



## **Seychelles National Tuna Development and Management Plan**

### **Deliverable 10: Final Version of the National Tuna Industry Development Framework**

**DELIVERABLE # 10**



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## APPROVAL

We, the undersigned, acknowledge that we have reviewed **Deliverable #10: Final Version of the National Tuna Industry Development Framework** presented in this document for the *Seychelles National Tuna Development and Management Plan* and hereby provide our approval.

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**REMARKS AND OBSERVATIONS (if any):**

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## **EXECUTIVE SUMMARY**

This is the Seychelles Tuna Industry Development Framework for the following year span: 2024 to 2033. It is a strategic document that outlines the goals, objectives, and key actions required for the sustainable development and management of the tuna industry. It was developed alongside the Seychelles Tuna Fishery Management Plan, which addresses issues relating to resource sustainability and governance of the harvest sub-sectors of the Seychelles tuna industry.

The Development Framework is formulated around five development pathway options that were informed by different sources including: i) the outcomes from a multi-criteria analysis (MCA) of fishing access arrangements that the Seychelles is currently using for granting access to vessels to fish for tuna and tuna like species within its EEZ, ii) inputs from key stakeholders involved in various capacities in the Seychelles tuna fishery and tuna industry; iii) other key considerations for the Seychelles tuna industry, which included considerations of a wide range of issues including environmental, financial, economic, social, legal, political, administrative, market and governance, among others, and iv) expert experiences from other countries and understanding of global economics.

The five-development pathways developed include:

- **Pathway one** on *optimizing the socio-economic benefits that can be derived from foreign vessel access agreements and to retain the Seychelles industrial vessels fleet;*
- **Pathway two** on *supporting the development of the Seychelles-owned semi-industrial and industrial fleets;*
- **Pathway three** on *maintaining Port Victoria as the hub of the Western Indian Ocean tuna fishery;*
- **Pathway four** on *increasing local value addition and facilitate international trade in fish and fish products; and*
- **Pathway five** on *improving governance of the Seychelles tuna industry.*

The purpose of the development pathways is to assist with high-level decision making for the sustainable and equitable growth of the Seychelles tuna fisheries. The pathways focus on areas where efforts should be placed over the next decade to derive optimal socio-economic benefits for the Seychelles from the tuna that are caught by its vessels and those making use of Port Victoria for landing and transshipment of tuna. Under each pathway, there is a set of priority focus areas and key considerations/recommendations for implementation along with key actions and the required budget and timeline for implementation. The development pathways are not mutually exclusive but rather complementary in allowing the Seychelles to strengthen its tuna industry and derive optimal benefit from its central location in the middle of the WIO fishing ground and as the hub of the Indian Ocean Purse seine fishing fleet. The development pathways should be applied concurrently to reduce the reliance on a single sub-sector and diversify the tuna industry. They can be pursued independently, but one should not take preference over the others.

The Seychelles Tuna Industry Development Framework was guided by inputs from stakeholders. Stakeholders are encouraged to stay engaged in the process for turning the recommendation made here into actions in the field that would improve the performance of the Seychelles tuna



industry and the companies and individuals that are associated with it. A mechanism is recommended within this framework to improve governance of the tuna industry and to foster greater involvement and collaboration from stakeholders.

## **1. INTRODUCTION**

Tunas have become very popular seafood products around the world over the last decades. In recent years, global commercial tuna fisheries have caught around 4.8 million metric tons of fish per year from the world's oceans with an estimated value of US\$42 billion to the global economy (Galland et al. 2016). The Indian Ocean (IO) constitute about 20% of the global tuna production (Chassot, 2017), representing about US\$2 billion in market value, of which up to 80% comes from the Western Indian Ocean (WIO) (Obura et al.2017). In 2020, a total of 1,071,335 metric tons of yellow fin, bigeye and skipjack ('tropical') tuna was caught in the Indian Ocean. Around two thirds of tropical tunas are caught within the national EEZs of coastal countries and the rest in high seas, mostly by distant water fishing fleets (Fiorellato et al. 2016).

The Seychelles archipelago lies in the heart of the WIO tuna fishing ground with an EEZ covering a surface area of more than 1.3 million km<sup>2</sup>. This sizeable marine space is a rich fishing ground which includes the migratory routes of important large pelagic tuna and tuna like species where an average of around 70,000 metric tons of tropical tuna are caught annually (SFA, 2022). Port Victoria has developed into the hub of the WIO tuna purse seine fishery where over 90% (> 300,000 Mt) of the catch made by purse seiners licensed to fish inside the Seychelles EEZ is landed or transhipped annually. Between 2015 and 2021, annual landing and transhipment in Port Victoria has averaged 353,664 Mt. About 84% of the purse seiners catch is transhipped through reefer vessels and reefer containers to other destinations for further processing and value addition. The remaining 16% of the purse seine catch is processed locally by the Indian Ocean Tuna Factory, which in 2021 exported 58,121 Mt of tuna products in the forms of tuna cans, fish oil, and fish meal at a total value of SCR 4,896 million (SFA, 2023). In that same year, the semi-industrial longline fleet caught 1,758 Mt of tuna of which more than 80% were processed by local fish processors and exported.

The tuna industry has thus developed to become a key driver of the Seychelles economy providing important revenue, jobs, and foreign exchange. The industry is currently built on a model of providing access for foreign fishing vessels to fish in the Seychelles EEZ and the provision of services and facilities for these vessels to land, sort, tranship and sell their catch, exchange crews, and take on provisions. At the end of 2022, there were 46 purse seiners, 12 supply vessels, 174 industrial longliners and 53 semi-industrial longliners licensed to fish in the Seychelles EEZ (SFA, 2022). Out of these is the Seychelles fleet comprising of 13 purse seiners serviced by four supply vessels, 40 industrial longliners, mostly from Taiwan, and 53 semi-industrial longliners. The artisanal (approx. 400 active vessels) and the sports and recreational fishery fleet (approx. 500 Hire craft licensed vessels) also catch tuna, however the catch is believed to be very small even in comparison with the semi-industrial longline fleet. The sports and recreational fishery, though it does not exclusively target tuna and tuna like species is very important as a tourism activity and is documented to have a total economic impact of between 36.0 million and USD 48.5 million per annum (Advance Africa Management Services, 2022).

The timing of the Seychelles Tuna Industry Development Framework is significant for Seychelles, especially as countries bordering and fishing in the Indian Ocean recognize the threat of overfishing to certain tuna species. There is thus a pressing need to align the developmental goals of the tuna industry reliant Seychelles with the expected supply of fish and to find ways to get

more benefits out of less fish. This is indeed possible due to the strategic position of the Seychelles but is also dependent on the development of the tuna industry being appropriately planned, followed, and governed. This development framework provides an approach for structuring the Seychelles tuna industry and for getting more out of less resources as certain tuna stocks show signs of declining population.

## 2. GOALS AND OBJECTIVES

### 2.1 Scope and Coverage

The Seychelles Tuna Industry Development Framework has a national scope and applies to all activities undertaken in the Seychelles tuna fishery value chain, and to services undertaken in support of the Seychelles tuna industry from pre-harvest to the point of export or local consumption. The Framework is for a period of 10 years starting from 2024 to 2033 and has three implementation phases: Phase 1 (year 1 – 3), Phase 2 (year 4 – 6), Phase 3 (7 – 10). This Framework supports the execution of the Seychelles Fisheries Sector Policy and Strategy (2019) and aligns with the requirements of the draft Seychelles Tuna Fishery Management Plan. In sectors that affect or are affected by the tuna industry, where development frameworks and plans already exist, these sector development plans and frameworks take precedent over this framework.

### 2.2 Long-Term Policy Objectives

The long-term policy objective (purpose) of this Development Framework is to articulate the strategies and key actions that needs to be implemented by the Seychelles to ensure the continued development and to derive the optimal socio-economic benefits from its tuna industry between 2024 and 2033. The strategies and actions were developed based on the results of a multi-criteria analysis on the different tuna fishery fleet segments, a situational analysis of the Seychelles tuna industry and inputs from key stakeholders in the industry provided in two workshops organized in March and June 2023. The Development Framework was developed to align with [Vision 2033: Towards a Sustainable and Inclusive Future](#) to have “*A resilient, responsible and prosperous nation of healthy, educated and empowered Seychellois living together in harmony with nature and engaged with the wider world*” and its sector-specific vision for the fisheries sector to “*Develop fisheries to its full potential whilst safeguarding the marine environment and resource base for sustainability*”.

### 2.3 Key Policy Linkages

This Development Framework contributes to the operationalization of several mission statements of [Vision 2033: Towards a Sustainable and Inclusive Future](#), the most pertinent of which include:

- **Mission statement a):** Build a modern, diversified and resilient economy.
- **Mission statement b):** Build a prosperous people-centred nation, providing excellent public services characterised by wide stakeholder participation with fair opportunities for all.
- **Mission statement c):** Create a strong enabling environment for free enterprise and entrepreneurship, foreign direct investment, and global partnerships.

It contributes to the implementation of the [Seychelles Fisheries Sector Policy and Strategy \(2019\)](#) and to each of its ten objectives ([Appendix 1](#)).

This Development Framework seeks to provide guidance for developing the Seychelles tuna industry to its full potential, while adhering to our international and regional obligations for sustainable management of the oceans, fish stocks and marine biodiversity, and the Seychelles national long-term vision for the tuna fisheries to have ***an Indian Ocean that is healthy and full of life from which the Seychelles can make sustainable use of the tuna resources for maximum socio-economic benefits of its people***, outlined in the draft Seychelles Tuna Fishery Management Plan (TFMP) that was produced in parallel with this Development Framework.

This Development Framework contributes to the achievement of the four strategic priorities (SP) of the [Seychelles Blue Economy Strategic Framework and Roadmap \(the Blue Economy Roadmap\)](#) on: *Creating sustainable wealth* (SP1), *Sharing prosperity* (SP2), *Securing healthy and productive oceans* (SP3) and on *strengthening the enabling environment* (SP4).

## **2.4 Industry Development and Management Objectives**

The development and management objectives of the Seychelles Tuna Industry Development Framework were defined through a consultative approach and are based on inputs provided by stakeholders during the consultative workshops and follow up feedback. They were articulated through the medium-term goals and operational objectives.

### **2.4.1 Medium-Term Goals**

This plan has four goals covering four broad categories, which include: i) infrastructure and services, ii) finance and economics, iii) governance, and iv) social.

