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Impact and implications of COVID-19 for the ocean economy and trade strategy

Case studies from Barbados, Belize and Costa Rica

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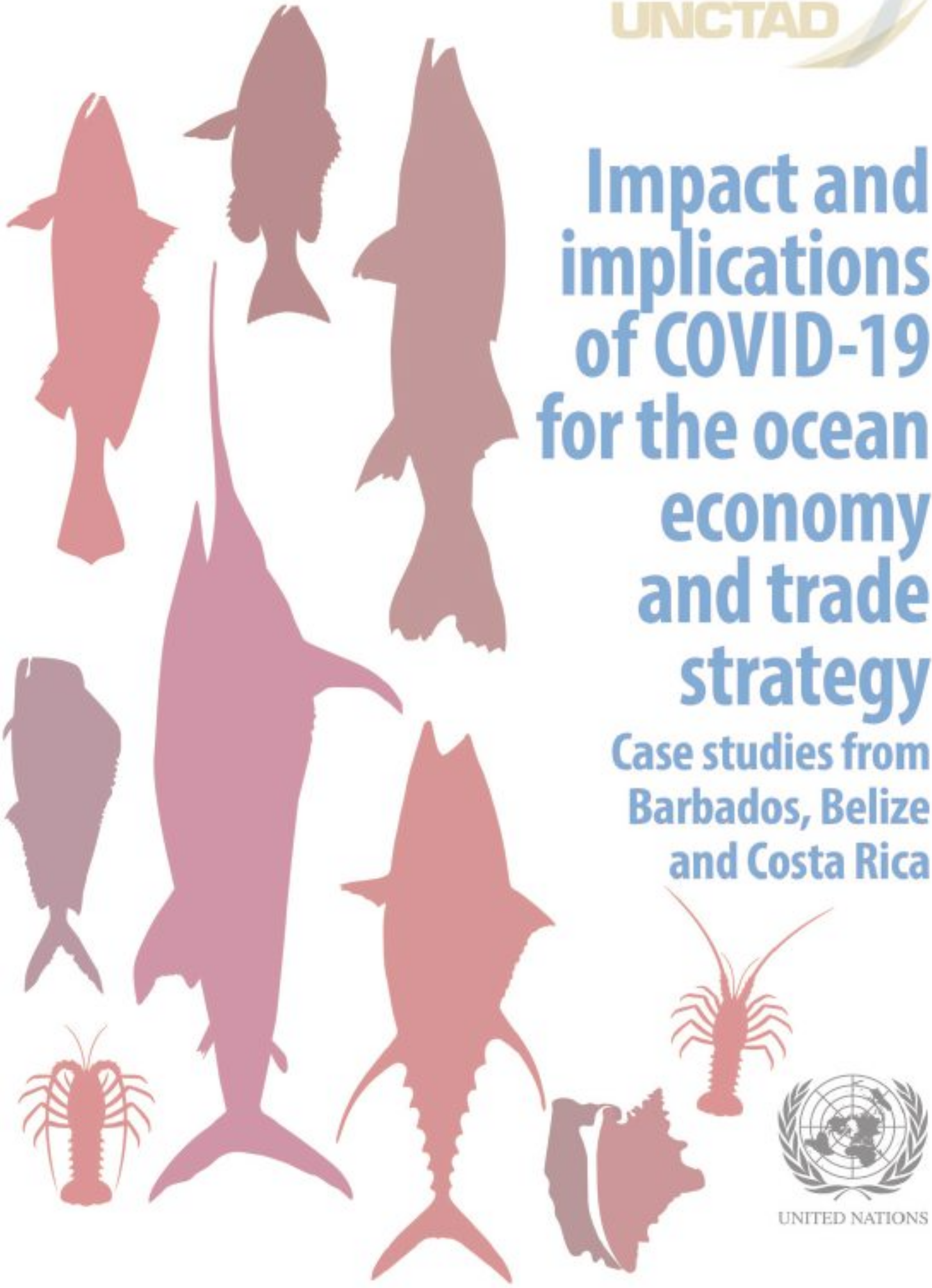

Impact and implications of COVID-19 for the ocean economy and trade strategy

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This publication has been edited externally.

United Nations publication issued by the United Nations Conference on Trade and Development

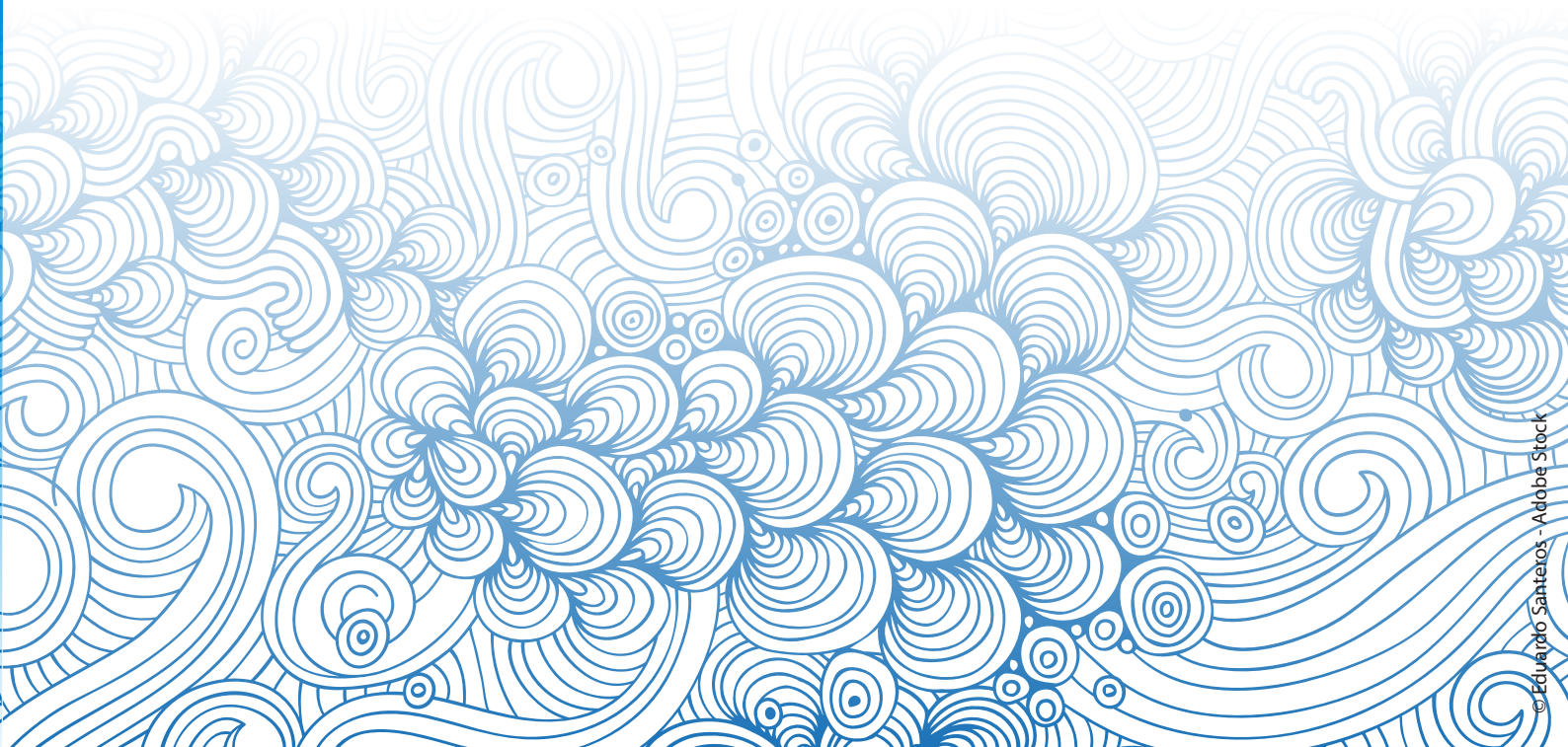
UNCTAD/DITC/TED/2021/4

eISBN: 978-92-1-001248-5

Acknowledgments

The Oceans Economy and Trade Strategy (OETS) project is funded by the United Nations Development Account and implemented by the United Nations Conference on Trade and Development (UNCTAD) in cooperation with the Division for Ocean Affairs and the Law of the Sea (DOALOS) of the Office of Legal Affairs of the United Nations.

This report was produced by Lahsen Ababouch, UNCTAD-DOALOS Senior Consultant. The document has benefited from comments and inputs from the staff of UNCTAD (David Vivas Eugui and Claudia Contreras) and DOALOS (Francois Bailet, Michele Ameri, Amanda Elise Stoltz and Bingzhuo Li).



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Notes

Reference to "dollar" and "$" indicate United States of America dollars, unless otherwise stated.
BB$ indicates Barbados dollar.
BZ$ indicates Belize dollar.

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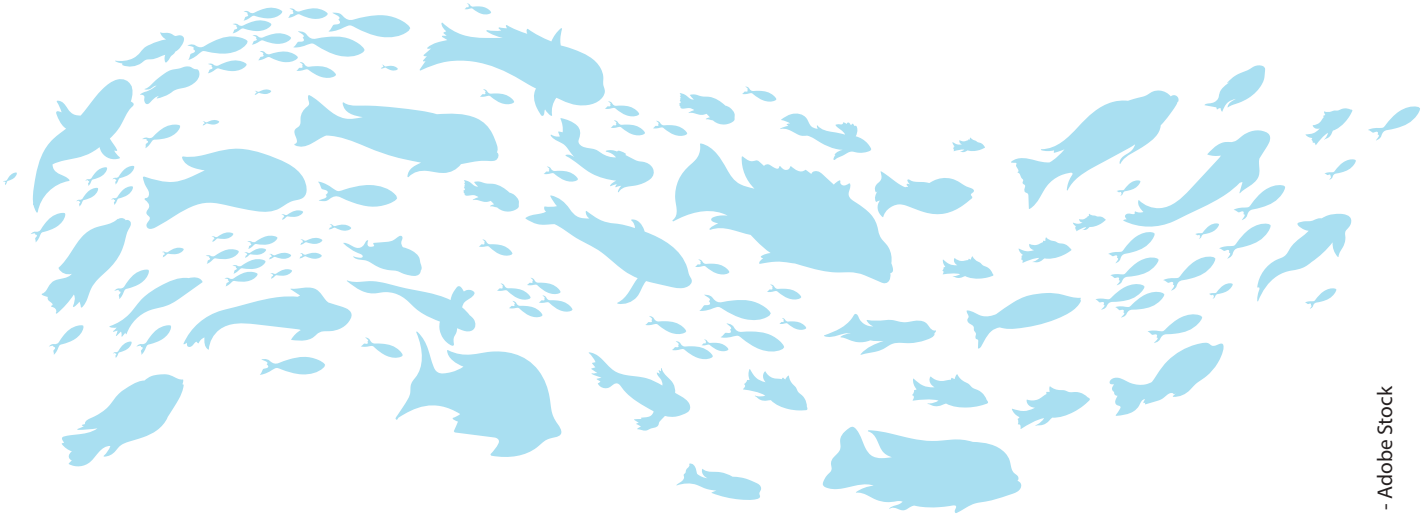

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Abbreviations and acronyms

COVID-19	Coronavirus disease
CRFM	Caribbean Regional Fisheries Mechanism
DOALOS	Division for Ocean Affairs and the Law of the Sea of the Office of Legal Affairs of the United Nations
ECLAC	Economic Commission for Latin America and the Caribbean
FAO	Food and Agriculture Organization of the United Nations
GDP	gross domestic product
ILO	International Labour Organization
IUU	illegal, unreported and unregulated (fishing)
LAC	Latin America and the Caribbean
MCS	monitoring, control and surveillance
MMABE	Ministry of Maritime Affairs and the Blue Economy (Barbados)
MPA	marine protected area
MSMEs	micro, small and medium enterprises
OECD	Organization for Economic Co-operation and Development
OETS	Ocean Economy and Trade Strategy
OLDEPSCA	Latin American Organization for Fisheries Development
OSPESCA	Central American Fisheries and Aquaculture Organization
SDGs	Sustainable Development Goals
SIDS	small island developing States
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
WECAFC	Western Central Atlantic Fishery Commission
WHO	World Health Organization

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Executive summary

Overview of the impact of COVID-19 on the global ocean economy

Coronavirus disease (COVID-19) has caused the largest economic contraction in modern times, estimated at –3.5 per cent in 2020. International trade declined by 9 per cent in 2020 and the equivalent of 255 million full-time jobs were lost. The initial lockdown of markets, borders and exports significantly restricted fishing and post-harvest activities, to the extent that several countries and companies considered that fishing was not an essential activity at the start of the pandemic. Most countries experienced sharp declines in fish production, estimated at between 40 to 80 per cent. Small-scale fishers and their communities were hardest hit and fleets fishing for export were most severely impacted.

Whenever and wherever fishing was authorized, demand had fallen significantly, causing a significant price decrease as a result of reduced spending of households on groceries, and the closure of export, tourism and related sectors. Retail sales, initially marked by extreme volatility, rebounded as demand increased and were enhanced by direct delivery and online fish selling platforms.

Marine aquaculture struggled to maintain its planned production cycles as supplies of production inputs such as seeds and feed, market demand and access to credit, were disrupted. Production and feed costs increased significantly because stocks were maintained alive until sale.

It is likely that reduced fishing effort provided a respite for many fish stocks. However, most studies suggest that 10 to 15 years of reduced fishing are required for depleted and severely overfished stocks to recover. In the absence of governance and management systems that sustain reduced pressure on fish stocks, such recoveries seem very limited and unlikely.

Travel restrictions were applied worldwide to prevent the spread of COVID-19 across borders and this brought tourism to a halt. Tourist arrivals decreased by 60 to 80 per cent in 2020, causing losses estimated at between $910 billion and $1.2 trillion and the closure of many micro, small and medium enterprises (MSMEs). Unlike many goods, which can be stored, traded or consumed at a later stage, a halt to tourism meant lost revenues and income that cannot be recouped.

The need for improved governance of the ocean space has been widely recognized for decades and prior to the COVID-19 pandemic, an upscaling of action-oriented initiatives, consultations and negotiations on climate change, biodiversity and sustainable development was seen. These culminated in the 2030 Agenda for Sustainable Development and the United Nations Decade of Ocean Science for Sustainable Development, but COVID-19 severely disrupted much of this dynamic. Many events were delayed, cancelled or postponed, casting uncertainty over relevant processes. Virtual meetings helped to advance some of the agendas and address the problems caused by COVID-19 in the ocean space. They re-affirmed the importance of collective, coordinated and multilateral action to address ocean governance challenges.

Like many other global crises, COVID-19 disproportionately affected vulnerable and marginalized people working in the ocean economy sectors. These include women, the young, migrants, indigenous and ethnic minorities, and displaced people. This was more evident in countries with weak health and sanitation infrastructure and persistent gender inequalities.

Measures adopted to address the impact of COVID-19 on the global ocean economy

To contain the spread of the virus, countries declared a state of emergency, confined citizens to their homes, closed borders and most productive economic activities, with the exception of essential services. To compensate for lost revenues, they adopted economic and social measures.

Support to fisheries and aquaculture took the form of funds to compensate loss of wages and revenues, and financial packages and fiscal incentives to resume production and processing, stimulate demand and support export. The type of measures and the extent of their application varied across countries and scales and depended on the resources available and the priorities set. Unfortunately, informal sectors including a large proportion of small-scale operations and vulnerable groups such as women, were often excluded. On the other hand, small-scale fishers and operators were encouraged to formalize their operations and reduce illegal, unreported and unregulated (IUU) fishing. Wherever and whenever marine fishing and aquaculture resumed, it required investment to adapt working conditions, procedures, and tools to respect sanitary protocols, enforce monitoring, control and surveillance (MCS) measures, conduct research and unlock production, processing, trade and transportation bottlenecks.

In many countries, small-scale fishers, cooperatives and caterers shifted to direct sale to customers and online markets, including home delivery. Many processors reduced the number of employees working in their facilities to respect social distancing and decrease expenditure.

In many small island developing States (SIDS), coastal and marine tourism and related activities were targeted as a priority by the social and economic measures adopted by governments. As restrictions on mobility and travel were loosened or lifted, countries adapted their entry formalities and upgraded sanitary protocols to bring back tourists safely. Adherence to the safety protocols required restructuring, infrastructure adjustments, investment and employee retraining, including for officers at ports and other points of entry. Digitalization and automation technologies were key to facilitating these changes in many countries.

Impacts and implications of COVID-19 for the ocean economy of Barbados, Belize and Costa Rica

Barbados, Belize and Costa Rica are "large ocean States" whose social and economic development depend highly on the ocean economy and trade-related sectors. The three countries are considered upper middle-income economies, attractive for investment in coastal and marine biodiversity and tourism. The Mesoamerican Barrier Reef, the second-largest reef system in the world, is a major tourist attraction, popular with sailors, snorkellers and divers. The three countries have invested significantly in eco-tourism, marine sports and recreational fishing.

The impact and implications of COVID-19 on tourism and related ocean economy sectors of the three countries were similar to those observed at the global level, but their extent and scale were commensurate with the challenges, dimension, resources and priorities of each country and its economy.

Although the scale and extent of the impact of COVID-19 on the key fish and seafood value chains differed between the three countries, they all suffered the multiple burdens of:

- severely reduced marine fishing, aquaculture and post-harvest activities because of confinement, and restriction on mobility and travel
- low fish demand both for domestic consumption and export
- closure of fish markets, shops, export and import businesses
- reduced workforce to carry out fishing and processing operations, in particular for vessels and processing cooperatives and companies that use seasonal labour and migrants
- severe impact on demand and prices as tourism and related hospitality sectors closed down.

Costa Rica, whose fisheries are much bigger and more dependent on exports than Barbados and Belize, was impacted most. In 2020, production and processing were reduced by 50 to 80 per cent, prices by 30 to 40 per cent and exports by 70 per cent. The United States of America, the major market for seafood exported by Costa Rica, experienced three successive waves of COVID-19 between March and December 2020, closing fish imports for most of 2020. Several fishing companies halted fishing in 2020, considering it to be unprofitable or not economically feasible.

In Belize, the pandemic coincided with the fishing season for spiny lobster and the end of the fishing season for queen conch. The 2020 quotas for both fisheries were filled and the same is expected for 2021. Difficulties in accessing fishing supplies, spare parts, repair and maintenance services increased the cost of fishing, whereas fish prices were reduced by 30 to 50 per cent. Lack of cash flow affected fishers, workers and cooperatives because of delayed cashing of export revenues, low domestic demand, low prices and disruption of financial transactions.

In Barbados, fisheries were initially categorized as non-essential businesses. Fishing and fish markets re-opened later, with customers allowed to do business on specific days and times of the week, based on the first letter of their surname. A major challenge was the opening of fish markets to coincide with the return of fishing boats. To plan their fishing trips, especially trips shorter than five days, fishers needed assurance that landing sites, ports, administration services and fish markets would be open when they returned to shore.

Measures adopted to mitigate the impact of COVID-19 in Barbados, Belize and Costa Rica

The three countries adopted measures similar to those deployed worldwide, in particular in the SIDS. It is likely that the social and economic programmes deployed benefited the organized and influential sectors of their economies first and most. As a result, qualified companies and actors in the ocean economy sectors of the three countries were able to enrol and benefit, but small-scale and informal fishing companies and actors, which include a large proportion of female employees, are likely to have benefited only marginally from the social protection and stimulus packages.

The following are illustrative of the type of actions adopted in the three countries:

- elaboration and dissemination of health and sanitary guides for adoption by fishing vessels and processing companies
- postponing the collection of annual fees for fishing licenses, aquaculture authorizations and for transportation and marketing of fishery products
- support to increase awareness and disseminate information about the fiscal, social and economic measures for the benefit of fisheries actors, in particular small-scale operators
- cash transfer to identified fishers and helpers, extension of cash (vouchers) and in-kind transfers (e.g., food packages) to the most vulnerable people of coastal communities
- awareness-raising and national campaigns to promote domestic fish consumption and distribution of fish and seafood packages to vulnerable communities
- mobilization of value chain actors and stakeholders around marine conservation actions and marine eco-tourism.

Equally important, the pandemic provided an opportunity to address projects that were shelved in the three countries because of other pressing considerations and priorities. For example, Barbados introduced important overhauls of marine fisheries infrastructure in the context of the country's blue economy strategy. Authorities launched a programme to renovate the infrastructure of fish markets to improve access to ice, solar panels, services for boats, engines and gears, and to implement measures to meet international sanitary requirements.

Like many countries that depend on tourism, the three countries have prioritized vaccination to defeat the pandemic, with the hope to achieve full vaccination by the end of 2021. As restrictions on mobility and travel were loosened or lifted, countries simplified travel and entry formalities, and reinforced adherence to sanitary protocols for the safety and security of tourists. This required

infrastructure adjustments and investment and support measures, such as training programmes and webinars organized for entrepreneurs and employees on sanitation protocols, business management, information technology, digital skills, marketing and e-commerce.

The three countries are promoting specific programmes to attract tourists. Barbados has launched the "12-month welcome stamp" to attract people who want to work remotely from Barbados. Belize welcomes tourists who have been fully vaccinated for at least two weeks and has launched the "expanded safe corridors" concept, whereby tourists are encouraged to only visit certified establishments. Costa Rica has launched the "*Pura Vida Pledge*", an initiative to promote responsible tourism for the local environment and communities.

Recommendations for building back better the ocean economy of Barbados, Belize and Costa Rica

The impact of COVID-19 on the ocean economy of Barbados, Belize and Costa Rica and the difficulties encountered in developing, negotiating, funding and deploying the mitigation measures revealed valuable lessons, challenges and opportunities that can help to position each country on the path to rebuilding a resilient and inclusive post-pandemic ocean economy. It is clear that going back to "business as usual" is impossible, with a post-COVID-19 "new normal" yet to be defined.

This study reiterates how the ocean economy in the three countries depends heavily on a few outside markets and customers, particularly the United States. The proximity of this country and its broad-based middle class with significant purchasing power certainly represent key advantages for the Caribbean. At the same time, however, there are evident risks if the market were to close down, not to mention that relying for a long period on one or a few markets limits innovation, including the diversification of products, processes and markets. On the other hand, during the COVID-19 crisis, domestic and regional markets presented opportunities that several companies were able to exploit by innovating and adapting products and processes to market demand, using online platforms to connect with consumers.

Implementing appropriate fisheries management in the three countries remains a major challenge that has caused a continuous decline in fish landings over the years, in particular for Barbados and Costa Rica. This is exacerbated by inadequate scientific research upon which to develop knowledge of the state of the resources. Scientific research on the marine environment is key for improved governance and management of the ocean economy and its living resources.

A reform of marine fisheries and aquaculture governance is essential to develop a science- and evidence-based fisheries management and conservation regime, MCS to combat IUU fishing, and to promote transparent and predictable markets that incentivize sustainability instruments such as traceability, certification, eco-labelling and social and environmental responsibility. Transparent and effective consultation processes with stakeholders should promote effective co-management schemes that can transform fishers from passive users into active and responsible stewards of the marine environment and its resources.

In order to diversify income streams and increase resilience in the maritime sector, Barbados, Belize and Costa Rica should consider assessing their potential and opportunities to attract private investment in sustainable marine aquaculture. Several countries in Latin America and the Caribbean (LAC) and other SIDS have been successful in this regard. For many years, marine shrimp farming in Belize was a model of successful aquaculture, meeting international environmental and social protection standards.

Species such as shrimp, bivalve molluscs (e.g., oysters and mussels), seaweed and sea cucumbers are considered by experts to be suitable for marine aquaculture. Bivalve molluscs and seaweed farming support conservation and improved livelihoods for coastal communities, including women and the youth, and in particular university graduates.

To exploit its potential in marine aquaculture, each country should consider assessing its institutional and scientific capabilities and the opportunities to upgrade them to address the technical and animal health aspects of aquaculture. Attracting private investors in marine aquaculture requires an enabling environment, supporting policies and services, and incentives that provide assurance and capacity to manage the risks of natural disasters and aquatic animal diseases. The LAC region has recorded many successful experiences in farming finfish, shrimp, seaweed and bivalve molluscs that should be studied with a view to learning and benefiting from them.

Coastal and marine tourism is likely to remain a major pilaster of the economy of Barbados, Belize and Costa Rica, but experts advise tourism-dependent small States to re-assess the approach that has prevailed so far. Although national and regional tourism are unlikely to replace international tourism, their promotion is necessary for diversification. The three countries have been promoting environmental ("eco") and sustainable marine tourism and they should consider consolidating natural marine areas and reserves, recreational fishing, wildlife watching and marine ecotourism. This can drive recovery by building traveller's confidence with a strong focus on safety, security, hygiene and sustainability, investing in digitalization and supporting decarbonation.

Increased production costs, restrictions on travel and mobility, and social distancing have accelerated digitalization and automation technologies across sectors and administrations. Technologies that improve safety at work and generate efficiency gains are likely to become mainstream in the future. The three countries and their companies should consider investing in digitalization to upgrade infrastructure and skills, in order to consolidate competitiveness and access lucrative markets.

Ocean governance, ocean science and marine research are important areas that can benefit significantly from investment in digitalization and innovative automation technologies. These technologies can complement, replace or expand current methods to collect data on resources and marine biology, enforce laws and protect habitats, ecosystems and biodiversity. Likewise, the use of remote sensing, satellite data and drones have proved useful, timely and cost-effective for MCS where coast guard patrols are not deployed. Enabling coastal and fisheries communities to use these automated technologies can mobilize stakeholders around citizen science initiatives and strengthen co-management of marine living resources.

Born out of necessity, teleworking, virtual meetings, webinars, and remote learning have proved very useful, feasible, adaptable and cost-effective. These e-methods have been rapidly adopted by public institutions and the private sector in Barbados, Belize and Costa Rica. The quality of digital connectivity available in the three countries is considered adequate, but the digital literacy of ocean economy operators will influence the countries' ability and future opportunities in domestic and international markets. Policies should be updated to break barriers, ensure cybersecurity, address the adverse effects of the digital divide, and create capacity to benefit from technologies and digitalization, not least for coastal communities.

Building on the work undertaken by the UNCTAD and DOALOS project on the OETS, Barbados, Belize and Costa Rica should consider integrating in a coherent manner, across sectors and institutions, post-COVID-19 policy goals and governance frameworks, to embrace their commitments to the 2030 Agenda for Sustainable Development and its goals related to the ocean economy. Like a double helix, achievement of the 2030 Agenda and the COVID-19 pandemic responses are intertwined. They could be addressed in a complementary manner, integrating actions to tackle emergency, support recovery and achieve the Sustainable Development Goals (SDGs).

The COVID-19 pandemic has re-affirmed the value of preparedness to protect and build resilience against climate change, health and other natural or human-induced disasters, especially for countries such as Barbados, Belize and Costa Rica that are regularly exposed to extreme natural events.

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A. CONTEXT, OBJECTIVES AND METHODOLOGY OF THE STUDY

1. Context of the study

Since March 2020, the world has experienced an unprecedented tragedy during which COVID-19 has changed the lives of people worldwide in unimaginable ways. In order to prevent the entry and spread of COVID-19 in their territories, governments declared states of emergency, closed borders, confined citizens to their homes and shut down most economic and social activities, with the exception of essential ones required to supply food, medicines, energy, water and other basic goods and services. This caused devastating social and economic damage worldwide, with the most vulnerable people and economies being hit hardest. Years of hard-won development progress have been reversed.

To deal with the devastating impacts of the pandemic and to prepare for a post-COVID-19 world, unprecedented recovery and stimulus packages have been adopted and implemented, with funding from governments, international development or financial institutions and donors. A high degree of uncertainty remains, however, as vaccine supply chains experience disruptions and new virus mutations or strains are identified.

