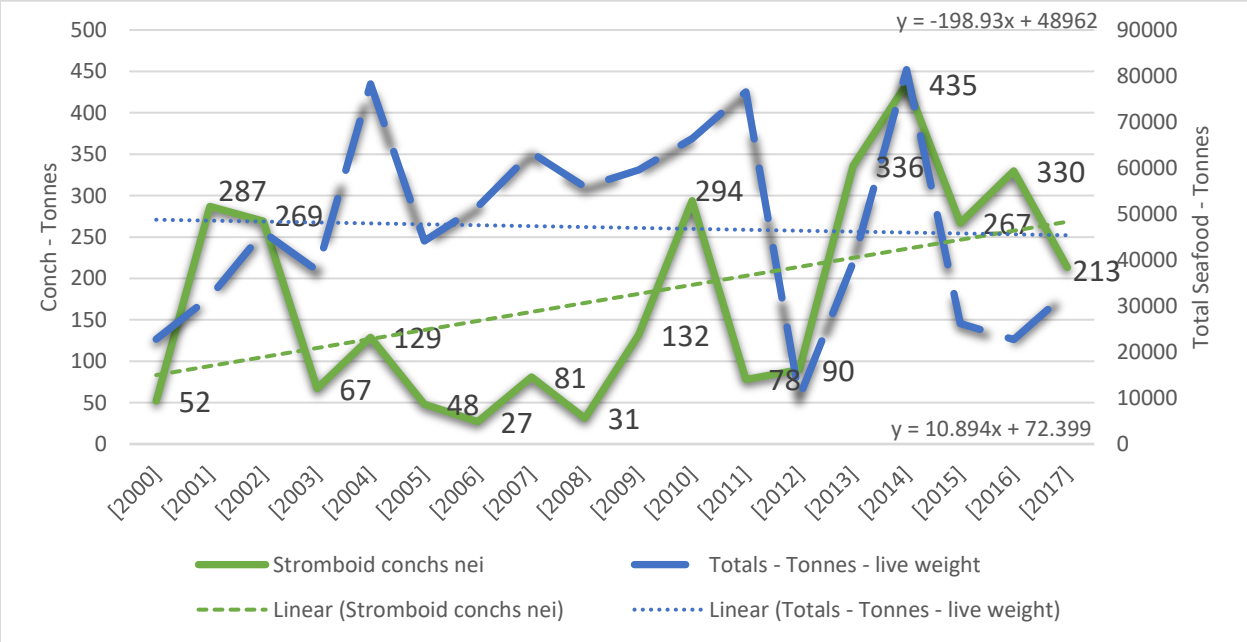


FIGURE 23: TOTAL SEAFOOD AND CONCH HARVEST FOR SVG, 2000-2017 (TONNES)
Source: FAO (2011-2020).

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. Based on Conch landings in SVG from Fisheries Division data, a total of 2,626,852 pounds were landed from 2009 to 2019 (**Figure 24**).

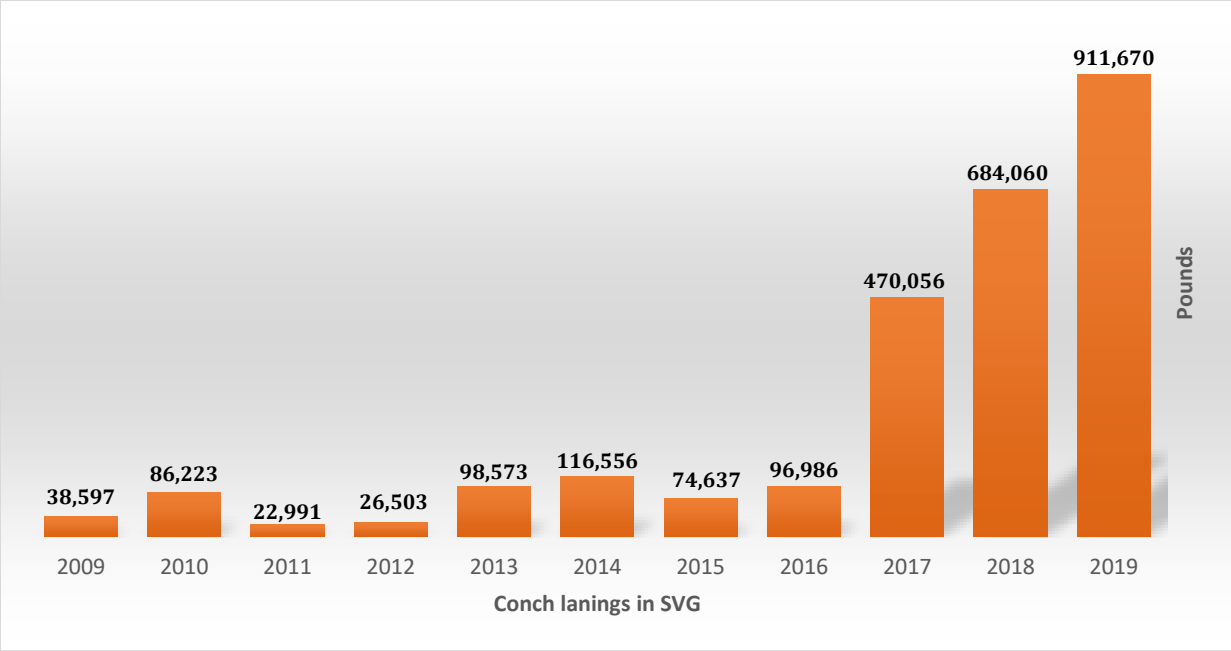


FIGURE 24: ANNUAL CONCH LANDINGS IN SVG, 2009–2019 (LBS.)
Source: SVG Fisheries Division (2020)

As the conch landings increased significantly since 2017, so did the value of these landings (**Figure 25**). However, what is noteworthy is that the unit value of the conch spiked in 2018 to EC$10.01/lb (ex-vessel price), but returned to previous levels and was at EC$6.45/lb in 2019 (**Figure 26**). So, the increased landings did not have a negative effect on the ex-vessel market price for conch, as is normally expected. Despite this, however, it should be noted that the ex-vessel price for conch has been generally falling, with an average decline of EC$0.14 annually for the 2009–2019 period.

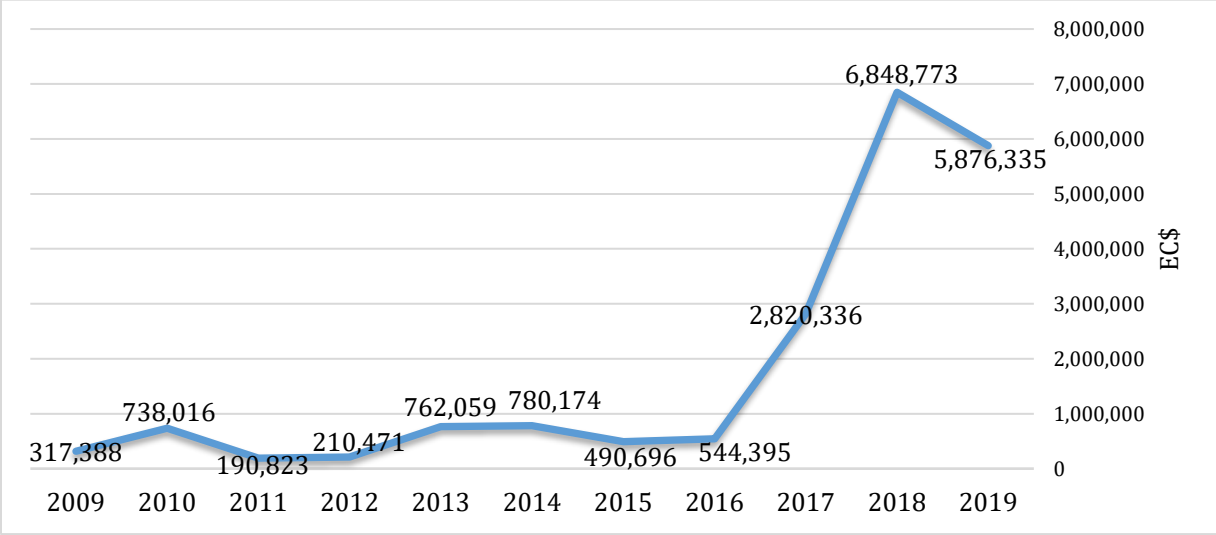


FIGURE 25: ANNUAL VALUE OF CONCH LANDINGS IN SVG, 2009–2019 (EC$)
Source: SVG Fisheries Division (2020)