- **Goal 1 - Infrastructure and services:** Recognize the existing infrastructure and develop essential infrastructure and services for a sustainable and competitive tuna industry with minimal carbon footprint and impacts on the environment.
- **Goal 2 - Finance and economics:** Create the enabling environment for the financing, promotion of investment, and economic development of the tuna sub-sector.
- **Goal 3 – Effective governance:** Modernize the governance of the tuna industry to meet the expectations of stakeholders and society.
- **Goal 4 - Social:** Increase local ownership, participation, and benefits shared from the tuna industry.

Goals concerning resource sustainability and effective governance of the tuna fishery are addressed as part of the Seychelles Tuna Fishery Management Plan.

### **2.4.2 Operational Objectives**

This Development Framework has 17 operational objectives of which three are related to infrastructure and services, four to finance and economic, five to governance and five to social goals. The objectives include:

#### **Infrastructure and Services:**

- **Objective 1.1:** Align the development of the tuna industry infrastructure and services with the expected supply of fish.
- **Objective 1.2:** Ensure the availability of adequate infrastructure and services to increase the competitiveness of Port Victoria relative to other ports in the region.
- **Objective 1.3:** Ensure the availability of adequate facilities to treat effluent from fish processing plants before discharge.

#### **Finance and Economics:**

- **Objective 2.1:** Enhance the economic value of the tuna fisheries sector.
- **Objective 2.2:** Develop mechanisms for greater local participation in economic activities and equity in the tuna sector.
- **Objective 2.3:** Enhance circular economy of tuna production.
- **Objective 2.4:** Provide support and make use of economic incentives to ensure the competitive advantage of the Seychelles tuna fishing sector.

#### **Effective Governance:**

- **Objective 3.1:** Actively engage stakeholders in the management of the Seychelles tuna industry.
- **Objective 3.2:** Ensure transparency in the management of the Seychelles tuna fisheries and industry.
- **Objective 3.3:** Strengthen the SFA and related fisheries institutions to manage the tuna sector.
- **Objective 3.4:** Harmonize and simplify administrative processes throughout the tuna industry.
- **Objective 3.5:** Support the improvement of the IOTC governance.

#### **Social:**

- **Objective 4.1:** Ensure that the Seychelles tuna industry contributes to the socio-economic development of the Seychellois Nation and preservation of the environment.
- **Objective 4.2:** Attract and keep human resources working in tuna fisheries related sub-sectors.
- **Objective 4.3:** Increase public information on all aspects of tuna fisheries and the importance of the tuna sector to the Seychelles economy.
- **Objective 4.4:** Ensure adherence to hygienic best practices and international labour standards across the Seychelles tuna industry.
- **Objective 4.5:** Empower the local private sector and devolve services that can be provided by the private sector.

To achieve each objective, several priority actions are identified for implementation through the five development pathways and are detailed in the Implementation Plan. In instances where there are actions that involve more than one development pathway, the action is assigned to only one pathway but inter-linkages among pathways are mentioned.

## **2.5 Consistency with Conservation Policies and Sustainability of Tuna Resources**

The Seychelles Tuna Industry Development Framework is structured in a way to integrate sustainable practices into every aspect of the Seychelles tuna industry operations. It adheres to local laws and procedures in place and is consistent with the objectives of the Seychelles Tuna Fishery Management Plan and management measures to ensure the sustainability of the Indian Ocean of tuna resources introduced by the FAO, IOTC, and SWIOFC and adheres to the ideals of the International Labour Organization (ILO) labour rights conventions.

### 3. PROFILE OF SEYCHELLES TUNA FISHING INDUSTRY

#### 3.1 Socio-Economic Benefits of Tuna Fisheries

The Seychelles fisheries sector accounts for about 25% of the National GDP (worth 1.59 billion US dollars in 2022), of which 22% is contributed by the industrial fisheries and fish processing sector. The Seychelles industrial fishing vessels are all foreign owned, whereas the semi-industrial, artisanal, and most hire craft vessels are locally owned. Following poor performance of the local industrial longline vessel *Seykor No. 1* in the late 1980s and the small purse seiner *Spirit of Coxe* early 1990s, the Seychelles tuna fisheries business model has focused on providing licence to foreign vessels to fish in the EEZ, developing the semi-industrial, artisanal and sports and recreational fisheries and in providing services to industrial fishing vessels making use of Port Victoria. In 2021, a new fish and fish products export record of 68,134 Mt valued at SCR 5,286 million was set (**Table 1**). Over 95% of the value of exported fish and fisheries products are derived from industrial tuna fisheries, tuna canning, and by-products from tuna canning in the form of fish oil and fish meal. The volume and value of export has been growing over the years.

**Table 1. Volume and value of fish and fish products exported for the years 2019, 2020, and 2021. Source: SFA Annual Report (2021).**

Exports	2019		2020		2021	
	Volume (Mt)	Value (SCR'M)	Volume (Mt)	Value (SCR'M)	Volume (Mt)	Value (SCR'M)
<b>Canned tuna</b>	35,951	3,098	42,976	4,383	49,145	4,676
<b>Fish oil</b>	1,158	77	881	77	971	69
<b>Fish meal</b>	7,809	115	9,003	174	8,005	151
<b>Fresh and frozen fish</b>	13,886	237	11,180	274	9,957	298
<b>Sea cucumber, shark fin and crustaceans</b>	46	50	58	87	56	92
<b>Total</b>	<b>58,850</b>	<b>3,577</b>	<b>64,098</b>	<b>4,995</b>	<b>68,134</b>	<b>5,286</b>

The Seychelles benefits more directly from the industrial tuna fishing through the payment of access fees and permits, local fishing vessels company expenditures and bunkering costs. For the year 2021, these local payments amounted to SCR 2,468.9 million (**Table 2**).

**Table 2. Annual local expenditure (SCR'M) of the industrial fishing fleet for the year between 2018 and 2021. Source: SFA Annual Report (2021).**

Expenditure categories	2018	2019	2020	2021
<b>Bunkering</b>	1,691.8	1,559.5	1,313.0	1,634.2
<b>Fishing vessels/company expenditures</b>	382.1	363.9	425.0	574.0
<b>Licence/access fees, catch above reference tonnage surcharges and EU sectoral support</b>	211.5	201.8	278.3	249.4
<b>Others</b>	1.1	0.9	2.1	3.0
<b>Total</b>	<b>2,286.5</b>	<b>2,166.1</b>	<b>2,018.5</b>	<b>2,468.9</b>



The tuna fisheries also play an important role in the creation of local jobs. In the industrial fisheries, most of the jobs created are land-based and are focused on providing services to the fishing fleets by vessel agents, port operators, stevedoring, bunkering, ship chandlery, repairs and maintenance and logistics services companies. A few Seychellois are employed on purse seine vessels; and Seychellois work on Seychelles purse seiners as scientific observers. However, no Seychellois are directly employed in the industrial longline fisheries; though the vessels in the semi-industrial fishery are locally owned, most fishers (70%) come from Sri Lanka, due to skill gaps in the local labour force.

Many jobs created by tuna fisheries are in the processing industry. The Indian Ocean Tuna (IOT) canning factory is by far the largest single employer, with a workforce of approximately 2,300 workers of which over 70% are foreign nationals. A 2022 employment study across the whole fisheries sector record 190 workers in local processing factories. These factories process mostly tuna and tuna-like species and bycatch.

Though the sports fishery that targets tuna and tuna like species is an important local employer, their contribution to the local labour force is not known. The sports together with the recreational fishery in the Seychelles Inner islands, which target both demersal and tuna and tuna like species was recently estimated to have an annual intake of between USD 62.8 – 91.9 million and an annual economic impact of USD 27 – 39.5 million (Advance Africa Management Services, 2022).

### **3.2 Historical Perspective**

Small-scale tuna fishing in the Indian Ocean has been ongoing over several centuries by the coastal and island countries. Industrialisation of the Indian Ocean tuna fishery started in the 1950s by Japanese deep-sea longliners (Finley, 2016; Zeller et al., 2023). Early catches by these longliners in the Western Indian Ocean indicated that the region rivalled the best fishing grounds in the circum-equatorial zone at the time. These positive results prompted the Seychelles to explore different types of fishing techniques and arrangements to make use of this abundant resource. Compared to the successes of the pole and line fishery in the neighbouring Maldives and Madagascar, trials of this fishing technique by the Seychelles in the early 1980s did not yield encouraging results. The main challenge of the endeavour was in finding and keeping live bait (Marsac et al., 2017). Seychelles continued to explore other fishing techniques, including purse seining and longlining. First reports of sport fishing were made in the years following the opening of the Seychelles international airport in 1971 (Christ et al., 2020; Le Manach et al., 1950).

The Indian Ocean industrial purse seine fishery started in 1979 with the Japanese purse seiner Nippon Maru. Its successes encouraged prospection by French purse seiners in the early 1980s. These exploratory expeditions provided encouraging results. By October 1983, the first fishing agreement had been signed between the Seychelles and Spain, and in January 1984, the first fishing agreement was signed between the Seychelles and the European Commission. The latter agreement would lead to years of cooperation between the Seychelles and the European Commission/Union in the development of the Indian Ocean tuna fisheries and set Port Victoria on the path to become the hub of the Western Indian Ocean tuna fisheries. By December 1984, 27 Franco-Ivorians and 13 Spanish purse seiners had obtained licenses to fish in areas under Seychelles EEZ, alongside several Asian longliners. In that same year, the Seychelles Fishing Authority (SFA) was created. It took over from the Seychelles Industrial Fisheries Authority

(SIFA) that had been created just a year before to manage the industrial tuna fisheries. In the first decades of its existence, the focus of the SFA was on the development of the fisheries sector. In 1986, the Seychelles Government enacted the Fisheries Act and Regulations to provide the legal framework for better control and management of fisheries. A revised Fisheries Act came into force in 2014.

The Seychelles started registering purse seiners in 1997, and industrial longliners in 1999. The small-scale longline fishery started operations in 1995. In 2021, the vessels licensed to fish in Seychelles waters had a nominal catch of 440,020 t from the Western Indian Ocean, of which around 32% was taken by Seychelles vessels. The Seychelles EEZ accounted for 13.4% (59,334 t) of the catch made by the vessels licensed to fish in Seychelles waters. Catch in the purse seine fishery continues to be dominated by skipjack (*Katsuwonus pelamis*) and yellowfin tuna (*Thunnus albacares*), whereas in the industrial longline fisheries, it is dominated by bigeye (*Thunnus obesus*) and yellowfin. The small-scale longline fishery primarily target yellowfin tuna. However, this was not always the case. In 2003, cadmium levels exceeding European Union (EU) thresholds were detected in a batch of swordfish from the small-scale longline fishery exported to the UK. In October 2004, the EU imposed an embargo on swordfish imports from the Seychelles, jeopardising the viability of the fleet as swordfish accounted for 50-80% of catches depending on the year. The fishery almost collapsed as the small-scale longline fleet halved due to this incidence. The ban was lifted in February 2005 after further investigations revealed that the regulatory thresholds did not apply to swordfish, and the EU established a new threshold for swordfish. It took a long time for the small-scale longline fishery to recover from this incident.