This study looks at the impact of COVID-19 on key ocean economy sectors and their governance, with a specific focus on three countries: Barbados, Belize and Costa Rica. It analyses the impacts of COVID-19, the measures undertaken, the lessons learned and future opportunities. It is divided into three parts. The general introduction (A) addresses the context, objectives and methodology of the study. B is an overview of the impacts and implications of COVID-19 on the global ocean economy and C addresses the impacts and implications of COVID-19 in the form of three case studies respectively for Barbados, Belize and Costa Rica.

2. Objectives of the study

Since 2018, UNCTAD and DOALOS have executed the OETS project in Barbados, Belize and Costa Rica. The ocean economy sectors and selected fish value chains of the three countries have been severely impacted since the start of the COVID-19 pandemic. In recognition of these challenges, the OETS project commissioned this study to assist the three beneficiary States in assessing the economic, social and environmental impacts of the COVID-19 pandemic on the selected OETS value chains, the measures adopted, their efficiency and opportunities, and to propose policy and regulatory recommendations to support the rebuilding and improvement of those value chains and their development.

3. Methodology of the study

Under the overall supervision of, and in close collaboration with the UNCTAD and DOALOS teams, the international consultant carried out online consultations and interviews with i) the OETS

project focal points in the three beneficiary States; ii) representatives of the stakeholders of the selected value chains; and iii) representatives of regional and international organizations working in the field of OETS in the region, and specifically in the three beneficiary States.

The interviews were supported by extensive research to assess i) the impact of COVID-19 on OETS globally, regionally and in each of the three countries, especially on economics and trade flows in relevant ocean-based sectors; ii) the policy and regulatory actions undertaken in response to the pandemic globally, regionally and in each of the three countries; and iii) the lessons learned and the way forwards for these three countries and their selected fish and seafood value chains.

The research analysed publications, reports and studies produced by a wide range of institutions working on the ocean economy, with particular interest in studies and projects implemented in the three States. It also analysed blogs, newspaper articles, videos and other relevant information available on the Internet. Significant time was devoted to update information regularly, and to identify peer-reviewed studies produced by renowned institutions or disseminated through trackers, dashboards, observatories and COVID-19-dedicated websites. A list of key references is provided at the end of the report. Links to consulted trackers, dashboards, blogs, websites and other Internet sources are referenced where considered necessary.

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B. OVERVIEW OF THE IMPACTS AND IMPLICATIONS OF COVID-19 ON THE GLOBAL OCEAN ECONOMY

1. Overview of the impact of COVID-19 on global health and social and economic development

The breadth and scope of the COVID-19 pandemic took everyone by surprise. The world economy has experienced the largest contraction ever in modern times, estimated at 3.5 per cent in 2020 (World Bank, 2021). International trade declined by about 9 per cent in 2020, with trade in goods declining by about 6 per cent and trade in services by 16.5 per cent (UNCTAD, 2021a). Foreign investment fell to historical lows, with inflows declining 42 per cent. According to the International Labour Organization (ILO), the working hours lost in 2020 were equivalent to 255 million full-time jobs, leading to $3.7 trillion in lost labour income (ILO, 2021).

In the LAC region, structural social and economic deficiencies hindered the containment of the virus, making the situation even more challenging. The highly populated urban areas provided fertile ground for the rapid spread of the virus. As a result, contagion plateaued at a high level for many weeks, with no marked decline until the month of September 2020 (PAHO, 2021).

The region suffered an historical economic contraction estimated at 7.7 per cent in gross domestic product (GDP) and a decline of 20 per cent in investment in 2020. Over 2.7 million firms, most of them MSMEs, have closed, increasing the number of jobless persons to 44.1 million and moving 22 million people into poverty. This affected 33.7 per cent of the total population (ECLAC, 2021).

In order to ensure a sustainable and inclusive recovery, returning to a business as usual model is not an option. The COVID-19 pandemic revealed in a striking way the necessity of placing human health and welfare and the protection of the environment at the centre of sustainable development. In this regard, the 2030 Agenda has never been as relevant as it is today. The actions that decision-makers take now to restore and rebuild the global economy will chart the course of economic growth and sustainability for many years to come. Recovery and stimulus packages represent a crucial lever for accelerating the shift to a sustainable future that delivers on the international commitments and global targets under the 2030 Agenda. While the solutions will differ from one country to another, this is a unique opportunity to reboot economic activities in a way that is more firmly in service of society and engaged on the course to restore the health of the planet for future generations.

2. Overview of the impact of COVID-19 on the global ocean economy

The ocean economy comprises the economic activities of sectors that exploit oceans and the seas to produce tradable goods and services. These sectors include coastal and marine tourism, marine fisheries, coastal and marine aquaculture, maritime transport, shipbuilding industries, renewable energy and marine biotechnologies (OECD, 2020a).

Prior to COVID-19, the global ocean economy was conservatively estimated to contribute $3 trillion to world GDP and 2.5 per cent of world gross value-added (OECD, 2016). A more recent report by UNCTAD, estimates the value of exports of ocean-based goods and services at $2.5 trillion in 2018 (UNCTAD, 2021d). It was initially projected to double by 2030 (OECD, 2016) but it has been severely hindered by COVID-19, with significant revenue losses throughout its various sectors. As with many crises, it is the most vulnerable groups, such as coastal communities, informal workers, women working in tourism, catering and post-harvest fisheries, that have been hit hardest. As the ocean economy sectors do not operate in isolation from one another, or from the coastal and ocean environment of which they are part (OECD, 2016), this has led to cascading and interrelated impacts across coastal societies and the marine environment.

A wide range of institutions from the United Nations, civil society, academia, finance and industry have been monitoring the impact of COVID-19 on the global ocean economy, in close consultation with States, stakeholders and partners and through targeted surveys and in-depth studies. They have been providing policy advice and guidance in their mandated areas and disseminating valuable and timely information, including through dedicated dashboards, trackers and websites. Links to these are provided in the list of references. Their main findings and recommendations as of 18 June 2021 are summarized hereafter, with a focus, as and where necessary, on the ocean economy sectors that are vital in the LAC region.

2.1 Impact of COVID-19 on global fisheries and aquaculture

Among the ocean economy sectors, marine fisheries and aquaculture make a significant contribution to food and nutrition security, employment, trade, culture and economic development in the world. Table 1 summarizes key indicators of global fisheries and aquaculture prior to COVID-19 (FAO, 2020a).

Of the total fish production, 113.6 million tons were harvested from the oceans and seas in 2019, mainly by small-scale operators who represent around 90 per cent of sea fishers and farmers. As a result, many coastal communities depend on the sector for their livelihoods, food security and income. Likewise, in many coastal regions and islands, the ocean attracts tourists for sunbathing, sailing, surfing and sport fishing; provides high quality fish and seafood to resorts, hotels, restaurants and cruise ships; and economic opportunities to companies that process and export high value species and products to lucrative markets, contributing to value addition and foreign exchange revenues.

Table 1. Key indicators of global fisheries and aquaculture

	Average/ year during 2006–2015	2016	2017	2018	2019
Inland fisheries (million tons)	10.6	11.4	12.0	12.0	12.1
Marine fisheries (million tons)	79.3	78.4	82.4	85.6	81.5
Inland aquaculture (million tons)	36.8	48.0	49.6	51.6	53.4
Marine aquaculture (million tons)	22.8	28.6	30.1	30.8	32.1
Total production (million tons)	149.5	166.4	174.1	180	179.1
Consumption (kg/capita/year)	18.4	19.9	20.3	20.5	20.3
Trade ($million)	117.1	142.6	156.0	164.1	165.7
Direct employment (million jobs)	58	59.6	59.8	60	60

Source: FAO, 2020a; FAO-FishStatJ, 2021.

The COVID-19 pandemic has significantly impacted marine fisheries and aquaculture throughout the world. The initial lockdown of airports, ports, markets and borders and the cessation of shipping

and air freight, stopped or significantly restricted fishing and post-harvest activities. Several countries initially considered that fishing was not an essential activity (FAO, 2020b).

Marine aquaculture in many countries struggled to sustain production cycles, as supplies of inputs (e.g., seeds and feeds), market demand and access to credit were disrupted. Confinement measures and travel restrictions for seasonal or migrant workers created a shortage of labour. As demand fell drastically, costs of production increased significantly because the stocked fish needed to be fed to stay alive, even at maintenance and no growth rates (FAO, 2021a).

2.1.1. Fish production, utilization and trade

Most countries experienced sharp drops in fish production during the first weeks of the pandemic, estimated at 40 per cent in the United States, 40 to 75 per cent in the LAC region, 50 per cent in the Mediterranean region, and 80 per cent in SIDS. Fleets fishing for export were more seriously impacted than those supplying domestic markets. Small-scale fishers and workers were hit hardest, and many could not access social protection or economic support programmes, where they existed (FAO, 2020b, 2021a).

Early on and in many different parts of the world, fishing was abandoned because it was not profitable. The costs of fishing supplies (ice, gear, bait, fuel and food) increased and could not be obtained on a credit basis as before. The safety of fishing boats, the health and welfare of the crews were a matter of high concern, in particular for boats travelling far from the coasts for long fishing trips. Adherence to social distancing and safe working conditions in small, cramped and humid working spaces on board fishing vessels was very challenging.

Reduced crew worked longer hours and for longer periods and they could not travel home due to flight restrictions and quarantine periods. This increased fatigue, anxiety, stress and the risk of accidents because of the fear of becoming ill while away at sea, with no medical assistance and the risk of ports refusing entry to crew who are not citizens of the port State (FAO, 2021a).

Improvements followed this initial phase because the industry adapted. But, in instances where fishing was authorized, a decline in demand caused significant price decreases. Uncertainty and anxiety caused many households to reduce their spending, resulting in a cancelling of purchases of fresh fish and seafood. Instead, consumers stocked up on foods with long shelf life, including frozen, canned and pre-packaged food, including fish and seafood. The closure of resorts, hotels, restaurants and tourism in SIDS reduced demand for fish and seafood. So did the closure of borders and the restrictions on shipping and travel, which halted international fish export.

Satellite-generated data indicate a 9 per cent decrease in the number of active fishing vessels and a 5 per cent decrease in the hours of fishing in 2020, as compared to 2019.[1] These data are likely to be an underestimate because they only concern fishing vessels that broadcast their positions via the automatic identification system (AIS), which excludes many artisanal fishing vessels. Many of the world's top fishing nations saw significant and sustained reductions in fishing activity in March and April of 2020. In some places, such as the United States and Japan, initial declines in activity appear to have been less pronounced and shorter-lived.

It is likely that reduced fishing effort provided a respite to many fish stocks, but most studies suggest that 10 to 15 years of reduced fishing are required for overfished stocks to recover. In the absence of proper governance and management systems that sustain reduced pressure on fish stocks, such recoveries seem very limited and unlikely (FAO, 2021a).

On land, fish processing was reduced significantly in many regions and countries, because of low demand and restrictive measures on workers. Where the processing of the harvest was possible, companies incurred additional costs to meet sanitary measures and to increase storage capacity to cope with incoming raw material and finished products (FAO, 2021a).

[1] https://globalfishingwatch.org/data/covid-19-brings-unmatched-downturn-in-global-fishing-activity/.

In distribution, the overall demand of the food service market decreased substantially, while retail sales were marked by extreme volatility initially, before increasing as demand increased, including for direct delivery to households through online fish selling platforms (Love et al., 2021). The shift in demand to non-perishable fish and seafood (pre-packaged, frozen and canned fish) was estimated to be 28 per cent in the LAC region during the period from January to August 2020, compared to the same period in 2019. Transportation by road or sea was affected by closed or restricted borders and customs and health inspection delays, while the large-scale cancellation of flights has restricted trade in some high value fresh products.[2]

2.1.2 Monitoring, control and surveillance

MCS capabilities and the resources of fisheries administrations all over the world, particularly in developing countries, were severely reduced. MCS staff were not able to attend in person to their duties in the ports, on board patrol boats, or on fishing vessels as observers. In some countries, national funds were directed to emergency activities, leaving underfunded MCS operations unable to function effectively. Several reports indicate that fishers may have engaged in illicit activities, including IUU fishing and fishing in closed areas (FAO, 2020b).

2.2 Impact of COVID-19 on other sectors of the ocean economy

Other sectors of the ocean economy include coastal and marine tourism and maritime transport. Coastal tourism refers to coastal or beach-based tourism and associated recreational activities, such as swimming, sunbathing, surfing and other activities taking place at the coast and for which the proximity of the sea is advantageous (e.g., cultural events, watching of sharks or dolphins). Marine tourism refers predominantly to water-based activities, such as sailing, yachting, cruising, snorkelling and sport fishing.

Prior to COVID-19, travel and tourism accounted for 10 per cent of global GDP and more than 320 million jobs worldwide, servicing some 1.5 billion travellers who in 2019 visited both large and small, developed and developing countries.[3] Its labour market offers a wide range of opportunities for employment, skills development and entrepreneurship, especially for women and youth, rural and coastal communities, and MSMEs. Coastal and marine tourism represents a major component of global tourism, with over 1 billion tourists in 2019, forecast to reach 1.5 billion in 2030.

Of the 20 most tourism-dependent small economies in the world, 13 are in the Caribbean and they depend almost completely on visitors from North America and Europe. As many other activities such as agriculture, the food industry, construction, transport, creative industry and museums depend on tourism, its real impact on GDP is around 2.5 times larger in the Caribbean. Being a service activity, tourism is highly labour intensive, accounting for 17 per cent of direct employment in the Caribbean and 4 per cent in Latin America. When indirect employment is included, this ratio increases to 35 per cent of employment in the Caribbean and 10 per cent in Latin America (Mulder, 2020).

Women represent almost 60 per cent of employment in accommodation and food service activities in Latin America and 62 per cent in the Caribbean, reaching over 70 per cent in several countries of the region. While most women work in low-paid employment, 51 per cent of tourism businesses are managed by women in Latin America. MSMEs represent the bulk of tourism firms in the LAC region, for example accounting for 98.7 per cent of tourism-related businesses in Costa Rica and 99.8 per cent in Mexico (Mulder, 2020).

The economic impacts of Covid-19 on tourism were swift and devastating. Travel restrictions were rapidly applied globally to prevent the spread of COVID-19 across borders. Tourist arrivals decreased by 60 to 80 per cent in 2020, causing losses estimated at between $910 billion and $1.2 trillion, the closure of many MSMEs related to tourism, and affecting women in particular.

[2] http://www.fao.org/in-action/globefish/covid-19/covid-19/en/.

[3] UNWTO Tourism Dashboard. See https://www.unwto.org/unwto-tourism-dashboard.

Because tourism has links with myriad other economic activities, many related sectors were highly impacted. Unlike goods, which can be produced, stored, traded or consumed at a later stage, a halt to tourism means lost revenues and income, which cannot be recovered later on.

Countries with a high degree of reliance on tourism, in particular the SIDS, were hit severely and will likely feel the negative impacts of the crisis for much longer than other economies (OECD, 2020b). The SIDS have seen a 25 per cent decline in tourism receipts, causing a $7.4 billion or 7.3 per cent fall in GDP. Tourist arrivals dropped by more than 70 per cent in 2020, with the impact felt most keenly by the Caribbean countries (in 2019, the Caribbean welcomed 38 per cent of the global total of cruise ship passengers [Mulder, 2020]).

The tourism sector's strong links with vital conservation and biodiversity efforts were severely compromised, resulting in losses of critical natural habitats, wildlife resources and the livelihoods of coastal communities, which depended on the revenue from eco and conservation tourism. Marine tourism is a key source of income for marine protected areas (MPAs) as many governments and coastal communities use the generated revenues to fund marine research and conservation, monitoring and protection activities in the protected areas. The loss of these revenues caused by the COVID-19 crisis has reduced management presence and increased fishing pressure in marine protected and conserved areas in many parts of the world (Hockings et al., 2020).

Maritime transport, another important sector of the ocean economy, is estimated to handle over 80 per cent of global merchandise trade by volume and more than 70 per cent by value. It depends on nearly 2 million seafarers worldwide, who make it possible for the world to receive the goods and products needed for everyday life (UNCTAD, 2021b). Lockdowns and travel restrictions introduced in response to the COVID-19 pandemic have caused disruptions of shipping services and supply chains, the functioning of ports and the mobility of seafarers. UNCTAD (2021b) estimates the global maritime trade to have contracted by 20 per cent during 2020. The most critical issues for international shipping during the COVID-19 pandemic were:

- border closures to airlines and port closures to cruise ships
- quarantine requirements and restrictions on personnel crossing borders in some countries
- crew changeover and repatriation for seafarers, including for cruise ships and yachts
- certification and licensing of seafarers
- supply, repairs, ship surveys and certification.

2.3 Impact of COVID-19 on global ocean governance

Ocean governance comprises the legal and institutional frameworks for ocean activities and their implementation across scales (global, regional, national and local) and sectors (fisheries, aquaculture, coastal and marine tourism, maritime transport, etc.). The United Nations Convention on the Law of the Sea (UNCLOS), "the Constitution of the Oceans" represents the global ocean legal framework, an umbrella instrument under which all activities in the ocean are regulated. It is supported by various binding (hard) and non-binding (soft) instruments addressing the legal and policy aspects of each sector. These instruments are elaborated by international and regional organizations and serve as a basis for the development and adoption of national legal and policy frameworks. States and their institutions (the institutional framework) are responsible for adopting and implementing national legal and policy frameworks, and for coordinating the ocean activities across scales and sectors.

Prior to COVID-19, the ocean economy was developing rapidly, driven by an increasing need for goods and services, energy, transportation and recreation. This had led to unprecedented pressures on the ocean which were further amplified by climate change, pollution and loss of vital biodiversity and ecosystem services. The need for better governance of human activities in the ocean space had been widely recognized and had seen an upscaling of action-oriented initiatives, consultations and negotiations on ocean governance, climate change, biodiversity and

sustainable development, culminating in their incorporation in the 2030 Agenda and the United Nations decade of Ocean Science for Sustainable Development.[4]

Unfortunately, much of this dynamic has been severely disrupted following the outbreak of COVID-19. Many events have been delayed, cancelled or postponed, casting uncertainty over relevant processes. Most meetings were held virtually to advance some of the agendas and address the problems caused by COVID-19 in relation to labour, travel, seafarers' mobility, managing shared fish stocks or ocean science. They highlighted the importance of collective action to address ocean governance challenges, through coordinated, multilateral actions.[5]

Regional fisheries bodies and regional fisheries management organizations, responsible for the coordination of the management and MCS of shared fish stocks around the globe, were unable to carry out their programmes fully. The majority of regional fisheries bodies and organizations were unable to deploy their at-sea observer programmes and to convene their statutory or compliance meetings to assess and review scientific data, analyses and enact recommendations, including on setting up catch quotas or fishing effort limits.

While acknowledging the unprecedented nature of the pandemic and the urgency of certain measures, many environmental and development non-governmental organizations warned that relaxing MCS would open the door for IUU fishing and undermine the recovery and resilience of many important fish stocks globally.[6] They raised concerns that the removal of key MCS elements, such as human observer coverage, bans on at-sea transhipments, port inspection, high seas boarding, and inspection would weaken the verifiability of fishing-related activities throughout the fisheries' supply chain.

2.4 Impact of COVID-19 on global ocean science

Ocean science is the study of the marine environment. It combines direct observation of the marine environment with systematic research to understand the processes that control it.[7] Managing ocean resources uses the science of marine biology and oceanography, of the habitats that support these resources, the oceanographic and environmental conditions that affect them, the socioeconomic factors that impact human choices relating to these species, and the interactions among them. This requires regular data collection through ocean surveys and sampling, assessments, analyses and forecasts to debate the best options possible for ocean management.

As a result of COVID-19, surveys to collect data necessary for oceanography, fish stock assessments, environmental and pollution monitoring were cancelled in most countries where they existed. The few that were undertaken operated under notable health and safety restrictions. It is feared that the pandemic has severely limited the collection of ocean science data and disrupted time series, for which missing data will never be collected (Link et al., 2021).

Likewise, travel restrictions have severely limited physical meetings to exchange scientific information and to enable scientists, managers and stakeholders to meet and discuss issues and options for marine resource management and ocean science. Most of these meetings have been postponed or moved to virtual platforms. For example, the Annual Science Conference of the International Council for the Exploration of the Seas was postponed to 2021. UNCTAD postponed its Fifteenth Ministerial Conference on Trade and Development to mid-October 2021. While virtual meetings have proved to be a safe and useful way to engage in consultations and exchange views, they have also presented challenges for matters that require negotiation.

4 https://www.oceandecade.org/.

5 https://sdg.iisd.org/news/officials-discuss-ocean-governance-conservation-for-covid-19-recovery/.

6 https://www.cffacape.org/news-blog/reducing-control-during-the-covid-19-outbreak-would-open-the-door-to-illegal-fishing.

7 https://www.bangor.ac.uk/oceansciences/about/what.php.en.

2.5 Impact of COVID-19 on vulnerable groups and women

COVID-19 disproportionately affected vulnerable and marginalized people such as women, the youth, indigenous and ethnic minorities, and displaced people, particularly in countries with weak health and sanitation infrastructure and persistent gender inequalities. As businesses lost revenue, many reduced their costs by laying off people, starting with the temporary and casual jobs disproportionally occupied by women and migrants (Northrop et al., 2020; FAO, 2021a).

The fishing and maritime transport sectors employ mainly men, including many migrants. On the other hand, women constitute most of the workforce in post-harvest activities and coastal and marine tourism. The proportion of women employed in post-harvest activities is estimated to be 80 to 90 per cent, and in Africa and Asia 60 per cent of all seafood traders and retailers are women (FAO, 2020a; Bennett et al., 2020).

In tourism, women represented 54 per cent of the workforce, although they are likely to occupy low-skilled, casual, seasonal or informal jobs. As a result, they were likely to lose their jobs first when COVID-19 restrictions swept across the globe. On the other hand, many women in several countries own MSMEs in the tourism and food services sector.[8] Because they faced higher barriers to access credit during the pandemic, they were more exposed to business closure and were more at risk of bankruptcy.

Adoption of teleworking by companies and administrations has enabled millions of workers to keep their jobs, partly or fully. This has benefited skilled workers and those with full-time work contracts. In marine fisheries, aquaculture and tourism, the large majority of women were at greater risk of losing their income. Closures of schools and day-care centres have massively increased childcare needs, which has impacted working mothers. Finally, the informality of several ocean economy sectors constitutes an added barrier for fishers, aquaculture and tourism workers to access protection from labour market policies and social protection mechanisms.

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[8] https://unctad.org/news/covid-19-puts-women-working-sids-tourism-industry-risk.

3. Overview of the measures adopted to address the impact of COVID-19

3.1 Measures adopted to address the impact of COVID-19 on health, social and economic development

The measures adopted to address the impacts of the pandemic were diverse and complex, reflecting the intricacy of the issues addressed, their order of priority and the countries' capacity and resources (Figure 1). The political and socioeconomic realities, the healthcare capacity and the resources available played out in the responses deployed by countries to mitigate the impact of the pandemic. Leadership was critical, and the ability to create a shared sense of commitment and sacrifice with citizens was essential to act in the most coherent and effective way.[9]

Unprecedented levels of resources, estimated at $12 trillion[10] were allocated by countries under considerable time and operational pressure, as speed was key to the effectiveness of government action on the health, economic and societal fronts. Operationalization and delivery of recovery and stimulus packages presented a wide range of unprecedented problems for pre-COVID-19 rules, regulations and operating procedures. Many countries struggled to disburse recovery and stimulus funds because traditional operating procedures could not cope with the large volume of funds and the speed required for their effective delivery. Digitalization was key to facilitate the implementation of measures.

The private sector innovated to keep businesses running. In areas such as retail sales and catering, people and businesses increasingly turned to online platforms to pursue economic and social activities and allow customers to order from the convenience and safety of their homes.

The Economic Commission for LAC manages a COVID-19 observatory for the region which reports on the policies adopted by individual countries to control the COVID-19 pandemic, in addition to regional and thematic analysis relevant to them. Figure 1 illustrates the diversity and number of measures adopted in the LAC region.

As a priority, governments engaged available resources to boost the capacity of their healthcare systems to cope with the health crisis and its flow of patients who quickly overwhelmed hospitals in many countries. Most LAC countries attempted to enact parallel measures to compensate for unemployment and economic losses. Enforcement capacity and resources varied across LAC countries but the space to manoeuvre remained limited for the majority as public revenues contracted and fiscal space remained limited. Estimates of the cost of the measures announced for the LAC region ranged from 0.5 per cent to 12 per cent of GDP, although the final value of these measures remains uncertain considering the significant information gaps around effective implementation (OECD, 2020c, 2020d).

[9] https://spssi.onlinelibrary.wiley.com/doi/epdf/10.1111/sipr.12075.

[10] https://www.oecd.org/economic-outlook/.

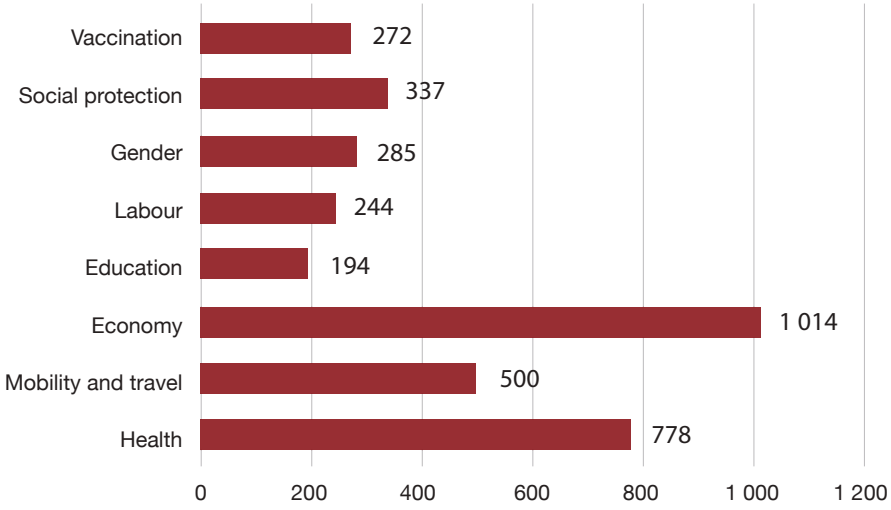

Figure 1. Overview of the number and types of policy measures adopted in the LAC region to mitigate the impacts of COVID-19

Source: ECLAC. Adapted from https://www.cepal.org/en/topics/covid-19.

3.2 Measures adopted to address the impact of COVID-19 on marine fisheries and aquaculture

Many countries that considered fishing to be a non-essential activity at the beginning of the pandemic changed policy, provided sanitary protocols were respected. The measures implemented to support fisheries and aquaculture were diverse and complex and included funds to compensate loss of wages and revenues, financial packages and fiscal incentives to resume production and processing, stimulate demand and support export (Table 2). The type of measures and the extent of their application varied widely across countries, scales and value chain nodes depending on the resources available and the priorities set. Unfortunately, informal sectors, including a large proportion of small-scale operations which employ vulnerable groups such as women, were often excluded. On the other hand, the measures implemented encouraged many small-scale fishers and operators to register their boats and operations, contributing to the reduction of IUU fishing and the informality of the sector.