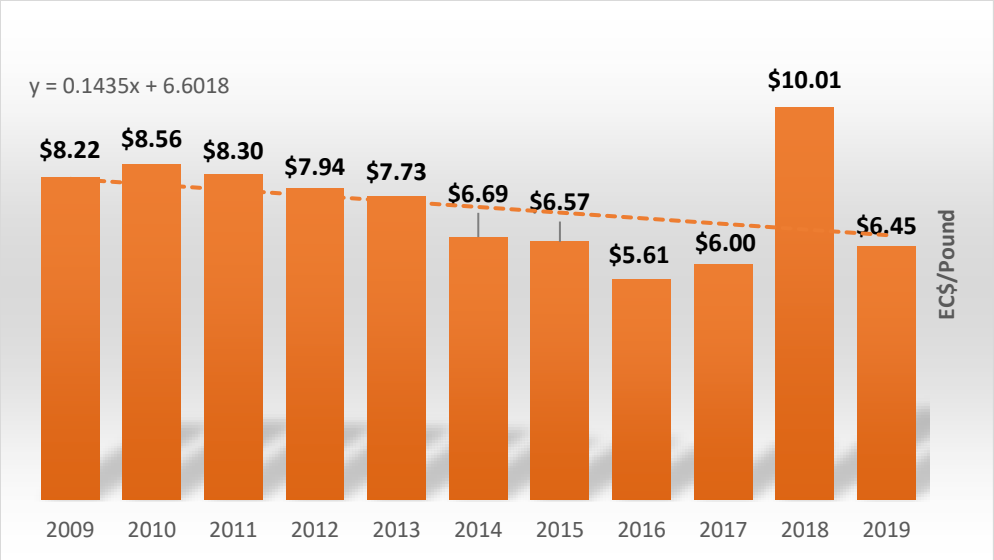


FIGURE 26: PRICE PER POUND OF EX-VESSEL CONCH IN SVG, 2009–2019 (EC$/LB.)
Source: SVG Fisheries Division (2020)

The overall decline in ex-vessel conch prices suggests that conch is becoming cheaper relative to other seafood and meat products in the SVG market, which would allow it to be more affordable to the local consumer, and also allow it to be more competitive in the export market. However, it also means that fishers and other SVG market actors are getting a lower price, while facing higher production costs. From 2010 to 2020, local fuel, labour and engine costs are estimated to have risen by 10 percent. These rising costs will, therefore, lead to a thinning of their profits over time, if it persists, and increases their economic vulnerability, as they overcapitalise the fishery. They would have to catch more conch over time to get the same revenue.

Conch is consumed locally mainly by tourists at restaurants and hotels. Visitor arrivals increased from 60,000 in 1995 to 356,000 in 2019, an approximate 5.5 times increase. Tourism receipts similarly rose from US$53 mil in 1995 to US$241 mil in 2018 (World Data, 2021). Tourism is becoming increasingly important to St. Vincent, and it accounted for 29.7 percent of GDP in 2018, up from 16.8 percent of GDP in 1995. This market therefore can be used as a pull factor for increasing the sale of conch value-added products such as samosas and fritters.

Monthly Conch landings

In 2015 and 2016, monthly conch landings were fairly stable throughout the year. However, for 2017 and 2018, most of the landings occurred from July to December. This occurrence reversed in 2019, where the last quarter of the year had overall lower volumes relative to the share of previous fourth quarter volumes (**Figure 27**).

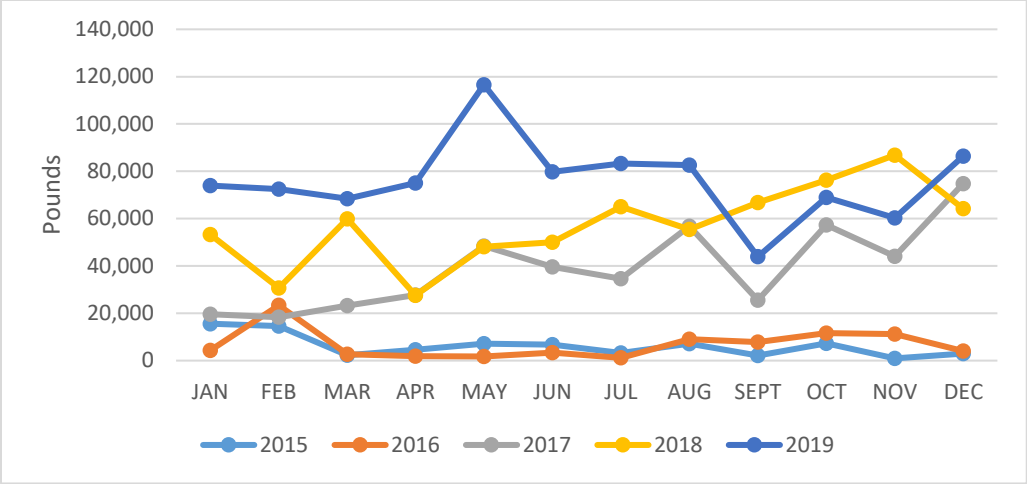


FIGURE 27: MONTHLY CONCH LANDINGS IN SVG, 2015–2019 (LBS.)
Source: SVG Fisheries Division (2020)

Except for the anomalous year 2018, the value and unit price for conch was consistent with observed volumes landed (**Figure 28** and **Figure 29**). Ex-vessel price was generally highest during the summer months when visitor arrivals are high. In 2019, the unit price peaked at EC$7.96/lb in July. The price was lowest at EC$5.29/lb in September 2019.

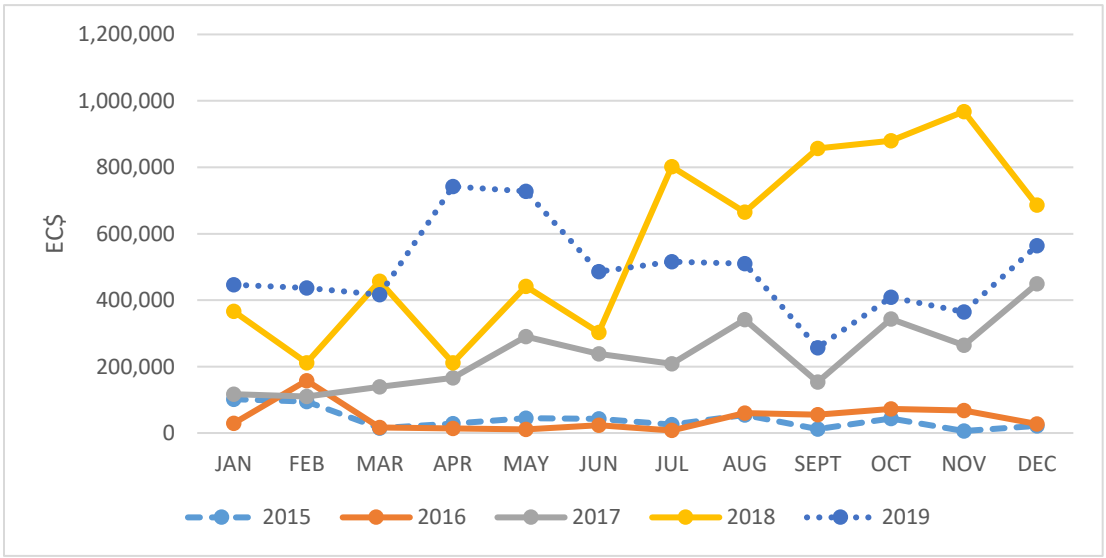


FIGURE 28: MONTHLY VALUE OF CONCH LANDINGS IN SVG, 2015–2019 (EC$)
Source: SVG Fisheries Division (2020)