In 2021, the Seychelles had 13 purse seiners, four supply vessels and 64 industrial longliners and 43 small-scale longliners under its flag fishing the Western Indian Ocean. For that same year, Seychelles granted foreign fishing licences to 124 industrial longliners, 33 purse seiners and 9 supply vessels to fish in its EEZ. The purse seine fishery continues to be dominated by vessels from Spain, Seychelles and France while the industrial longline fishery is dominated by vessels from Taiwan Province of China (POC), Seychelles, and China.

Today, the Western Indian Ocean tuna fishery is highly developed and is faced by a number of sustainability challenges, including the overexploitation of certain stocks, the environment and ecosystem impacts of Abandoned, Lost, or otherwise Discarded Fishing Gears (ALDFGs), and bycatch of non-target species (Gopalakrishna Pillai & Satheeshkumar, 2012; Kaplan et al., 2014). The effect of industrial tuna fisheries on non-targeted species and the impacts of ALDFGs became apparent very early on. In the purse seine tuna fisheries, early observer data put the annual average discards of tuna and by-catches at around 47 tonnes for every 1,000 tonnes of tuna caught (Amandé et al., 2012) and highlighted the growing problem of fish aggregating devices (FADs) on bycatch (Marsac et al., 2017). Throughout the world, it had been shown that the vast majority of discards and bycatch by purse seiners came from schools associated with floating objects, with free schools generally having few associated species (Amandé et al., 2008; Fonteneau et al., 2000; Gilman et al., 2017). The other identified issue with FADs was the entanglement of endangered, threatened, and protected (ETP) species like turtles and sharks, and the FADs getting stranded in shallow areas (MacMillan et al., 2022; Pons et al., 2023), where they cause damage to sensitive habitats (Mourot, 2022). The longline fisheries are also associated with high levels of bycatch and discards (Clarke et al., 2014). In certain areas, sharks can account for 75% of discards in the longline fisheries.

Realising that the Indian Ocean area was inadequately served by international fishery bodies and that offshore fisheries resources were not being adequately managed, the Council of the Food and Agriculture Organisation (FAO) of the United Nations established the Indian Ocean Fishery Commission (IOFC) in 1967 by means of the Council's Resolution 2/48. At the first session of the IOFC in 1968, the Committee for the Management of Indian Ocean Tuna (CMIOT) was established with the mandate "to assist IOFC in its consideration of the steps required to introduce management measures for heavily exploited stocks of tuna when these measures are found necessary." Increases in landings from the Indian Ocean in the years that followed, prompted many Indian Ocean coastal States to reiterate their concern over the lack of a proper management body to regulate tuna fishing in the region and on the need to establish long-term institutional arrangements for the management of Indian Ocean tuna stocks. After more than 20 years of discussions and negotiations, the Indian Ocean Tuna Commission (IOTC) was created in 1996 under the aegis of the FAO, with its headquarters in the Seychelles. Its main objective, function and responsibility was to "promote cooperation among its members with a view to ensuring, through appropriate management, the conservation and optimum utilization of stocks covered by [its Establishment] Agreement and to encourage the sustainable development of fisheries based on such stocks."

Soon after its creation, the IOTC started adopting resolutions to regulate and manage the impacts of fisheries on the stocks under its mandate, including on associated biodiversity, and to increase the amount of scientific information available for stock management. The Seychelles have actively contributed to the drafting of many of these resolutions and continues to implement them with a high level of compliance (see Assan et al., 2023). At least three tagging programmes have been implemented since and have generated new data on the growth and movement of Indian Ocean tuna species. The IOTC continues to encourage its members to undertake research on various components of the biology of tuna and associated species, as well as on fisheries, and to share the data. It periodically assesses the stocks of tuna and tuna-like species under its management mandate, as well as other species affected by IOTC fisheries. CMMs implemented by the IOTC and its members is helping to address many of the environmental impacts of fishing on the environment, but these are not fully resolved.

At the local level, work is currently underway on strengthening the legal framework for the management of fisheries through the revision of the Fisheries Act and Regulations. An essential element of the legal framework revision is the domestication of Regional Fisheries Management Organisation (RFMOs) resolutions to which Seychelles have not objected.

### **3.3 Access Rights and Tenure**

Current access right and tenure for access to the tuna fishery can be broken down into four broad categories as per

**Figure 1**, and further detailed below. All licenses and fishing authorisations are valid for a period of one year, unless otherwise specified.

**3.3.1 Commercial Fisheries**

“Commercial fishing” is not defined in the Fisheries Act (2014), but is taken to be the harvesting of fish, either in whole or in part, for sale, barter or trade. In the Seychelles, commercial fishing has five categories of licences or permits.

**3.3.1.1 Local fishing Vessel Licence**

In the small-scale fisheries sub-sector, there are two broad categories of local fishing vessel licenses for operating within the Seychelles EEZ: i) artisanal fishing vessel license, and ii) semi-industrial longline vessel license. In the large-scale fisheries sub-sector, there are three types of local fishing vessels licenses for: i) purse seiners, ii) industrial longliners, and iii) supply vessels.

All Seychelles vessels require an authorisation to operate outside of the Seychelles EEZ if they are fishing on the High Seas or in the EEZ of other countries. Details of the different local fishing licenses and authorisations are provided for the year 2023 in **Table 3**.

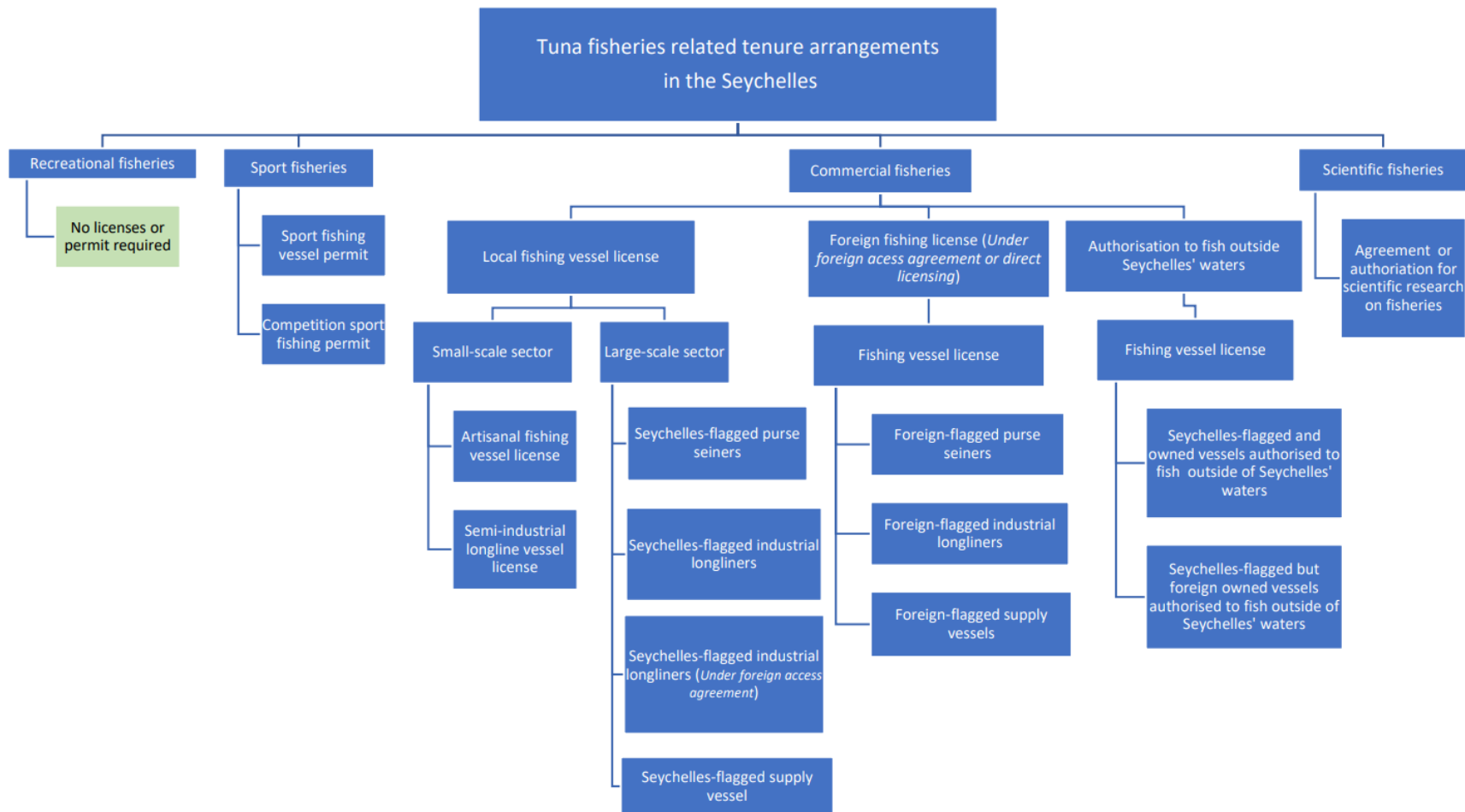
**Table 3.** The fees and validity period for different types of fishing licenses and authorisations required to get access to tuna fisheries resources by local fishing vessels.

License type	Validity period	Amount	Currency
<b>Small-scale fisheries sub-sector</b>			
Artisanal fishing vessel license	12 months	500	SCR
Semi-industrial longline vessel license	12 months	500	SCR

Authorisation to operate outside of the Seychelles EEZ.	12 months	500	SCR
<b>Large-scale fisheries sub-sector</b>			
Purse seiner fishing vessel license	12 months	115,000	Euro
Supply vessels license	12 months	5,000	Euro
Industrial longliners fishing vessel license	12 months	30,000	USD
	6 months	25,000	USD
Authorisation to operate outside of the Seychelles EEZ - Purse seiner.	12 months	5,000	Euro
Authorisation to operate outside of the Seychelles EEZ – Industrial longliner.	12 months	3,000	USD
Authorisation to operate outside of the Seychelles EEZ – Supply vessel.	12 months	1,000	Euro

**3.3.1.2 Foreign fishing vessel licence:**

There are three broad types of licenses that the Seychelles issue to foreign vessels to fish in its EEZ for: i) industrial longliners, ii) purse seiners and, iii) supply vessels. Industrial longliners have the option of taking a 12-months or 6-months licenses, whereas purse seiners and supply vessel licenses are for a 12-month period. The license fees that were being charged for the different types of foreign vessels licenses are detailed in **Table 4**. The amount paid by these vessels are defined in the different access agreements.