The resumption of marine fishing and aquaculture required the adaptation of working conditions and procedures to enforce MCS, conduct research and unlock production and processing, trade and transportation bottlenecks. Major fishing and aquaculture producing nations took swift action and, as a result, the sector may not have suffered as much as initially feared. As mobility was restricted, transportation by sea became difficult and fish exporters struggled with the low and uncertain demand, and the associated trade risks, especially where there was limited processing and freezing capacity to preserve and store the fish until demand resumed. Countries like China launched a national fish demand and supply platform to connect producers to processors and buyers, streamlining production with demand, directing surplus production to freezing and cold storage, and facilitating national and international trade (FAO, 2021a).

Table 2. Measures to address the impact of COVID-19 relevant to the global ocean economy

Measures	Examples
Health measures	▌Lockdown of citizens and curfews ▌Restriction on mobility and travel ▌Social distancing and wearing of face masks ▌Testing for severe acute respiratory syndrome-coronoavirus-2, isolation and quarantine of positive cases ▌Treatment of diseased people ▌Vaccination
Economic measures	▌Fiscal measures (tax deferral, reductions or suspensions) to individuals or to companies to encourage employment ▌Packages to stimulate the economy and support its recovery (grants, direct lending or loan guarantees, tax reduction) ▌Debt relief and suspension of credit to individuals and MSMEs ▌Public spending in infrastructure to create employment and stimulate demand ▌Issuing of electronic permits and licenses for harvesting/processing activities
Social measures	▌Measures to stimulate consumption (reduction or elimination of value-added tax, purchase vouchers, subsidies) ▌Measures to compensate lost income and livelihoods (cash transfer, cash for work, food/in-kind transfer) ▌Labour policy to prohibit dismissal, enable reduced working hours, elective work leave ▌Guarantee of basic services
Environmental measures	▌Up to 30 per cent of the recovery resources were earmarked for clean energies and the transition to a green and carbon neutral economy

Source: Compiled by the author based on information from various sources.

In many countries, fishers or cooperatives and small-scale caterers shifted to direct sale to customers, including via home delivery. Many processors reduced the number of employees in their facilities to respect social distancing and lower expenditure. Others moved into or strengthened their positions in retail and online markets, following the shift in consumer demand. Companies selling frozen and shelf-stable products, or companies with strong relationships with retailers, shifted sales from the hotel and restaurant sector to retail and online markets (Love et al., 2021).

The lockdown of government institutions and the shift to teleworking reduced the capacity of many governments to enforce MCS. Several countries issued temporary rules or emergency action to waive the coverage requirements of observers deployed at sea or in landing sites to monitor fisheries and ocean and biodiversity data.[11] E-administration and virtual meetings to exchange logbooks, landing declarations and sales notes helped to expedite clearances.

3.3 Measures adopted to address the impact of COVID-19 on other sectors of the ocean economy

In many countries, coastal and marine tourism was considered too big to fail. These countries enacted a broad range of policy measures, such as cash transfers, grants, tax relief, payroll support and loan guarantees to assist tourism businesses. In some countries, banks suspended loan repayments and in others, support was provided to vulnerable people, in particular informal workers, migrants and women.

Global travel safety protocols were implemented to reopen travel and tourism, wherever and whenever confinement and restrictions were eased. However, this had only limited success because many people did not feel comfortable to travel to a foreign country during the pandemic. In an effort to attract tourists, some countries offered long-term permits, encouraging visitors to stay and work virtually while enjoying the coastal and marine environment. In 2021, hope was restored with the roll-out of vaccination programmes in many countries.

[11] https://www.govinfo.gov/content/pkg/FR-2020-03-27/pdf/2020-06426.pdf.

Adherence to the safety protocols in developing and small States required significant business restructuring, infrastructure adjustments and employee retraining, including for officers at ports and other points of entry. Digitalization and other integrated technologies that enable contactless payments and services, and other forms of automation, have proved useful but onerous and costly for many developing countries to implement. In instances where confinement and restrictions were eased, domestic tourism provided some respite for tourism business in the 2020 summer, although the relief was often short-lived because the virus caused successive surges in infection in many regions.

For maritime transport, restrictions on the mobility of seafarers and the functioning of ports' procedures and services significantly slowed down shipping and trade at the beginning of the pandemic. The highest level of cooperation and coordination was required from relevant United Nations agencies, including the International Maritime Organization (ILO) and World Health Organization (WHO), and shipping and ports' authorities to provide effective guidance to governments and the maritime industry.[12] At the national level, the shipping companies, maritime administrations and other authorities (e.g., health, customs, immigration and border control, seaport and civil aviation) were trained to comply with international guidance and the adopted safety measures and protocols. Digitalization has been crucial for the effective functioning of ports' procedures and services and the continuity of the maritime supply chain during the pandemic. The use of digital infrastructure and applications simplified e-administration processes and facilitated trade and cross border logistics.

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[12] https://www.imo.org/en/MediaCentre/HotTopics/Pages/Coronavirus.aspx.

4. Challenges and opportunities for a sustainable global ocean economy

Experience of past global crises teaches us that after recovery, each crisis leaves behind it permanent structural changes. COVID-19 is no exception. As a result of the measures deployed to mitigate its impacts and adapt to the crisis, opportunities for improvements have emerged. The opportunities are likely to reshape the global economy, unleash technological innovation, redefine consumers' needs and behaviours and the role of society and companies. Most improvements have been incremental and have involved adapting to and improving existing practices, but a few have been transformational or disruptive. As the world emerges from the crisis, successful innovations are likely to become mainstream opportunities, both as a means of addressing immediate needs and as a way of reorienting development to meet future challenges. These innovations represent good opportunities for the future of the ocean economy and have the potential to influence the way in which goods and services are traded, ocean science, the mobility of people, automation and the likely adoption of "green and clean economy" – social and environmental protection policies being central to economic recovery and the use of the stimulus funding.

4.1 Rethinking supply chains to address market vulnerability

The COVID-19 pandemic is revealing how vulnerable and fragile certain global supply chains can be, and the necessity to rethink supply chain strategies. A model in which businesses rely on a single or a handful of suppliers concentrated in a few countries has been shown to be a fragile one. For example, this was the case for many items required for the food industry, such as sanitizer, single-use gloves, head covers and protective coats, packaging, etc. Over the years, for the sake of efficiency, the production of these items was outsourced, mainly to Asia. Similarly, export businesses that relied on only a few buyers whose countries closed their borders to imports were faced with unsold merchandise and losses, in the case of perishable goods, because cold storage capacity was found to be insufficient. This was the case of the fish and seafood export business, in which over 60 per cent of trade is directed to three main markets which closed successively in 2020 as the pandemic moved from Asia to Europe and then to the Americas.

As a result of the disruption to import and export business, government and companies have been considering how and where fish and seafood is processed and sold, and how to improve control along the value chains in which they trade. Seafood equipment suppliers report important investments in "nearshoring" or "reshoring" processing that was outsourced prior to the COVID-19 pandemic, with a view to reducing dependence on a few seafood producers, processors and suppliers.[13]

Concurrently, domestic markets have expanded as fishers, cooperatives and processors adapted their products and processes for direct delivery using online platforms and direct connections with local consumers. Expanding domestic markets and exploring new markets, in particular regional markets, and elaborating targeted promotion strategies for fish and seafood, represent an opportunity to diversify markets, products and value addition. Online retailing is expected to develop in an unprecedented way as consumers' habits shift and they adapt to online shopping which requires the adaptation of packaging, distribution and communication.

4.2 Accelerated adoption of innovations, digital technology and economy

Digital economy refers to an economy based on digital computing technologies. It comprises underlying technologies and infrastructure, the information and communication technologies themselves, and the wider range of sectors using digital products and services, such as e-commerce (UNCTAD, 2021c).

[13] https://www.intrafish.com/opinion/9-ways-coronavirus-is-changing-seafood-forever/2-1-775088.

Prior to COVID-19, the adoption of automation technology and digitization were driven mostly by cost-efficiency and competitiveness. Now, in a world concerned about pandemics, health and safety considerations have also become a central motivation, with the aim of reducing virus transmission during production and processing (OECD, 2020e). Increased production costs, restrictions on travel and on the mobility of migrant workers, and social distancing have accelerated the development of digitization and automation technologies, such as robotics, artificial intelligence and vision systems for measurement, monitoring and tracking. As a result of the pandemic, technologies that improve safety at work and generate efficiency gains are likely to be retained beyond the crisis. Countries and companies prepared to deploy these innovations and technologies would gain competitive advantage and market access.

Teleworking accelerated the use of Internet applications that were previously feasible but not widely adopted. Born out of necessity, the use of video conferencing, remote learning, webinars, electronic surveys and e-administration have developed at an unprecedented rate to become part of an environment that is regarded as normal. COVID-19 has exposed slow procedures, complex bureaucracies and rigid hierarchies that delayed actions, even when resources were available. The emergency forced many to break through rigid bureaucratic systems and adapt rules using an electronic exchange of documentation, clearances and approval.

E-commerce has shown its potential for diversifying the scope and geographic reach of trading opportunities and expanding the range of both established businesses and new enterprises. It also plays an increasingly important role in the supply and distribution of both goods and services in domestic markets. This was particularly noticeable in marine fisheries and tourism. However, the growth of e-commerce is inhibited in many developing countries by a range of barriers in infrastructure, finance, resources and governance. Countries that overcome these barriers and establish enabling policies and frameworks for e-commerce will be better placed to leverage its potential benefits and address challenges, both domestically and internationally, while those that fail to do so risk becoming less dynamic at home and less competitive abroad. In the absence of measures to take advantage of e-commerce, there is a risk that digital innovations will increase inequality rather than advance equity (UNCTAD, 2021c).

The ability of ocean-based businesses to participate in domestic and international markets depends increasingly on the quality of digital connectivity available to them, the availability of reliable communications networks, the existence of online platforms and services, and digital literacy. Policies should be put in place to break barriers, address the adverse effects of the digital divide, not least for coastal and low-income households, and build trust and confidence in online business. Consumer protection against unfair trade practices, product safety and cybersecurity concerns have been amplified in the context of the pandemic. In future, consumers will demand a safer e-commerce environment and require companies to adjust and provide more transparency and cybersecurity (UNCTAD, 2021c).

Directing stimulus investments towards marine technologies can support marine science and improve observation and understanding of the ocean more efficiently and effectively. New electronic monitoring programmes can support, replace or expand fisheries observer programmes that collect scientific data, enforce laws and protect endangered species. Expanding the use and interpretation of satellite data and enhanced drones can curtail IUU fishing where marine patrols are not or cannot be deployed.[14]

4.3 Increased focus on clean and green technologies and environmental protection policies

Though quite different from environmental threats such as climate change and natural disasters, COVID-19 amplified, in a way never seen before, the perception of governments and the public of the risks resulting from humanity's exposure to natural events with a global reach. The health,

[14] https://www.wri.org/insights/8-ways-rebuild-stronger-ocean-economy-after-covid-19.

social and economic impacts of the Covid-19 pandemic have affected every country, community and sector in the world. At the same time and in spite of the hardships of lockdowns, there were tangible positive environmental changes, such as a decrease in daily global emissions of greenhouse gases, the sharpest drop in global daily carbon output since records began, and cleaner air, skies and rivers than there have been in decades.[15]

Likewise, the role of governments was central to enact measures to control the pandemic and its economic and social impacts, and to stimulate recovery. This central role has enabled governments to prioritize policy goals and greater incentives for investment in green and clean economies and environmentally friendly solutions. Despite the unprecedented economic recession, this focus on green and clean economies has snowballed, with governments, donors and international development or financial institutions prioritizing their integration in recovery and investment plans. This offers a unique opportunity for governments and sectors of the ocean economy to streamline conservation and environmental protection in their post-COVID-19 recovery and investment plans. Investment in green technology should include the ocean economy, with incentives offered to the sectors that invest in it.

Specific to the ocean economy, there are real opportunities for developing countries to build better marine fisheries, aquaculture and tourism sectors. For fisheries and aquaculture, these opportunities require a re-focusing of priorities to enact effective fisheries management and marine conservation, and to promote transparent and predictable markets that incentivize sustainability instruments such as traceability, eco-labelling and social and environmental responsibility. Sustainable marine aquaculture offers real possibilities, especially for small coastal and island States, to invest in shellfish and seaweed farming. These are environmentally friendly aquaculture systems, whose products are in high demand. They require policies that can create an enabling environment for investors, allowing them to take advantage of stimulus and recovery plans, national, regional and international opportunities for capacity building and technology transfer.

Sustainable coastal and marine tourism should become a priority in socioeconomic and ocean affairs programmes, and be mainstreamed in coastal zone management plans. Natural marine areas and reserves and recreational fishing, wildlife watching and marine ecotourism operators can drive recovery by building traveller confidence with a strong focus on safety and hygiene. Expanded digitalization of tourism services will enable flexibility, accelerate contactless services, virtual experiences and real-time information provision. The crisis is an opportunity to rethink tourism by considering the longer-term implications of investing in digitalization, supporting low carbon transition, and promoting the structural transformation needed to build a stronger, more sustainable and resilient tourism economy (OECD, 2020b; 2021a).

4.4 Centrality of international cooperation, multilateralism and solidarity

Combatting the pandemic revealed that any global crisis can only be defeated through a collective effort, highlighting the importance and values of international cooperation, multilateralism and solidarity. These values enabled the sharing of information about the virus and best practices to control the disease; sharing protective and medical equipment, medicines and vaccines; and coordinating the re-opening of borders and the movement of people and goods. Fighting COVID-19 and preparing for recovery highlighted the need for the international community to ensure access to vaccinations for all, address climate change mitigation and adaptation, combat inequality and facilitate predictable and transparent trade.

The pandemic presents an enormous challenge and unique opportunities for achieving the 2030 Agenda. The SDGs are a roadmap that encompasses most aspects of human and planetary

[15] The bright side of Covid-19: seven opportunities of the current pandemic. See https://www.forbes.com/sites/jeroenkraaijenbrink/2020/03/23/the-bright-side-of-corona-seven-opportunities-of-the-current-pandemic/?sh=5ecc015b785c.

well-being. The pandemic has impacted every one of these aspects and emphasized the wisdom of what is encapsulated by the SDGs – the challenges we face cannot be dealt with in isolation. Like a double helix, the SDGs and the COVID-19 pandemic responses are intertwined and cannot be tackled separately. There is a unique window of time to instil coherence in the measures and actions adopted for recovery from the COVID-19 pandemic and to implement integrated solutions to achieve the SDGs.[16]

The pandemic has demonstrated the value of preparedness for protecting and building resilience against health and other natural or human-induced disasters, ensuring actions are evenly distributed across demographic groups, regions and economic sectors. This requires strengthening the capacity of all countries, in particular developing countries, for early warning, risk mitigation and management of health risks and other natural and human-induced shocks.

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[16] https://feature.undp.org/covid-19-and-the-sdgs/.

C. THE IMPACTS AND IMPLICATIONS OF COVID-19 ON THE OCEAN ECONOMY OF BARBADOS, BELIZE AND COSTA RICA

I. Introduction

Since the start of the COVID-19 pandemic, the ocean economy sectors and the fish value chains of Barbados, Belize and Costa Rica have been severely impacted. Production, processing, consumption, trade and distribution were disrupted and the capacity of institutions to deliver governance duties and enforce coastal responsibilities were severely limited.

In recognition of these challenges, the OETS project, implemented since 2018 by UNCTAD and DOALOS in Barbados, Belize and Costa Rica, commissioned this study to assist the three beneficiary States to assess the economic, social and environmental impacts of the COVID-19 pandemic on the selected OETS value chains, the measures adopted and their efficiency, opportunities, and the impacts on ocean governance frameworks. The study also proposes policy and regulatory recommendations for supporting the re-building and improvement of the value chains in the short, medium and long term.

At the launch of the OETS project in 2018, wide consultations with stakeholders were undertaken by UNCTAD/DOALOS in each country and the following fish and seafood value chains were identified as the focus of the OETS project:

- longline pelagic fishery and tuna loin processing for Barbados
- lobster, queen conch and finfish for Belize
- tuna, *mahi mahi* and artisanal finfish for Costa Rica.

The methodology employed in this study involved online consultations and interviews as described in A, Section 3. The interviews were supported by extensive research which analysed relevant publications, reports and studies addressing the ocean economy worldwide and in the three countries.

Part C of this report addresses the impacts and implications of COVID-19 for Barbados, Belize and Costa Rica. It proposes policy interventions and regulatory recommendations that may be implemented in the ocean economy of the three beneficiary States to support the redevelopment of the selected value chains during the post-COVID-19 era. By doing so, it builds on the lessons learned during this study and best practice policy interventions which can assist Barbados, Belize and Costa Rica to enhance the resilience of their value chains to future large-scale systemic disturbances.

II. Case study 1: Barbados

1. Introduction

Barbados is the most eastern island of the Caribbean, facing the Atlantic Ocean to the east and the Caribbean Sea to the west. A British colony since 1627, Barbados achieved independence in 1966. Barbados covers an area of 430 km^2 and is a highly populated island; it is the fourth most densely populated country in the Americas with a population of 287,375 in 2020.

Economically Barbados has evolved over time. Until 1950, it was a low-income economy dependent upon sugar production, but today it is an upper-middle-income country with a diversified economy based on tourism and the offshore financial sector. It generates one of the highest per capita incomes in the Caribbean, in spite of the difficult economic challenges it has confronted in recent years.

The economy of Barbados is highly dependent on the coastal and marine environment, its natural resources and the economic sectors that exploit them. The ocean economy is based on marine fisheries, coastal and marine tourism, port services and maritime shipping. Like many Caribbean countries, Barbados is exploring the possibilities and opportunities that may be gained from the diversification and strengthening of its ocean economy (UNCTAD, 2019a; UNCTAD, 2020b; Roberts et al., 2020).

2. Overview of the ocean economy and trade strategy of Barbados

2.1 Overview of marine fisheries and aquaculture in Barbados

In Barbados, marine fisheries provide food and nutrition, employment and recreation opportunities. The economic contribution of marine fisheries was estimated to be between $12 million and $16 million per year, based on the ex-vessel and retail prices collected at the major markets. This contribution can be three times higher along the entire value chain. In 2006, the value was estimated at $25 million along the entire value chain, 3.3 times greater than the ex-vessel estimate of $7.5 million (Mahon et al., 2007).

The number of people employed by fisheries in Barbados is estimated to be about 6,000. When considering direct and indirect employment, this number was estimated to be 8,800 (FAO, 2021c). The harvest sector is made up of fishers (63 per cent) and boat owners (37 per cent) who are generally also fishers (78 per cent). Support services employ people for boat building, repair and maintenance of boats, engines, fishing gears and electronic equipment. Post-harvest activities include boners who clean and prepare fish, vendors and processing workers, cooks and servers at fish frys (community-based grilling events) and restaurants (FAO, 2021c).

2.1.1 Ecological, social and economic importance of marine fisheries

Barbados has a short coastline of 95 km and a narrow geological continental shelf of 320 km^2 which means that deep water is found close to shore. The country's exclusive economic zone (EEZ), estimated at 186,899 km^2, is 430 times larger than its land area, with fishing areas extending from inshore coral reef to territorial sea (12 nautical miles) to international waters (>200 nautical miles) (FAO, 2021c). Beyond the narrow geological continental shelf areas, the EEZ of Barbados consists of a deep-water column, particularly to the east in the Atlantic Ocean where depths of 2,000 metres can be found within 5 nautical miles of the coast.

Fisheries in Barbados are open access and limited conservation measures are in place. A few stock assessments have been undertaken but regular surveys required for comprehensive fisheries management are not conducted (Gill et al., 2019). The status of commercial fish stocks varies from stable, in the case of dolphinfish and kingfish, to overexploited for most of the reef and other coastal resources (FAO, 2021c).

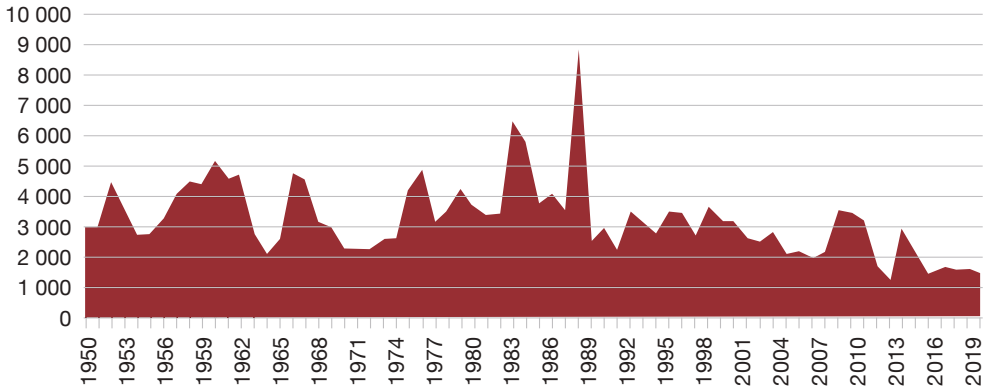
The fisheries resources are grouped into nine categories for management: two offshore fisheries (large pelagic fish and flying fish), and the inshore fisheries comprising shallow shelf reef, deep slope and bank reef, and coastal pelagic fisheries. In addition, the lobster and queen conch fisheries are very small, with unknown status and catch data (FAO, 2021c). A moratorium on the catch of sea turtles closed the fishery after 1998[17] and strict access controls have been imposed on the sea urchin fishery. In most cases, the main fishing season runs from November to July, when over 90 per cent of the annual catch is landed.

The fishing fleet comprises some 1,146 licensed fishing boats, including Moses (3 to 6 m in length), launches or day-boats (6 to 12 m), ice boats and longliners (both of which are longer than 12 m). Moses are used primarily as fishing and diving platforms for reef and coastal fisheries. Launches primarily land flying fish and large pelagic fish. Iceboats are used primarily for harvesting flying fish and large pelagic fish on trips of 5 to 10 days. Longliners catch primarily tunas, swordfish and other large pelagic fish on fishing trips of 12 to 28 days (FAO, 2021c; UNCTAD, 2019a; UNCTAD, 2020b).

The catch is landed at some 30 fish sites around the island, categorized according to their infrastructure and facilities as primary (markets), secondary (sheds) and tertiary (beaches) landing sites. Most of the catch is landed at the primary sites and often sold directly to fish vendors (who are predominantly women), processors and consumers (FAO, 2021c; UNCTAD, 2019a; UNCTAD, 2020b).

Total fish production was estimated at 1,517 tons in 2019, mostly from marine fisheries, with a small amount of tilapia (25 tons) derived from aquaculture. Total production of marine fisheries has decreased significantly over the years from 3,269 tons in 2010 to less than 1,500 tons in 2019. In fact, the decline started years earlier: the landings averaged 3,500 tons during the period 1950 to 1980, with a peak average of 4,605 tons during the 1980s and the highest landings of 8,939 tons recorded in 1988 (Figure 2).[18] Figure 3 shows the composition of the fish species harvested in 2019.

Figure 2. Landings of marine fish in Barbados during the period 1950–2019 (tons)



Source: FAO-FishstatJ, 2021.

[17] http://www.barbadosseaturtles.org/pages/faqs/index.html.

[18] Ibid.

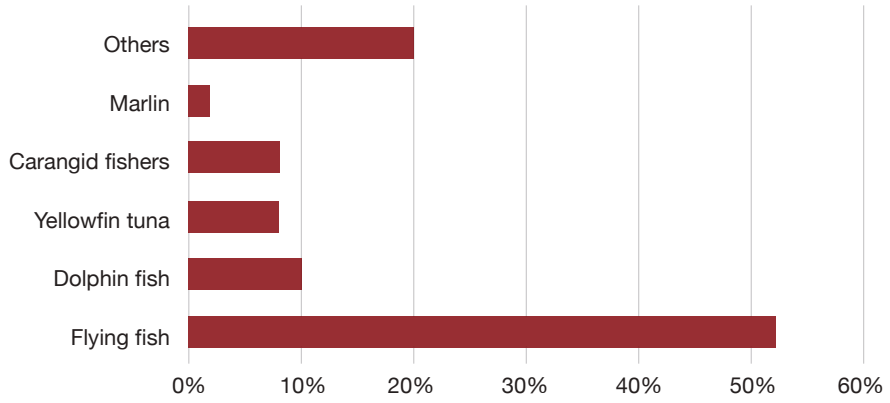


Figure 3. Principal marine fish species captured in Barbados in 2019

Source: FAO-FishstatJ, 2021.

2.1.2 Fish utilization and trade

At the landing sites, fish is sold mainly to vendors (over 50 per cent), processors (30 per cent), directly to consumers (9 per cent) or exporters (6 per cent). A small amount (2 per cent) is sold to restaurants, hotels and catering institutions. Processors can also import frozen fish and vendors can purchase fish from the processors. Exporters handle mainly large pelagic fish such as tunas and swordfish caught by longline vessels (FAO, 2021c).

The main fish markets are equipped with potable water, ice plants, processing facilities and indoor fish stalls. This is the case of the Bridgetown public fish market which has a fishing harbour, ice production facilities and rooms for fish processing. Likewise, Oistins – Berinda Cox fish market – has a jetty, ice production facilities, fish processing rooms and market stalls. Other markets have a dedicated building equipped with running water and fish cutting facilities and yet others are simple landing sites with no physical infrastructure (FAO, 2021c).

Fish consumption in Barbados is high at around 40.3 kg per capita in 2013. This is greater than the world average of 20.3 kg per capita and much higher than the LAC average of 10.5 kg per capita per year, reflecting the cultural and historical origins of the Carib Indian diets based on fish and staples such as maize and cassava, beans, fruits and vegetables. Other fish products have been firmly established in the diet because of colonial influence (e.g., salted cod and mussels) or are imported to cater to the tourism industry. Important fish groups consumed in Barbados include pelagic fish (23.5 kg per capita, per year), other marine fish (13 kg per capita, per year) and crustaceans (1.8 kg per capita, per year) (FAO, 2021c).

Barbados is a net importer of fish and fishery products. In 2018, exports were estimated to be 143 tons, valued at $490,000, compared to the import of 8,254 tons valued at $29.7 million. Exports in 2018 were 108 tons of marine fishes and 34 tons of tunas, including 8 tons of bigeye tuna and 26 tons of yellowfin tuna. Export of marine fishes has increased significantly from 12 tons in 2015, in contrast to tuna exports which decreased from 175 tons in 2015. Much of the locally caught tuna is exported to the United States.

Imported species are more varied to cater for the needs of Barbadians and tourists. Many of the processing facilities import fish from Trinidad and Tobago, Guyana, Suriname, Canada and Viet Nam. Dolphinfish is also sourced from Peru, shrimp from Indonesia and lobster tails from Jamaica. Fish imported from the United Kingdom and the United States include cod, salmon, halibut, seabass, soles, scallops and live mussels (FAO, 2021c).

2.2 Overview of other ocean economy sectors of Barbados

Tourism remains the most important economic sector for Barbados, generating an income of $1.3 billion in 2019, estimated at 10.4 per cent of GDP and 72 per cent of total export value. Over 17,500 persons are directly employed in tourism and related activities. This number increases to 47,000 or 37 per cent of total employment in the country, when other areas that attract investment related to tourism are included.[19] Over 1.55 million tourists visited Barbados in 2019 to stay on land, on cruise ship or yachts. The tourism industry of Barbados is well developed, and the country is established as a leading tourism destination (IDB, 2021).

Although its importance for the economy of Barbados is well recognized, no assessment of the value of coastal and marine tourism has been made. The cruise and stay-over tourism categories represented 853,00 and 697,000 visitors respectively in 2019. Recreational yachting presents good potential because Barbados has been historically a stop-over for sailing boats cruising the Caribbean. Underwater sightseeing has developed recently. It includes snorkelling, scuba diving and glass-bottomed boats for underwater viewing of coral reefs and aquatic biodiversity. Some 30,000 to 50,000 divers visit the country per year, also attracted by artificial reefs which attract many aquatic animals.