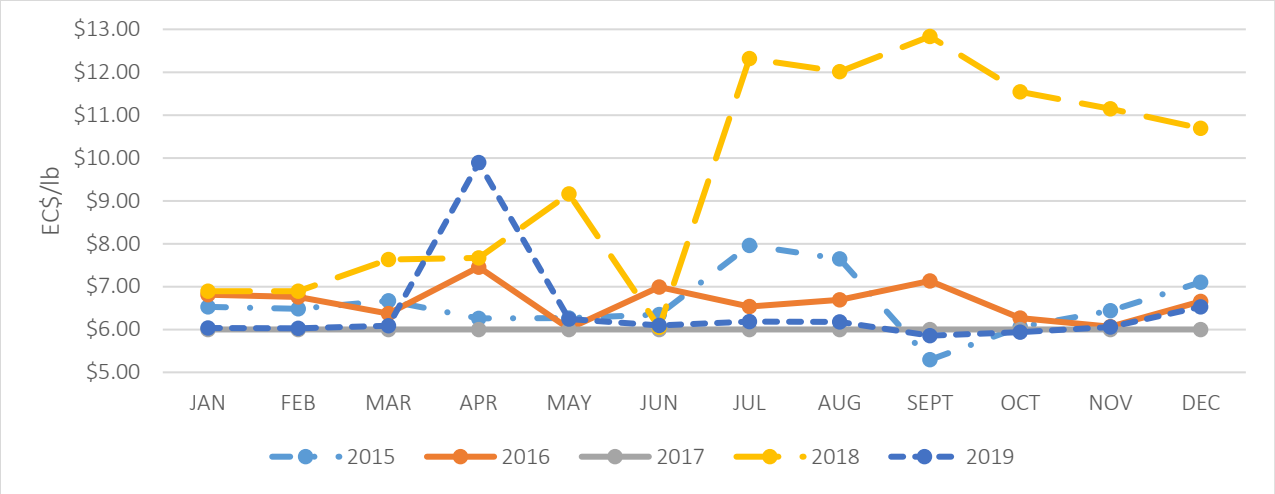


FIGURE 29: MONTHLY CONCH PRICE IN SVG, 2015–2019 (EC$/LB.)
Source: SVG Fisheries Division (2020)

Conch export

In 2018, 89.5 percent of all conch landed in SVG was exported. From 2018 to 2020, the conch was exported to the United States, Saint Lucia, Trinidad and Tobago and the British Virgin Islands. Conch exports skyrocketed in 2017 (**Figure 30)** and continued to rise sharply in 2018 and 2019 (Figure 28). This occurred as the Argyle International airport was completed in February 2017, so fishers were now able to get more direct flights to Miami. This increased transportation route was a significant pull factor in the fishery. However, unlike the case where the ex-vessel price was close to 2017 values (**Figure 31**), in 2019, the value of exports increased from EC$6.33/lb in 2016, to EC$6.75/lb in 2017, and then to EC$11.05 in 2019. It isn't clear how this export value is distributed across exporters.

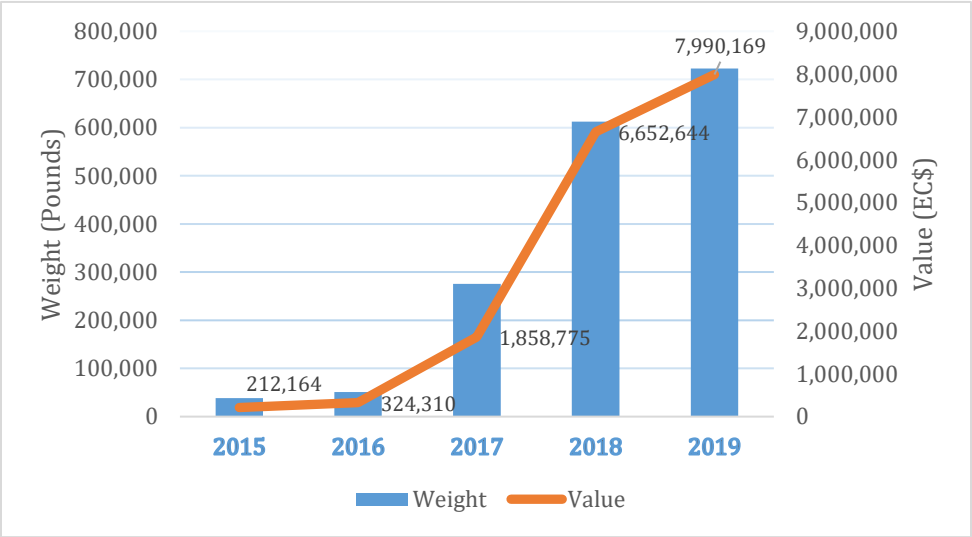


FIGURE 30: CONCH EXPORT WEIGHT AND VALUE IN SVG, 2015–2019
Source: SVG Fisheries Division (2020)

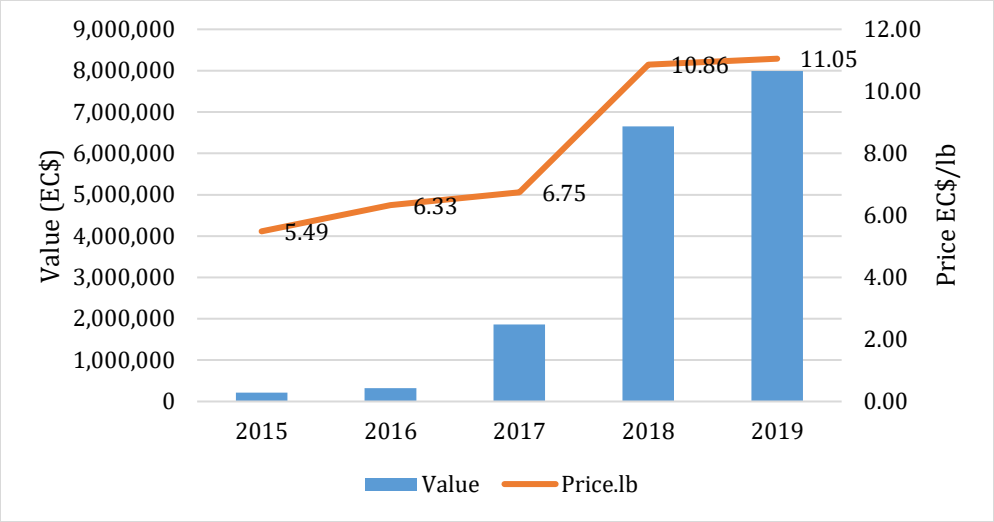


FIGURE 31: CONCH EXPORT VALUE AND UNIT PRICE IN SVG, 2015–2019
Source: SVG Fisheries Division (2020)

Value-added Conch meal products export

The volume and value of conch and conch product exports in SVG in 2019, as meal options, are shown in **Table 6** and **Table 7** (Kris Isaacs, Senior Fisheries Officer, Personal Communication). Volumes and values were similar for 2019 as for 2017 (not shown). In 2017, the total volume of processed conch products were 1,813.52 pounds, with 863.12 pounds of samosas. That year, processed conch accounted for EC$29,550, with samosas accounting for just over half that amount at EC$15,846. In 2018, the total volume of processed conch products were 1,931 pounds, with 783 pounds of samosas. However, all the processed conch accounted for EC$48,108, with samosas accounting for EC$18,611 and being outpaced by conch fritters, which were valued at EC$24,000. Conch fritters were only valued at EC$12,000 in 2019. These figures suggest that there is significant variability in the market for conch food value-added products, but the cause of this variability is not certain.

TABLE 6: MONTHLY WEIGHTS OF CONCH AND CONCH PRODUCTS EXPORTED FROM SVG, 2019 (LBS.)