**Figure 1.** Tenure arrangements in place in 2023 for fishing vessels to get access to tuna resources in the Seychelles Exclusive Economic Zone (EEZ) and for authorization of Seychelles vessels to fish outside of the Seychelles EEZ.

**Table 4.** The fees and validity period of fishing licenses to get access to fish for tuna and tuna-like species inside the Seychelles Exclusive Economic Zone by different types of fishing vessels under different types of fishing agreements for the year 2023.

<b>Type of vessel</b>	<b>Duration</b>	<b>Amount</b>	<b>Currency</b>
<b>Longliner</b>			
TTA/TFI Agreement	12 Months	33,000	USD
	6 Month	25,000	USD
SFPA EU/SEY Agreement	12 Months	7,650	Euro
MAURITIUS/ SEY Agreement	12 Months	39,000	Euro
	6 Months	22,750	Euro
<b>Purse Seiner</b>			
SFPA EU/SEY Agreement	12 Months	59,500	Euro
Private Agreement	12 Months	120,000	USD
MAURITIUS/ SEY Agreement	12 Months	143,000	Euro
<b>Supply vessel</b>			
SFPA EU/SEY Agreement	12 Months	5,000	Euro
Private Agreement	12 Months	5,000	USD
MAURITIUS/ SEY Agreement	12 Months	5,000	Euro

### **3.3.2 Recreational Fisheries**

"Recreational fishing" is defined by the Fisheries Act (2014) as any fishing activity undertaken by a vessel not exceeding ten metres for recreational purposes which does not involve any commercial activity and result in the trading, offering for sale or selling of fish. Recreational fishing can also be undertaken by individuals from the shoreline or in locally registered or unregistered boats. No licences or permit is required to participate in the recreational fisheries.

### **3.3.3 Sport Fisheries**

"Sport fishing" is defined by the Fisheries Act (2014) as any fishing activity undertaken for sport or recreation which involves the hiring, chartering, or leasing of a vessel and its annexes not exceeding 40 metres in length overall but which does not result in the trading, offering for sale or selling of fish. Sport fishing is also often also referred to as charter fishing. It is usually targeted at visiting tourists and is performed on Hire Craft vessels licenced under the Control of Hire Craft Act (1967). Licensing fees vary depending on the length of the vessel, between SCR 500 to SCR 10,000 per annum and is doubled in cases where the hire craft does not belong to a Seychellois. Licensing of hire craft vessels is the responsibility of the Seychelles Maritime Safety Authority.

As part of sport fishing, there is "**competition sport fishing**", which means any fishing activity which: (a) is undertaken for sport among competitors who are observing a prescribed set of rules; (b) involves the hiring, chartering or leasing of a vessel not exceeding 40 metres in length overall, and catch for charitable purposes authorised by the Authority; and (c) does not result in the trading, offering for sale, or selling of fish.



Section 18 of the Fisheries Act (2014) makes provision for a sport fishing permit to be paid to SFA while Section 19 makes provision for a ‘competition sport fishing fee’. However, at present no fees are being charged by SFA and the vessels are not requiring permission from SFA to fish.

### 3.3.4 Scientific Fisheries

Scientific fisheries are the undertaking of fishing activities for the purpose of fisheries research. Permission to engage in scientific research on fisheries requires an agreement as per Section 10 (1) of the Fisheries Act (2014). Authorisation for the undertaking of scientific fisheries may be on terms and conditions specified by the SFA and may include a fee.

## 3.4 Fleet Structure

The evolution of the number of Seychelles-registered vessels licensed to fish for tuna and tuna-like species in the Indian Ocean, and the number of foreign vessels licensed to fish in Seychelles waters are detailed in **Table 5**.

**Table 5. Number of Seychelles registered, and foreign vessels licensed to operate in the Seychelles Exclusive Economic Zone (EEZ) by vessel type between the year 2011 and 2022. Source: SFA (2023).**

Fleets		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Purse seiners	Seychelles	8	8	7	11	13	13	13	13	13	13	13	13
	Foreign	28	28	26	34	38	38	35	34	34	32	33	33
Supply vessels	Seychelles	4	5	6	10	11	12	12	14	9	9	7	4
	Foreign	9	8	10	16	20	23	24	24	19	18	15	8
Industrial longliners	Seychelles	23	32	33	35	42	47	51	54	56	57	63	58
	Foreign	32	121	113	94	105	136	147	137	101	92	111	130
Semi-industrial longliners	Seychelles	4	7	6	9	11	28	31	30	36	35	41	53
<b>Total No. Vessels</b>		108	209	201	209	240	297	313	306	268	256	283	299

### 3.4.1 Industrial Purse Seine Fleet

For the year 2022, the industrial purse seine fleet licensed to fish in the Seychelles EEZ comprised 46 vessels. The number of licensed vessels had increased over the years to reach a peak of 51 vessels in 2015 and 2016 and then started to decline as a result of less EU and “other countries” purse seiners taking licenses. Out of this fleet, 13 vessels are under the Seychelles flag. The 13 purse seine vessels are assisted by four supply vessels.



### **3.4.2 Industrial Longline Fleet**

For the year 2022, 176 industrial longline vessels were licensed to fish within the Seychelles EEZ, of which 58 were Seychelles flagged. The number of longliners licensed to fish in Seychelles waters has fluctuated over the years with an annual average of about 152 vessels. Taiwan POC remains the country with the most vessels in the fishery with 105 vessels licenced in 2022. Over the last decade the annual number of Taiwan POC vessel participating in the fishery have fluctuated between 30 and 113 vessels. The number of Seychelles flagged vessels have steadily increased over the last decade from 24 vessels in 2011 to 64 vessels in 2021 but decreased to 58 vessels in 2022. The majority of these vessels are foreign-owned, and they are licensed under the TFI agreement. Historically, China has had the third highest number of industrial longline vessels licenced to fish in Seychelles waters. However, in 2022, only seven Chinese industrial longline vessels were licensed. The number of Chinese vessels licenced to fish in Seychelles waters has decreased substantially from a high of 50 vessels in 2018.

Since 2017, industrial longline vessels from the European Union are being licensed to fish in Seychelles waters under the EU/Seychelles SFPFA. In 2022, there were three EU vessels licenced. Oman and Mauritius are new entrants in the industrial longline fishing in Seychelles waters. In 2022, three Omani and 12 Mauritian vessels were licenced.

### **3.4.3 Semi-Industrial Longline Fleet**

In 2022, 53 semi-industrial longliners were active and made a catch of 2,073 Mt, an 18% increase over 2021 due to an increase in fishing effort exerted (2021: 41 vessels) and trips (564 vs 375). The number of vessels participating in the fishery and fishing trips made have increased over the years, especially since 2015.

Around 2016, the focus of the semi-industrial longline fishery shifted from catching swordfish to catching yellowfin tuna. The percentage (by weight) of yellowfin tuna in the catch has steadily increased over the years to reach 93% in 2022. Swordfish remains the second most abundant species taken, accounting for about 3% of the catch in 2022, followed by marlins (1%) and bigeye tuna (1%). The other groups together account for around 2% of the catch. There are however concerns with regards to the declaration of shark catch coming from this fleet. Official numbers are low and does not tally with the amount of shark fins that are being exported from the Seychelles.

### **3.4.4 Artisanal Vessel Fleet**

The Seychelles artisanal fishing fleets do not specifically target tuna since reliable fishing grounds are usually located off the Mahe Plateau, at least 40 km away from the main inhabited islands. However, local fishermen will target tuna if they are observed during fishing. The SFA's Catch Assessment Survey of the artisanal fishing fleet does not feature tropical tunas. Kawakawa are the most landed tuna species by the artisanal fishing fleet. Annual catch of Kawakawa over the last decade has fluctuated between 70 and 125 Mt. In 2021, there were 329 small-scale vessels participating in the artisanal fishery.

### **3.4.5 Sports and Recreational Fleet**

The sports and recreational fishery targets tuna, billfish, dorado, wahoo as well as other non-tuna fishery associated species like Giant trevally. The sports and recreational fishery is primarily targeted at taking visitors out for fishing expeditions. A typical fishing day would involve both trolling for tuna and tuna like species and demersal fishing for species such as snappers and groupers. The catch is usually landed and sold to restaurants, the public or given away. However, it is illegal for operators in this fishery to sell their catch. From time-to-time fishing competitions are organised that targets tuna and tuna like species. Total annual catch estimates of tuna and tuna like species from the sports and recreational fisheries are not known.

## **3.5 Catch, Landing, and Transshipment**

### **3.5.1 Catch in the WIO**

#### **3.5.1.1. Total Catch**

The best IOTC scientific estimate from its Area of Competence put the nominal catch at just above 2 million Mt for the year 2022. The catch consists principally of tropical (62%) and neritic tuna (21%) and is dominated by the purse seine and gillnet fishery. Most of the catch is made in the Western Indian Ocean (FAO Area 51) than the Eastern Indian Ocean (FAO Area 57). Total 2022 catch from the IOTC Area of Competence is the highest on record.

#### **3.5.1.2 Catch by vessels licensed to fish in the Seychelles EEZ**

The total catch in the WIO by vessels licensed to fish within the Seychelles EEZ has seen increasing trends over the last decade from 266,875 Mt in 2011 to 403,269 Mt in 2021. The catch peaked in 2018 at 465,825 Mt. In 2022, nearly 95% of the catch were made by purse seine vessels and close to 5% by industrial longline vessels, with Seychelles semi-industrial vessels accounting for about 0.5% of the annual catch.

#### **3.5.1.3 Catch by Seychelles vessels**

The catch of tuna and tuna-like species made by Seychelles vessels in the IOTC Area of Competence has nearly doubled over the last decade from 71,016 Mt in 2011 to 132,613 Mt in 2022. According to the IOTC's best scientific estimate, the nominal catch of Seychelles vessels in 2021 accounted for 7.3% of the catch made in the IOTC Area. On average over this period, the majority of Seychelles catch were being made by purse seiner (85%), industrial longliners (14%) and semi-industrial long liners (1%) in order of importance. Over the last decade Seychelles catch had principally consisted of skipjack and yellowfin tuna. For the year 2021, skipjack made up 59% of the catch, followed by yellowfin (24%), bigeye (12%) and other species (5%).