Like many islands, Barbados depends on maritime shipping for over 95 per cent of its trade in goods. Although not busy by global standards, a significant number of ships transit through the EEZ of Barbados, from Europe on their way to the Panama Canal, or from the east coast of the United States. The main port is in Bridgetown, with several smaller loading facilities located elsewhere on the island. Since 2003, the Port of Bridgetown has been administratively organized into the Barbados Port Inc. for international shipping and cruise ships.

2.3 Overview of the governance of ocean economy and trade strategy in Barbados

There are at least 20 government/parastatal agencies whose mandate relates one way or another to the development and management of the ocean economy in Barbados.[20] A study carried out for UNCTAD/DOALOS (UNCTAD, 2019a) provided a comprehensive analysis of the legal and institutional framework governing the ocean economy sectors in the country. Roberts et al. (2020) recently concluded a scoping study on blue economy in Barbados, which expands on the UNCTAD/DOALOS study (UNCTAD, 2020b) to address wider links to other ministries, policies and economic sectors.

Two ministries are directly responsible for the governance of the ocean economy sectors in Barbados. They are the Ministry of Maritime Affairs and the Blue Economy (MMABE) and the Ministry of Environment and National Beautification. The MMABE was created in 2018 to integrate various marine activities and consolidate the government's prioritization of the strategic and sustainable use of marine resources (UNCTAD, 2019a; Roberts et al., 2020).

Traditionally, the Fisheries Division is responsible for issuing fishing and other licenses or permits, registering vessels and certifying their activities and harvests, as per the Fisheries Act of 1995. The national conservation commission is responsible for enforcing conservation regulations in relation to marine protected or restricted areas. In addition, units from the ministries of Agriculture and Food Security, Energy and Water Resources, Foreign Affairs and Foreign Trade, Tourism and International Transport, Health and Wellness, and the Office of the Prime Minister enforce rules and regulations dealing with post-harvest fisheries, food safety and MCS. These various ministerial institutions operate under dense legal and policy frameworks defining rules, and ways and means to deliver their duties (FAO, 2021c; UNCTAD, 2019a; Roberts et al., 2020).

[19] Economic impact reports. World Travel & Tourism Council. See https://wttc.org/Research/Economic-Impact.

[20] https://www.gov.bb/ministries.

The interests of fishers and other stakeholders in the sector are represented by the Barbados National Union of Fisherfolk Organizations (BARNUFO), which comprises five fishers' organizations and two boat owners. The objective of BARNUFO is to improve the socio-economic conditions of fishers and their communities. BARNUFO is responsible for administering a group medical plan for fishers, arranging training and awareness-raising workshops, implementation of the small-scale fisheries guidelines and coordination of an annual week of fishers' activities.

Enforcement of the legal frameworks relies on the Office of the Attorney General responsible for the Police and the Judiciary and the Coast Guard, which is under the responsibility of the Office of the Prime Minister. Both play a significant role in the regulation of the ocean economy sectors. The Maritime Affairs Committee includes representatives of various stakeholder groups and is tasked with coordinating work on maritime affairs and avoiding duplication of activities (UNCTAD, 2019a).

At the international and regional level, Barbados is party to UNCLOS, fisheries instruments (the United Nations Fish Stocks Agreement and the Compliance Agreement),[21] the Convention on Biodiversity (CBD), the Convention on International Trade in Endangered Species (CITES) and the Convention on the Prevention of Marine Pollution from Ships (MARPOL). Likewise, the Fisheries Division is active in regional organizations to which Barbados is party. These include the Western Central Atlantic Fishery Commission (WECAFC), the Caribbean Regional Fisheries Mechanism (CRFM), the International Commission for the Conservation of Atlantic Tunas (ICCAT) and the Convention for the protection and development of the marine environment in the wider Caribbean region, or Cartagena Convention (FAO, 2021d).

3. Impact and implications of COVID-19 on the ocean economy of Barbados

Barbados recorded its first case of COVID-19 on 17 March 2020. The country urgently adopted the measures recommended by the WHO to prevent further entry and spread of the virus in the country. It declared a national emergency on 28 March 2020 with comprehensive lockdown measures which included the closure of all non-essential businesses and a 24-hour curfew for the month of April 2020. This prohibited all but essential workers from leaving their homes – except for medical reasons or to visit banks and supermarkets, following a schedule based on the first letter of people's last name. The authorities monitored the spread of the virus by testing, tracing and isolating positive cases. As the epidemiological curve showed signs of flattening, the authorities announced a four-phase reopening plan starting on 29 April 2020, for the gradual reopening of the economy. Repatriation flights commenced in June 2020 and commercial flights resumed on 12 July 2020. Vaccination (phase 4) commenced on 9 February 2021.

Unfortunately, Barbados faced its second and most serious wave of COVID-19 cases during December 2020, prompting the authorities to reinstate a curfew from 1 January 2021, and a full lockdown on 20 February 2021. On 1 March 2021, Barbados entered a phased reopening plan with social distancing protocols and curfew restrictions remaining in place. As of 18 August 2021, 4,581 infections and 48 COVID-19 related deaths were reported in the country.

3.1 Impact of COVID-19 on the social and economic activities and development in Barbados

The pandemic had a profound impact on the economy of Barbados. Tourism was completely halted for months, starting in March 2020. Non-essential businesses were closed, resulting in layoffs or pay cuts for employees. Overall, the economy contracted by 27 per cent in the second quarter of 2020 and 18 per cent in the third quarter, with an overall 17.6 per cent contraction for 2020.

[21] The agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (of the Food and Agriculture Organization of the United Nations).

The unemployment rate increased threefold in 2020, reaching 30 per cent, resulting in reduced consumption and a six-fold increase in claims for social protection interventions.[22]

The tourism sector contracted by 16.2 per cent in the first semester of 2020, reflecting a 17.9 per cent reduction in long-stay arrivals over the same period. As a result, a significant amount of pressure was placed on the National Insurance Scheme and Welfare Department, with approximately one quarter of the workforce filing for unemployment benefits by May 2020.

A telephone-based national survey was conducted between May and June 2020, with the main objective of quantifying the consequences of the COVID-19 pandemic (Garavito et al., 2020). A previous survey conducted in 2016/17 to assess the living conditions in Barbados allowed for a comparison and review of socioeconomic trends before and after the COVID-19 shock.

Overall, the survey documented significant labour market disruptions, with relatively more severe consequences among low-income households. Almost a quarter of Barbadian households reported having lost their main source of income between January and April 2020, and the share of households reporting an income level below the minimum wage increased approximately threefold during the survey period. This income loss has translated into worsening living standards as 41.6 per cent reported not being able to meet their basic household needs.

Job losses were more prevalent among women (36 per cent women vs. 32 per cent men). Females earning low incomes were the most affected, with 62 per cent reporting job losses compared to 38 per cent of men. More than a third (38 per cent) of laid-off workers were employed in the tourism, accommodation and food services industry; 14 per cent were employed in the wholesale and retail trade sector; and 13 per cent were employed in construction. Business and office closures were the most commonly reported reasons for job losses, followed by the inability to get to work. Another 10.9 per cent of the population was laid off while business continued.

In April 2020, the Barbados Employers' Confederation surveyed 121 enterprises to assess needs and identify key challenges faced by businesses in Barbados in the context of COVID-19.[23] The surveyed enterprises worked in 19 different sectors, including retail (20 per cent), finance and insurance (16 per cent), health care/personal care (14 per cent), tourism and hotels (11 per cent); only 2 per cent were in agriculture and fisheries. Around 38 per cent of the surveyed enterprises had stopped their activities and 65 per cent reported having laid off or planning to lay off workers. Around 69 per cent reported inadequate cash flow and low demand, 37 per cent reported the absence of workers because of the restrictions, 36 per cent because of business partners affected and 29 per cent could not get input supplies. Surprisingly, many enterprises reported being able to restart their activities within 7 days (37 per cent), 30 days (28 per cent) and 90 days (20 per cent), with only 3 per cent considering closing temporarily or permanently.

3.2 Impacts and implications of COVID-19 on the ocean economy and trade strategy in Barbados

3.2.1 Impact and implications of COVID-19 for marine fisheries

Fishing, fish processing and marketing were initially categorized as non-essential businesses, bringing the activity to a halt for over a month. Although the national emergency extended to 30 June 2020 during the first wave of infections, the authorities allowed fish markets to re-open on 15 April 2020, with customers allowed to do business on specific days and times of the week based on the first letter of their surname. However, fishers, especially those undertaking short fishing trips (less than 5 days), needed assurance that landing sites, port, administration services and fish markets were open so that they could land and sell their harvest.

[22] https://www.imf.org/en/Countries/BRB.

[23] https://www.ilo.org/caribbean/public-information/WCMS_756559/lang--en/index.htm.

During the recent lockdown (3 to 28 February 2021) the authorities closed fish markets, fish landing sites and sheds, and government run locations that supply or trade in fish. They advised that fishing vessels should stay in port during the lockdown period, although the COVID-19 directive does not prevent fishers from taking their boats out to sea. Fishers were advised to carefully examine the circumstances so as to find markets open when they returned from fishing.[24]

Overall, since the beginning of the pandemic, fishing and post-harvest activities were reduced because of the successive lockdowns requiring:

- confinement, and restriction on mobility and travel
- closure of fish markets and shops
- a reduced workforce to carry out fishing and processing operations.

In fact, the desk review indicates that during the first months of the pandemic, fishing, processing and fish sales were brought to a standstill. As the country tackled the urgent health, social and economic impacts of the pandemic, fishing resumed gradually, only to be confronted with a disruption in the supply of inputs, credit, repair and maintenance of fishing boats, engines and gear, processing and labour shortages. This was further complicated by new lockdowns that were imposed to deal with a surge in the pandemic early January 2021.

Barbados is a net fish importing country. Restrictions on the activities of the port and the closure of fishing in neighbouring and other countries that export fish to Barbados have disturbed the supply of fish to the country. Although data were not available at the time of this study, it is likely that the impact was limited because most of the resorts, restaurants and hotels that use imported fish to cater to tourists were closed. The major concerns were around the ability of local fishers to land and sell their catch when returning from fishing.

As was the case in many other Caribbean islands, lockdown measures reduced the mobility and resources of the management and enforcement personnel from the MMABE and the other institutions to discharge their respective duties. As national funds were prioritized for unemployment relief and recovery of the economy, less funds were available to effectively conduct surveys and MCS activities and this may have encouraged irresponsible and illegal behaviour. It is likely that this has had a limited effect in Barbados where online administration performed effectively, and the institutions concerned adapted quickly to the restriction measures and requirements.

To make matters worse, the volcano la Soufriere, which had been dormant since 1979, erupted in the neighbouring island state of Saint Vincent and the Grenadines, on 9 April 2021, with several smaller eruptions and tremors occurring over the following days, causing power cuts, disrupting water supplies and covering the island with white ash.[25] Although Barbados is 190 kilometres to the east of the centre of eruption, strong winds carried ash all the way to Bridgetown. People were urged to stay indoors and told to avoid breathing in the ash. Officers from the MMABE were requested to assist as Barbados deployed a contingent to support the humanitarian assistance and disaster response mission to Saint Vincent and the Grenadines. Experts feared that the explosive eruptions of the Volcano could continue for up to a year.[26]

3.2.2 Impact and implications for other ocean economy sectors

Barbados relies heavily on tourism, and in particular coastal and marine tourism, for foreign exchange earnings. Visitors come mainly from the United Kingdom (33 per cent), the United States (31 per cent) and Canada (11.8 per cent). Tourists also visit the country from other European, Caribbean or Asian nations. In 2019, tourism accounted for almost 40 per cent of economic activity and 33.4 per cent of employment in Barbados. The accommodation and food services sector

[24] https://www.nationnews.com/2021/02/18/ag-clears-air-fishing-national-pause/.

[25] https://weather.com/photos/news/2021-04-12-st-vincent-volcano-photos.

[26] https://www.bbc.com/news/world-latin-america-56713564.

accounted for approximately 17 per cent of economic activity and 13 per cent of total employment (IDB, 2021).

The severe reduction of tourism and its spillover effects on other sectors of the domestic economy significantly widened the public deficit to 5.1 per cent of GDP in the first three quarters of 2020 (ECLAC 2021). Tourism came to a standstill between March and July 2020, with a 66 per cent decrease during the first nine months of 2020 compared to 2019. Overall, stay-over arrivals and cruise passenger arrivals declined by 71 and 64 per cent, respectively in 2020.

Women constitute around 62 per cent of employment in tourism and related hospitality sectors and occupy lower paid jobs (68 per cent of men's wages). They represent a large proportion (85 per cent) of vulnerable workers and 55 per cent of workers below the poverty level in tourism. They were the group most impacted by the shutdown of the tourism sector (Alleyne, 2021).

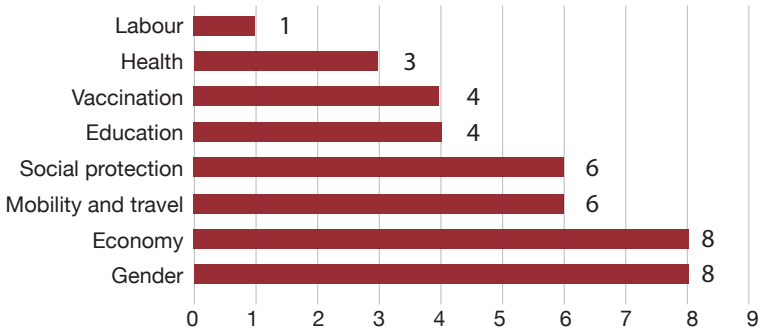
Flights resumed in mid-July 2020 and the authorities launched the 12-month welcome stamp. This programme builds on the concept of the "digital nomad" and seeks to promote Barbados as an oasis for foreigners able to work remotely, offering tax-free stays for 12 months or longer for workers and businesses.[27] Barbados leverages its political stability, well-developed tourism infrastructure and fast fibre-optic Internet and mobile services to attract digital nomads.

3.3 Measures adopted to mitigate the impact of COVID-19 on the ocean economy of Barbados

Following the declaration of a public health emergency in Barbados, the authorities issued the Covid-19 Emergency Management Order 2020, which set out the general legal framework for the government's response to Covid-19. Subsequently, Covid-19 emergency management curfew directives have been issued. They provide detailed instructions on the implementation of the Order, including the restrictions on the movement of people and business operations.[28]

Non-essential services were ordered to close. Essential businesses and services remained open but were subject to restrictions on opening hours. Physical distancing rules were introduced, and a general stay-at-home order was instituted. In parallel, the government channelled support to the population and companies through its social protection programmes and expanded the range of benefits available. According to the ECLAC observatory which tracks the public policies adopted by LAC countries, Barbados had adopted and deployed 40 measures by 22 March 2021 (Figure 4). Time wise, priority was given to controlling the pandemic and the virus' circulation, addressing health impacts alongside social protection and economic recovery. This was necessary to cater for the needs of the large number of people who lost jobs and income, as tourism and related sectors were closed for months.

Figure 4. Types and numbers of policies adopted by Barbados to address COVID-19



Source: Elaborated by the author based on ECLAC data. See https://www.cepal.org/en/topics/covid-19.

[27] Twelve-month Barbados welcome stamp for visitors. See https://gisbarbados.gov.bb/blog/twelve-month-barbados-welcome-stamp-for-visitors/.

[28] https://gisbarbados.gov.bb/download/official-gazette-june-7-2021-part-a-no-67/.

Barbados has a broad social protection system in place, delivered by the National Insurance Scheme (NIS) or directly by the government to cover public service pensions and a broad range of social assistance programmes. These are primarily managed through the welfare department and the national assistance board. The support was structured into:

- The Unemployment Benefit Fund, to provide support for six months to those who were laid off or on short working weeks who received 60 per cent of their salary for the days not worked.
- The Household Survival Program which included an Adopt-a-Family programme and welfare support of up to BB$ 10 million each. The Adopt-a-Family programme aimed to raise funds by combining contributions from the public with the government allocation of BB$ 10 million in an effort to assist 1,500 vulnerable families and provide welfare support to households with no employed individuals during the pandemic, and no benefits from the other programmes.
- The Business Cessation Benefit of BB$ 20 million offered a one-time benefit for the months of April and May 2020 of BB$ 1,500 per month, to self-employed people negatively impacted by the pandemic and who were registered and compliant with the NIS.

These social programmes have been useful and benefited many households in 2020. The telephone survey described before revealed that these social programmes assisted 24 per cent, 13 per cent and 17 per cent of low, high and middle-income households, respectively. The broad social protection system and support mechanisms in place in Barbados have likely shielded the most vulnerable during the pandemic.

3.3.1 Measures adopted to address the impact of COVID-19 on fisheries and aquaculture

During this review and desk study, it was not possible to assess fully the extent to which the marine fisheries sector and its post-harvest activities benefited from these measures in Barbados. It is likely that many fishers and workers in the marine fisheries value chain, who qualified for any of the above-described programmes, were able to enrol and benefit. A MMABE compensation of BB$ 250 per week for fishers unable to go to sea, was reported by local media.[29] The situation of fisheries value chain companies is not clear. Online consultations organized in April and May 2020 by UNCTAD/DOALOS[30] were informed that fisheries were not included in the stimulus package to companies, which targeted mostly tourism and related activities.

Likewise, agriculture and fisheries companies accounted for only 2 per cent of those included in the above-mentioned Barbados Employers' Confederation survey. Therefore, measures enacted in response to COVID-19 may have had a marginal impact on companies in the fisheries value chain, at least at the beginning of the pandemic. Recently, local media reported on the possibility offered by the MMABE for these companies to be partially compensated for lost revenue through the financial assistance for small businesses offered by the Department of Commerce and Consumer Affairs in the Ministry of Energy, Small Business and Entrepreneurship.[31]

On the positive side, the pandemic provided an opportunity to address urgent infrastructure and processing issues. The MMABE introduced important overhauls of marine fisheries in the context of the country's blue economy strategy, such as a programme to renovate the country's fish markets by improving infrastructure and access to ice, solar panels, services for boats, engines, gears, and to implement measures to meet international sanitary requirements for fish and seafood.[32] Some

[29] Fisheries ministry 'working to restart industry by March 1' – Barbados Today. See https://barbadostoday.bb/2021/02/23/fisheries-ministry-working-to-restart-industry-by-march-1/.

[30] https://unctad.org/es/node/26953.

[31] Fisheries ministry 'working to restart industry by March 1' – Barbados Today. See https://barbadostoday.bb/2021/02/23/fisheries-ministry-working-to-restart-industry-by-march-1/.

[32] Fisheries undergoing major overhaul. See https://barbados.loopnews.com/content/fisheries-undergoing-major-overhaul.

20 fish aggregation devices have been deployed around the country's maritime jurisdiction to create opportunities for the fish to gather in particular marine spaces. This should increase fishing productivity, decrease costs and improve MCS.

Likewise, the key findings and recommendations of the UNCTAD/DOALOS OETS project to improve the longline pelagic fishery value chain by adding value to yellowfin tuna by processing it into loins, have served as the basis for a project launched in November 2020.[33] The OETS feasibility study (UNCTAD/DOALOS/FAO, 2021) concluded that the large pelagic fishery of Barbados offers great potential for transitioning the tuna fishery to a fresh loin product that uses sustainability criteria and traceability to improve market access and tuna sales prices, while ensuring increased compliance with sustainable fisheries management. An implementation plan looked at ways, means and costing to improve electronic data collection, MCS and compliance with sanitary requirements and the ICCAT management measures (UNCTAD, 2020b).

To discharge their duties under COVID-19 mobility restrictions, officers of the MMABE and other collaborating institutions adopted teleworking, virtual meetings and online capabilities, as well as electronic submission of documents for e.g., registration, applications for fishing licenses, fish sale and landing declarations, etc. For operations that required face to face meetings, advanced appointments were planned via the Internet and meetings took place in full respect of sanitary measures. Information exchange, awareness raising, training, consultative and other joint decision-making processes were conducted virtually.

Given the high quality of connectivity in Barbados, several sectors have adapted quickly to e-commerce platforms. This does not seem to be the case for fish and seafood companies, likely because of the short distribution chain in a small island, where people purchase mostly fresh fish. A platform was launched for fishers and farmers to market, sell and arrange delivery of their produce by connecting to buyers online.[34] A good example is the not-for-profit organization, Farmfinder which aims to build the capacity of fishers and farmers to offer goods more efficiently and safely to consumers. This will include publicly available training, such as webinars on how to pivot business operations using digital tools, and quality control through the implementation of a traceability and sustainability stamp feature.

3.3.2 Measures to address the impact of COVID-19 on other ocean economy sectors

Tourism and related sectors have been prioritized by government policies and stimulus packages. Barbados has opened its borders to visitors since 1 July 2020, adopting measures to facilitate travel and entry formalities, while providing assurances about the safety and security of tourists. These include requirements for COVID-19 testing, quarantine and strict sanitary protocols in hotels and restaurants. It has also promoted the concept of the digital nomad by launching the 12-month welcome stamp to attract people who want to work remotely from Barbados, offering tax-free stays for 12 months or longer for workers and businesses.[35]

To support the tourism sector, the government of Barbados passed a BB$ 300 million stimulus package in September 2020, called the Barbados Employment and Sustainable Transformation (BEST) programme. This is the country's largest fiscal stimulus package aimed at safeguarding jobs in the tourism sector, minimizing bankruptcies and strengthening the competitiveness of the sector until normality returns. The programme also provides financing for green initiatives, digitization of processes and systems for lower cost and improved service, and investment in local suppliers. The three main features of the BEST program are:

[33] https://gisbarbados.gov.bb/blog/effort-on-to-improve-barbados-tuna-industry/.

[34] https://www.bb.undp.org/content/barbados/en/home/presscenter/pressreleases/20191/fisherfolk-and-farmers-going-digital-.html.

[35] Twelve-month Barbados welcome stamp for visitors. See https://gisbarbados.gov.bb/blog/twelve-month-barbados-welcome-stamp-for-visitors/.

- The government will make an investment in qualified tourism firms to enable them to re-engage all of their workers on 80 per cent of their normal salary for up to two years, should the need arise.
- A commitment to greening tourism through water conservation and water harvesting measures, and the installation of renewable energy capacity to reduce reliance on fossil fuels.
- A requirement to review all processes, payments and systems to ensure their suitability in today's world and, where necessary, to undertake their digitization.

A gradual recovery in tourism, however, depends highly on the willingness of tourists to travel to Barbados. This depends on positive developments in the health crisis in the United States, the United Kingdom and Canada, the main source countries for tourism in Barbados. It also depends on the success of the vaccination roll-out in Barbados. As of 18 June 2021, 146,850 vaccine doses have been administered in Barbados. A total of 67,200 vaccine doses, out of a total of 100,800, were received in two batches from the COVID-19 Vaccines Global Access (COVAX) initiative, which is working for global equitable access to COVID-19 vaccinations (WHO, 2021).

4. Challenges and opportunities for sustainable ocean economy and trade in Barbados

As the vaccination programme is progressing satisfactorily, planning by Barbados for the short- and long-term future takes into consideration the impact of the measures implemented, the lessons learned, and the obstacles encountered. These have revealed, more than ever before, the key importance of sustainability issues for the ocean economy and the strong interlinkages between its sectors. Barbados recognizes the necessity and the opportunity to address, in a coherent and integrated manner under the auspices of the MMABE, the marine environment, the sustainable use of its resources and the conservation of its dependent marine ecosystems.

There is optimism for tourism to start during the second half of 2021, as the main countries of origin of visitors are rapidly rolling out their vaccination programmes and their economies are recovering. These countries have also allocated significant compensation and stimulus funds. Their citizens have disposable income to spend, including for travelling abroad. Potentially, there could be a positive geographic advantage for Barbados as adventurous long-haul travellers may prefer to travel to countries closer to home. It is expected that as tourism picks up in Barbados, benefits will trickle down to related sectors, restoring the demand for fish and seafood from the hospitality sector, Barbadians themselves and the export market.

4.1 Challenges and opportunities for marine fisheries in Barbados

Previous studies by FAO (2020c), UNCTAD (2019a, 2020b) and Roberts et al. (2020), among others, have identified key challenges to OETS, and ways and means to address them. These studies were an important source of information for setting up priorities at the time the MMABE was deploying measures to mitigate the impacts of COVID-19 on OETS and adapt to the crisis. Renovation of landing sites and fish markets are important endeavours to improve quality and safety, reduce post-harvest losses and improve the use of solar energy. Processing tuna into loins can create value in Barbados, as well as local employment along the tuna value chain.

Nevertheless, overfishing remains a major challenge that has caused a continuous decline in landings over the years. This is exacerbated by insufficient knowledge of the state of the resources and their biological behaviour. Such knowledge is required to balance fishing effort and capacity with the ability of the stocks to reproduce sustainably. As Barbados is considering a reform of the fisheries' legal framework, target species diversification efforts and modern fisheries management based on the best available science, should be at the centre of the reform (UNCTAD, 2020b). Transparent and effective consultation with stakeholders should enable effective implementation

of co-management schemes that can transform fishers from passive users of the resources into active and responsible stewards of the sea and its living ecosystems. This would also open opportunities for coastal communities to assist with data collection and assume citizen scientist responsibilities.

4.2 Challenges and opportunities for other ocean economy areas

Coastal and marine tourism has been and is likely to remain a main pilaster of the economy of Barbados. However, experts advise tourism-dependent small States like Barbados to take a fresh look at the approach that has prevailed so far (Commonwealth Secretariat, 2021). They predict that international, long-haul travel is likely to recover slowly and, although national and regional tourism are unlikely to replace international tourism, their promotion can pave the way for diversification and provide a launch pad from which to prepare and showcase the state of preparedness of Barbados to safely receive international tourists and cater to their recreational, cultural, nature watching, marine sports and entertainment needs. A digital transformation to develop connectivity and virtual promotional campaigns can help promote the unique opportunities Barbados offers in coastal and marine tourism.

Many SIDS are exploring innovative approaches to diversify and invest in long-term tourism. Barbados has pioneered the 12-months welcome stamp in the Caribbean. Other opportunities exist in educational tourism (e.g., George University accounts for 20 per cent of the GDP of Grenada), medical tourism, business relocation, cultural and heritage tourism and digital nomads. [36]

In February 2021, on the occasion of the Fifth session of the United Nations Environmental Assembly, which addressed the environmental dimension of sustainable development for building a resilient and inclusive post-pandemic world,[37] Barbados re-affirmed its commitments towards a 2030 target of a fossil free economy, and the transformation of the waste management system. It informed the session about the national climate resilience and ecosystems restoration framework initiative, including the national clean and green programme, the Roof-to-Reef project, and the prominence given to greening the tourism sector through water conservation, the installation of renewable energy capacity and marine conservation.

4.3 Conclusions and recommendations

The pandemic has highlighted the vulnerability to international shocks of tourism-dependent SIDS like Barbados, that are also highly dependent on imports for major commodities. On the other hand, several domestic value chains in Barbados showed resilience and good potential for the post-COVID-19 recovery, particularly in agriculture, fisheries and the retail and catering sectors. The latter adapted quickly, offering delivery services and local food and fish in lieu of imported products.

Under the umbrella of the MMABE, implementation of a blue economy national plan, within the broader national framework for economic development, has never been as relevant as it is now. Ways and means for integrating it in a coherent manner with the national green economy development framework, a low carbon economy, a circular economy, sustainable consumption and production, and the Roof-to-Reef project, have been recently explored (Roberts et al., 2020).