SPECIES NAME	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
PROCESSED FISH													
Smoked Conch	0	0	N/A	0	0	0	0	0	0	0	0	0	0
Curry Conch	0	0	N/A	0	0	0	0	0	0	0	0	0	0
Conch fritters	0	220	N/A	0	0	28	0	0	0	0	0	120	368
Conch samosas	82	0	82	0	0	264	0	0	0	0	264	408	1,100
Conch & callaloo	60	0	60	0	0	0	0	0	0	0	0	259	380
MONTHLY TOTAL	**142**	**220**	**142**	**0**	**0**	**292**	**6**	**0**	**0**	**0**	**264**	**787**	**1,853**
SHELL FISH													
CONCH	67,998	47,992	64,507	74,939	67,812	70,600	77,228	47,942	37,201	59,146	60,628	46,900	722,893

TABLE 7: MONTHLY VALUE OF CONCH AND CONCH PRODUCTS EXPORTED FROM SVG, 2019 (EC$)

SPECIES NAME	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
PROCESSED FISH													
Smoked Conch	0	0	0	0	0	0	0	0	0	0	0	0	0
Curry Conch	0	0	0	0	0	0	0	0	0	0	0	0	0
Conch fritters	0	6,400	0	0	0	800	0	0	0	0	0	4,800	12,000
Conch samosas	1,618	0	1,618	0	0	1,215	0	0	0	0	4,050	5,670	14,170
Conch & callaloo	647	0	647	0	0	0	0	0	0	0	0	1,618	12,000 2,912
MONTHLY TOTAL	**2,265**	**6,400**	**2,265**	**0**	**0**	**2,015**	**0**	**0**	**0**	**0**	**4,050**	**12,088**	**29,082**
SHELL FISH													
CONCH	701, 535	424, 432	673, 846	741, 248	629, 016	794, 435	1,036, 203	577, 131	456, 714	687, 307	715, 852	552, 450	7,990, 169

5.2 Global market trends

Since the 1980s, global commercial catch has increased in response to international market demand (Paris et al., 2008). Both fishing pressure and exports have increased over the past two decades, resulting in diminishing population density across the range (Acosta, 2006; Ehrhardt, 2008) (NOAA, 2014, p. 16). As a result, globally, conch catch rates increased significantly to the mid-1990s and then declined to about half the mid-1990s level by the early 2000s (NOAA, 2014, p.16). The increased exports came primarily from United Sates import demand for conch primarily from the Caribbean.

Nicaragua accounts for 32 percent of global conch trade in 2020. In the region, Jamaica, Bahamas and the Turks and Caicos Islands are the top producing countries (see **Figure 32**). SVG accounts for only 1.2 percent of the global conch harvest.

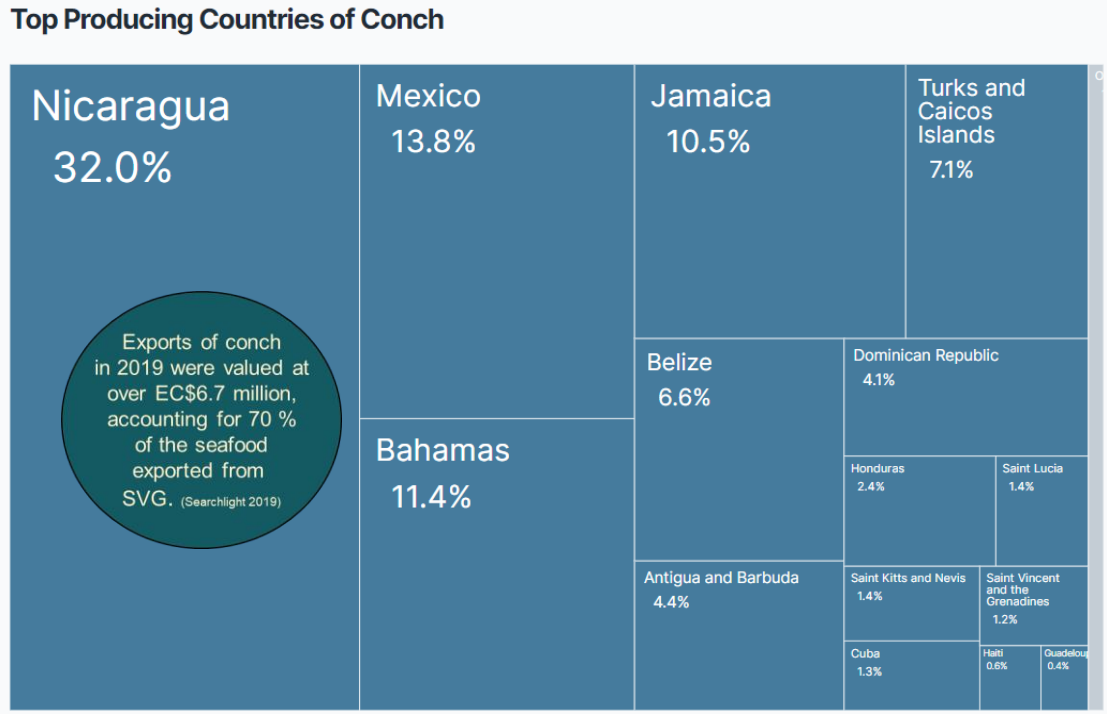


FIGURE 32: GLOBAL CONCH MARKET 2020
Source: Tridge (2020)

Since 1996, global production showed high variability, from a high of approximately 43,000 tonnes in 1997 to a low of approximately 22,000 tonnes in 2007 (**Figure** 33). The market showed a general declining trend in conch production over this time, as the pressure on the stock increased. However, since 2007, production showed a generally upward trend, ending at approximately 35,000 tonnes in 2007, which is still less than the levels previously achieved in the mid-1990s.

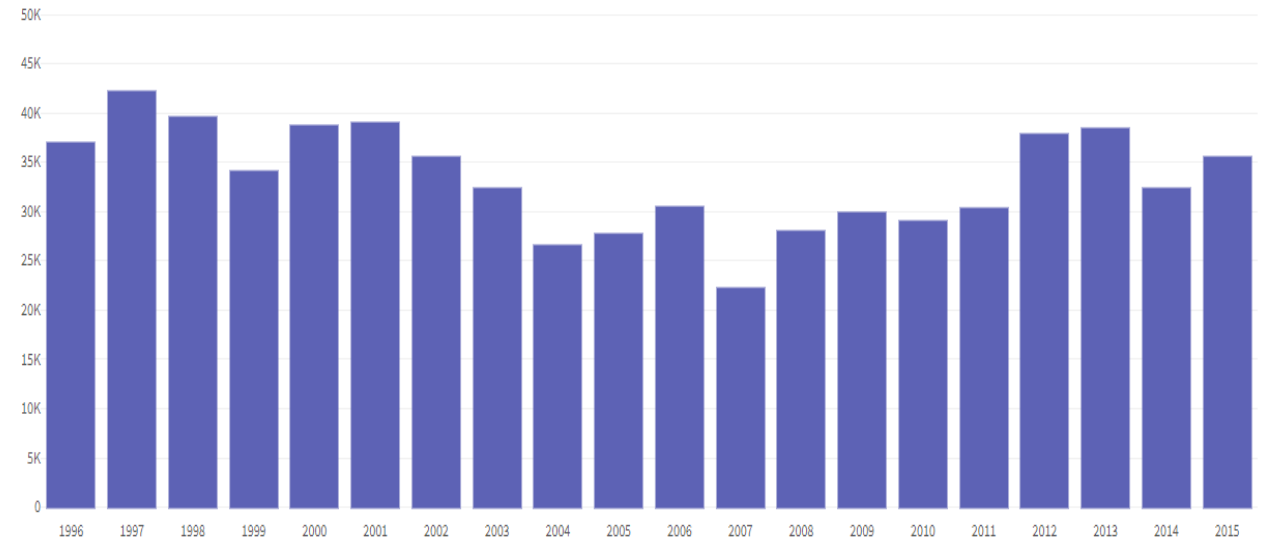


FIGURE 33: GLOBAL CONCH PRODUCTION, 1996–2015
Source: Tridge (2020)

The demand for processed conch meat is very strong for all exported conch. The top importers and exporters are China and India, respectively, as shown in **Table 8.** China represented 19 percent of all imports in 2018, with a market value of US$630.88 mil. The total import market was, therefore, worth US$3,320.42 mil in 2018. Conch exports from SVG are therefore entering a highly lucrative market space. Between 2017 and 2018, China's demand almost doubled, growing by 79.5 percent in that short period. This continued its strong demand for conch, since its demand grew almost four-fold, by 385.4 percent between 2015 and 2018 (as shown by its 3-year growth in value).

China is followed by Italy and Spain as the second and third most important importers, based on value. These countries commanded 14.8 percent and 13.6 percent of the global market, respectively. In total, China, Italy and Spain accounted for 47.4 percent of the global import market, by value. Out of the top six conch importing countries, Thailand exhibited the highest import demand for the previous three years, growing by 879.1 percent, which is an almost ten-fold increase in imports. This was followed by Vietnam, with just over an eight-fold increase (740.4 percent) and then Italy, with an approximate five-fold increase (402.1 percent). Despite this strong three-year growth, imports for Japan and Thailand fell by almost 50 percent relative to 2017, which reflects some market instability for imports in these countries.