### **3.5.2 Catch in Seychelles EEZ**

#### **3.5.2.1 Total catch**

Between 2011 and 2022, total catch of tuna made within the Seychelles EEZ has ranged between 43,000 and 127,000 Mt annually. On average about 86% of the catch is taken by purse seiners, 13% by industrial longliners and 1% by semi-industrial longliners. Catch within the Seychelles

EEZ is principally dominated by bigeye and yellowfin tuna in the industrial longline fishery and largely by skipjack and to a lesser extent yellowfin in the purse seine fishery.

**3.5.2.2 Catch by Seychelles vessels**

Between 2011 and 2022, total catch of tuna made within the Seychelles EEZ by Seychelles vessels has ranged between 9,500 and 33,000 Mt. On average about 78% of the catch is taken by purse seiners, 18% by industrial longliners and 4% by semi-industrial longliners. Like for the rest of the WIO region, catch taken by Seychelles vessels within the Seychelles EEZ is principally dominated by bigeye and yellowfin tuna in the industrial longline fishery and by skipjack and yellowfin in the purse seine fishery. The catches of Seychelles purse seiners are mostly made in the Western Indian Ocean in the area around the Seychelles and between Seychelles and Somalia, as well as in the Arabian Sea and in the Mozambique Channel. The catches of Seychelles industrial longline vessels are more widely distributed and also come from areas in the Eastern Indian Ocean, as well as from areas south of the 30 degrees latitude. However, most of the industrial longline catches are made in areas in the South of the Seychelles EEZ. Most of the catch of the semi-industrial longline fleet comes from within the Seychelles EEZ, with fishing concentrated around the edge of the Mahe Plateau and Banks where there are upwelling activities.

**3.5.3 Landing and Transshipment**

Over 90% of tuna caught in the West Indian Ocean by purse seiners licensed to fish in the Seychelles EEZ (373,212 Mt in 2022) passes through Port Victoria. Most of the fish (about 84% of discharges) are transhipped for processing elsewhere, with regional canneries in Mauritius and Madagascar accounting for 80% of the transshipments. Transshipment of tuna via freezer containers have become more popular over the last decade. In 2021 and 2022, 73% and 56% of the tuna were respectively transhipped through reefer containers, with the remainder transhipped through reefer vessels. About 13% of the purse seine catch in 2021 and 2022 was landed and used for local processing by the IOT cannery in Victoria. Very small amount of the catch from the industrial longliners licensed to fish in Seychelles waters are transhipped or landed in the Seychelles.

Landing and transshipment by Seychelles vessels have fluctuated over the years with peak in total landing and transshipment recorded in 2018 (Error! Reference source not found.). Landing from semi-industrial vessels peaked in 2022 at 2,073 Mt.

**Table 6.** Landing and transshipment in metric tons (Mt) of Seychelles vessels operating in the industrial and semi-industrial tuna fishery for the year 2015 to 2022. Source: SFA (2023).

Product	2015	2016	2017	2018	2019	2020	2021	2022
Purse seine – Landing	26,854	16,513	13,863	13,299	18,044	14,585	16,001	15,516
Purse seine – Transshipment	53,061	85,495	107,720	107,561	86,524	89,642	97,070	98,580

Industrial Longline – landing and transshipment	12,520	15,009	14,704	17,558	22,866	22,469	14,526	9,898.3
Semi-industrial Landing	195	966	1,108	1,267	2,008	1,485	1,758	2,073
<b>TOTAL</b>	<b>92,630</b>	<b>117,983</b>	<b>137,395</b>	<b>139,685</b>	<b>129,442</b>	<b>128,181</b>	<b>122,439</b>	<b>126,067</b>

### 3.5.4 Bycatch

About 1.0% of the catch landed and transhipped in Port Victoria in 2022 (3,725 Mt) were considered as bycatch. Most of the purse seine bycatch re used for bycatch processing by local companies, prior to export (Poseidon, 2019).

## 3.6 Processing, Exports, and Imports

### 3.6.1 Processing

Indian Ocean Tuna Ltd. a subsidiary of Thai Union, IOT remains the dominant player in the Seychelles tuna processing sector. The Port Victoria-based IOT cannery is one of the largest tuna canneries in the world with seven cold stores to store 25 days’ supply of fish. The company makes tuna cans from three species of tuna landed in Seychelles: skipjack, yellowfin, and bigeye tuna. It has a typical raw material input of 300 Mt per day and can produce up to 1.4 million cans of tuna per day. The IOT factory employs around 2,000 people. Its current annual tuna requirement is around 80,000 Mt but seeks to increase annual production to 100,000 tonnes of raw material, with a focus on increased inputs of yellowfin tuna. The raw materials come principally from EU purse seine vessels (operating on the high seas, and the EEZ of coastal states under FPA arrangements), Seychelles vessels (under EU beneficial ownership) and vessels under other flags. Occasionally raw materials are imported from other countries (e.g., the Maldives) and regions such as the South-West Pacific and East Atlantic. The IOT makes canned tuna that are sold under several well-known brands such as Petit Navire (France), John West (UK), Mareblu (Italy), among others.

In 2021 and 2022, about 13% of the catch made by purse seiners licensed to fish in the Seychelles EEZ was landed in Seychelles and used for local processing by the IOT. The IOT factory has a fishmeal production facility, and a subsidiary company of IOT, Ocean Products Seychelles extracts oil using proprietary technology from the tuna heads for fish oil for use in the nutraceutical and pharmaceutical industry.

There are at least seven Seychellois processing companies that buy tuna from purse seiners (including bycatch), and from artisanal and semi-industrial fishermen for processing for the local and international markets. Local processing by these local companies includes the gutting and cleaning of tuna and export as whole tuna or parts such as loins, bullets (head removed) and v-cuts (belly removed) on ice. Certain quantities of processed tunas are specifically prepared for the local market and include different types of cuts such as loins, steaks, cubes, and belly. Tunas not fit for human consumption are usually sold as pet food and as bait to local fishers.

The main local processing zones for tuna are located at the Victoria Fishing Port and at the Providence Fishing Port. Zone 14 on Ile du Port has been identified as a tuna processing zone for the industrial fishing sector. There are plans to build six processing plants by five local investors and one foreign investor with a footprint of over 70,000 m<sup>2</sup>. General products from these plants once completed will include frozen fish, pre-cooked fish, tuna loins, by-catch and by-product development of pet food and fish feed. The estimated required raw material per day for these six processing plants is estimated at around 170 Mt, to be delivered by a combination of purse seine (Tuna in brine and -60C), industrial long-liners (-60C) and semi-industrial long-liners (Fresh tuna on ice).

### **3.6.2 Exports**

The Seychelles has between 2016 and 2022 exported an annual average of 171,000 Mt of fish and fish products, the vast majority derived from the tuna fishery. The largest component of the export consists of frozen fish exported by Seychelles purse seiners, canned tuna, fish meal and fish oil exported by IOT, frozen fish exported by Seychelles industrial longliners, fresh and frozen fish<sup>1</sup> exported by local fish processors (**Table 7**).

**Table 7.** Volume (Mt) of fish and fish products exported from Seychelles between 2016 – 2022. Source SFA (2024).

Volume (Mt)							
Products	2016	2017	2018	2019	2020	2021	2022
Canned tuna <sup>2</sup>	36,904	34,665	36,356	35,951	42,976	49,145	50,118
Fish oil	1,037	572	1,641	1,158	881	971	521
Fish meal	8,084	8,322	8,029	7,809	9,003	8,005	5,333
Purse seine – transhipped fish	85,495	107,720	107,561	86,524	89,642	91,070	98,580
Industrial longline transhipped fish	15,009	14,704	17,558	22,866	22,469	14,526	9,898.3
Fresh and frozen fish <sup>1</sup>	3,099	5,561	10,966	13,886	11,180	9,957	13,202
Others	57	60	49	46	58	56	75
<b>Total</b>	<b>149,685</b>	<b>171,604</b>	<b>182,160</b>	<b>168,240</b>	<b>176,209</b>	<b>173,730</b>	<b>177,727</b>

The Seychelles Fishing Authority reports that the value of fish and fish products exported in 2022 amounted to SCR 4,496 million, a reduction from 5,286 million recorded in 2021 (**Table 8**). However, this did not include the value of 105,596 Mt of frozen fish that was exported by Seychelles purse seiners and industrial long liners at a value of at least SCR 2,000 million. The main market buyers of frozen tuna from purse seiners are canneries in Mauritius and Madagascar while the main buyers of frozen tuna from the industrial longline fishery is the sashimi trade in

<sup>1</sup> Fresh and frozen fish here also include fish from the artisanal fishery, whole or processed, as well as bycatch from the industrial purse seine fishery, either exported directly by vessel operators or that are sold to local fish processors.  
<sup>2</sup> Canned is also made using tuna that the Indian Ocean Tuna Company purchase from non-Seychelles flagged vessels landed in Port Victoria or imported from other countries.

Taiwan and Japan. The European countries remain the main market for Seychelles canned tuna. In 2021, France was the top destination for canned tuna exports accounting for 46% (SCR2.170 billion) of the exported canned tuna, followed by the United Kingdom (23% (SCR1.110 billion), and Italy (16%). (SCR0.750b). In 2021, the top three markets for fish meal were Taiwan, Australia, and Bangladesh, accounting for 69% of total export. The main markets for fish oil on the other hand were Iceland, Switzerland, and Australia.

**Table 8.** Value (SCR 'M) of fish and fish products exported from the Seychelles between 2016 – 2022. Source SFA (2024).

Value (SCR 'M)							
Products	2016	2017	2018	2019	2020	2021	2022
Canned tuna	3,473	3,494	3,817	3,098	4,383	4,676	4,008
Fish oil	41	35	293	77	77	69	32
Fish meal	103	115	127	115	174	151	93
Fresh and frozen fish	69	108	223	237	274	298	298
Others	36	44	41	50	87	92	64
<b>Total</b>	<b>3,725</b>	<b>3,796</b>	<b>4,501</b>	<b>3,577</b>	<b>4,995</b>	<b>5,286</b>	

### 3.6.3 Imports

The Seychelles is also an importer of fish, particularly tuna. Most of the imports come through the purchase of tuna by IOT from foreign flagged vessels (EU and other flags). The amount of tuna imported fluctuates over the years. Between 2016 and 2022, the average annual import was around 70,200 Mt. Some tunas are also imported from other countries with MSC-certified fisheries for certain canned tuna products. In 2021, frozen tuna destined for IOT made up 98% of total imports of fish and fishery products in terms of volume (66,500 Mt) and 94% (SCR 1,882 million) in value in 2022.