Building on the achievements of the UNCTAD/DOALOS OETS project, the proposed blue economy plan can be aligned to serve as a basis for discussion with stakeholders in the coastal and marine communities and other related sectors, including at the regional level. The plan should be framed to embrace the commitments of Barbados to the 2030 Agenda, its ocean economy and related SDGs. From the perspective of a post-COVID-19 transition and recovery, the ocean economy sectors in Barbados may be considered in relation to their development trajectories and stages, including:

[36] https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2021/05/NURSE_Presentation.pdf.

[37] https://www.unep.org/environmentassembly/outcomes-online-session-unea-5.

- Mature sectors such as coastal and marine tourism, port services and shipping, and fisheries subject to proper management. The recovery and development of these sectors require consolidation of their competitiveness by investing in technologies, conservation, sustainable practices, innovations and digitization.
- Growth-stage sectors such as marine eco-tourism and certain fisheries value chains for which infrastructure exists but requires embracing best practices, investment and innovation.
- Pre-development stage and promising sectors that need further research and development, incubation, investment and infrastructure, building on experiences in other SIDS and Caribbean countries. These include marine aquaculture of seaweeds, bivalve molluscs, shrimp, corals or sea urchins, biotechnology and bioprospecting of molecules and products used in the pharmaceutical, food and cosmetic industries.

The proposed blue economy plan has identified key pillars, some of which are relevant to OETS and aligned with the blue economy approach promoted by UNCTAD and deployed during the UNCTAD/DOALOS project for longline fisheries and tuna processing (UNCTAD, 2020b). These are presented in Table 3, as included in the MMABE strategic goals and work plan for the period 2020 to 2021 (Roberts et al., 2020). The plan aims to achieve greater protection of the marine environment and its resources, strengthened coordination across sectors in the application of management and conservation measures and in the use of surveillance and enforcement tools. It also aims to generate new research, innovation and knowledge of the marine environment and ecosystems and support science-based policies and decision-making.

Table 3. Promising blue economy sectors in Barbados

Ocean economy sector	Subsectors	Stage of development
Tourism and marine sports	Coastal tourism	Mature
	Aquatic sport tourism	Growth
	Cruise tourism	Mature
Sustainable use of living marine resources	Fisheries	Mature/growth
	Marine aquaculture	Pre-development
	Biotechnology/bioprospecting	Pre-development
Port services	Port services	Mature
	Maritime shipping	Mature
Marine conservation and ecosystem services	Marine conservation	Growth
	Ecosystems services (carbon sinking, coastal protection)	Pre-development

Source: Roberts et al. (2020).

Born out of necessity, teleworking, virtual meetings and remote learning have proved to be very useful, feasible, adaptable and cost-effective. Their adoption by the government and private sector was accelerated in Barbados during the COVID-19 pandemic. The quality of digital connectivity available to OETS operators will influence their ability and future opportunities in domestic and international markets. The reliability of communications networks, the existence of online platforms and services, and digital literacy are equally important. Policies should be designed to break barriers, ensure cybersecurity, address the adverse effects of the digital divide, not least for coastal communities and low-income households.

Insufficient scientific research in the marine environment is recognized as an impediment for improved governance and management of the ocean resources and related economy (FAO, 2020a). In this regard, the MMABE should consider assessing its capacity and digital infrastructure to enable the use of innovative techniques for scientific research. Electronic monitoring programmes can complement, replace or expand observer programmes that collect data on resources, enforce

laws on MCS and protecting habitats, ecosystems and endangered species. Likewise, satellite-generated data and the use of drones have proved to be useful for coast guards, especially where sea patrols are not deployed. It can be timely and cost-effective to mobilize coastal communities around initiatives for the co-management of marine living resources. This can be accelerated by providing incentives to promote investment in technologies that can support remote marine science, data collection and observation and enable transparent consultations.

The SDGs encompass almost every aspect of the well-being of nature and people. Activities to achieve the SDGs and recover from COVID-19 should be intertwined and addressed in a complementary manner by adopting coherent and integrated solutions.[38] The pandemic has demonstrated the value of preparedness to protect and build resilience against health and other natural or human-induced disasters, ensuring actions are evenly distributed across demographics, communities and economic sectors.

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[38] https://feature.undp.org/covid-19-and-the-sdgs/.

III. Case study 2: Belize

1. Introduction

Located on the northeast coast of Central America, Belize is surrounded by the Caribbean Sea to the east, Mexico to the North and Guatemala to the west and south. It is the only English speaking country in Central America and the country's institutions and official language reflect its history as a British colony. Even so, the culture of Belize is more typical of that of other Central American countries. Its small population is ethnically diverse and includes a large proportion of immigrants. Independent since 1981, Belize has a stable and democratic political system. Its economy relies primarily on tourism and exports of marine and agricultural products. To varying degrees, these export-based sectors employ seasonal labour, including migrants from neighbouring countries. Despite its status as a middle-income developing country, with a GDP per capita in 2019 estimated at $4,480, there are important income disparities in Belize. The national unemployment rate masks substantial age and gender differences, with unemployment among youth and women being more than three times the national average.

2. Overview of the ocean economy of Belize

2.1 Overview of marine fisheries and aquaculture in Belize

The coastline of Belize is 386 km long. It borders the second largest barrier reef in the world, the Mesoamerican Reef System, and has an EEZ of 34,426 km^2, a network of creeks and lagoons, small cay and mangrove islands. These geographical features provide very good habitats for marine life and fishing.

Fisheries in Belize comprise a small coastal or artisanal fishery and a larger, high seas fishery exploited by foreign fishing vessels. Belize is an "open registry" State and authorizes foreign fishing vessels to fly its flag and operate on the high seas under the 1995 FAO Compliance Agreement. In 2019, there were 60 foreign fishing vessels flying the flag of Belize (UNCTAD, 2019b, 2020c).

According to FAO statistics, total marine fish production was estimated to be 214,203 tons in 2019, including 500 tons from marine aquaculture. The catch of the foreign fleet decreased from over 350,000 tons 15 years ago to 207,000 tons in 2019.

This study addresses only the coastal fisheries and aquaculture. There is no regular and systematic research to assess the status and potential of major fisheries resources in Belize, except for the spiny lobster and queen conch fisheries. The stocks of both species are surveyed every two years by the Belize Fisheries Department (BFD) and are considered stable and not overexploited. Other finfish species exploited commercially include groupers, snappers, hogfish, king mackerel and barracuda. The BFD has initiated plans for piloting a finfish landing assessment and a management plan with the support of the UNCTAD/DOALOS OETS project and the Environmental Defense Fund.

Marine fisheries and aquaculture play an important role in the social and economic development of Belizean coastal communities (Table 4). In 2019, fish production was estimated to be 6,251 tons harvested by 2,550 fishers using 594 fishing boats (FAO, 2021c). Over 15,000 Belizeans (4 per cent of the population) worked directly or indirectly along the fisheries and aquaculture value chain.

Fish consumption in Belize has decreased steadily over the years, from 16.1 kg per capita in 2000 to around 13.8 kg per capita in 2016. Belizeans consume mainly fresh marine fish, whereas most lobster and queen conch production is exported. In contrast to neighbouring countries, only a few women sell fish in Belize (BFD).

Table 4. Key indicators of coastal fisheries and aquaculture in Belize

		2000	2005	2010	2015	2016	2017	2018	2019
Total fish production (tons)		9,662	15,024	11,463	7,503	4,888	4,663	7,289	6,811
Employment (persons)		3,800	3,230	3,210	3,210	2,751	2,710	2,710	2,550
Consumption (kg/capita)		16.1	14.1	15.3	14.8	13.8	n.a	n.a	n.a
Export of fish and seafood	**tons**	2,663	9,595	7,097	11,107	3,772	3,237	3,140	n.a
	thousand $	32,284	43,023	31,334	44,637	21,634	20,432	21,539	n.a
Import of fish and seafood	**tons**	1,761	2,685	676	664	871	537	665	n.a
	thousand $	3,313	2,589	1,214	934	952	671	905	n.a

Source: FAO-FishstatJ, 2021.

Fishers use mainly motorized skiffs (88 per cent), sailboats (11 per cent) and a few dories and canoes. Skiff vessels use longlines to catch large pelagic fish and sharks, or handlines for deep slope fishing of snappers, jacks, groupers or grunts. A fishing trip takes 5 to 6 days. Fishing is carried out during the day, with fishers camping at night on islands along the barrier reef. The harvest is landed at designated landing sites for cooperatives or fishing companies to sell the catch.

The fishing seasons are from June to February of the following year for spiny lobster and from October to July of the following year for queen conch. This provides fishers with the opportunity to fish one of the two species throughout the year. Queen conch is harvested by free diving to collect individuals on the seafloor in relatively shallow waters (2 to 10 m). Spiny lobster is harvested by free-diving and using a hooked stick. Other fishers use traps placed in shallow areas to lure lobsters into the trap, or a shade (*casita*) to lure the fish into the shaded area, where they are picked using a hooked stick, snare, or net bag.

Aquaculture has been practiced in Belize since 1982. The industry has developed steadily and was firmly established by 2005, with investment in large-scale tilapia, marine shrimp farming and marine cage culture of cobia, although the latter ceased in 2011 because of the destruction of the farm infrastructure by a hurricane. Shrimp culture, which reached 11,000 tons in 2004, had distinguished itself by achieving international sustainability and environmental certification of eight Belizean shrimp farms in 2015, making Belize the first country with 90 per cent of shrimp production certified to sustainability and social responsibility standards. Unfortunately, the industry was decimated by an outbreak of the early mortality syndrome disease in 2014, reducing production and exports to below 1,000 tons in 2016 (Daly and Fernandez-Stark, 2018). At present, very few farms are in operation and produce 500 tons per year at most. Likewise, tilapia is currently a family-scale business producing 60 tons per year. Farming of seaweed has been recently introduced by the Nature Conservancy in collaboration with the private sector and BFD.[39]

In Belize, fish processing is carried out by two companies and four cooperatives. Each cooperative or company has its own landing stations and processing plants, where workers wash, clean and dress the seafood before packing, freezing and storing for export. Cooperative and company managers are responsible for compliance with sanitary and hygiene requirements.

Post-harvest operations comply with specific regulations and requirements under the 2020 Fisheries Resources Act and other regulations relevant to industry, trade and commerce. These requirements address the registration of businesses, implementation of sanitary and CITES requirements, labelling and traceability. BFD, the Agriculture Health Authority and the Bureau of Standards are responsible for the enforcement of post-harvest and trade-related measures.

Exports have increased since 2000, reaching a maximum of 11,107 tons in 2015, valued at $44.607 million (Table 4). The main export products are spiny lobster and queen conch (UNCTAD,

[39] How seaweed farming is uplifting women and communities in Belize. See https://thefishsite.com/articles/how-seaweed-farming-is-uplifting-women-and-communities-in-belize.

2020c). A steep decrease in exports in 2016 was caused by the significant decrease in shrimp aquaculture, coupled with a quota reduction for queen conch. Since then, export has stabilized at between 3,100 and 3,300 tons valued at $21.54 million in 2018. Most fish and seafood exports are destined for the United States which accounted for 73 per cent in volume in 2018, consisting of 88 per cent lobster and queen conch. Other markets include France, United Arab Emirates, Mexico, Spain, Australia, Guatemala and Jamaica (FAO, 2021c).

In 2018, Belize imported around 560 tons of fish and seafood, in the form of fresh, frozen or preserved fish such as canned and cured fish for local consumption. Some of this seafood is imported for tourist resorts, restaurants and hotels.

2.2 Overview of the governance and management of fisheries and aquaculture in Belize

Belize has been regularly praised for effective management and conservation of marine living resources. Its experience has been studied and shared with Caribbean and other developing countries exploiting similar resources and facing similar challenges (UNCTAD, 2019b; 2020c). Coastal fisheries and the selected value chains addressed by the OETS project are the responsibility of the BFD of the Ministry of Agriculture, Fisheries, Forestry, the Environment and Sustainable Development (Figure 5).[40]

After more than 10 years of wide consultation, the Fisheries Resources Act No. 7 was adopted in January 2020. The Act lays down rules for:

- Long-term conservation to protect the marine environment, preserve biodiversity and ecosystems, by setting forth provisions on the declaration of fishing areas and marine and inland water reserves.
- Management and sustainable use of fisheries resources to prevent overfishing, establish effective data collection systems and strengthen governance and effective enforcement. It also sets a wide range of provisions on:
  - the determination of total allowable catch
  - the development of fisheries management plans
  - the prohibited fishing gear and methods
  - the port State measures to fight IUU fishing
  - the designation of fishing priority areas
  - the terms and conditions of fishing licenses for foreign and local fishers
  - MCS in the ports of Belize and the powers of fisheries officers
  - regional cooperation, fisheries access agreements and licensing of foreign vessels
  - improvement of the welfare and livelihoods of fishers and fishing communities.

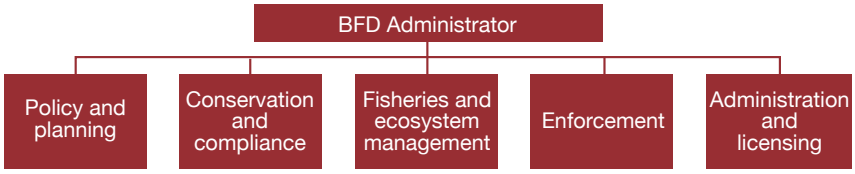


Figure 5. The Department of Fisheries in Belize

Source: Author's own elaboration.

The BFD conservation and compliance unit is responsible for enforcing fisheries regulations by patrolling Belizean inland and marine waters and establishments such as restaurants, to enforce

[40] http://fisheries.gov.bz/.

compliance and adherence to the rules and regulations, and making arrests and prosecuting offenders. These tasks are conducted in collaboration with enforcement institutions such as the Police, Coast Guard and Customs Department. A key challenge for BFD is the limited human and financial resources that are required to discharge its duties effectively.

The Fisheries Resources Act No. 7 of 2020, establishes a Fisheries Council, an advisory body responsible for the conservation, management, and development of fisheries (Figure 6).

Conservation of marine life and habitats has a long tradition in Belize, which committed early on to protect its important marine biodiversity and habitats through international instruments such as UNCLOS, the CBD and the Ramsar Convention. The 2020 Fisheries Resources Act reinforces the establishment of MPAs and marine reserves in support of fisheries and aquaculture management. MPAs cover 21.6 per cent of the territorial seas of Belize and 10.1 per cent of its EEZ (UNCTAD, 2019b). Nine MPAs are directly managed or co-managed by the BFD. They were enacted as fisheries management tools and are multi-use with 80 per cent reserved for general use, 15 per cent for conservation and 5 per cent for preservation.

Belize is party to several international agreements and participates in various regional and international organizations related to the management and conservation of marine living resources. These include the Central American Fisheries and Aquaculture Organization (OSPESCA), the CRFM, the Latin American Organization for Fisheries Development (OLDEPESCA), WECAFC and the Caribbean Community Common Fisheries Policy.

Figure 6. The Fisheries Council of Belize (Fisheries Resources Act No. 7, 2020)

Source: Elaborated by the author based on the Fisheries Resources Act No. 7, 2020.[41]

The participation of Belize in the activities of these organizations indicates a strong and active international presence where sharing of information and the transfer of knowledge and best practices take place. Through continued collaboration and knowledge transfer, pathways to develop the fisheries and seafood processing sectors in Belize might be identified.

2.3 Overview of other related ocean economy sectors

The ocean economy sectors relevant to the activities and selected value chains of the OETS project are coastal and marine tourism, related coastal hospitality businesses and, to a lesser extent, maritime transport. Tourism represents 20 to 25 per cent of the country's GDP, at a value estimated to be $409 million in 2017. Owing to the important linkages between tourism and the remainder of the economy, the overall impact is believed to be much bigger at $700 million or 40 per cent of GDP (UNCTAD, 2019b). Seaside destinations concentrate over half of the tourists to Belize, and are home to 35 per cent of the country's tour operators. Half of the beds available in hotels and resorts are located in the top beach locations of Belize. In 2016, three quarters of the accommodation and food services sector were located in coastal regions (UNCTAD, 2019b).

[41] http://www.fao.org/faolex/results/details/en/c/LEX-FAOC197105.

Tourism employed close to 21,000 Belizeans in 2017, corresponding to 13 per cent of the national workforce. Overall, it is estimated that the sector and related activities create over 90,000 jobs – equal to 45 per cent of national employment – and employ more women than other sectors of the economy. In 2018, 46 per cent of employees in the Belizean tourism sector were female, ten per cent more than in other sectors (UNCTAD, 2019b).

Some 69 per cent of tourists come from the Unites States, followed by Europe (12 per cent) and Central America (7 per cent). In 2017, the most popular tourist attractions in the country were the Belize Barrier Reef, MPAs and offshore islands. The most popular coastal activities were snorkelling, fishing, diving and sailing. Other recreational activities are possibly untapped.[42]

The two main ports that handle maritime transportation and shipping in Belize are the Belize City and Big Creek ports. They are privately run to transport most traded goods, with Big Creek handling most exports of agricultural and food products, and the Port of Belize City handling most imports, particularly those from the United States. As the government has clearly adopted a strong marine conservation policy, the existence of the coral barrier reef and other natural physical assets, limits the expansion of port infrastructure and operations.[43]

3. Impact and implications of COVID-19 on the ocean economy of Belize and measures adopted

Following the detection of the first case of COVID-19 infection in Belize on 20 March 2020, the government adopted the measures recommended by WHO to prevent the entry and spread of the virus and the disease in the country. Like most countries, it declared a state of emergency, closed borders and schools, monitored the spread of the virus by testing, tracing and isolating positive cases, confined citizens to their homes and shut down most economic and social activities, except for the essential activities required to supply food, energy, water, medicines and other basic services.

Following the successful containment of the first wave of the pandemic, Belize experienced a domestic outbreak during the summer of 2020, which impacted the country severely. Since then, the evolution of the pandemic has been carefully monitored, with restrictions imposed as and where needed. Although the country opened for tourism on 1 October 2020, under a strict safety protocol for tourism sites, facilities, workers and visitors, COVID-19-related restrictions for Belizeans remained largely unchanged as of 24 April 2021. These included a nightly curfew, businesses and recreational facilities operating at reduced capacity, schools and ports of entry closed and people working from home whenever possible. As of 18 August 2021, 15,010 infections and 344 COVID-19 related deaths were reported in the country.[44]

Much has been published on the impact of COVID-19 and its long-term consequences in Belize. Unfortunately, most of the information and knowledge provided is at the macro level. Although some useful information on agriculture has been published, less information about marine fisheries and aquaculture has been produced. Research conducted under the OETS project and through this study, indicates that the sector generally lacks national surveys and studies by national economic and statistical services, with the exception of targeted surveys conducted by the BFD. The sector deserves to be addressed, not only through targeted studies or as an addendum to studies of agriculture. It should be made visible by including it in the national mechanisms that regularly survey, monitor and report on the social, cultural and economic trends in Belize.[45]

[42] https://fishingbooker.com/blog/belize-fishing/.

[43] https://publications.iadb.org/publications/english/document/Transport-Sector-in-Belize.pdf.

[44] https://www.imf.org/en/News/Articles/2021/03/12/mcs031221-belize-staff-concluding-statement-of-the-2020-article-iv-mission.

[45] https://covid19.who.int/region/amro/country/bz.

3.1 Impact and implications of COVID-19 on the social and economic activities in Belize

The impact of COVID-19 has been detrimental to the economy and society of Belize. The pandemic has caused the largest contraction in the economy of Belize in recent decades, owing to substantial declines in tourism, manufacturing and retail and agriculture. Tourism and related economic sectors, which account for around 60 per cent of foreign exchange earnings and 40 per cent of GDP, have been hardest hit, with a 75 per cent fall in visitor numbers in 2020 compared to 2019. Social distancing and lockdowns severely impacted sectors of the economy that require the presence of workers and customers. As a result, real GDP contracted by 14.1 per cent in 2020. Job losses in tourism, commerce, distribution and other related sectors have caused a severe decline in employment, estimated at 35.8 per cent between March 2020 and November 2020 according to a survey by the Belize Institute of Statistics (BIS).[46] As businesses scaled back operations and employment, part-time workers, in particular women, experienced job losses at a disproportionately higher rate than full-time employees, 90 per cent of whom were still employed as of November 2020. Most (97.6 per cent) of the accommodation and food services industry reported significantly reduced revenues. On the other hand, the pandemic tested the capacity of the private sector to adapt to crises and over 20 to 25 per cent of businesses reported having to change the types of products or services offered, the methods of production or the means of interacting with customers.

At the macro-economic level, the pandemic caused a sharp fall in national revenue and a rise in expenditure on providing support to affected households and businesses. This led to an increase of the unemployment rate from 9 per cent in 2019 to 23.1 per cent in 2020, and of the public debt from 98 per cent of GDP in 2019 to 126 per cent in 2020. Under a scenario of containment of the pandemic through vaccines, the economy is projected to recover in 2021, with GDP growth of 7.5 per cent. This is expected to be driven by various sectors, in particular a recovery in tourism. Agriculture is also expected to bounce back, bolstered by higher value added in crops and livestock production. Lastly, manufacturing is forecast to grow, underpinned by a recovery in output in the food and beverage, electricity and water subsectors.[47]

3.2 Impact and implications of COVID-19 on the ocean economy of Belize

Marine fisheries and aquaculture suffered a triple burden as a result of the pandemic and the measures adopted to contain it, and their consequences for fish demand and export. Lockdowns halted completely fishing and post-harvest activities, and fishers expressed anxiety about the risks of COVID-19 to their health and the welfare of their families. When fishing resumed, fishers initially struggled and then adapted to the sanitary measures implemented on board fishing boats. The issue was the inadequate availability and high costs of fishing supplies, spare parts and repair services. This was made more difficult because of limited cash flow. Lack of cash flow affected not only fishers but also fish workers and cooperatives because of a lack or delayed cashing of export revenues, very low domestic and international demand, low prices and disruption of financial transactions.

A surge in infections coincided with the fishing seasons for spiny lobster (July to February), and the end of the fishing season for queen conch (October to July). This provided fishers with the opportunity to fish one of the two species and earn a steady income, despite uncertainties around fish demand and export in 2020.

For the 2020–2021 season, lobster fishing closed on 30 February, instead of 15 February 2020, and opened again on 15 June 2020. This change was necessary to comply with the protocols of the

[46] http://sib.org.bz/wp-content/uploads/BusinessEstablishmentSurvey_2021-02.pdf.

[47] https://www.imf.org/en/Countries/BLZ.

OSPESCA regulation. A key impact of the pandemic was the cancellation of the annual lobster festival which attracts tourists and provides a significant earning opportunity for fishers. Although the lobster harvests were generally good, prices were half of what they were in 2019, selling on the market for BZ$15 per pound rather than BZ$30 per pound. The cooperative bulk price was BZ$12 per pound,[48] lower than previous years to compensate for the decrease in the export price from 30 to BZ$20 per pound, as reported during interviews with focal points and representatives from the selected fish and seafood value chains.

The beginning of the pandemic coincided with the end of the 2019–2020 queen conch fishing season, which closed on 27 March 2020 as the quota was filled. The current season was officially launched on 1 October 2020, extending until 30 April 2021, or the date when the set quota is filled.

A public notice of the BFD was publicized widely to inform stakeholders and the public of the rules and regulations and request its assistance to report cases of illegal fishing. Other stakeholders (non-governmental organizations, coastal communities) were reported to have conducted boat-to-boat outreach and awareness raising activities in support of the regular conch monitoring.

The disruption of export, shipping and financial transactions was primarily a concern for the 2021–2022 export season, according to a cooperative manager. Arrangements for the 2020–2021 export season were processed prior to the pandemic. The other concern was insufficient cold storage capacity to hold products awaiting the return of international demand and the resumption of exports. The additional storage cost, combined with investments in equipment to meet sanitary requirements (social distancing, sanitation, temperature controls) increased the production costs, thereby significantly reducing the profit margins.

Finfish harvesting and domestic consumption were equally or more seriously impacted by the pandemic because of the closure of fish markets, restaurants and accommodation businesses and the shift of consumer preference to staple foods and eventually preserved fish such as canned fish. Demand decreased significantly causing a corresponding decrease in prices.

Lockdown measures reduced the mobility and resources of the management and enforcement personnel of the BFD and the other institutions to discharge their respective duties. As national funds were prioritized for unemployment relief and recovery of business, less funds were available to effectively conduct surveys, research and MCS activities and this may have encouraged irresponsible and illegal behaviour. A local newspaper reported that camera surveillance enabled police and rangers in San Pedro to apprehend and prosecute individuals harvesting queen conch from a marine reserve and possessing undersized lobster.[49]

The abovementioned BIS survey indicates that women, who represent a large proportion of the workforce in tourism, accommodation, food services and post-harvest fisheries are likely to have suffered higher unemployment rates and loss of livelihoods. Given the low-skilled jobs they occupy, some informally, it is also likely they have not fully benefited from the unemployment relief programme.

The regional fisheries bodies to which Belize is party were not able to carry out their regular activities as planned, with early events delayed, cancelled or postponed. As they adapted to the COVD-19 containment measures of their respective host countries and their members, they used virtual meetings for expert and technical consultations, exchange of data, information and practices. Interviews with both the WECAFC and Cartagena Convention secretariats confirmed the difficulties encountered but also highlighted the possibilities offered by using virtual meetings and online interactions. In fact, the WECAFC secretariat confirmed that attendance of statutory meetings was the highest ever. However, the quality and outcomes of the meetings were reduced, in particular in relation to important decision-making issues. This is likely the result of uncertainty

[48] https://www.sanpedrosun.com/business-and-economy/2020/06/15/lobster-season-officially-opens-fishers-at-odds-with-fishing-cooperatives-for-proposed-low-prices/.

[49] https://www.sanpedrosun.com/crime-and-violence/2020/08/18/offenders-fined-55k-for-possession-of-illegal-marine-product-at-hol-chan-marine-reserve/.

regarding the conduct of formal procedures through virtual means, and the inability of countries to commit to activities and related resources before the pandemic is brought under control.

The BIS survey revealed that as businesses lost revenue, many reduced their costs by laying off workers, starting with the temporary and casual jobs disproportionally occupied by women.

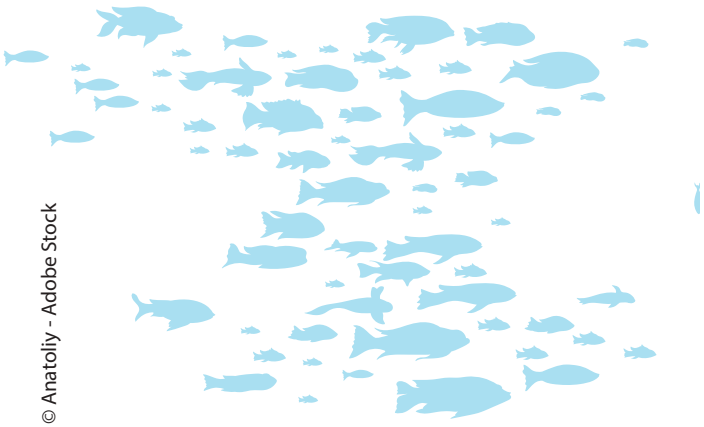
Tourism is strongly linked to marine conservation and biodiversity in Belize. Many tourists visit the country to enjoy its coasts, barrier reef, natural parks, MPAs and other marine cultural and wildlife sites. In the absence of tourists, the revenues of coastal communities, both for conservation and their livelihoods, have been severely compromised. Tourism is a key source of income to fund marine research and conservation efforts. As these revenues decreased because of the COVID-19 restrictions, fishing pressure in marine protected and conserved areas increased because of a reduced management presence.