TABLE 8: TOP CONCH IMPORTERS AND EXPORTS, 2018

Top Importers

Rank	Country	Import Value in 2018 USD	Shares in Import %	1-Year Growth in Value %	3-Year Growth in Value %
1	China	$630.88M	19.0%	+79.5%	+385.4%
2	Italy	$491.78M	14.8%	+7.5%	+402.1%
3	Spain	$449.41M	13.6%	-13.1%	+123.9%
4	Vietnam	$245.60M	7.4%	+197.1%	+740.4%
5	Japan	$218.09M	6.6%	-48.3%	+75.8%
6	Thailand	$213.23M	6.4%	-46.5%	+879.1%

Top Exporters

Rank	Country	Export Value in 2018 USD	Shares in Export %	1-Year Growth in Value %	Revealed Comparative Advantage %
1	India	$622.24M	18.8%	+128.7%	10.24
2	Peru	$370.49M	11.2%	+206.8%	39.52
3	Indonesia	$342.74M	10.3%	+33.8%	8.72
4	Japan	$295.84M	8.9%	+378.6%	2.17

Source: Tridge (2020)

The top four conch exporting countries all showed positive and very strong growth between 2017 and 2018. India's exports more than doubled in value (the one-year growth was 128.7 percent), while Japan's export value for conch was almost five-fold (at 378.6 percent). This market is, therefore, very competitive, as these exporters are vying for increased demands globally.

5.3 Regional market trade

Imports

Table 9 shows that the total annual imports of fish for food for all CRFM Member States was 87,717 MT in 2018, valued at US$330.4 mil. Of this, SVG imported 470 MT, valued at US$2.3 mil (CRFM, 2020).

TABLE 9: WEIGHT AND VALUE OF IMPORTS OF FISH FOR FOOD, CRFM MEMBER STATES (2018)

Member States	Weight of fish imports for food (t) 2018	Value of fish imports for food (in millions of United States dollars) 2018
Anguilla *(2010 est.)*	450	1.9
Antigua and Barbuda	1, 964	8.2
Bahamas	5, 614	39.6
Barbados	8, 614	28.9
Belize	281	0.6
Dominica	570	2.1
Grenada	878	4.6
Guyana	2, 126	3.6
Haiti ***(2009 est. from the Fisheries Department)***	12, 500	46.1
Jamaica	33, 522	116.9
Montserrat ***(2016 est.)***	66	0.4
St. Kitts and Nevis	1, 251	6.2
Saint Lucia	2, 248	11.0
St. Vincent and the Grenadines	470	2.3
Suriname	4, 547	6.1
Trinidad and Tobago	11, 036	44.7
Turks and **Caicos Islands *(2016 est.)***	1, 580	7.2
Totals	87,717	330.4

Source: Extracted from Table 27, CRFM (2020)

Exports

A review of the data provided in Error! Reference source not found. shows that for 2018, the three largest domestic exporters of fish, by value, were Suriname, Guyana and the Bahamas; together they accounted for 84.9 percent of total volume of domestic exports of fish for food from the region. However, for 2018, SVG exported only US$2.5 mil in domestic food for fish, equivalent to only 0.9 percent of the region's exports, by value.

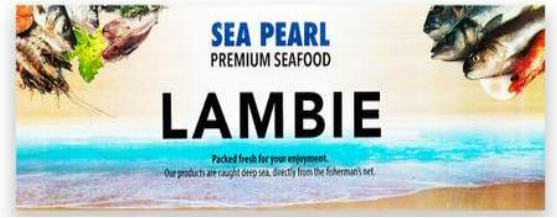
TABLE 10: WEIGHT AND VALUE OF EXPORTS OF FISH FOR FOOD, CRFM MEMBER STATES (2018)

Member States	Weight of fish exports for food (t) 2018	Value of fish exports for food (in millions of United States dollars) 2018
Anguilla *(2010 est.)*	0	0.0
Antigua and Barbuda	47	0.78
Bahamas	2, 532	81.2
Barbados	145	0.5
Belize	1, 422	21.4
Dominica	15	0.07
Grenada	653	6.6
Guyana	23, 929	110.9
Haiti *(2009 est. from the Fisheries Department)*	0	0.0
Jamaica	499	9.2
Montserrat *(2016 est.)*	0	0.0
St. Kitts and Nevis	19	0.1
Saint Lucia	0	0.00
St. Vincent and the Grenadines	464	2.5
Suriname	35, 456	41.7
Trinidad and Tobago	7, 648	17.1
Turks and Caicos **Islands *(2016 est.)***	93	1.4
Totals	72, 922	293.45

Source: Extracted from Table 34, CRFM (2020)

Conch is available regionally in many markets such as 'Fish Fries', which are informally structured, open-air seafood sale areas which are comprised of several micro-seafood vendors who cook the seafood on-site and sell and serve the food at covered or uncovered concrete or wooden seating areas, usually with tabled options. The fare is normally grilled or fried seafood with side dishes such as fries, rice or other carbohydrate menu item. These sales are normally done in an environment with local music, dancing and small to large crowds, depending on the popularity of the 'Fish Fry' event. Conch is also sold in fish markets, supermarkets and specialty fish shops (**Table 11**).

TABLE 11: REGIONAL CONCH PRODUCTS AND PRICES

Product Description/ Source	Local Price/kg	US$ Price/kg
 Source: Trinitrolley.com 2020 Wild-caught, skin-on, vacuum packed, frozen, Origin: Grenada, 1.8 lbs. = 0.82 kg/ Ocean Delight	EC$ 48.52 /kg	$17.99/kg
 Source: PriceSmart (2020) Sea Pearl Frozen Lambie (Conch), Bag, 816 g /1.8 lb. @ EC$ 0.22 PriceSmart, Trinidad and Tobago – all branches Ready-for-Pickup Time: All orders will be processed overnight and made available for pick up the day after your order is completed.	EC$36.85 /kg	$13.66/kg

6 SWOT analysis and risk assessment of Conch production

Conch shells are currently used in foundations for houses and also to establish new 'islands'. One such island is 'Happy Island', an entertainment space that was created entirely from discarded conch shells as the foundation. Conch is also used to decorate walls and homes in SVG. In Belize, Conch are marketed for use in restaurants and as art (see **Figure 34**). In addition to these craft opportunities, other opportunities are highlighted in the SWOT analysis in **Table 12** and **Table 13**.

(a) Conch soup served in the Conch shell bowl in Belize

(b) Designer Conch shell art in Belize

(c) Conch shell jewelry sold in Belize

(d) Conch shell bowl and spoon souvenir in Belize

FIGURE 34: CONCH VALUE-ADDED PRODUCTS IN BELIZE
Source: The Belize Travel Blog (2020)

TABLE 12: SWOT ANALYSIS – STRENGTHS AND OPPORTUNITIES

STRENGTHS	OPPORTUNITIES
Production ▪ Relatively new and modern Fisheries Centres throughout the SVG ▪ Increasing number of vessels and fishers in the conch fishery over time ▪ Conch stock assessment is planned to be implemented in the short-term. ▪ There is widely available information globally on how to manage conch. ▪ SVG has an advantage in the trade of conch shells, as CITES banned the import of conch products from many producers (including Antigua and Barbuda, Barbados, Dominica, Dominican Republic, Haiti, Honduras, and Trinidad and Tobago). ***Processing*** ▪ Adequate processing capacity and technology to meet current local and export needs ▪ Adequate record keeping ***Marketing/Trade*** ▪ Strong market access to the United States, especially with improved airlift ▪ Close proximity to a number of other Caribbean islands where there is a favourable demand for fish and fish products in the tourism and hospitality industry ▪ Vibrant hotel, restaurant and catering enterprises ensure an attractive local market price for onch products, for the buyer. ***Consumption*** ▪ There is strong regional and international demand for conch. ▪ Global conch demand is increasing rapidly.	***Production*** ▪ Premium price for sustainably-managed fishery ▪ There is interest in the shell for cosmetic use. ▪ The operculum/nail is a premium product. At the moment, only small amounts are exported from SVG. Most of the opercula are currently dumped. ***Processing*** ▪ Explore export market for conch trimmings, using existing local experience ▪ Conch trimmings may be used in the local school feeding programme ▪ Training in the production of craft items (especially household items) and jewelry using the conch shell, will allow for more production of these goods and the offering of higher quality conch byproducts to be available for tourists locally and for the regional or international export. ▪ Training in the use of opercula in the production of necklaces, bracelets and other jewelry will allow a new craft sector to be developed. ***Marketing/Trade*** ▪ Fishers can receive a larger share of the conch export price if they sell the conch as a group, with negotiated prices and sale agreements with the aggregator(s). ▪ Increasing exports of Conch from 2017 can be a basis for further market penetration via deepening or expanding in existing United States markets. ▪ Exporting of finished conch shells as a home decoration item ▪ Export of conch jewelry products ▪ Export of conch opercula ▪ Each conch should be checked carefully for a possible pearl once the shell is removed. Even though these are rare occurrences, they are extremely high priced. Their rarity is increasing as less conch are being marketed due to declining stocks overall worldwide.