## 3.7 Fishing Ports, Landing Sites and Anchorages

### 3.7.1 Fishing Ports and Landing Sites

The Seychelles has 1,300 m of berthing space that can cater to the industrial tuna sector. In addition, there is a port dedicated to the semi-industrial tuna fishery and several smaller ports, jetties and marina that caters to the small-scale artisanal fisheries and the sports and recreational fisheries.

#### 3.7.1.1 Industrial Fishing Ports

There are several ports and transshipment infrastructures that cater to industrial tuna fishing vessels. These facilities are briefly described below.

**Long Pier Fishing Port:** The Industrial Fishing Port is operated by the Seychelles Ports Authority and is dedicated to serving the industrial fishing sector. It has a total of 384 m of berthing space and is the main port used for unloading to the IOT factory. It has a total of eight bunkers and six water points and can accommodate vessels up to 115 m in length and a maximum draft of 7.5 m.



**IPHS Fishing Port:** The IPHS port is operated by Ile du Port Handling Services Ltd, a public private partnership entity with Government of Seychelles, Jaccar Holdings (Foreign Investor) and Seychellois investors as shareholders. The IPHS Port has a total quay length of 425 m, seven bunkering points, and can accommodate vessels with a maximum draft of 12 m.

**Mahe Quay:** Mahe Quay is the commercial port of Port Victoria. It is operated by the Seychelles Ports Authority and has a berthing space of 370 meters. It mostly caters to containerized cargo vessels, but also handles dry and breakbulk cargo, military, tankers (cement, oil and gas), supply ships, mega and superyachts, cruise ships and occasionally industrial fishing vessels when berth space is available.

**Zone 14 Port:** The Zone 14 port is located adjacent to the net repair zone and mostly caters to purse seiner dropping nets for repairs and pick up. It can handle vessels of up to 155 m in length and 7.5 m in draft.

**Tuna Buoys:** Two tuna buoys (Tuna Buoy and English River Buoy) exist in the Port Victoria area where fishing vessels can layover and tranship catch.

### **3.7.1.2 Semi-Industrial Fishing Ports**

The semi-industrial longline tuna fleet mostly make use of the Providence Port. The Providence Port has a total of 332 m of berthing space and is close to the Providence Fish Processing Facility. Semi-industrial vessels also make use the berthing facility in front of Oceana Fisheries and Sea Harvest for unloading catch and for loading ice.

### **3.7.1.3 Artisanal Fishing Ports**

The Victoria artisanal fishing quay is the largest port serving the artisanal fishing fleet with a total of 220 m of berthing length, part of which is sometimes used for landing by semi-industrial longline vessels at Oceana Fisheries and Sea Harvest. Some landing of tuna is also done at the Bel Ombre Port. Small amounts of tuna and tuna-like species are also landed by the artisanal fishing fleets at other artisanal fishing quays such as at La Retraite, Cascade, Baie Ste Anne, and beach landing sites throughout the country.

### **3.7.1.4 Sports and Recreational Fishing Marina and Landing Sites**

Eden Island Marina is the main sports and recreational fishing landing site on Mahe Island followed by Marine Charter in Victoria and Bel Ombre. On Praslin the main landing site for the sports and recreational fishing fleet is located at Baie Ste Anne and the beach of Côte d'Or. Many recreational fishers also land their catch on beaches around the island of Mahe, Praslin and La Digue.

## **3.8 Ancillary Services**

From the start of industrial tuna fishing, several ancillary services have developed to support the tuna fishing industry. The main ones include:

**Vessel agencies:** Vessel agents represents foreign fishing companies in Seychelles. It is a requirement of the Fisheries Act (2014) that all fishing vessels applying for a license to fish in the Seychelles EEZ to have a local agent. In 2021, there were seven registered fishing vessel agents.

**Ship chandlery:** Ship chandlers are companies that offer a full service to vessel operators. These services include but are not limited to food provisions, repairs, spare parts, safety inspections, medical supplies, general maintenance and much more. In 2023, there were nine registered ship chandlers. It is unclear how many of them work with industrial tuna fishing vessels.

**Hull Repairs and Maintenance:** Hull repair and maintenance companies carry out repairs on fishing vessels. Most of the repairs required by industrial vessels are for inspection, welding and fixing of damaged components on the boat hull. Hull repair and maintenance companies provide services such as underwater welding, mechanical repairs, repairs to propellers, unblocking of water intakes or outlets, applying anti-fouling and paint, etc. There are four commercial slip ways that can cater to semi-industrial vessels but not industrial vessels. Hence major repairs on industrial vessels are usually undertaken at other ports in the region with dry docks such as Madagascar, Mauritius, Kenya, South Africa, Dubai, etc.

**Electronic Equipment Repairs and Maintenance:** Seychelles Electronic Maritime Company (SeyCMI) is the main company providing services for the repair and maintenance of electronic and communications equipment on industrial and semi-industrial fishing vessels.

**Stevedoring:** Stevedoring is the process of loading or offloading cargo from a ship. Efficient stevedoring is a backbone of the Seychelles tuna industry. The stevedores are involved in landing of catch and transshipment of catch from fishing vessels to reefer vessels or reefer containers. In 2023, there were five registered companies providing stevedoring service to the industrial fisheries sector. An employment and capacity needs assessment study for the Seychelles fisheries sector undertaken in 2022 indicated that there were 114 stevedores of which 67% were Seychellois.

**Provision of Reefer Container:** Since the majority of tunas are presently being transhipped through reefer containers as opposed to reefer vessels, the provisioning of reefer containers has become an important ancillary service in the industrial fisheries sub-sector. In 2021, 237,396 Mt of fish were transhipped by seiners in Port Victoria via reefer containers which equate to a minimum use of 8,047 standard 40 ft high cube reefer containers. Most of the reefer containers used in the Seychelles are supplied by the global shipping company Maersk. The Seychelles Ports Authority has reserved 16,691m<sup>2</sup> of land at Ile du Port to cater principally for refrigerated containers.

**Container Haulage:** Container haulage is undertaken via the road network between the Mahe Quay and the Fishing Port and IPHS Port, and between fish processing facilities and the different ports. Most of the containers used in the sector are 40 ft standard high cube reefer containers for the export of fish. However, a substantial number of dry containers are also used for importing materials for provisioning fishing vessels. At least 20,000 individual container haulage trips are made annually in the Seychelles for the tuna industry.



**Construction of FADs:** Around 80% of the tuna from the WIO region caught by fishing vessels licensed to fish in the Seychelles EEZ are captured in association with Drifting Fish Aggregating Devices (DFADs). Purse seiners operating within the IOTC Area of Competence can purchase up to 500 instrumented buoys annually follow up to 300 operational buoys at any one time. With 46 purse seiners licensed to fish in Seychelles waters the demand for FADs is substantial. While FADs are mostly constructed on-board vessels by crew, a proportion are still constructed on land in the Seychelles. Shifting the construction of FADs to be a solely land-based activity has important economic potential.

**Cold Storage:** Cold storage space for fish is a requirement for the development of the local post-harvesting sector. The newly built Central Common Cold Storage (CCCS) has a capacity of 12,600 Mt and rents out storage space to third parties. The facility can handle 450 Mt of tuna and bycatch per day from fishing vessels and has the capacity to store 10,000 Mt of fish at -20° C and 2,600 Mt at -40°C. CCCS is an EU approved storage facility and holds the MSC Chain of Custody certification. The Indian Ocean Tuna Ltd. (IOT) has an estimated 5,000 Mt storage capacity, which it utilizes for its own use.

**Sorting Services:** Sorting, sizing, and grading of tuna and bycatch is offered by the Central Common Cold Store (CCCS) facility in Zone 14. CCCS provides efficient cold chain management while sorting fish and guarantees full product traceability. After sorting fish are either stored in the facility, loaded onto containers for export or dispatched to local clients.

**Quality Control:** Quality control of fish and fish products helps ensure that the fish products are safe for human consumption and that it meets the requirement of receiving markets. In processing plants, quality control is usually undertaken in-house. Quality and quantity control services for the tuna purse seiner fleet and reefer vessels discharging in Port Victoria is undertaken by the Société de Contrôle d'Expertise Maritime de Pêches (SOCOMEPE). The Fish Inspection and Quality Control Unit (FIQCU) is the Seychelles Competent Authority (CA) which performs all the official controls on fish and fishery products sanitary conditions for export purposes.

**Provision of Salt:** Salt provisioning is an important activity for the purse seine fleet that stores most of their catch in frozen brine. Salt provisioning to purse seiners is usually done by the local vessel agents. The salt is imported from overseas and stored in hangars.

**Net Repairs:** Seychelles provide services for the repair of damaged purse seine nets on Zone 14. Currently there are five companies offering net repair services in Port Victoria.

**Container Storage, Plugin and Monitoring Services:** Storage of empty containers (mostly reefer containers) are done by cargo vessel agents. Plugin facilities for stuffed reefer containers are offered by IPHS on the IPHS port and by Land Marine Ltd on Mahe Quay for reefer and refrigerated containers before delivery to the client or before export. Both companies are responsible for monitoring these containers while plugged in.

**Sale of Fishing Gear:** Industrial and semi-industrial fishing companies usually import their own fishing gear. Numerous local fishing gear shops supply the artisanal and the sports and recreational fishing sub-sectors.

**Sale of Bait:** Semi-industrial fishing vessels mostly use artificial bait. Companies do import small amounts of bait consisting mostly of squid and milkfish. The artisanal fishery usually gets their own bait or procure it from other fishermen or from local fish processors.

**Sale of Ice:** The sale of ice to semi-industrial, and artisanal fishing vessels is done by the SFA, Oceana Fisheries and Sea Harvest. For the year 2022, SFA sold SCR 5.98 million of ice but it is unclear what percentage was purchase by the semi-industrial longline fishery.

**Supply of Electricity:** Electricity to land-based services is usually supplied by the Public Utilities Corporation using mostly heavy fuel oil for generation. For the year 2021 the PUC supplied a total of 207,329,418 kWh of electricity to the commercial sector at a value of SCR 935,785,650. It is not known how much of this electricity was used by the tuna industry. Some companies in the tuna industry have installed photovoltaic systems as means or reducing their carbon footprint and the cost of energy.

**Supply of Water:** Supply of water to the tuna industry is principally through the Public Utilities Corporation. The Indian Ocean Tuna Canning factory also produce its own water through desalination. For the year 2021 the PUC supplied a total of 2,286,347 m<sup>3</sup> of water to the commercial sector at a value of SCR 76,063,727. It is not known how much of this water was used by the tuna industry.