3.3 Measures adopted to mitigate the impact of COVID-19 on the ocean economy of Belize

On 1 April 2020, as a result of the outbreak of COVID-19, the Government of Belize declared a state of public emergency across the entire country. This and the related curfews were extended to the end of June 2020 and re-imposed several times during 2020 and 2021 to prevent the spread of COVID-19. Statutory instruments are regularly issued to provide instructions on the implementation of the emergency or curfews, particularly in relation to restrictions on the movement of people and business operations.[50]

Following a successful containment of the first wave of the pandemic, Belize experienced a domestic outbreak during the summer of 2020, which left the country among the hardest hit in the Caribbean.[51] Since then, evolution of the pandemic has been carefully monitored, with restrictions imposed as and where needed. These restrictions include a nightly curfew, businesses and recreational facilities operating at reduced capacity, schools and ports of entry closed and people working from home whenever possible.

In parallel, the government channelled support to the population and companies through its social protection programmes and expanded the range of benefits available. According to the ECLAC observatory[52] which tracks the public policies adopted by LAC countries, Belize had adopted and deployed 88 policy measures as of 22 March 2021. These measures addressed a wide range of areas covering public health, education, national security, gender, social protection and economic recovery (Figure 7). Priority was given to controlling the pandemic and the spread of the virus, addressing health impacts and concurrently deploying urgent social protection and economic recovery measures.



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[50] https://www.pressoffice.gov.bz/statutory-instruments/.

[51] https://www.imf.org/en/News/Articles/2021/03/12/mcs031221-belize-staff-concluding-statement-of-the-2020-article-iv-mission.

[52] https://www.cepal.org/en/topics/covid-19.

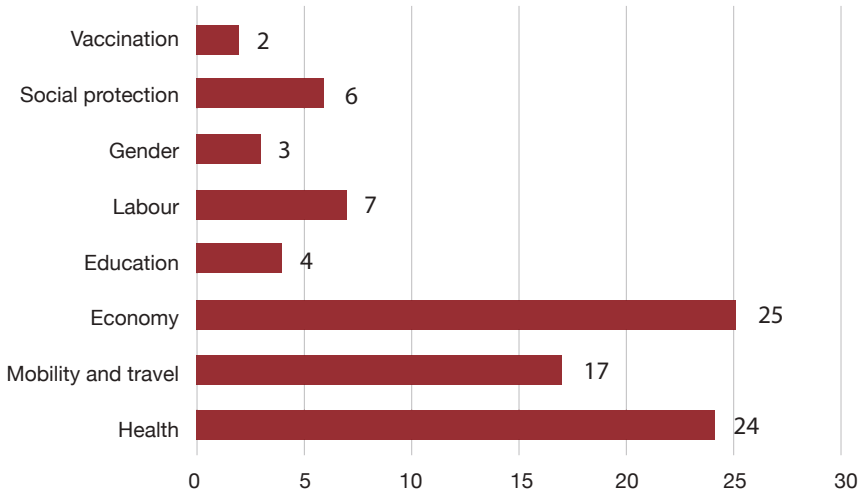


Figure 7. Types and number of policies adopted by Belize to address COVID-19

Source: Elaborated by the author based on ECLAC data. See https://www.cepal.org/en/topics/covid-19.

Of relevance to the ocean economy is the Economic Relief Program (ERP), which consisted of a BZ$25 million Unemployment Relief Program[53] and a BZ$14.5 million support programme to help MSMEs.[54] The Unemployment Relief Program provided BZ$150 every two weeks for 12 weeks to persons who were laid off. The Enterprise Program provides financial relief to MSMEs to help safeguard and promote retention of employees, while assisting MSMEs as they transition and adapt to the economic challenges presented by the COVID-19 pandemic. The programme provided grants to qualified micro-enterprises, wage subsidies for employee retention and soft loans to qualified MSMEs to assist with working capital in preparation for reopening and accelerating production.

The design, implementation and monitoring of the programmes are the responsibility of the COVID-19 national oversight committee, co-chaired by the Prime Minister and the Leader of the Opposition. Out of 81,052 applications received, 44,552 were approved. Figure 8 shows the distribution of unemployed beneficiaries. Aquaculture workers did not qualify for the programme. Of the qualified people, 13,150 were employed in tourism and 1,239 in agriculture and fisheries, including 1,129 fishers.[55]

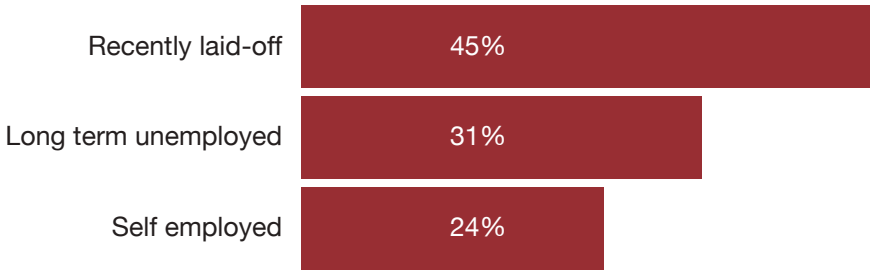


Figure 8. Distribution of beneficiaries of the Unemployment Relief Program in Belize

Source: Based on data extracted from ECLAC data. See https://www.cepal.org/en/topics/covid-19.

In August 2020, the second phase of the Government's ERP was initiated to ensure continuation of the Unemployment Relief Program and to initiate disbursement for the MSMEs Support Program, with a view to completing all disbursements within 90 days. Figure 9 summarizes the allocation of the total $28.5 million.

[53] https://www.covid19.bz/the-covid-19-unemployment-relief-program/.

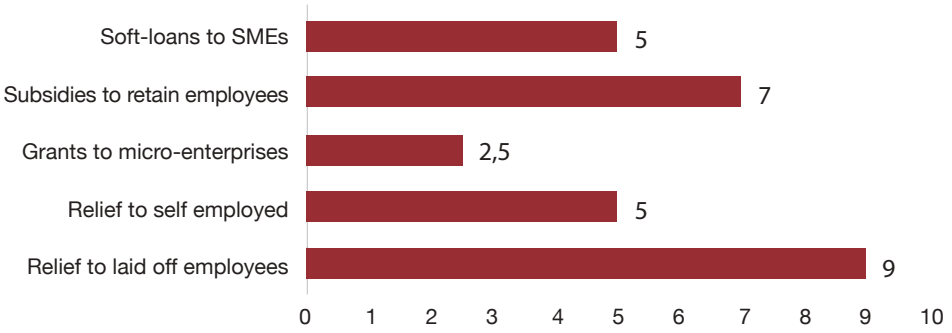
[54] https://www.covid19.bz/belizemsp.

[55] https://www.pressoffice.gov.bz/summary-report-of-unemployment-relief-program/.

3.3.1 Measures adopted to address the impact of COVID-19 on marine fisheries and aquaculture

To discharge their duties under the COVID-19 restrictions, officers of the BFD and collaborating institutions adopted teleworking, virtual meetings and online capabilities and electronic submission of documents such as registration, fishing and boat license applications and logbook and landing declarations. For operations that required face to face meetings, advanced appointments were made and meetings took place in full respect of health measures.[56] Information exchange, awareness raising, training, consultative and other joint decision-making engagements were conducted virtually. BFD reported a three-day virtual enforcement workshop was organized in September 2020 for its marine reserve staff and co-managers. The workshop provided a refresher on fisheries regulations and aimed to build knowledge on report writing, evidence compilation and case filing preparation.[57]

Figure 9. Allocations of the Economic Relief Program (second phase, BZ$ million)



Grants to micro-enterprises were capped at $2,500 each and soft loans were capped at $15,000 for small enterprises and $25,000 for medium enterprises.

Source: Based on data extracted from ECLAC. See https://www.cepal.org/en/topics/covid-19.

As reported by the BIS, operators along the fish value chain adapted to the COVID-19 restrictions and the resulting depressed demand and prices. Individual fishers and self-employed people shifted to direct and online sales, bypassing intermediaries and delivering directly to customers. Processing companies reduced the number of employees in their facilities to respect social distancing guidelines. The extent of the lay-offs is not known, although one cooperative processing plant employing 400 people, mainly women, reported laying off 5 per cent of employees. A lack of cash to advance to fishers, uncertainty about international demand and low prices forced the company to temporarily reduce production by 30 per cent.

3.3.2 Measures adopted to address the impact of COVID-19 on other ocean economy sectors

Tourism and related sectors have been targeted as a priority by the government policies and stimulus packages under the ERP. Belize opened its borders to visitors on 1 October 2020, adopting measures to facilitate travel and entry formalities while providing assurance about the safety and security of tourists. These include requirements for COVID-19 testing, quarantine (in particular for tourists coming from specific countries), and strict sanitary protocols in hotels and restaurants. Belize welcomes tourists who have been fully vaccinated at least two weeks prior to arrival and has developed "expanded safe corridors" that use trained tour operators, hotels, restaurants, transportation and sites that fully respect COVID-19 sanitary requirements.

Like many SIDS that depend on coastal and marine tourism, Belize has prioritized vaccination to control the pandemic. The country launched its vaccination programme at the end of February

[56] https://fisheries.gov.bz/updates/#notices.

[57] https://fisheries.gov.bz/virtual-enforcement-workshop/.

2021 and since 31 March 2021 the programme has been supported by the COVAX initiative. Over 84,302 vaccine doses were administered by 20 June 2021.[58] After 11 March 2021, travellers who completed full vaccination at least two weeks prior, were allowed to visit Belize without a COVID-19 test.

4. Challenges and opportunities for sustainable ocean economy and trade in Belize

As the vaccination is progressing satisfactorily, planning for the short- and long-term future of the ocean economy in Belize should take into consideration the impact of the measures implemented, the lessons learned, and the obstacles encountered. These have revealed, more than ever before, the key importance of sustainability for the ocean economy and related trade built around coastal and marine tourism, marine fisheries and aquaculture, marine conservation and the interlinkages between these different sectors of the ocean economy.

There is optimism for tourism to the Caribbean Islands to start during the second half of 2021, as the main source countries (United States, Europe and Canada), are advancing rapidly with the vaccination of their citizens and their economies are recovering. These countries have also allocated significant compensation and stimulus funds. Their citizens have disposable income to spend, including for travelling abroad.

The COVID-19 pandemic revealed several challenges for marine fisheries and aquaculture in Belize and these require adaptation and transformative change. The challenges and the measures adopted to address them can be converted into opportunities under the new normal that is emerging. This will require social, economic and environmental sustainability to play a central role, investment in innovation and technology and a strong degree of public–private partnership (PPP).

4.1 Challenges and opportunities for marine fisheries and aquaculture in Belize

Marine fisheries and aquaculture depend heavily on outside markets and customers, with the United States importing over 80 per cent of the fish and seafood produced by Belize. With export to the United States completely closed for several months in 2020, Belizean fish and seafood companies and cooperatives worried whether they should and could adapt quickly enough to redirect exports to other destinations within the LAC region, Asia or non-traditional markets of Europe. This calls for the development of a comprehensive marketing and trade promotion strategy that can strengthen the traditional trade and businesses linkages with the United States and other traditional markets for Belize, while at the same time offering the possibility of minimizing trade-related risks by diversifying products, processes, markets and opportunities.

COVID-19 has revealed how narrow, single-focus, luxury or export market business models can be risky. Building domestic demand by developing products adapted to domestic consumers, catering and retail markets should be carefully analyzed and promoted. This may not realize high prices, but it can provide return on investment, including by reducing the costs of intermediaries and other brokers in importing countries. Other efficiencies and cost savings are possible because of the shorter supply chain. Proven solutions include running surveys to identify local preferences, promoting local demand and creating direct sales routes via the Internet to reconcile what the fishers and caterers can offer and what the consumers want and can afford to pay.

Exploring new markets and developing products that suit their consumers' preferences and expectations will require a fully-fledged value chain analysis for lobster, queen conch and high-value finfish. Work carried out under the OETS project has advanced the analysis in relation to resources, governance, economics and trade. This study shows that most of the recommendations

[58] https://covid19.who.int/region/amro/country/bz.

made prior to COVID-19 are still valid. However, the impacts of COVID-19 have shifted priorities somewhat, requiring a targeted analysis of potential markets, including domestic and regional markets, and their preferences and requirements post-COVID-19. This can help to develop new products to promote in these markets and best practices to meet their requirements.

The post-COVID-19 horizon offers good opportunities to explore a PPP to undertake this endeavour, using an in-depth analysis of economic, environmental and social costs and benefits, and planning for their equitable distribution along the various nodes and actors of the value chain. This analysis expands beyond other approaches (e.g., fishery improvement projects [FIPS]) that address import market requirements and best practices to meet them. When successfully conducted, FIPs can promote market access and expansion of exports but the benefits are often realized quickly by the partners downstream in the value chain, while the burden of behaviour change and investment falls primarily on the first mile actors who may not see a return on their investment for some time. The PPP can also be instrumental in leveraging the resources necessary to implement such a project, including through the follow up to the ERP.

Sustainable marine aquaculture has shown good potential in Belize for over a decade. Until recently, marine shrimp farming in Belize was a model for successful aquaculture, fully compliant with international environmental and social protection standards, but a devastating outbreak of disease closed down most shrimp operations and deterred investors. Now is probably the time to revive interest and opportunities in sustainable marine aquaculture, building on existing operations and a national biosecurity programme to guard against disease. Potential exists not only in shrimp farming, but also in seaweed, bivalve molluscs and sea cucumbers, to name a few. A seaweed farming initiative that benefits women was launched five years ago in Belize.[59] Seaweed farming provides a good link between conservation and improved livelihoods for coastal communities, including women. Seaweed is used for human consumption but also by other industries to produce carrageenan, cosmetic products, food ingredients and additives. At the same time, farmed seaweed generates habitat for marine life to feed and reproduce. While providing valuable ecosystem services, it enables a new alternative for economic diversification and livelihoods, without overexploiting natural resources. Sea cucumbers show promising potential for marine aquaculture. The animals have been harvested for many years in Belize, with the first rules to regulate their exploitation adopted in 2009.[60]

4.2 Challenges and opportunities for other sectors of the ocean economy in Belize

Coastal and marine tourism remains an important pilaster of the economy in Belize. It depends heavily on outside visitors, mainly from the United States and Europe. Americans represent 69 per cent of the tourists that visit Belize annually. The proximity of the United States and its broad-based middle class with significant purchasing power represent key advantages for Belize. At the same time, it presents a serious risk if the market closes down to Belizean businesses, as occurred during the initial phase of the COVID-19 pandemic.

It is generally predicted that international, long-haul travel is likely to recover slowly. Although national and regional tourism are unlikely to replace high numbers of international tourists, their promotion can pave the way for a diversification of the industry and provide a launch pad from which to prepare and showcase the state of preparedness of Belize to safely receive international tourists and cater to their recreational, cultural, nature watching, marine sports and entertainment needs. Other opportunities to diversify and invest in long-term tourism include promoting cultural and heritage tourism, or the digital nomad concept aimed at attracting people who want to work remotely from Belize.

[59] How seaweed farming is uplifting women and communities in Belize. See https://thefishsite.com/articles/how-seaweed-farming-is-uplifting-women-and-communities-in-belize.

[60] https://www.sciencedirect.com/science/article/abs/pii/S2352485517303225.

4.3 Conclusions and recommendations

4.3.1 Digitalization, e-commerce and automation technologies

Prior to to the COVID-19 pandemic, automated applications, teleworking and remote meetings were considered promising for various sectors and activities in Belize, including marine fisheries, conservation and tourism. Following COVID-19, these technologies have proved their usefulness, feasibility and cost-efficiency both in government and the private sector. For example, in food processing and retail, they help monitor the health of employees, reduce human to human interactions, and enhance physical barriers during operations. Video camera surveillance has enabled the apprehension of offenders and the curbing of irresponsible behaviour. Teleworking accelerated the adoption of internet applications that were previously feasible but rarely used. Born out of necessity, the use of video conferencing, remote learning, electronic surveys and e-administration have become a regular part of new operating practices. The pandemic accelerated the adaptation of electronic applications, exchange of documentation, clearances and approvals in a safe and verifiable way. The use of remote e-administration, working, learning and conferencing proved feasible and its challenges were identified and local solutions were implemented.

The quality of digital connectivity available to fisheries and aquaculture operators will influence their ability and future opportunities in domestic and international markets. Equally important are reliable communications networks, the existence of online platforms and services, and digital literacy. Policies are needed to break barriers, ensure cybersecurity and address the adverse effects of the digital divide, not least for coastal and fisheries communities.

Fishers and fish and seafood operators should take advantage of national and regional initiatives such as the recently launched project of the Belize Trade and Investment Development Service and the United Nations Development Programme for "Building Resilient MSMEs – Accelerating Digitalization". This project seeks to establish national structures to support the accelerated digitalization of MSMEs in Belize, strengthen the MSME ecosystem and build a digital/virtual platform that provides MSMEs with capacity building and knowledge exchange, inclusive of a business to business e-commerce portal where goods and services providers can connect to deliver through digital channels. It is pilot tested with 150 MSMEs using the Virtual Knowledge Center.[61]

4.3.2 Clean and green technologies and environmental protection policies

Belize is highly vulnerable to natural hazards, climate change and economic shocks. Although it is a very different hazard, the COVID-19 pandemic amplified, in a way never seen before, the perception of the risks of exposure to events with global reach. The health, social and economic impacts have affected all Belizeans and all sectors of the economy. The government's role was central to enact measures to mitigate the pandemic's economic and social impacts and to stimulate recovery. Belize has an excellent opportunity to use this centrality to prioritize immediate and future national policy goals and greater incentives for investment in green and clean economies and environmentally friendly solutions. This would consolidate its performance in fisheries management and conservation and enable it to use funding mechanisms and resources for recovery and investment plans that prioritize clean and green technologies.

The post-COVID-19 future is currently uncertain, although the progress with vaccination offers hope and optimism. The rapid roll-out of vaccination in the United States, Europe, Belize and other countries in the Caribbean calls for optimism. There are unique opportunities to accelerate work towards achieving the 2030 Agenda and its ocean economy-related SDGs. The 2030 Agenda encompasses almost every aspect of the well-being of nature and people. Responses to achieve the SDGs and recover from the COVID-19 pandemic should be integrated and addressed in a

[61] https://belizeinvest.net/2021/04/20/building-resilient-msmes-through-digitalization/.

complementary manner, using coherent solutions to tackle emergencies, support recovery and achieve the SDGs[62].

The pandemic has re-affirmed the value of preparedness to protect and build resilience against health and other natural or human-induced disasters. The country remains highly vulnerable to severe events such hurricanes, flooding, coastal erosion, sea level rise and coral bleaching. These challenges will only intensify as the age of climate change advances, requiring an upgrade of resilience-building and sustainability initiatives.

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62 https://feature.undp.org/covid-19-and-the-sdgs/.

IV. Case study 3: Costa Rica

1. Introduction

Costa Rica is a central American country bounded by Nicaragua to the north, the Caribbean Sea to the northeast, Panama to the southeast, and the Pacific Ocean to the southwest. Costa Rica is an upper middle-income country, which became the 38th member of the Organization for Economic Co-operation and Development on 22 May 2021. The combination of political stability, a strong social compact and steady growth has resulted in one of the lowest poverty rates in LAC.

The economy of Costa Rica has been based on agriculture and fisheries, with important developments in tourism and technology over the past 20 years, making these the top-earning industries in the country (OECD, 2020f). Social and economic results have been achieved with successful environmental policies, such as the pioneering Payments for Environmental Services Program. This programme has been successful in promoting forest and biodiversity conservation and reversing deforestation – an achievement equalled by only a few tropical countries in the world. However, these policies have yet to trickle down to the marine environment. Despite noticeable achievements, the marine space needs environmental and economic instruments to promote sustainable use and conservation of natural marine resources (World Bank, 2020).

2 Overview of marine fisheries, aquaculture and related ocean economy sectors in Costa Rica

2.1 Ecological, social and economic importance of fisheries and aquaculture

The marine environment of Costa Rica hosts approximately 3.5 per cent of the world's marine biodiversity. It forms part of the great marine ecosystem of the Central American Pacific and of the East Tropical Pacific scenery, together with Panama, Colombia and Ecuador. The coastline of Costa Rica straddles the Pacific Ocean and the Caribbean Sea and the country's EEZ stretches over 613,683 km^2, ten times more than its land area, making it a large maritime nation. Both coasts and marine spaces have different physical, biological and ecological characteristics (Table 5).

Table 5. Geographic and socioeconomic indicators of fisheries and aquaculture in Costa Rica

Land area	51,100 km^2
Pacific coast length	1,016 km
Pacific EEZ	589,683 km^2
Caribbean coast length	212 km
Caribbean EEZ	24,000 km^2
Total fish production in 2019	36,814 tons
Consumption in 2017	18.5 kg/capita
Contribution to national GDP in 2019	0.3 per cent
Employment in 2018	8,397 people
Fishing fleet (total number of fishing boats)	2,000 coastal and industrial fleet and 5,000–8,000 artisanal vessels
Value of fish exports in 2018	$139 million
Value of fish imports in 2018	$150 million

Source: FAO, 2019. Country profile of Costa Rica. See http://www.fao.org/fishery/facp/CRI/es.

Fisheries and aquaculture in Costa Rica contribute significantly to food and nutrition security and employment of coastal communities. Per capita fish consumption increased from 4.94 kg in 1997 to 18.47 kg in 2017. The share of fish in animal protein intake nearly doubled over 20 years, from 4.6 per cent to 9 per cent (FAO, 2021b). Employment along the fish and seafood value chain was estimated at 9,540 jobs in 2018, a mere 0.37 per cent of the total national labour force and a sharp decrease (50 per cent) compared to 2013 (OECD, 2019, 2021b). A large proportion of those jobs are likely to be held by women who are mostly employed in processing and sales.

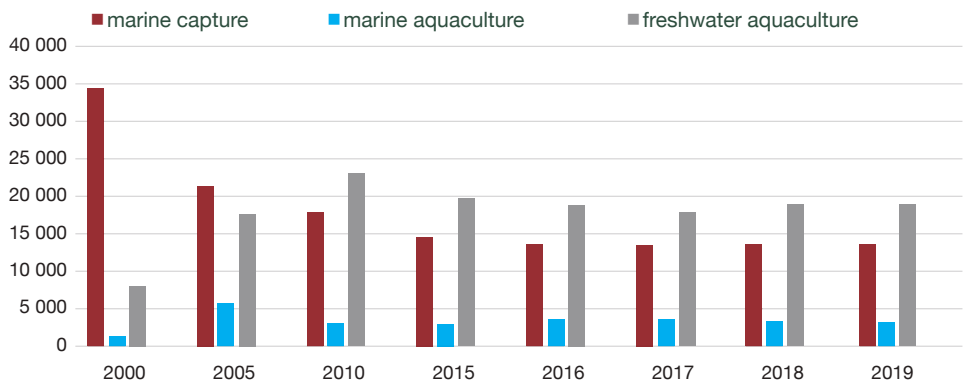
Despite their small contribution to the economy of Costa Rica, marine fisheries are critically important for coastal communities as a source of livelihood. Along both coasts, fisheries-dependent families have limited alternative income-generating opportunities, due to the skills gap between fishers and the requirements of other sectors such as tourism. Communities such as those in the province of Puntarenas, where 78 per cent to 88 per cent of coastal fishing activity is concentrated, have experienced economic decline in recent years. The coastal regions where fishing takes place are among the poorest in Costa Rica, with a high unemployment rate and the lowest scores in the national social progress index (World Bank, 2020).

2.2 Resources, production, utilization and trade of fisheries and aquaculture

Several targeted surveys of ecological and biological indicators of living marine resources in Costa Rica have been conducted. However, these surveys are fragmented and do not replace a national research programme to regularly assess the potential of living resources and their state of exploitation, enabling proper management that balances conservation and harvesting sustainably. A recent report by the World Bank (2020) highlights that overexploitation of coastal fisheries is the main cause of marine fisheries decline, reflected in a 45 per cent decrease in the volume of the catch of coastal fisheries between 2000 and 2015.

According to FAO (2021b), total fish production was estimated to be 36,814 tons in 2019, including 13,615 tons from capture fisheries and 23,249 tons from aquaculture. A good proportion of the marine harvest (49 per cent) was made up of cartilaginous fish such as sharks and rays, followed by tunas, bonito and billfishes (28 per cent). Aquaculture has developed significantly over the past decades, from 9,708 tons in 2000 to 19,880 tons in 2019, compensating for the significant decrease in capture fisheries, from 35,163 to 13,565 tons, over the same period. Tilapias and marine shrimps account for over 90 per cent of the total fish farmed in Costa Rica. The share of aquaculture in total fisheries production increased from 21 to 61 per cent in 20 years (Figure 10).

Figure 10. Fisheries and aquaculture production in Costa Rica in tons (2000–2019)



Source: FAO-FishstatJ, 2021.

Fishing in Costa Rica is performed by small-scale artisanal and coastal boats with an overall length of less than 12 m, and industrial large-scale fishing vessels with a length greater than 12 m. Three types of fishing fleets exploit the marine resources of Costa Rica:

- tuna fishing by foreign purse seiners operating under licenses granted by the authorities
- fishing of large pelagic species with longlines
- fishing of coastal demersal and pelagic species and crustaceans by artisanal boats using mainly lines, gillnets and hand ropes.

Fish harvested in Costa Rica is distributed in the form of whole or dressed fish or fillets, as fresh (iced/chilled), frozen or canned products. It consists mainly of large pelagic fish, groundfish, sharks and shrimp. Export is destined mainly for the United States, Central and Latin America and Europe. Figure 11 presents export trends for the period 2000 to 2018. Some high-quality yellowfin and albacore tuna is exported to the United States and Europe in the form of vacuum packed individually quick frozen loins for sushi/sashimi restaurants, or destined for southern European countries such as Italy and Spain (FAO, 2021c; UNCTAD, 2019c).

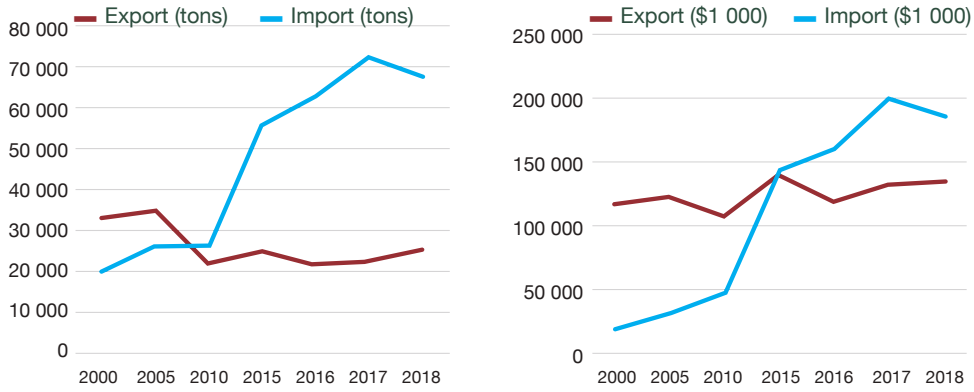


Figure 11. Trade of fish and seafood in Costa Rica (2000–2018, in tons and $1,000)

Source: FAO FishstatJ, 2021.

Costa Rica is a net importer of fish and seafood (Figure 11). Fish imports increased from $19.7 million in 2000 to $185.9 million in 2018. Between 2000 and 2018, the export value increased by 14.4 per cent, while the import value increased by 842 per cent, equivalent to 13.3 per cent annual growth rate. The fish trade balance of Costa Rica changed from a $94.4 million surplus into a $51.0 million deficit between 2012 and 2018 (FAO, 2021b).