STRENGTHS	OPPORTUNITIES
	Consumption ▪ Fishers and processors should target the rapidly-growing tourism market in SVG, since most of the local demand for conch is by visitors. ▪ Increased use of conch via increased hosting of seafood festivals ▪ Fisher groups and processors can create stronger business contracts with hotels, guest houses and other accommodations to offer conch value-added products to visitors, as the number of tourist arrivals is growing rapidly. ▪ Tourists should be able to access the purchase of conch jewelry and decorative items at hotels and guest houses. ▪ Within the context of the increasing trends in nutrition-related chronic non-communicable diseases in Trinidad and Tobago, the consumption of conch offers the opportunity for a change in nutrition patterns that could contribute to healthier lifestyles.

TABLE 13: SWOT ANALYSIS – WEAKNESSES AND THREATS

WEAKNESSES	THREATS
Production ▪ Overharvesting—this refers to capturing the conch at a rate that is faster than they can be replenished by reproduction. This is the main weakness in the conch fishery. There are no trips or season limits on the amount that should be harvested. This means that the fishery can collapse before regulation is enacted. ▪ There is poor data collection from the fishers. Often, fishers do not state where the conch was caught. The size needs to be monitored and size limits strongly enforced. ▪ Many undersized conch are harvested. ▪ The waste of the conch shell is becoming an eyesore.	***Production*** ▪ Potential negative impacts on the acidification of oceans and declining shell production as a result of climate change ▪ Susceptibility of ecosystems and capital inputs (boats, landing sites, processing sites) to effects of natural disasters (hurricanes, storms, sea level rise) ▪ Over-reliance on a single species increases the fishers' economic vulnerability, as the stock is subject to disease occurrence or loss of habitats. ▪ Areas used to 'crawl' the conch may be polluted, so bypassing this step is preferred in order to reduce this potential risk to the processors. **Marketing/ Trade**

WEAKNESSES	THREATS
▪ Discarding of conch shells on the conch grounds is polluting the grounds and discourages habitation of the site by other conch. ▪ There is no closed season, which is allowing increased fishing pressure. This is likely to result in the collapse of the fishery. ▪ Harvest of juveniles—taking thin lip (roller) conch before they are mature enough to reproduce. ▪ Lack of enforcement of fishery regulations. ▪ Subjective fishery regulations—regulations permit the harvest of conch with a well-formed lip. The term 'well-formed' is subject to interpretation. It is understood that it means flared and thick but does not quantify what this means by giving, for example, a minimum lip thickness. ▪ Not all the conch is recorded by the Fisheries Division. This occurs mainly if the landed Conch is not processed by the Fisheries Centres located throughout SVG. ***Processing*** ▪ Conch trimmings are going to waste on the artisanal side of the value chain. The level of trimmings export was not determined. **Marketing/ Trade** ▪ Very limited formal contract arrangements are in place. ▪ The strong demand for conch meat is squeezing out interest in developing other Conch value-added products. **Consumption** • Low local conch consumption due to poor information and understanding of how to use the product, and its benefits.	▪ Competition from other lower-cost markets in Central America, such as Nicaragua, can reduce the local exports for conch. **Consumption** ▪ Competition from imported ready-to-cook products

7 Conclusion and recommendations

The Queen Conch fishery in SVG, which previously had declining landings, is now showing rapidly-increasing landings and associated exports. This is largely due to increased market access with direct airlift to Miami, as the new Argyle International Airport was opened in 2017. Demand for fresh or frozen conch is low among locals, even though food items such as conch samosas, conch fritters, and conch and callaloo are available and even exported in small quantities. The effort in the fishery increased in the last three years to meet the increased international demand. The ex-vessel price remains relatively low, and historically, ex-vessel prices are showing an overall decline. This is occurring even as the unit export value for conch increased significantly from 2017. This suggests that exporters are receiving an increasing share of the consumer dollar, and that fishers are getting a shrinking share of the foreign consumer dollar.

Conch is primarily consumed by tourists locally, as it is relatively more expensive than fish, which is in high demand by locals. As a result, the main buyers are hotels and restaurants. The potential for market growth locally will therefore be heavily dependent on conch fishers strengthening links with these buyers to ensure that conch dishes are prominent on their menus. This market potential is also based on tourism growth in St. Vincent. The Fisheries Division provided HACCP training to local producers of conch value-added products (e.g. fritters, samosas), however, government does not provide any directed financial or other support to these processors.

The new marketing arrangements to purchase conch on the local market for export is an entirely privately operated system, with the Fisheries Division having regulatory oversight. However, most key stakeholders identified the need to ensure that the conch fishery is sustainable, as the most important goal of the fishery. However, recent market pressure is threatening the fishery's sustainability. As a result, key recommendations are suggested in section 7.1.

7.1 Key recommendations

Production

1. The Fisheries Division should set catch limits for conch, while increasing its monitoring and enforcement functions. Catch limits for each season would eliminate the race for fish that would occur with a simple closed season.
2. The Fisheries Division should implement more monitoring of the catch of juvenile conch, as this was seen as a widespread problem. Already the fact that fishers have to go to deeper and deeper water to catch conch may be a sign that the inshore habitats are overfished.
3. Fishers should observe better safety practices at sea. Several reports and stakeholders indicated that several fishers suffer from the bends each year. This is an avoidable risk and cost. Fishers who suffer from the bends have to seek expensive medical treatment and can possibly die if the impact is too severe.
4. Fishers should enhance existing cooperatives to negotiate better prices and contractual arrangements with exporters, so that they can reduce their effort and expenditure in the fishery (less trips and gear), while securing a better sale price, and hence larger profit.

Securing markets

5. Place greater emphasis on getting value for premium markets, in a sustainable way, such as the market for conch trimmings.
6. Assist craftsmen in the production of jewelry and decorations using Conch shells, especially whole, polished shells.
7. Train fishers in collecting and trading Conch pearls, which have a significant price premium.
8. Provide targeted market support for the identification and penetration of markets for Conch opercula. Becoming established in these markets will reduce the need to exploit the conch for its meat only, so that a single conch can provide much more value to the stakeholders along the value chain.
9. Support the business links of craftsmen to hotels, guest houses and restaurants to feature jewellery and craft items made from the conch shell.
10. Promote the adoption of conch as a bigger part of the local menu for tourists, via adoption by local and regional chefs, seafood festivals and gourmet food events which feature conch.
11. Promote the use of conch festivals to market the use of conch to tourists and locals.
12. Provide additional training in food health and safety standards, to allow value-added product processors to meet the requirements of new regional and international markets.

It is clear that there are spaces for new and existing entrepreneurs in the SVG conch market to seek additional value, but the resource management for conch has to be significantly strengthened to avoid a collapse of the stock.

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Appendix 1 - Methodological framework and identification of fishery value chains for focused Analysis

Methodology

This section outlines the process for the participatory selection and analysis of three fisheries value chains from the seven StewardFish target countries. The key steps of this methodology are as follows:

1. Identification of value chains for consideration
2. Development of selection criteria
3. Desk research and interviews within country experts
4. Scoring and value-chain selections
5. Development of preliminary value chains with a focus on primary actors
6. Participatory Webinar with key industry stakeholders in each country, where the key objectives are as follows:
    a. Outline the core concepts of a fishery value chain and how actors can benefit from using this approach
    b. Develop common goals for key actors
    c. Identify key primary market actors, their roles and risks
    d. Discuss and agree on key market limitations and solutions, in achieving common industry goals
7. Develop the description and identification of primary and secondary actors in each fishery, via online survey or online/telephone interviews

   Solicit estimates of volumes and prices of selected species from key industry stakeholders, via online/telephone interviews
8. Preparation of final value chain analysis report

Identification of Value chains for consideration

Each of the seven countries was asked to identify three species that require value chain development, based on their country objectives. Representatives (Focal points) from the departments of fisheries from the participating countries were contacted and asked to provide information on three value chains that they believed had high potential for value-chain development under the project. Departments of fisheries were asked to provide any background documentation on the state of the fishery, state of the value chain, current catch levels and information on potential markets for the species/value chain products identified. Each of the seven countries was asked to identify three species that require value-chain development, based on their country objectives. All countries provided three species/species groups, except for St. Lucia, who provided two species groups. It should be noted that while countries were asked to identify three species, value chains considered are not limited to specific species, but also can relate to specific products[1] within the value chain and catch methods[2].