**Recycling of fishing gears:** Several new companies have set up recently to export old fishing nets to other countries where they can be recycled. The nets are being cut in smaller pieces and packed into containers for export. Other companies are also servicing and repairing instrumented buoys so that they can be re-used.

## **4. POLICY AND LEGAL FRAMEWORK**

### **4.1 Policies**

#### **4.1.1 Seychelles Fisheries Sector Policy 2019**

The Fisheries Sector Policy and Strategy (2019) is the overarching policy for the fisheries sector of the Republic of Seychelles. It is set within the context of Vision 2033, which aims to build a modern, diversified and resilient economy and places a priority on increasing environmental sustainability and resilience. The broader context also includes the Seychelles response to the 17 United Nations Sustainable Development Goals, the Blue Economy Roadmap and the Seychelles Marine Spatial Planning initiative, which all focus on growing an ocean-based economy in a way that is environmentally and socially sustainable, with fisheries and aquaculture as important sectors.

The Policy is structured around ten Policy Statements, each of which is underpinned by several strategic action plans and policy directives. The Policy Statements are based on the following priority areas:

1. Good governance and institutional strengthening
2. Sustainable management of fisheries and climate resilience
3. Infrastructure support and value chain development
4. Building efficiency in the industry
5. Investment and economic growth
6. Seychellois stakeholding in the industrial fisheries sector
7. Employment, training, resourcing and human resource development
8. Strengthening Monitoring, Control and Surveillance
9. Research and innovation in the fisheries sector and aquaculture
10. Sustainable development of aquaculture

The Policy and Strategy provide details of the extensive legislative and administrative framework for fisheries and aquaculture and the relevant international and regional instruments, both legally binding and voluntary, and take note of Seychelles' membership in regional fisheries bodies, which include the Indian Ocean Tuna Commission (IOTC), Southwest Indian Ocean Fisheries Commission (SWIOFC), Southern Indian Ocean Fisheries Agreement (SIOFA).

A 2023 review of the implementation of the Policy and Strategy found impressive progress in the achievement of its goals and objectives. It however noted that more progress had been made in the implementation of some policy areas than others. Some obstacles that were noted as part of the review included institutional and budgetary concerns and the fragmented, disorganised and indecisive fisher associations. The development of tuna fisheries management plan and development framework was not specifically mentioned in the 2019 Policy, but the 2023 review report noted the absence of a policy on developing and domesticating industrial longlining, as a means to do more with less, and recommended that it is addressed in the next policy and in the formulation of this Tuna Industry Development Framework.

## **4.2 Legislations**

This Section describes the key laws that are in force or in the process of being amended that control the Seychelles fishing sector.

### **4.2.1 Fisheries Act (2014)**

The Fisheries Act, 2014 provides a general framework for management of tuna fisheries and licensing vessels, but it has many gaps or inconsistencies and does not include many fundamental international or regional obligations. In response to this the Seychelles has undertaken a comprehensive update of its fisheries laws in the form of the gazetted Fisheries and Aquaculture Bill (2023) and its accompanying draft Fisheries and Aquaculture Regulations. The formulation of the Fisheries and Aquaculture Bill and Regulations involved extensive stakeholders' consultations.

The Fisheries Act (2014) is divided into seven parts: Preliminary, Fisheries Management, Licensing Requirements, Appeals Board, Enforcement Measures, Offences, and Miscellaneous. On the other hand, the gazetted Fisheries and Aquaculture Bill (2023) is much more extensive and is presented in sixteen parts. As part of efforts to strengthen the management of the tuna fishery, the Bill contains clear provisions for the adoption of conservation and management measures and fisheries management plans, the implementation of international conservation and management measures and a wide range of specific management measures and prohibitions.<sup>3</sup> Robust provisions are included on fisheries access and information, data and statistics. The licensing requirements, conditions and processes are clearly set out. The MCS provisions include various powers and authorities, inspection procedures and requirements for the monitoring system and the Fisheries Monitoring Centre. Legal processes including jurisdiction, evidence, summary administrative offences and fines and penalties are also addressed.

### **4.2.2 Fisheries Regulations**

A suite of Fisheries-related Regulations has been adopted and the current list of fisheries regulations include:

- Fisheries Act (Subsidiary legislation) 2010 Regulations (vessels, licensing, gear, protected areas)
- Fisheries (Mahe Plateau Trap and Line Fishery) Regulations, 2021
- Fisheries (Aquaculture) Regulations, 2020
- Fisheries Amendment Regulations 2007 (amending 1987 Regulations)
- Fisheries (Shark Finning) Regulations, 2006
- Fisheries Regulations 1987 (1991 edition)
- Licenses (Fisheries) Regulations 1987.

The basic regulations adopted in 1987, as amended, generally provide for licenses, gear, and fisheries management but don't specifically refer to tuna and tuna-like species. The draft Fisheries and Aquaculture Regulations implement many aspects of the Fisheries Comprehensive Plan and a number of specific IOTC conservation and management measures related to species and MCS. They contain parts relevant to tuna and tuna-like species on:

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<sup>3</sup> Including management of bycatch, marking of vessels, requirements for fish aggregating devices and transshipments.

- Conservation, management, development and sustainable use
- Requirements for fishing and other activities
- Vessel classification, licence preconditions
- Licences, authorisations, other permissions
- Documentation for import, export, re-export
- Monitoring, control, and surveillance

The Regulations also contain fifteen Schedules which provide technical elaborations or forms for specific Regulations.

#### **4.2.3 Export of Fishery Products Act and Regulations**

The [Export of Fishery Products Act](#) controls fish exports. It requires permit for establishments, factory vessels and establishes a Fish Inspection and Quality Control Unit. The Export of Fishery Products (Sanitary) (Amendment) Regulations, 2011 SI 55 of 2011 prohibits export of fishery products for human consumption unless prepared, processed, or packed pursuant to a permit. In particular, it provides that no person shall export fishery products for human consumption from Seychelles unless they are prepared, processed or packed in an establishment, a freezer vessel, or a factory vessel subject to a permit granted in accordance with Section 3 of the Act. Amendments to the Export of Fishery Products (Sanitary) Regulations 2010 were approved in 2022 to allow Seychelles to remain in line with the requirements laid under the European Union (EU) legislation. The amendments, proposed by the fish inspection and quality control unit, the competent authority for sanitary controls and certification of fish that is exported and a division of the Seychelles Bureau of Standards (SBS), follows a sanitary audit conducted by the EU in 2018, where it was found that certain provisions in the local legislation are yet to be amended to reflect the changes in EU law.

#### **4.2.4 Food Act**

[The Food Act, 1990](#) regulates the preparation, manufacturing, processing, cooking, packaging, storage and distribution of food.

#### **4.2.5 Harbour Act**

[The Harbour Act, 1932](#) control harbours and refers to harbour dues and rates leviable by virtue of regulations. Regulations may be made for traffic control, and the prohibition, control and regulation of persons and goods entering or leaving the Port Security Area.

#### **4.2.6 Merchant Shipping Act**

[The Merchant Shipping \(Amendment\) Act, 2019](#) regulates bareboat charters and hire craft among others.

#### **4.2.7 Seychelles Investment Act**

[The Seychelles Investment Act, 2010](#) establishes the Seychelles Investment Board and provides for a legal environment that is conducive to a greater flow of investments into the Republic and

the protection of the rights of investors. [The Seychelles Investment \(Economic Activities\) Regulations, 2014 SI 71 of 2014](#) designates the economic activities that are reserved for Seychellois and those allowable for foreign participation subject to certain conditions. If an activity does not appear on the list, it will be considered by government. “Fishmonger” is reserved for Seychellois; fisheries related activities are not mentioned in the Second Schedule of activities allowable for foreign participation.

## **5. MANAGEMENT AND INSTITUTIONAL FRAMEWORK**

### **5.1 International Obligations**

The Seychelles have regional obligations that are of relevance for the management and development of its tuna fishery and industry to the Indian Ocean Tuna Commission (IOTC) and the Southwest Indian Ocean Fisheries Commission (SWIOFC). While the IOTC has a management mandate, and its Resolutions are legally binding, the SWIOFC only has an advisory mandate and the instruments it adopts are all voluntary and not legally binding.

Relevant international obligations include those set out in the 1982 UN Law of the Sea Convention (UNCLOS), 1995 UN Fish Stocks Agreement (UNFSA) and 2009 FAO Port State Measures Agreement (PSMA). FAO has adopted a number of voluntary instruments, including fisheries-related Guidelines (e.g. on flag State performance, bycatch and discards and other) and the 1995 Code of Conduct for Responsible Fisheries. They are all based on international instruments and best practices.

Other legally binding international instruments to which Seychelles is party and membership in international organizations that may also have an indirect bearing on fisheries activities and legislation are shown below.

- 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- 1978 International Convention for the Prevention of Pollution from Ships (MARPOL)
- 1985 Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean<sup>4</sup>
- 1992 Convention on Biological Diversity (CBD)
- 1992 United Nations Framework Convention on Climate Change (UNFCCC)
- 2000 United Nations Convention against Transnational Organised Crime (UNTOC)
- International Maritime Organization (IMO)
- International Labour Organization (ILO)

### **5.2 National Management Bodies**

There are several national management bodies that play important roles in the functioning of the Seychelles tuna industry. This section describes these key institutions and their functions.

#### **5.2.1 Department of Fisheries**

The Department of Fisheries (DoF) forms part of the Ministry of Fisheries and Blue Economy (MOFBE). Its mandate is to provide a conducive policy and legal environment to ensure sustainable fishing, facilitate appropriate physical infrastructure and institutional framework to attract investment and facilitate operations towards improving value chain aimed for export and as a means of national food and nutrition security status and increasing the contribution to the Gross Domestic Product.

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<sup>4</sup> The focus is on sound environmental management of natural resources, and it does not specifically create legal obligations relating to fish. The Convention fosters sustainable ocean management through ecosystem-based approaches, noting the institutions, rights and frameworks established to organize the use of these waters under the 1982 Law of the Sea Convention.