Fish exports generated around $134.9 million in 2018, and included finfish (90.5 per cent) and shrimp (9.5 per cent) (FAO, 2021b). Tunas, bonitos, billfish and tilapia each represented 19.5 per cent of the exports by volume. In value, the export of tilapia generated $33.2 million (23 per cent) in 2018, as compared to the tuna/bonitos/billfish group valued at $24.3 million (18 per cent), and shrimp valued at $12.3 million (9 per cent).

2.3 Governance and management of fisheries and aquaculture

Over the years, Costa Rica has faced several challenges regarding the governance of its living aquatic resources and marine ecosystems, even though it has a good reputation for managing terrestrial natural resources and biodiversity. The situation is complicated by the competing interests of many stakeholders, from small-scale to coastal and large-scale fleets which target similar species within 60 miles of the coast. This is particularly complex in the case of large pelagic fish, with different stakeholders sometimes pursuing divergent interests and using technologies that are not always selective enough for the Pacific ecosystem and its protected marine species such as turtles and dolphins.

Fisheries management is difficult in the absence of institutional research to regularly survey the potential and status of the commercial fish stocks and the impact of their harvesting on protected marine species. These subjects were studied during the implementation of the OETS project. Recommendations on how best to address them were discussed (UNCTAD, 2019c, 2020d) and they have been reviewed by the recently approved World Bank project on the sustainable development

of fisheries in Costa Rica (World Bank, 2020). In addition, the longline FIP reports regularly on the longline fleet and its catches.[63]

2.3.1 Institutional and legal framework and management

The institutional and legal framework for the management and conservation of living aquatic resources in Costa Rica is relatively complex and involves several ministries and agencies mandated by specific laws and regulations to administer sectors such as fisheries, tourism, maritime shipping, etc., or to oversee cross-cutting issues such as trade promotion, adoption of standards for goods and services, security and enforcement of the rule of law.

These various ministries and institutions operate under a dense legal framework which takes as its basis the international and regional instruments to which Costa Rica is party.[64] The OETS project thoroughly analysed these subjects and the challenges they pose (UNCTAD, 2019c, 2020d). Reports emanating from the project conclude that the policy and legal mechanisms that regulate living aquatic resources in Costa Rica are adequate, despite gaps in specific areas and in enforcement capabilities.

The basis for fisheries and aquaculture development in Costa Rica is the fisheries and aquaculture Law No. 8436 of 2005. The objectives of the law are to encourage and regulate fisheries and aquaculture activities along the value chain, from harvest to markets. It is implemented by the Costa Rican Institute of Fisheries and Aquaculture (INCOPESCA) through regulations and directives enacted by the Institute, the Ministry of Agriculture, or jointly with other institutions mandated to manage related aspects of the ocean economy. The Law defines the roles and responsibilities of INCOPESCA, sets forth terms and conditions for research, training and the conservation, management and sustainable use of living aquatic resources. It defines the terms and conditions for:

- licensing foreign and national fishers and vessels
- sport fishing
- zonation of the marine fishing space
- fishing gear and methods, fish sizes and landing
- MSC
- regional cooperation
- offences and penalties for violating the provisions of the Act and its supporting regulations.

Other laws of relevance to fisheries and aquaculture are:

- Law No. 7384 (16 March 1994) creating INCOPESCA
- Law No. 7291 (23 March 1992) ratifying UNCLOS
- Law No. 7416 (30 June 1994) ratifying the CBD
- Law No. 8000 (5 May 2000) creating the service of National Coastguard
- Law No. 7744 (19 December 1997) on tourism, including articles on coastal and marine tourism.

More recently in 2019, Costa Rica enacted an Executive Decree (No. 41775-MP-MSP-MAG-MINAE-MOPT-TUR)[65] signed by the President and five ministers (Public Security, Agriculture and Livestock, Environment and Energy, Public Works and Transport, and Tourism). The Executive Decree defines the new mechanism for governance of the marine environment with the objective to improve and consolidate interministerial coordination and participation of citizens. It creates a permanent

[63] https://fisheryprogress.org/fip-profile/costa-rica-large-pelagics-longline-and-green-stick.

[64] http://www.fao.org/faolex/.

[65] http://extwprlegs1.fao.org/docs/pdf/cos191287.pdf.

interministerial commission for marine governance coordinated by the Ministry of Environment and Energy.

2.3.2 International and regional cooperation

Costa Rica is a party to several international agreements and participates in various regional and international organizations responsible for the management and conservation of living aquatic resources. The organizations of particular relevance to the OETS project are OSPESCA, OLDEPESCA, WECAFC and the Inter-American Tropical Tuna Commission (IATTC). The participation of Costa Rica in the activities of these organizations reflects a strong and active international presence in which sharing of information, transfer of knowledge and best practices take place. As a member of the OECD, Costa Rica is committed to report, collaborate and disseminate best practices for the management of living aquatic resources under the auspices of the OECD Committee on Fisheries (OECD, 2021b).

2.4 Other relevant sectors of the ocean economy in Costa Rica

The ocean economy sectors of Costa Rica relevant to the activities and selected value chains of the OETS project are coastal and marine tourism, related coastal hospitality businesses (hotels, resorts, lodges and restaurants) and maritime transport. Over the past two decades, Costa Rica has succeeded in becoming a highly sought after tourist destination. It has a diversified tourism offering for visitors to enjoy the coast and marine landscapes, sea sports, MPAs and wildlife viewing.

Tourism represents five per cent of the country's GDP, rising to 8.2 per cent when indirect effects are considered. In 2018, the sector directly employed 157,000 people, corresponding to 6.6 per cent of total employment. It is the most important source of foreign exchange in the country, with over 3 million tourists contributing $2.2 billion in 2018. The main tourism markets are the United States (41.9 per cent), Central America (22.9 per cent), Europe (15.9 per cent) and South America (6.3 per cent). Seaside destinations concentrate 68 per cent of the tourists and are home to many tour operators, with a large proportion of the accommodation in the hotels and resorts of the country located in top beach locations. Popular coastal and marine activities include snorkelling, sport fishing, diving and sailing (OECD, 2020f).

A pioneer of eco-tourism in the region, Costa Rica invests significantly to attract eco-tourists to visit its extensive national parks and protected areas. Its Certification for Sustainable Tourism Standard was recognized in 2020 by the Global Sustainable Tourism Council (for the country's efforts in the development of sustainable tourism).[66]

A recent report (Cascante and Sandoval, 2019) estimates that 151,000 sport fishers visited Costa Rica in 2015, contributing 1.16 per cent of GDP. This contribution was estimated to be $460.4 million in 2017, with $201.7 million for transport, $210.7 million for lodging and $48.4 million for other sport and charter fishing activities. The main fish species captured by anglers are sailfish, marlin, *mahi mahi*, yellowfin tuna, wahoo, rooster and snook. The report is rich with useful information and data and describes a methodology that could be adapted by other countries and extended to other aspects of the coastal and marine tourism sector.

3. Impact of COVID-19 on the ocean economy of Costa Rica and measures adopted

Costa Rica reported its first case of COVID-19 on 6 March 2020, prompting the authorities to declare a state of national emergency and adopt the measures recommended by WHO to prevent further entry and spread of the virus in the country. The country closed its borders, non-essential activities

[66] https://www.gstcouncil.org/costa-rica-cst-standard-gstc-recognized-standard/.

and schools, and monitored the spread of the virus by testing, tracing and isolating positive cases. Its health care system and its emergency preparedness enabled Costa Rica to respond quickly to the health impact of the pandemic, compared to other countries of the region. As of 18 August 2021, there have been 432,139 confirmed cases of COVID-19 and 5,255 deaths in the country.[67]

3.1 Impact of COVID-19 on social and economic activities in Costa Rica

The crisis hit the country at a time of fiscal fragility and a worryingly high unemployment rate, which especially affected women. The pandemic caused the paralysis of the service sector, an engine of the economy which employs 70 per cent of the workforce. The International Monetary Fund (IMF)[68] estimated the contraction of the economy was 4.5 per cent in 2020, causing an increase in poverty and unemployment which was at 19.4 per cent at the close of 2020, after reaching a high of 25 per cent during the summer of 2020. This unprecedented impact was caused by:

- a significant reduction in trade
- a sharp decline in tourism and related sectors, with many tourism sites, resorts, restaurants and hotels completely closed down for months
- lower domestic demand
- a significant decline in revenue from other sectors.

The sectors where women work most, such as retail, tourism, hotels and restaurants, cleaning services, and paid domestic work, have been most affected by COVID-19, whereas women are less represented in the most dynamic, technological, and high-productivity economic activities and sectors. Self-employed women or informal activities did not receive social welfare protection or insurance, earned lower wages and had no savings when the pandemic started (OECD, 2020d, 2020e, 2020f).

3.2 Impact of COVID-19 on marine fisheries and aquaculture

3.2.1 Impact on fish production, utilization and trade

Like most central American and Caribbean countries, fisheries and aquaculture in Costa Rica suffered the multiple burdens of:

- severely reduced fishing and post-harvest activities because of confinement, and restriction on mobility and travels
- low fish demand both for domestic consumption and export
- closure of fish markets and shops
- A reduced workforce to carry out fishing and processing operations, in particular for vessels and factories that use seasonal labour and migrants.

Interviews with stakeholders complemented by desk research and the reports of regional consultations led by OSPESCA revealed a dramatic situation in 2020 and part of 2021. During the initial phase of the pandemic, fishing, processing and export were brought to a standstill. As the authorities tackled the urgent health, social and economic impacts of the pandemic, fishing resumed gradually, only to be confronted with severe disruption in the supply of inputs, credit, repair and maintenance of fishing boats and gear, processing and cold storage facilities and labour shortages. The United States, which is the major market for Costa Rica, experienced three successive waves of the pandemic between March and December 2020, and closed fish imports for most of 2020. The owner of six longline fishing vessels in Costa Rica reported complete suspension of fishing activities for most of 2020 while waiting for clients in Florida and California

[67] https://covid19.who.int/region/amro/country/cr.

[68] https://www.imf.org/en/Countries/CRI.

to resume business, for new order opportunities to materialize and for border procedures and transport logistics to become operational and predictable.

According to INCOPESCA, production and processing were reduced by 50 to 80 per cent, prices by 30 to 40 per cent on average and exports by 70 per cent in 2020. Early on, the Chamber of Exporters of Costa Rica reported a drop in prices of up to 50 per cent, extension of payment periods and up to 30 per cent of orders cancelled, causing a sharp decrease of 20 to 30 per cent in exports to Europe, the United States and Hong Kong SAR, China (DOALOS, 2020).

In addition to the shutdown of imports by the United States and Europe, other causes for the halt of fishing and processing were:

- A contraction of the national economy and the subsequent reduction of incomes and purchasing power of many families caused a shift in domestic consumption patterns, reducing the purchase of fresh fish and seafood and stockpiling staple and long shelf life foods of animal origin, including canned fish.
- The restrictions on export, travel and mobility and the subsequent closure of restaurants, hotels and resorts, caused up to 80 per cent of the fishing fleet to remain at the quayside during the first months of the pandemic (DOALOS, 2020).

As the sector adapted and the restrictions eased, fishing resumed by July 2020, with the obligation to respect a comprehensive protocol for hygiene and sanitation on board vessels,[69] fish farms and processing operations.[70] The working conditions on board fishing vessels were difficult because crew worked for longer periods, with no breaks ashore, as a result of the imposition of quarantine requirements and restrictions on mobility and travel. The lack of inspection of ships and their crew, who feared contracting the virus without medical assistance, exacerbated the anxiety on board vessels.

Once landed, the harvest required extended storage time and capacity for refrigeration and cold storage. This increased the costs of production, with some post-harvest quality loss occurring in circumstance where storage capacity and infrastructure were inadequate.

Seafood processing facilities were confronted with a severe reduction in their workforce, because of the restrictions on mobility and the physical distancing requirements which allowed for fewer workers to be accommodated. As women represent over 68 per cent of the seafood processing workforce they were most impacted, especially because many women hold unskilled and low-paid jobs.

Shrimp farmers struggled to maintain the planned production cycles because supplies of inputs such as seeds and feed, as well as market demand and access to credit, were disrupted. Mobility and travel restrictions for seasonal or migrant workers created a shortage of labour. Longer farming cycles and storage of products in anticipation of a return of demand increased costs, while sale prices decreased.

3.2.2 Impact on marine fisheries and aquaculture governance

As occurred in other countries of Central America and the Caribbean, COVID-19-related restrictions have reduced MCS capability and the resources of INCOPESCA and *Servicio National de Guardacostas* (National Coastguard Service). Staff were not available or not available in sufficient numbers in the ports, on board patrol boats and fishing boats as observers. As national funds were directed towards emergency activities, resources for MCS activities were reduced, which may have encouraged irresponsible behaviour and illicit activities, in particular in small-scale fisheries where many fishing boats were not registered prior to COVID-19. Likewise, surveillance of MPAs was very

[69] https://climapesca.org/wp-content/uploads/2020/07/Lineamientos-prevencion-COVID-19-Pesca.pdf.

[70] https://www.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/---sro-san_jose/documents/publication/wcms_764285.pdf.

difficult, if not impossible, as the restrictions on mobility prevented engagement with community management associations and the collection of data (DOALOS, 2020).

The regional fisheries bodies to which Costa Rica is party were not able to carry out their regular, planned activities, with early events delayed, cancelled or postponed. The IATTC resumed its statutory and advisory meetings and workshops late in the summer of 2020.[71] All the meetings, including up to July 2021 took place virtually, enabling consultation and agreement on management measures. However, in the absence of observers and inspection of fishing vessels, the level of compliance is difficult to assess. A similar situation is reported by WECAFC[72] that organized all its consultative and capacity building activities virtually.

Overall, the interviews conducted for this study with INCOPESCA managers, industry representatives, stakeholders of the selected fisheries value chains, the WECAFC and Cartagena Convention secretariats, confirmed the difficulty of undertaking safe and sustainable marine fishing and aquaculture production. Difficulties and challenges faced prior to COVID-19 were amplified because of uncertainty and the risk of a long-lasting crisis, while some difficulties were circumvented using virtual meetings and administration, online trading and remote learning. While the value and feasibility of virtual meetings was fully recognized, their quality and outcomes did not always measure up to expectations, in particular in relation to important issues for which decisions were required. The uncertainty caused by COVID-19 affected the ability of countries to commit to activities and invest resources prior to the pandemic being brought under control. There was serious concern in Costa Rica about the inability of the IATTC to reach agreement in December 2020 for the reconduction of 2020 decisions about tuna quotas and rules for the use of fish aggregating devices.[73]

3.2.3 Impact on other ocean economy sectors

Sport fishing opened officially in September 2020 but was idle for most of that year in the absence of tourists and anglers. Although tourism opened on 1 November 2020, travel restrictions in the United States and Europe and uncertainty and fear about contracting COVID-19 away from home, did not encourage travel, leaving most resorts, hotels and restaurants in Costa Rica closed for most of 2020 and early 2021. The number of tourists in 2020 was estimated to be about 1 million, approximately one third of the 2019 record. The encouraging figures of December 2020 and early 2021 – in particular good numbers of tourists from the United States where vaccination was progressing quickly – the sanitary protocols and requirements for hospitality establishments and the roll-out of vaccinations in Costa Rica, all call for hope, with projections estimating an influx of $1.5 billion from American tourists alone in 2021, creating 80,000 jobs, 2.5 points of GDP and a trickledown effect to other sectors, including marine fisheries, aquaculture and sport fishing.[74]

3.3 Measures adopted to mitigate the impact of COVID-19 on the ocean economy in Costa Rica

Following the declaration of a state of national emergency in March 2020, the government of Costa Rica adopted urgent measures to control the spread of the virus, ensure public security and the supply of essential goods and services. According to the ECLAC observatory[75] which tracks the public policies adopted by the LAC countries, Costa Rica adopted and deployed 231 measures as of 15 June 2021, one of the highest in LAC. This reflects a political environment that enables the country to adopt policies fast and decisively.

[71] https://www.iattc.org/HomeENG.htm.

[72] http://www.fao.org/fishery/rfb/wecafc/en.

[73] https://ticotimes.net/2020/12/10/project-advances-to-move-tuna-sein-boats-100-miles-from-coast.

[74] https://www.travelagentcentral.com/central-america/costa-rica-shows-gradual-rebound-visitation-at-end-2020.

[75] https://www.cepal.org/en/topics/covid-19.

These measures were enacted through Presidential Executive Decrees or Ministerial Decrees approved by the assembly as and when needed. They addressed a wide range of areas covering public health, education, national security, gender, social protection and economic recovery (Figure 12). Priority was given to controlling the pandemic and the circulation of the virus, concurrent with social protection and economic recovery.

According to the Caribbean Council, a trade and investment organization,[76] the Government of Costa Rica announced a post-COVID-19 economic plan to reinvigorate the economy through measures ranging from public expenditure to business loans, to incentives to production. The plan included tentatively $1.6 billion in loans with preferential rates for the productive sector, to give businesses a boost and generate employment. It also made provision for $5.5 billion in public investments for 2020 and 2021, which is expected to create 109,000 direct jobs. Of this, approximately $2 million are allocated to public–private partnerships. The funding was to be provided by restructuring the national budget and contracting loans, including a rapid financing instrument of $508 million by the IMF to address the emergency.[77]

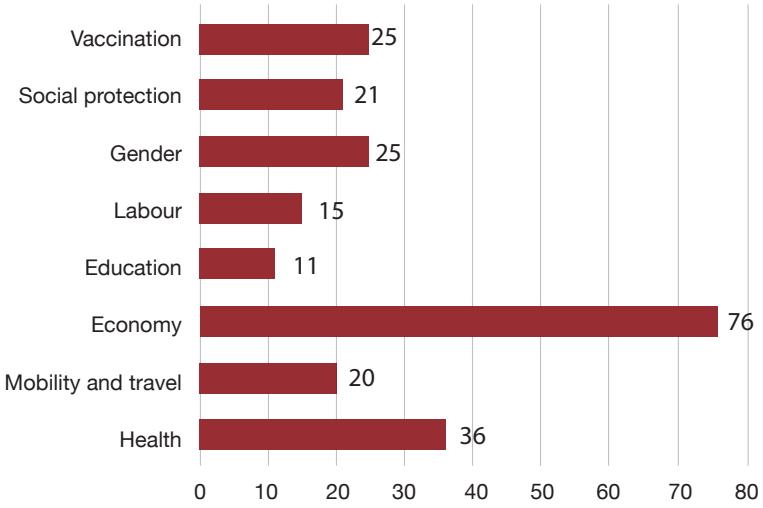


Figure 12. Types and number of policies adopted by Costa Rica to address the COVID-19 pandemic

Source: Elaborated by the author based on ECLAC data. See https://www.cepal.org/en/topics/covid-19.

3.3.1 Measures adopted to address social and economic impacts of COVID-19

In contrast to most other countries, Costa Rica did not opt for complete lockdowns. Instead, it implemented the strategy *"Costa Rica trabaja y se cuida"* (Costa Rica works and takes care of itself), which imposed restrictions on vehicle mobility and limited business hours and physical presence at work, coupled with a strict sanitary policy for social distancing, the wearing of face masks and hand sanitation. Key to the ocean economy sectors are the economic, labour and social protection measures summarized in Table 6.

An example of an integrated initiative to support the recovery of businesses is Alivio,[78] a relief programme that aims to support companies affected by the COVID-19 crisis in Costa Rica. The benefiting company must have been operating for at least two years in the agriculture, food industry, or service sectors (with the exception of tourism). It should be legal, disposing of all necessary permits and operating under the required health and sanitary protocols. Alivio provides seed capital (non-reimbursable funds), specialized technical accompaniment and capacity conversion/building for the stabilization and conversion of the business of productive MSMEs, SMEs exporting

[76] https://www.caribbean-council.org/costa-rican-government-announces-post-pandemic-economic-stimulus-package/.

[77] https://www.imf.org/en/Countries/CRI.

[78] https://www.procomer.com/exportador/programas/programa-alivio/.

or with export potential that can adopt the requirements necessary for their business to survive. As of 15 June 2021, 181 companies were participating in phase 3 of the programme, down from the 191 companies initially selected and reduced to 184 during phase 2.

3.3.2 Measures adopted to address the impact of COVID-19 on the ocean economy

An analysis of the abovementioned policies demonstrates clearly that most, if not all of the measures have direct or indirect implications for the ocean economy sectors and trade in Costa Rica, and the communities that depend on them. It is not possible at this point in time to quantify the extent to which the ocean economy of Costa Rica has benefited from the measures.

A desk study of the various programmes and the interviews conducted indicate that organized and influential sectors of the agro-industries and tourism are likely to have benefited most from these measures. On the other hand, sectors and areas such as small-scale fisheries, informal and seasonal workers and those who are self-employed in tourism are likely to have benefited less from economic and social protection policies, as a result of these groups not being organized and in many cases being informal businesses. For example, the list of 181 companies enrolled in phase 3 of the Alivio programme only mentions one seafood restaurant, but it does not indicate a fishing, aquaculture or fish processing company. It does, however, include agro-industry and food export companies, which may work in the fish and seafood sectors.

Table 6. Important economic, labour and social protection measures implemented in Costa Rica

Economic policies	Labour and social protection policies
Fiscal policies such as: ▌ tax deferral (e.g., moratorium or payment of taxes on income, value addition or import merchandize) ▌ tax reductions (e.g., 75 per cent reduction in health and pension insurance tax base) ▌ 15 to 50 per cent reduction on vehicle property tax	**Safety of workers** by: ▌ authorizing teleworking for public institutions, ensuring the presence of a maximum of 20 per cent of public servants ▌ granting accumulated vacation periods or authorizing advance vacations
Monetary policies such as: ▌ reduction of interest rates in the market to create favourable conditions for credit	**Unemployment relief**: ▌ under the *"Bono Proteger"* programme that provided temporary subsidies to about 700,000 people for up to three months, extendable for up to two more periods ▌ establishing the right of employees to withdraw their labour savings in the labour capitalization fund in case of temporary employment suspension or reduction of the duration of work
Business policies such as: ▌ a moratorium on the payment of business taxes ▌ postponing the collection of annual fees for fishing licenses, aquaculture authorizations, and transportation and marketing of fishery products ▌ a moratorium on the collection of default interest, support to MSMEs, including through non-refundable funds and training	**Cash and in-kind transfers** through: ▌ adoption of new transfers ▌ increase in existing transfers ▌ expansion of cash transfers to new recipients ▌ early disbursement of transfers ▌ distribution of food packages
Economic stimulus package to companies and individuals: ▌ access to funds to stimulate productivity ▌ new measures for the relief and reactivation of the tourism sector (e.g., gradual opening to the Chinese market, tourism infrastructure, support for small and medium enterprises and transporters) ▌ access to credit in rural territories ▌ measures to lower costs in restaurants and hotels	

Source: Elaborated by the author based on information extracted from ECLAC data. See https://www.cepal.org/en/topics/covid-19.

3.3.2.1 Measures adopted to address the impact of COVID-19 on fisheries and aquaculture

Specific measures to alleviate the impact of COVID-19 on fisheries and aquaculture have been enacted with the support of INCOPESCA and other agencies. They include:

- elaboration and/or dissemination of health and sanitary guidelines for adoption on board fishing vessels (OSPESCA/SICA/COMISCA, 2020) by shrimp peeling companies and women (ILO/INAMU, 2020)
- postponing the collection of annual fees for fishing licenses, aquaculture authorizations, and transportation and marketing of fishery products
- INCOPESCA's support to increase awareness and disseminate information about the fiscal, social and economic measures for the benefit of actors in the fisheries sector, in particular the small-scale ones
- cash transfer by the Social Aid Institute of the equivalent of $236 per month to 1,473 fishers and helpers, for a total of $10.5 million
- extension of cash (vouchers) and in-kind transfers (e.g., food packages) to the most vulnerable people of coastal communities
- a national campaign to promote domestic fish consumption and promote distribution of fish and seafood packages to vulnerable communities.

To discharge their duties under mobility restrictions, INCOPESCA and other collaborating institutions adopted teleworking, virtual meetings and online actions. E-administration adopted electronic submission and clearance of registration, landing declarations, applications for fishing licenses, permits for fish transport, export, import or aquaculture, etc. Face to face meetings were organized in full respect of sanitary measures, provided appointments were made in advance via the Internet.[79] Information exchange, awareness raising, training activities, consultative and other joint decision-making processes were conducted virtually.

The private sector adapted to the COVID-19 restrictions in an effort to maintain fishing, farming and processing, in spite of seriously depressed demand and prices. Fishing vessels and processing companies reduced the number of people employed because of the low demand, in particular for export, and also to respect social distancing guidelines. Other fishers, individually or in groups, adopted direct sale, online business interactions and direct delivery, to sell to customers.

The pandemic proved useful for accelerating initiatives that had been shelved, even though they were considered necessary. In 2019, INCOPESCA developed, in collaboration with the National Production Council, a strategy to introduce fishers to farmers' markets. This pipeline initiative was accelerated by the pandemic and seen as a welcome alternative to the closed hospitality sector and export business. It enabled artisanal fishers to earn a living and meet the livelihood needs of their families. For example, the Guanacaste Chamber of Fishers (CPG) and INCOPESCA launched the *Arroz y Frijoles* ("Rice and Beans") initiative,[80] whereby the CPG buys catch from the fishers and sells it at the farmers' markets. This initiative is named after the opportunity to keep bringing the basic food – *arroz y frijoles* – to the tables of fishers. CPG covers the costs of fish collection, cleaning, refrigerated transport and selling. The process begins at a fish collection centre in Playas del Coco, where fish is delivered by artisanal fishers from fishing areas around the centre. According to early estimates, in June/July 2020 CPG was able to collect and sell up to 1,600 kg per week.[81]

The CPG, in partnership with the Costa Rica Forever Association, organized *"Alisto"* to provide fishers with fuel, ice and bait for fishing. With support from INCOPESCA, the CPG centre was able to adhere to *"PescaconCiencia"*, an outreach activity that relies on fishers to collect scientific data to improve

[79] https://www.incopesca.go.cr/.

[80] https://vozdeguanacaste.com/en/fishers-sell-their-products-at-farmers-markets-for-the-first-time-in-guanacaste/.

[81] https://costaricaporsiempre.org/en/noticias/alivio-para-pescadores-de-guanacaste-en-medio-de-emergencia-por-covid-19/.

management.[82] As a result, CPG was able to deploy a monitoring system to collect data on fish species, size and weight and landing at the collection centre. The collected data are very useful for guiding future management decision-making. Overall, this PPP has provided a fish marketing business model and created employment for people who were trained to collect data on landings and improve management, accounting and the operation of the centre. Equally important, only registered and licensed fishers are able to enrol in the initiative, which helps to significantly reduce IUU fishing which is unfortunately still rampant in artisanal fisheries.

At the regional level, regular consultations organized by OSPESCA[83] since March 2020 enabled the sharing of valuable information on the impact of COVID-19 on the ocean economy sectors, the challenges encountered, and the measures adopted to address them.

OSPESCA and the Confederation of Artisanal Fishers of Central America, have accelerated work on the regional project to strengthen intra-regional markets for fisheries and aquaculture products in support of regional food and nutrition security. The project provides technical assistance, capacity building and experience sharing opportunities to connect existing collection centres and improve regional fish and seafood value chains that can meet the growing regional demand for fish and seafood, especially in rural populations.[84]

3.3.2.2 Measures to address the impact of COVID-19 on other ocean economy sectors

Coastal tourism and related sectors have been targeted as a priority by government policies and stimulus packages to relieve the effects of COVID-19. Costa Rica opened its borders to visitors on 1 November 2020, adopting measures to facilitate visa and travel formalities while providing assurance regarding the safety and security of tourists. These include the requirement for health insurance, a health pass and COVID-19 testing and strict sanitary protocols in hotels and restaurants that are allowed to operate at 50 per cent of maximum capacity.