Development of selection criteria

[1] For example, by-products of flying fish

[2] For example, Pelagic FAD fisheries

A literature review was conducted on methods for prioritisation of value chains for development[3], participatory methods for value chain analysis of smallholders/artisanal fisheries[4] and gender-based methods of value-chain analysis[5]. Based on this global literature review, a number of potential selection criteria were identified by the primary researcher (Appendix 1). Potential selection criteria were discussed (with the technical Consultant leading the analysis, the technical CANARI team and the FAO Regional Coordinator for StewardFish) and a final set of criteria were agreed upon. The criteria for prioritisation of value chains for further development were as follows:

1. **Scale of positive impact on artisanal fisherfolk (numbers, employment and income).** How significant is potential impact of developing this value chain on artisanal fisherfolk who are the primary beneficiaries of this project?
2. **Potential for market development.** What is the potential of this species for market development based on end consumer demand and other factors?
3. **Environmental sustainability.** How well established is sustainability within this value chain/ species? Considering the catch methods used, health of species stock, established sustainability practices, does the development of this value chain reduce or increase impacts on the ecosystem?
4. **Level of private sector involvement.** To what extent is the private sector, beyond artisanal fisherfolk, involved in this value chain? How interested is the private sector in investing/participating in this value chain?
5. **Socio-economic and institutional frameworks.** How strong are institutional frameworks to support the long-term development of this value chain? How equitable are existing socio-economic frameworks?

Desk research and interviews with local experts

A detailed desk review of available peer reviewed literature, grey literature and government reports was conducted to gather information on the state and potential of the identified value chains per country. Seven interviews were conducted with Department of Fisheries representatives. Interviews were multipurpose, as they were used to gather additional data on value chains identified and to validate earlier desk research findings. All interviews conducted were virtual and/or telephone based.

Scoring of value chains and shortlisting

The value chains identified were then scored using the criteria in Table 1. Each criterion could be scored on a rating scale from a minimum of 1 to a maximum of 5. The logic of the rating scale for each criterion is detailed in Table 1. Each criterion was assigned a weight based on its relative importance to value chain development, based on the literature review. Scores for each value chain under each criterion were assigned based on a combined analysis of the gathered data and the local expert interviews. Scores assigned by the technical consultant were discussed in detail with the CANARI and FAO representatives before finalisation to provide a final level of expert validation and ensure all available information on the value chains was considered. Scores for each value chain were then summed and a total score assigned. The Consultant along with the CANARI and FAO representatives decided that with limited resources to

[3] http://pubs.iclarm.net/resource_centre/AAS-2015-02.pdf

[4] https://www.crs.org/sites/default/files/tools-research/participatory-market-chain-analysis-for-smallholder-producers.pdf

[5] https://www.oecd.org/derec/denmark/45670567.pdf

conduct three value chain analyses overall, the approach would be to undertake one per country for three of the seven countries, using a set of criteria to decide on the species for each analysis. The three value chains selected were thus those with the highest total score, with the caveat that one value chain per country could be selected and the same species should not be selected for more than one country. Based on this system, the final selected value chains for development under this consultancy were.

1. Queen Conch – St. Vincent and the Grenadines (score of 5 out of 5)
2. Spiny Lobster – Jamaica (score of 4.5 out of 5)
3. Dolphinfish – Barbados (score of 4.5 out of 5)

For full details on scoring please refer to Table 1 below.

Table 1: Value Chain Ranking (Value chains selected for further development highlighted)

	Criteria	Positive Impact on artisanal fishers (numbers, employment and income)	Potential for market development	Environmental sustainability	Level of private Sector involvement	Socio Economic and Institutional Framework	TOTAL
	Criteria Weight	0.25	0.25	0.15	0.1	0.25	1.0
Country		5=Very significant engagement 4= significant engagement 3=Fair engagement 2=Poor engagement 1=Very poor engagement	5=Very significant market potential 4= significant market potential 3=Fair market potential 2=Poor market potential 1=Very poor market potential	5=Highly established sustainability 4= Well established sustainability 3=Fairly established sustainability 2=Poorly established sustainability 1=Very poorly established sustainability	5=Very significant engagement 4= significant engagement 3=Fair engagement 2=Poor engagement 1=Very poor engagement	5=Excellent frameworks 4= Good frameworks 3=Fair frameworks 2=Poor frameworks 1=Very poor frameworks	
Antigua and Barbuda	Pelagic (Specifically FAD fishery) - mainly Dolphinfish, Yellowfin tuna and Blackfin tuna, Wahoo	4	2	4	4	4	3.5
	Diamond Back Squid	2	4	5	3	2	3.1
	Demersal Fish	5	4	4	3	4	4.2
Barbados	Flying fish, inclusive of byproducts	4	4	3	3	4	3.8
	Jacks (related to Sargassum)	5	3	3	3	4	3.8
	Dolphinfish (*Mahi mahi*)	5	5	4	4	4	4.5
Belize	Lobster Fishery	5	3	4	4	5	4.3
	Conch Fishery	5	3	4	4	5	4.3
	Finfish Fishery	4	3	4	4	3	3.5
Guyana	Artisanal Fishery (Bangamary)	5	4	4	4	3	4.0
	Artisanal Fishery (Siluriforms) - catfish	5	3	5	2	3	3.7
	Artisanal Fishery (Butter fish and Sea Trout)	5	3	4	2	3	3.6
Jamaica	Queen Conch	4	5	5	5	4	4.5

	Spiny Lobster	5	4	5	4	4	4.4
	Blackfin tuna	5	4	5	3	4	4.3
Saint Lucia	Lobster Fishery	3	3	4	4	3	3.3
	Pot Fish Fishery	5	4	4	3	4	4.2
St Vincent and the Grenadines	Queen Conch (*Strombus gigas*)	5	5	5	5	5	5.0
	Robin (*Decapterus macarellus*)	5	4	4	3	5	4.4
	Jacks (*Selar crumenophthalmus*)	5	4	4	3	5	4.4

Appendix 2 – List of webinar participants and interviewees

STEWARDFISH SVG VCA WEBINAR - AUGUST 27, 2020 - FINAL PARTICIPANTS LIST			
No.	**NAME**	**ORGANISATION**	**JOB TITLE**
1	Ms. Jeniel Gill	Massy Stores	Marketing Assistant
2	Ms. Beverley Thompson	National Development Foundation	Senior Projects Officer
3	Mr. Audwin Andrews	Sustainable Grenadines (SusGren) Inc.	-
4	Mr. Lloyd Baptiste	Goodwill Fisherfolk Co-op	Fisher
5	Mr. Winsbert Harry	St. Vincent and the Grenadines National Fisherfolk Cooperative	President
6	Ms. Jennifer Cruickshank-Howard	Fisheries Division	Chief Fisheries Officer
7	Kris Isaac	Fisheries Division	Senior Fisheries Officer
8	Mr. Jeremy Searles	Fisheries Division	Senior Fisheries Assistant
9	Sheldon De Nobriega	Villamar (processing establishment which specialises in conch Samosas)	Manager
10	Eldon Ogarro	Goodwill Fishermen's Cooperative	Secretary
11	Lesroy Noel	-	-
12	Eardley Simmons	Bequia Seafood	-
13	Peter Regis	Union Island Fisherfolk Cooperative	Fisher/Boat owner
14	Benjamin Wilson	Tobago Cays Marine Park	Park Ranger
Partners			
15	Dr. Shelly-Ann Cox	UWI-CERMES	Project Officer
16	Dr. Maren Headley	CRFM Secretariat	Programme Manager – Fisheries Management and Development
17	Ms. June Masters	CRFM Secretariat	Statistics and Information Analyst
18	Mr. Terrence Phillips	FAO	Regional Coordinator- StewardFish
19	Ms. Neema Ramlogan	CANARI	Technical Officer
Facilitators			
20	Dr. Sharon Hutchinson	UWI	Food and Resource Economist
21	Mr. Alexander Girvan	CANARI	Senior Technical Officer/Environmental Economist
22	Ms. Melanie Andrews	CANARI	Technical Officer