According to the ECLAC observatory,[85] most of the measures described in Table 6 concern the tourism sector and related activities. Examples include:

- VAT exemption, reduction of aircraft fuel price
- $15 million under the *Bono Proteger* program to preserve jobs in the tourism sector
- incorporation of the tourism cluster for the central Pacific region
- the possibility for employers and employees to reach agreements on reductions in work time and earnings to avoid dismissals
- launch of the project "Sustainable Tourism Development post-Covid-19" involving Costa Rica, Paraguay, Ecuador and Germany, funded through the Regional Fund for Triangular Cooperation in Latin America and the Caribbean. The project seeks to contribute to a green economic recovery and reactivation of tourism in the region.

Employment in tourism and related sectors is characterized by informality, part-time, temporary, seasonal, self-employed and independent work. These flexible jobs help business adjust to seasonal fluctuations but they have also contributed to increasing job precariousness and instability. Employees carrying out essential tasks and first line customer services, although indispensable to the sector, have also been vulnerable because of the pandemic. Other initiatives include:

- The Ministry of Tourism developed a series of courses for entrepreneurs and employees on aspects of controlling the pandemic, sanitation protocols, business management, finance and marketing.

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[82] https://www.incopesca.go.cr/acerca_incopesca/transparencia_institucional/participacion_ciudadana/pesca_con_ciencia.aspx.

[83] https://www.sica.int/ospesca/.

[84] https://www.sica.int/busqueda/Proyectos.aspx?IDItem=84945&IDCat=23&IdEnt=47&Idm=1&IdmStyle=1.

[85] https://www.cepal.org/en/topics/covid-19.

- Tourism agencies organized training webinars to promote information technology and digital skills, entrepreneurship and digital marketing to facilitate interaction with potential customers and take advantage of e-commerce.[86]
- The Tourism Board launched the *"Pura Vida Pledge"*, an initiative to educate visitors about responsible tourism and the actions needed to make a difference for the local environment and communities during and in the post-COVID-19 world. The commitment to five pillars of sustainable and responsible travel include certification for sustainable tourism, carbon offsetting, volunteering, respecting the environment and quality assurance.[87]
- The community centre of Buceo in collaboration with the Talamanca association for conservation and ecology, launched in March 2020, the *Mano Vuelta* campaign to promote community food self-production and self-sufficiency. Able men went fishing while women cultivated their gardens to produce vegetables. The sargassum seaweed, which is an environmental problem in other Caribbean countries, was used to fertilize the crops they grow. *Rondon*, a secular traditional fish soup made of tubers and spices grown in family gardens, combined with fish cooked in coconut milk, re-emerged during the pandemic. This dish symbolizes best the link between land and sea in the Caribbean.[88]

Like many countries that depend on tourism, Costa Rica has prioritized vaccination to defeat the pandemic. The country launched its vaccination programme on 24 December 2020. The plan is to vaccinate 3.5 million people in 2021, including through the COVAX initiative which delivered a first batch of vaccines on 4 April 2021. By 20 June 2021, Costa Rica had administered 1.091 million vaccine doses. In addition to purchasing vaccine doses, the government has authorized the private sector to import vaccines under the strict controls of the health authorities. The plan was to ensure one million people received the two doses of the vaccine by the end of June 2021, adding one more million between July and September 2021.

The government is doing its best to encourage coastal and marine tourists to return to Costa Rica. Tourists need to feel confident and secure leaving home and traveling abroad, without the worry and fear of contracting the virus. Unfortunately, the most optimistic scenarios project at most 800,000 visitors in 2021, 20 per cent less than 2020.[89] It is hoped that the vaccination roll-out in the United States, Europe and Costa Rica can reinstate confidence and overcome these pessimistic projections.

4. Challenges and opportunities for sustainable ocean economy and trade in Costa Rica

The COVID-19 pandemic has had far reaching implications for OETS in Costa Rica. The measures implemented, the lessons learned, and the obstacles revealed have highlighted, more than ever before, the interlinkage between the various sectors of the ocean economy, the key importance of sustainability issues – not only for living aquatic resources but also for the dependent marine ecosystems and economic sectors – and the necessity to integrate policies across sectors, moving away from fragmentation and short-term subsectoral immediate interests. In a country praised for the success of its environmental policies on land, the ocean economy sectors cannot afford to continue lagging.

Key challenges to OETS have been brought into focus by studies undertaken by INCOPESCA (2019), the OETS project since 2018, OECD (2019, 2021b) or the World Bank (2020), to cite the most recent

[86] https://www.cepal.org/sites/default/files/publication/files/46502/S2000751_en.pdf.

[87] https://ethicaltraveler.org/reports/destinations/the-worlds-ten-best-ethical-destinations-2021/.

[88] https://www.icsf.net/images/yemaya/pdf/english/issue_61/2353_art_Yemaya_61_Returningpercent20toper-cent20landpercent20andpercent20seapercent20Bypercent20Marapercent20Surezpercent20Toro.pdf.

[89] https://www.reuters.com/world/americas/new-wave-covid-19-infection-threatens-costa-rica-tourist-revival-2021-05-03/.

ones. The COVID-19 pandemic and the measures employed to mitigate and adapt to the crisis, have revealed how far-reaching these challenges are, requiring deep adaptive and transformative changes to prepare for the new normal that will hopefully emerge beyond the COVID-19 crisis.

4.1 Challenges and opportunities for marine fisheries and aquaculture

Costa Rica enjoys 3.5 per cent of the world's marine biodiversity, a longline industry that catches large pelagic fish, such as tuna and *mahi-mahi*, and access to important offshore tuna resources, currently exploited predominantly by licensed foreign vessels. However, Costa Rica is faced, more than ever before, with the difficult challenge of balancing the need to extract wealth and services from the sea for the nation and further developing the marine fisheries and aquaculture sector, while conserving marine biodiversity and ecosystems. COVID-19 accentuated how marine fisheries need appropriate management, based on research, and MCS and enforcement. This requires a responsible and constructive dialogue between stakeholders, keeping a focus on the primary responsibility of the state for managing living marine resources and the ocean economy sectors that depend on them.

Key ocean economy issues have been topical for almost a decade. In 2012, a Presidential Commission on Marine Governance[90] prioritized the challenges of ecosystem degradation, overexploitation, and the use of ocean space for illicit activities and identified the following governance issues that need to be addressed to reverse the trend:

- lack of clear policies and interinstitutional coordination to administer ocean spaces and resources
- overlapping competencies among agencies with responsibility for managing marine resources
- gaps in key areas of living marine resources governance and management
- lack of financial strategies for ensuring sustainability in the management of marine areas
- increasing conflict among sectors interested in expanding their use of the ocean
- limited presence of the State in maritime jurisdictions
- Lack of marine spatial planning.

These issues are still very important because the decline in catch has continued, with landings decreasing by 58 per cent between 2000 and 2019, causing significant losses in terms of natural wealth extraction, revenue of fishers and export value. The main driver of this decline remains overexploitation and degradation of habitats and ecosystems. Over the years, fishers have found themselves chasing fewer and smaller specimens, in lower quantities and with lower market value. Recent studies indicate that 8 of the 10 targeted fish species in the Gulf of Nicoya are facing high rates of overexploitation and that maximum sustainable yield was reached decades ago.[91] Although data on fish stocks are scarce, it is likely that the situation is similar for nearshore fishery resources across the Pacific and Caribbean coasts (INCOPESCA, 2019; World Bank, 2020).

A national fisheries development plan was approved in 2013 through ministerial decree Nº 37587-MAG,[92] to address these issues. Unfortunately, the plan was not supported by sufficient resources, which affected implementation and monitoring actions. As of today, INCOPESCA continues to control fishing effort with gear restrictions, minimum fish size limits and seasonal closures. These are necessary but insufficient measures for long-term ecosystem-based management. Output control measures, such as total allowable catch, require capacity to carry out data collection and stock assessments, which is not yet available at INCOPESCA.

[90] https://www.cremacr.org/wp-content/uploads/2012/07/Informe-Final_Comision-Gobernanza-Marina.pdf.

[91] https://www.researchgate.net/publication/333055217_The_Gulf_of_Nicoya_Costa_Rica_Fisheries_System_Two_Decades_of_Change.

[92] http://www.fao.org/faolex/results/details/en/c/LEX-FAOC125386.

The following are recent developments designed to address some of the shortcomings in governance and value chain development, as reported by the Committee on Fisheries of the OECD (OECD, 2021b).

- Article 7 of Law No. 7384 was modified to extend the INCOPESCA Board of Directors to include representatives of the ministries of Foreign Trade, Economy, Industry and Commerce and Environment and Energy.
- A 2019–2023 strategic plan for aquaculture development was adopted to promote an ecosystem approach based on the principles of sustainability, competitiveness and social responsibility.
- INCOPESCA is developing three fisheries management plans, in collaboration with the recreational fishing lobby group *Federacion Costarricense de Pesca*.
- The scientific and technical coordination commission was reactivated to support policymaking and implementation of the three fisheries management plans.
- The formal adoption of rights-based artisanal fisheries.
- Promotion of citizen science and a participatory monitoring programme involving fishers and distribution centres.
- Generalization of MCS regulations to mandate the use of vessel monitoring systems by the medium-scale commercial fleet.
- Elaboration and adoption of the 2021–2025 National Plan of Action for sharks.[93]

Opportunities exist for recovery from the impact of COVID-19 to structure long-term and sustainable OETS. The recovery should build on the work undertaken under the OETS project implemented by UNCTAD/DOALOS (UNCTAD, 2019c, 2020d), the commitments of Costa Rica as a new OECD member, the 2019–2023 fishery improvement project for longliners and the recently approved World Bank project on the sustainable development of fisheries in Costa Rica (World Bank, 2020). Table 7 describes the project's main actions and interventions.

Table 7. Summary of key actions and interventions of the project on the sustainable development of fisheries in Costa Rica

Strengthening governance and management	Investing in infrastructure and value chains	Strengthening social and environmental sustainability	Project management, monitoring and communications
Strengthen institutional and legal frameworks	Create an enabling environment for sustainable growth and climate resilience	Incentivize and facilitate stock recovery and the generation of marine ecosystem services	Strengthen INCOPESCA's capacity to manage, implement and report on project activities
Strengthen research capacity and MCS enforcement	Public investment in infrastructure and services to support private investment	Engage with stakeholders for participatory stock rebuilding plans	Establish an action plan for gender equity and vulnerable groups
Strengthen inter-ministerial cooperation	Expand tuna landing infrastructure	Strengthen social support to expand livelihood opportunities for coastal communities	Establish an effective mechanism for stakeholder consultations, communications and knowledge dissemination
Promote export and market access opportunities	Invest in inshore aquaculture infrastructure	Pilot innovative financial mechanisms	Strengthen the mechanisms to redress grievances

Source: Elaborated by the author based on information from World Bank (2020).

4.2 Challenges and opportunities for other ocean economy and trade sectors in Costa Rica

As in Barbados and Belize, coastal and marine tourism is an important pillar of the economy of Costa Rica. It depends heavily on American visitors. The proximity of the United States and its broad-based middle class with significant purchasing power, are key advantages for Costa Rica. At the same time, it presents a high degree of risk associated with dependence on a single market.

[93] https://www.incopesca.go.cr/publicaciones/Plan_accion_nacional_conservacion_tuburon_CR.pdf.

Although national and regional tourism are unlikely to replace international tourism, they both offer good opportunities for Costa Rica. Their promotion can improve diversification and prepare the country to safely receive international tourists and cater to their recreational, cultural, nature watching, marine sports and entertainment needs. Other opportunities to diversify and invest in long-term tourism include educational, medical, cultural and heritage tourism, as well as digital tourism to attract people who want to work remotely from Costa Rica.

4.3 Conclusions and recommendations

4.3.1 Marketing and trade

The COVID-19 pandemic revealed how the ocean economy, employment and livelihoods in coastal communities of Costa Rica are strongly dependent on export, tourism and related sectors. The country is highly dependent on the United States and European markets for over 80 per cent of fish exports and over 70 per cent of tourist visitors annually. The proximity of the United States and the broad base of the American and European middle class with significant purchasing power represent key advantages for Costa Rica. However, the pandemic revealed how risky this can be. Exporting to one or very few markets limits the diversification of products, processes and markets.

With exports completely closed for months in 2020 as a result of COVID-19, fish and seafood companies in Costa Rica were unable to adapt quickly enough to redirect exports to other markets that were open for import. This calls for the development of a comprehensive marketing and trade promotion strategy that can strengthen the traditional trade and businesses linkages with the United States and Europe. At the same time, it should explore the possibility of diversifying products, markets and opportunities to minimize trade-related risks.

The COVID-19 pandemic revealed how significant the domestic market can be, provided fishers and companies can adapt their products, processes and distribution methods. Also, the potential for national and regional tourism is significant. New and comprehensive OETS are needed to adapt the offer, products and prices to domestic and regional demands, reconcile what the fishers and caterers can offer, and what the customers want and can afford. Costs can be reduced by bypassing intermediaries, brokers and other agents in importing countries and improving the efficiency of the supply chain with domestic value adding.

Exploring new markets and developing products that suit consumers' preferences and expectations requires a fully-fledged value chain analysis (VCA) for large pelagic fish (tuna, swordfish) and other valued fish species (*mahi mahi*, billfish, grouper). The VCA should build on the OETS work conducted by UNCTAD/DOALOS and use the opportunities offered by blended finance models and the World Bank-funded project on sustainable fisheries development.

As demonstrated by several countries of the LAC region, sustainable marine aquaculture presents real possibilities in Costa Rica. The 2020–2023 Strategy for Aquaculture Development tasks INCOPESCA to identify investment opportunities and expand marine aquaculture. This should include the farming of bivalve molluscs, seaweeds or sea cucumbers. Mollusc bivalves and seaweed farming provide a good solution for the protection of the marine environment, conservation and improved livelihoods for coastal communities, in particular for women. Mollusc bivalves are herbivorous aquatic animals that clean the marine environment by filtering seawater to feed on the phytoplankton. Seaweed is used for human consumption, to produce carrageenan, cosmetic products, food ingredients and additives. Farmed seaweed also generates habitats for marine life, creating an environment for feeding and reproduction. Sea cucumbers are another species with a promising potential for marine aquaculture. The animals have been harvested for many years in the region and the successful experiences of other countries can be explored for adaptation in Costa Rica.

4.3.2 Digitalization, e-commerce and automation technologies

Although rarely used prior to COVID, teleworking, webinars and virtual meetings have proved very useful, feasible, adaptable and cost-efficient, accelerating their adoption by public administrations and private operators in the ocean economy sectors of Costa Rica. They were deployed in markets and retail and food processing operations to monitor customers and the health of employees, and to reduce human to human interactions.

Policies were enacted to authorize teleworking and its use was adopted widely in government offices and by ocean economy operators. Born out of necessity, the use of video conferencing, remote learning, electronic surveys and e-administration have become part of a new way of working. The COVID-19 pandemic accelerated the adaptation and safe use of electronic applications, exchange of documentation, clearances and approvals, thereby reducing transaction time and costs.

The quality of digital connectivity available to ocean economy operators influences their ability and opportunity to compete in domestic and international markets. The 2020 OECD report on LAC economic outlook (OECD, 2020g) focused on the role of digital transformation as a tool to foster development in the region, in particular in the context of the Covid-19 crisis. The report highlights the significant progress Costa Rica has made in digital inclusion and praises the country's performance in enabling digital innovation and the national administrations' willingness and capacity to use ICT. Costa Rica stands above the LAC average for most indicators, with an efficient communication infrastructure, transport connectivity and human capacity.

Digital applications are likely to reshape several aspects of the ocean economy, redefine consumers' needs and behaviours and the role of society and companies. As an example, among the many affordable digital applications deployed in Costa Rica, the OECD report features *Bola de Cristal* (Crystal Ball), a smart digital platform matching jobs and skills supply and demand. It also informs users on skills needed in the knowledge economy and careers in high demand, promotes training and certification customized to user profiles, supports financial products for access to training and certification, and creates opportunities in the knowledge economy.

In this respect, opportunities exist to address the need for information on marine ocean economics, communities, ecosystems and living aquatic resources. This gap has been recognized as a major impediment for improved governance and management of the ocean economy. The digital infrastructure, capacity and competencies of Costa Rica should be leveraged to explore innovative techniques to collect the necessary data. Initiatives such as *PescaconCiencia* discussed in Section 3.3.2.1, should be up-scaled and accelerated with the aim of mobilizing coastal communities to co-manage marine resources and orienting stimulus investments towards technologies that can support ocean science, including citizen science, data collection and observation. Electronic monitoring programmes can expand observer programmes that collect data to manage resources, enforce laws and protect habitats, ecosystems and endangered species.

4.3.3 Clean and green technologies and environmental protection policies

Like many Central American and Caribbean countries, Costa Rica is highly vulnerable to natural hazards, climate change and economic shocks. Though quite a different hazard, COVID-19 amplified – in a way never experienced before – the risk of exposure to events with a global reach. The health, social and economic impacts of the pandemic have affected all citizens and sectors. The Government's role was central to the implementation of measures to mitigate the pandemic's impacts and policies and plans for recovery. INCOPESCA and stakeholders have an excellent opportunity to use this centrality and citizens' engagement to inspire ongoing initiatives and projects and promote incentives for investment in green energies and clean technologies.

The successful roll-out of vaccination programmes in many countries, including the United States and Europe supports Costa Rica's strategy to reach protective immunity through vaccination. This

offers hope and optimism. Now, the country has a unique opportunity to accelerate work towards achieving the 2030 Agenda and its related SDGs and build on the ongoing projects, strategies and initiatives, including those designed for economic recovery post-COVID-19. The SDGs encompass almost every aspect of the well-being of nature and people. Activities to achieve the SDGs and recover from COVID-19 should be intertwined and addressed in a complementary manner by adopting coherent and integrated solutions.[94] The pandemic has demonstrated the value of preparedness to protect and build resilience against health and other natural or human-induced disasters, ensuring actions are evenly distributed across demographics, communities, and economic sectors.

V. Conclusions and recommendations: rebuilding the ocean economies of Barbados, Belize and Costa Rica

The impact of COVID-19 on the ocean economies of Barbados, Belize and Costa Rica and the challenges faced in developing, adopting and implementing mitigation measures revealed valuable lessons, challenges and opportunities to reposition each country on a path to building a resilient and inclusive post-pandemic ocean economy. While it is clear that returning to business as usual is impossible, the new, post-COVID-19 era is yet to be defined.

This study reiterates how the ocean economy in the three countries depends heavily on a few sectors, export markets and customers, particularly the United States. The proximity of the United States and its broad-based middle class with significant purchasing power certainly represents key advantages for Central America and the Caribbean, but at the same time, there are evident risks when the United States' market closes down, as it did during the early phase of the Covid-19 pandemic. Furthermore, relying for a long period on one or a few markets limits innovation, the diversification of products, processes and markets, and competitiveness. On the other hand, opportunities were discovered in domestic and regional markets and several companies exploited these through innovation, adapting products and processes to market demand and using online platforms to connect with consumers.

Implementing appropriate fisheries management in the three countries remains a major challenge that has caused a continuous decline in fish landings over the years, in particular in Barbados and Costa Rica. This is exacerbated by inadequate scientific research to develop knowledge and understanding of the state of the resources. Scientific research on the marine environment is key to improved governance and management of the ocean economy and its living resources.

A reform of marine fisheries and aquaculture governance is essential to develop a science- and evidence-based fisheries management and conservation regime, enforce MCS, combat IUU fishing, and promote transparent and predictable marketing that incentivizes sustainability instruments such as traceability and eco-labelling that rewards social and environmental responsibility. Transparent and effective consultative processes with stakeholders should promote effective co-management schemes that can transform fishers and fishing communities from being passive users into active and responsible stewards of the marine environment.

In order to diversify income streams and increase resilience in the ocean economy, Barbados, Belize and Costa Rica should consider assessing their real potential and opportunities to attract private investment in sustainable marine aquaculture. Several countries in LAC and other SIDS have been successful in this regard. For many years prior to the 2014 outbreak of the devastating early mortality syndrome disease, marine shrimp farming in Belize was model of success, fully compliant with international environmental and social protection standards.

[94] https://feature.undp.org/covid-19-and-the-sdgs/.

Species such as shrimp, bivalve molluscs (e.g., oysters and mussels), seaweeds and sea cucumbers are considered by experts to be suitable for marine aquaculture in the Caribbean. Bivalve molluscs and seaweed farming support conservation and improved livelihoods for coastal communities, including women and the youth, and in particular university graduates.

To exploit its potential in sustainable marine aquaculture, each country should consider upgrading its institutional and scientific capabilities to manage aquatic animal health and efficiently prevent diseases. Attracting private investors into marine aquaculture requires an enabling environment, incentives and supporting policies and services that provide assurance and capacity to manage the risks of natural disasters and aquatic animal diseases. The LAC region has recorded many successful experiences in farming finfish, shrimp, seaweeds and bivalve molluscs that should be studied with a view to learning and benefiting from them.

Coastal and marine tourism is likely to remain a main pilaster of the economies of Barbados, Belize and Costa Rica. However, experts advise tourism-dependent small States to re-assess the approach that has prevailed so far. Although national and regional tourism are unlikely to replace international tourism, their promotion is necessary for diversification. The three countries have promoted environmental and sustainable marine tourism for years and they should consider consolidating natural marine areas and reserves, recreational fishing, wildlife watching, and marine ecotourism. This could drive recovery by building travellers' confidence with a strong focus on safety, security, hygiene and sustainability, investing in digitalization and supporting decarbonation.

Increased production costs, restrictions on travel and mobility, and social distancing have accelerated digitalization and automation technologies across sectors and administrations. Technologies that improve safety at work and generate efficiency gains are likely to become mainstream in the future. The three countries should invest in digitalization to upgrade infrastructure and skills, consolidate competitiveness and improve access to lucrative markets.

Ocean governance, ocean science and marine research are important areas that can benefit significantly from investment in digitalization and innovative automation technologies. These technologies can complement, replace or expand current methods of collecting data, enforce laws and protect habitats, ecosystems and biodiversity. Likewise, the use of remote sensing, satellite data and drones have proved to be useful, timely and cost-effective for enforcing MCS. Enabling coastal and fisheries communities to use these automated technologies can mobilize stakeholders around citizen science initiatives that can strengthen data collection and co-management of marine living resources.

Born out of necessity, teleworking, virtual meetings, webinars, and remote learning have proved to be useful, feasible, adaptable and cost-effective. These e-methods were rapidly adopted by public institutions and the private sector in Barbados, Belize and Costa Rica at the start of the COVID-19 pandemic and the quality of digital connectivity available in the three countries is considered adequate. The digital literacy of ocean economy operators will influence the countries' ability and future opportunities in domestic and international markets. Consequently, they should consider updating their policies to break barriers, ensure cybersecurity, address the adverse effects of the digital divide, and create capacity to benefit from technologies and digitalization, not least for coastal communities.

Building on the work undertaken by the UNCTAD/DOALOS project on the OETS, Barbados, Belize and Costa Rica should consider integrating in a coherent manner, across sectors and institutions, post-COVID-19 policy goals and governance frameworks, to embrace their commitments to the 2030 Agenda and its goals related to the ocean economy. Like a double helix, achievement of the 2030 Agenda and the COVID-19 pandemic responses are intertwined. They should be addressed in a complementary manner, integrating actions to tackle emergency, support recovery and achieve the SDGs.

The pandemic has re-affirmed the value of preparedness to protect and build resilience against climate change, health and other natural or human-induced disasters, especially for countries such as Barbados, Belize and Costa Rica that are regularly exposed to extreme natural events.

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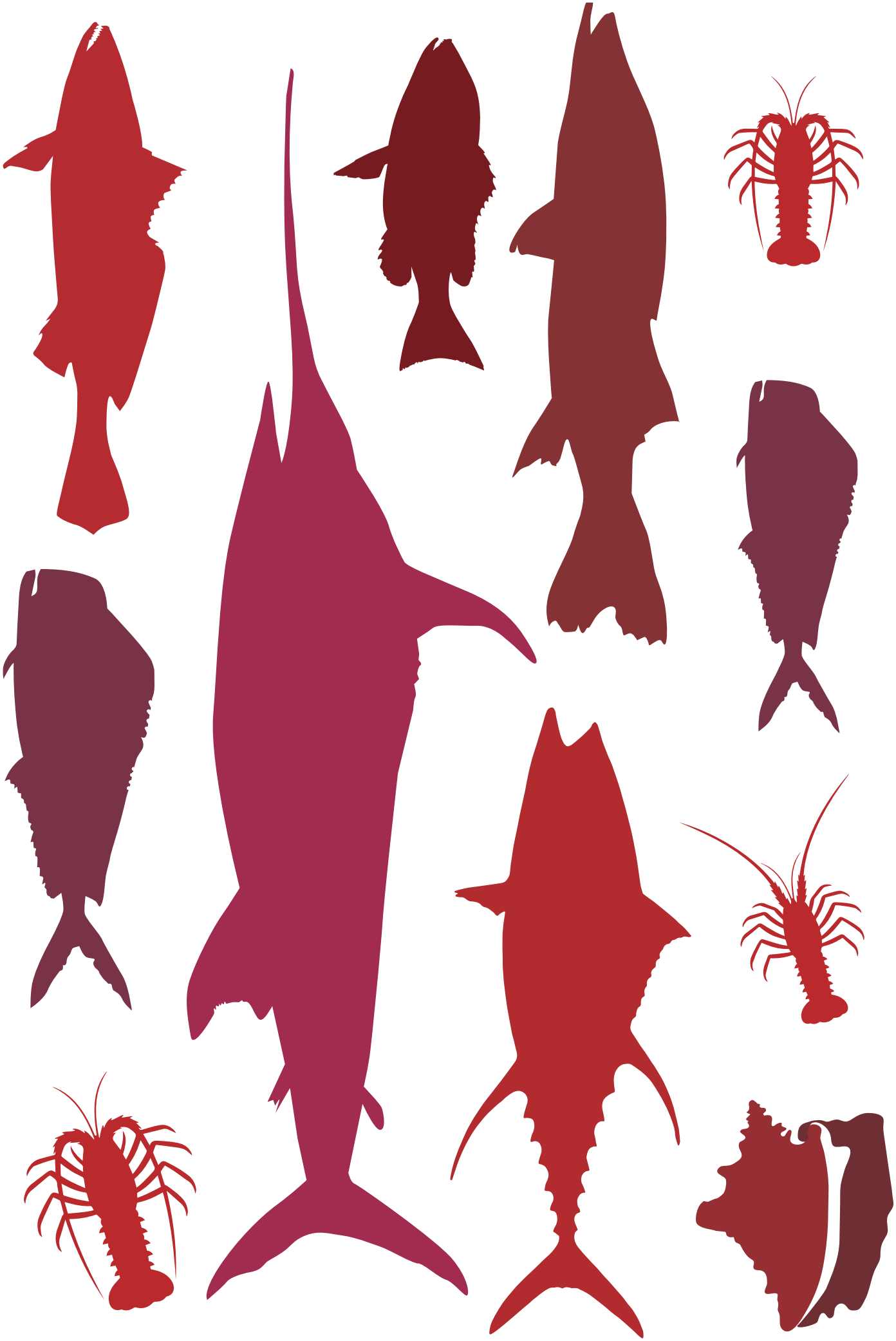

Printed at United Nations, Geneva – 2118970 **(E)** – January 2022 – 401 – **UNCTAD/DITC/TED/2021/4**