List of interviewees

Name	Job title
Mrs. Jennifer Cruickshank-Howard	Chief Fisheries Officer, Fisheries Division
Mr. Kris Isaac	Senior Fisheries Officer, Fisheries Division

Ms. Alisa Martin	Fisheries Officer, Quality Assurance and Product Development Unit, Fisheries Division
Mr. Reynaldo Harold	Fisheries Assistant, Quality Assurance and Product Development Unit, Fisheries Division
Ms. Nicolette Thomas	Secretary, Fisheries Division
Mr. Audwin Andrews	Sustainable Grenadines (SusGren) Inc.
Mr. Winsbert Harry	○ Fisher ○ President, St. Vincent and the Grenadines National Fisherfolk Cooperative ○ Representative for SVG on the CNFO ○ Fishery Liaison Officer, Goodwill Fishermen Cooperative
-	Sunrise Supermarket, Arnos Vale
-	Greaves Marketplace, Pembroke
-	Massy Stores
Overall Data	
Ms. June Masters	Statistics and Information Analyst, CRFM Secretariat, St. Vincent and the Grenadines

Appendix 3: Seafood Landings and Ex-Vessel Value in SVG, 2000–2017

Species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Albacore	704	1370	300	1555	89	802	141	422	201	185	207	423	397	384	438	405	399	399
Atlantic chub mackerel	2132	2187	4904	6132	9543	4289	2574	6064	4949	2738	5208	4851	311	5793	18676	5251	2359	8034
Bigeye tuna	1216	506	13	103	18	0	114	568	171	292	396	38	25	16	30	496	622	889
European anchovy	4072	5065	10736	10103	16257	10123	12333	11954	10181	13280	13367	19677	2198	2279	49	0	0	38
European pilchard(=Sardine)	0	11	289	1367	3172	1745	2373	3333	2280	3200	4266	13458	2491	3491	802	199	1772	1461
Hakes nei	28	18	100	273	99	13	40	10	1	1	6	21	39	62	448	377	208	413
Jack and horse mackerels nei	6249	9562	17213	11268	29780	21056	23061	28091	23950	21791	27211	13540	1523	16498	35380	13664	9734	14250
Marine fishes nei	427	500	970	176	868	274	613	429	184	504	682	1637	34	759	1453	0	1455	1923
Porgies, seabreams nei	5	21	17	36	86	14	33	20	23	56	174	64	2	213	647	179	246	204
Sardinellas nei	2493	3407	7095	3003	8831	4217	5301	7171	9905	12819	11911	19160	1429	8536	21650	3297	4229	2740
Stromboid conchs nei	52	287	269	67	129	48	27	81	31	132	294	78	90	336	435	267	330	213
Tuna-like fishes nei	0	0	0	0	0	0	0	1	0	0	0	0	19	118	99	250	424	544
Other species	3435	7647	3012	3117	5192	1525	2295	2177	1475	2314	1794	2668	1078	674	771	1626	529	1105
Totals - Tonnes - live weight	22799	31944	46076	37767	78315	44104	51584	63309	55898	59587	66367	76576	10185	39507	81384	26167	22743	32985

FAO. 2020. Fishery and Aquaculture Statistics. Global production by production source 1950–2018 (FishstatJ). In: FAO Fisheries Division [online]. Rome. Updated 2020. www.fao.org/fishery/statistics/software/fishstatj/en

Appendix 4: Monthly Seafood Landings and Ex-Vessel Value in SVG, 2000–2017

Landings (lbs.)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
2015	15,599	14,572	2,235	4,594	7,124	6,800	3,250	7,116	2,178	7,229	940	2,999	74,637
2016	4,343	23,351	2,691	1,909	1,755	3,412	1,171	9,039	7,778	11,645	11,160	4,038	82,292
2017	19,538	18,321	23,227	27,646	48,443	39,660	34,665	56,841	25,593	57,259	44,057	74,807	470,056
2018	53,220	30,676	59,893	27,594	48,189	50,050	65,086	55,375	66,732	76,214	86,830	64,201	684,060
2019	74,022	72,479	68,363	75,033	116,616	79,767	83,345	82,628	43,898	68,931	60,234	86,354	911,670

Value (EC$)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
2015	101,787	94,487	14,901	28,740	44,660	43,185	25,875	54,416	11,528	43,776	6,050	21,290	490,696
2016	29,573	157,855	17,149	14,230	10,568	23,852	7,647	60,507	55,488	72,958	67,704	26,866	544,395
2017	117,227	109,925	139,365	165,876	290,657	237,962	207,989	341,044	153,556	343,556	264,339	448,841	2,820,336
2018	366,755	211,406	456,926	211,626	441,390	302,807	801,800	665,385	856,474	879,635	967,990	686,580	6,848,773
2019	446,635	436,847	416,187	742,188	728,002	486,237	515,313	510,249	257,050	409,023	364,870	563,735	5,876,335

Price/Pound	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
2015	$6.53	$6.48	$6.67	$6.26	$6.27	$6.35	$7.96	$7.65	$5.29	$6.06	$6.44	$7.10	$6.57
2016	$6.81	$6.76	$6.37	$7.45	$6.02	$6.99	$6.53	$6.69	$7.13	$6.27	$6.07	$6.65	$6.62
2017	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00
2018	$6.89	$6.89	$7.63	$7.67	$9.16	$6.05	$12.32	$12.02	$12.83	$11.54	$11.15	$10.69	$10.01
2019	$6.03	$6.03	$6.09	$9.89	$6.24	$6.10	$6.18	$6.18	$5.86	$5.93	$6.06	$6.53	$6.45

Source: Ministry of Agriculture, Forestry, Fisheries, Rural Transformation, SVG (2020)

Appendix 5: Seafood Landings and Ex-Vessel Value in SVG

	2014		2015		2016		2017		2018	
Type	**Quantity (lbs.)**	**Value**	**Quantity (lbs.)**	**Value**	**Quantity (lbs.)**	**Value**	**Quantity (lbs.)**	**Value**	**Quantity (lbs.)**	**Value**
Conch	116,556	780,174	74,637	490,696	82,292	544,395	470,056	2,820,336	684,060	6,848,773
Lobster	111,579	1,507,496	116,288	1,590,478	66,868	965,714	119,334	1,670,218	139,043	2,558,618
Shark	18,479	115,687	11,902	72,378	13,154	80,029	14,892	90,834	13,073	83,455
Balahoo	86,475	172,500	232,918	432,057	203,746	381,601	68,270	136,355	107,394	214,668
Bonito	27,095	198,461	20,733	157,480	11,488	85,642	10,780	82,324	33,987	227,073
Cavalli	35,294	257,377	41,094	252,355	49,892	305,881	52,786	372,946	56,125	387,984
Dolphin	120,413	1,079,049	205,330	1,837,900	207,602	1,862,832	98,001	876,113	158,972	1,425,857
Jacks	190,040	741,145	223,735	1,014,932	131,252	599,832	245,130	1,019,961	431,688	1,570,171
Kingfish	45,472	403,442	19,183	167,454	36,829	326,772	19,907	174,779	35,017	305,206
Porpoise	570	2,450	9,897	67,423	7,940	39,700	5,557	27,783	21,405	107,025
Tuna	54,475	435,134	63,596	507,733	78,574	624,246	130,381	1,041,318	148,035	1,153,362
Red Hind	94,935	815,317	48,494	428,852	38,960	348,285	67,846	580,866	35,019	309,923
Red Snapper	14,394	101,300	7,818	63,978	7,262	62,364	16,184	132,688	27,819	237,299
Robin	344,107	1,392,595	283,088	1,281,169	142,423	645,905	76,516	348,858	132,454	571,775
Skip Jack	86,931	667,564	102,073	812,232	123,295	968,401	70,675	546,472	53,713	425,462
Other Species	265,904	1,532,400	323,164	1,944,318	229,692	1,528,767	298,424	2,055,322	392,130	2,321,743
TOTAL	**1,612,719**	**10,202,091**	**1,783,950**	**11,121,435**	**1,431,269**	**9,370,366**	**1,764,739**	**11,977,173**	**2,469,934**	**18,748,394**

Source: Ministry of Agriculture, Forestry, Fisheries, Rural Transformation, SVG (2020)