The DoF is also responsible for negotiations of fisheries access for foreign fishing vessels. It has adopted guiding plans, policy and strategies documents that form the basis of ongoing actions, including the:

- [2019 Fisheries Comprehensive Plan](#)
- [2019 Seychelles Fisheries Sector Policy and Strategy](#)
- [2018-2022 Seychelles National Aquaculture Policy](#)

### **5.2.2 Seychelles Fishing Authority**

The Seychelles Fishing Authority (SFA) is a parastatal organization which functions as the executive arm of Government for fisheries and related matters. The Authority was created in August 1984 by the [Seychelles Fishing Authority \(Establishment\) Act](#) which give SFA power to do all things necessary or convenient relating to the performance of its functions, including the following which are most relevant to tuna management and development.<sup>5</sup> An amendment Bill is in process aimed at streamlining the mandates of the SFA and strengthening its governance. The current Act describes SFA functions as (Section 5):

- (a) to promote, organize and develop fishing, fishing industries and fishing resources in Seychelles;
- (b) to assist in the formulation of the national policy with respect to fishing, fishing industries and fishing resources and in the implementation of that policy;
- (c) to conduct negotiations, or engage in meetings, seminars or discussions, with regard to fishing or fisheries or the establishment or operation of fishing industries, whether at a national or international level, on behalf of the Republic or otherwise;
- (d) to identify the manpower training requirements of Seychelles with regard to fishing and fishing industries; and
- (e) those mentioned in any other written law.

Section 6 of the SFA Establishment Act details the powers of the SFA. Those most relevant for tuna management and development are:

- enter into partnership or joint ventures;
- carry on any business or enterprise for or in connection with -
  - (i) fishing or fisheries;
  - (ii) processing, transporting, handling, marketing or distributing fish or fish products;
  - (iii) exporting fish or fish products;
  - (iv) the sale of equipment or apparatus to be used for fishing; or
  - (v) any other matter relating to its functions where, in the opinion of the Authority, the carrying on of such a business or enterprise is in the best interest of the Republic;
- conduct surveillance operations, in conjunction with the Ministry of Defence, in relation to fishing operations in the exclusive economic zone or in the waters super adjacent to the continental shelf;
- monitor the catch of all fishing vessels;
- carry out scientific and development research.



SFA may exercise these powers either acting alone or, where appropriate, in association with any other person including the Government, a foreign Government or any agency or instrumentality thereof. The Act also provides for the Board of Directors, staff and financial requirements.

In 2023, the SFA was made up of 10 Departments. Their functions are described in detailed in the SFA Strategic Plan (2022-2027).

### **5.2.3 Fish Inspection and Quality Control Unit (FIQCU) of SBS**

The *Fish Inspection and Quality Control Unit* (FIQCU) of the Seychelles Bureau of Standards is the Seychelles Competent Authority<sup>6</sup> which performs all the official controls on fish and fishery products sanitary conditions for export purposes. The Export of Fishery Products Act, 1996 and its subsidiary legislations provide the FIQCU with the legal mandate it requires to execute its function as Competent Authority. The FIQCU was given status of Competent Authority by the EU for certifying all export of fish and fishery products to the EU in 1999 following the EU's evaluation mission in August 1998.

The FIQCU issues *Sanitary Certificates* for every consignment of fish and fishery products exported from the Seychelles to any destination country. Its principal functions are to:

- Approve fish processing establishments, fishing vessels and landing sites based on compliance with the requirements of the legislation.
- Verify compliance with food safety and hygiene requirements through the performance of audits and inspections on all processing establishments, fishing vessels and landing sites.
- Verify compliance with food safety conditions through sampling of fish and fishery products, water, and ice for microbial, chemical and physical quality.
- Review and approve Hazard Analysis and Critical Control Point system (HACCP) at the processing establishments.
- Issue health certificates for all consignments of fish and fishery products exported from by the Seychelles.
- Control imported fishery products as raw material for manufacturing and re-export.
- Issue non-commercial certificates to travellers carrying small quantities of fish as part of their accompanying luggage.

### **5.2.4 Seychelles Licensing Authority**

The mandate of the Authority is to facilitate business socio-economic development through issuing and enforcement of the Licences Act and Licence Regulations and to create the enabling environment for sustainable business development in Seychelles. In the fisheries sector, the SLA is responsible for issuing licenses for all licensable activities apart from fishing vessel licenses and fishing activity licenses, which are under the responsibility of the SFA. In issuing licenses for activities in the fisheries sector under its responsibility, the SLA consults other agencies such as the SFA, FIQCU, Public Health Authority, etc. especially before the issuance of licences requiring inspections by other agencies.

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<sup>6</sup> The Export of Fishery Products Act, 1996 and its subsidiary legislations provide the FIQCU with the legal mandate it requires to execute its function as Competent Authority. The FIQCU was given status of Competent Authority by the EU for certifying all export of fish and fishery products to the EU in 1999 following the EU's evaluation mission in August 1998.

### **5.2.5 Public Health Authority**

The Public Health Authority is responsible for disease prevention and control through the implementation of the Public Health Act and policies and strategies for the prevention of non-communicable and communicable diseases. One of its responsibilities in the fisheries sector is the inspection of fish processing facilities and the issuance of *Sanitary Certificate* for facilities processing fish for the local market.

### **5.2.6 Department of Trade**

[The Trade Department](#) forms part of the Ministry of Finance, National Planning and Trade. It is responsible for trade related policies and for the negotiation of trade agreements. One of its roles related to the fisheries sector is the issuance of export permit for fish, usually valid for one year. Before granting the export certificate the Trade Department requires the exporter to hold a:

- Certificate of Origin (applicable to some markets only, i.e. where preferential tariffs apply) from the Seychelles Chamber of Commerce and Industry;
- Catch Certificate from SFA for validation as non-IUU caught fish (applicable to some markets only e.g. EU) and
- Sanitary Certificate from FIQCU.

### **5.2.7 Seychelles Revenue Commission**

The Customs Division of the Seychelles Revenue Commission is responsible for final verification of all documents before export, including:

- Export Permit issued by the Trade Department, Ministry of Finance, National Planning and Trade;
- Sanitary Certificate issued by the Fish Inspection and Quality Control Unit (FIQCU), Seychelles Bureau of Standards;
- Certificate of Origin (for each export for some markets where preferential tariffs apply) issued by the Seychelles Chamber of Commerce and Industry; and
- Catch Certificate for validation that catch is non-IUU (for some markets only, e.g. EU) issued by the SFA.

## 6. MAJOR ISSUES

There are several issues that have the potential of affecting the development of the Seychelles tuna industry and that should be addressed by this development framework. The issues can be classed in five broad categories and are succinctly outlined below.

### 6.1 Environment and Resource Sustainability

**Over-Fishing of Target Species:** As of the end of the second quarter of 2023, six of the 15 species under the IOTC management mandate were considered overfished and subject to overfishing. These include the yellowfin and bigeye tuna, the blue marlin, striped marlin, longtail tuna, and the narrow-barred Spanish mackerel, all of which are captured by the Seychelles tuna fishing fleets. The stock status of four other species (black marlin, Indo-Pacific sailfish, bullet tuna, frigate tuna) were classified as uncertain, mostly due to uncertainty in catch data and lack of knowledge of the species biology and productivity. Only four of the species under the IOTC management mandate were considered not to be overfished nor subject to overfishing. These include the albacore tuna, skipjack tuna, swordfish, kawakawa, and the Indo-Pacific king mackerel. Though the skipjack tuna was considered not to be overfished nor subject to overfishing, the IOTC Scientific Committee predicts that environmental conditions will enter in a less favourable period that will affect stock productivity and have highlighted the need for the IOTC to ensure that catches of skipjack tuna during this period do not exceed the agreed catch limit.

**Impacts on Non-Target Species and Habitats:** Non-target species in tuna fisheries refer to species of marine life that are caught incidentally while fishing for tuna. These species may include various types of fish, marine mammals, sea turtles, seabirds, and other organisms that are not the primary target of the fishing operation but are caught unintentionally in the fishing gear. The accidental capture of non-target species, also known as bycatch, is a significant concern in tuna fisheries due to its impact on marine ecosystems and biodiversity. Impacts on non-target and ETP species are also caused by Abandoned, Lost or otherwise Discarded Fishing Gears and Devices (ALDFGDs) such as longlines, fishing buoys, DFADS that entangle marine species or get caught in shallow areas where they physically impact habitats such as coral reefs, seagrass beds and shallow lagoons. IOTC Resolutions 19/02 and 23/06 now require all DFADS to be constructed from non-entangling and non-mesh materials to prevent entangling of marine species.

**Effluent Discharge and Pollution:** Effluent discharge and water pollution is a problem in Port Victoria, where effluent with high nutrient loads from fish processing plants are discharged into the environment after having undergone only primary treatment. The high nutrient load causes problem of eutrophication of the water column and anoxia in surface sediments. Both conditions affect ecosystem functioning and biodiversity in the area.

**Waste Accumulation:** Tuna fishing and processing in the Seychelles contributes to the overgrowing waste problem. Old fishing gears such as lines, nets, conventional buoys, and radio buoys have definite lifespans and have to be replaced from time to time. Processing of tuna also creates waste such as metal scraps and packaging waste. Some of this waste ends up in the local landfill whereas others are now being exported for recycling overseas. There is now a programme to export old purse seine nets from Seychelles for recycling overseas as well as the collection and reutilisation of instrumented buoys.

**Climate change:** There is already a very good assessment of climate change impacts, vulnerabilities, and adaptations on Western Indian Ocean marine fisheries (Moustahfid et al., 2018) in which the Seychelles is prominently featured. However, the issue of climate change and the fisheries sector and the possible effects that climate change could have on the Seychellois society is not something which is frequently discussed in the Seychelles. Climate change is exacerbating the impact of natural phenomenon such as the El Niño and the Indian Ocean Dipole (IOD). El Niño and positive IOD conditions result in higher sea surface temperature (SST) and deeper thermocline in the Western Indian Ocean which affects the redistribution of large pelagic fishes targeted by industrial fisheries to greater depths, where they become inaccessible to purse seine gears, or to the cooler Eastern Indian Ocean, where they are followed by industrial purse seiners. The situation occurred in 1998 and is well documented (Marsac, 2017; Moustahfid et al., 2019). In summary, tuna schools migrated towards the Eastern Indian Ocean and were followed by a shift of fishing activity to the East Indian Ocean by purse seiners that usually fish the Western Indian Ocean. These purse seiners made use of Asian Ports rather than Port Victoria which resulted in a 40% decrease in tuna landings and transshipments and a loss of 34% of vessel expenditure to economy (Robinson et al., 2010). Such a shift in vessel activity affects the whole fisheries value chain in the Seychelles when it occurs and has profound impact on the national economy.

## **6.2 Facilities, Infrastructure and Services**

**Limited Space and Land Availability:** Limited land and space is one of the major development barriers in the Seychelles. Limited land and space have impacted the construction of infrastructure for the Seychelles fishing industry. It has resulted in infrastructure such as fish processing plants being decentralised. This has an impact on the cost of construction, the supply of utilities, as well as the cost of operation.

**Inadequate Infrastructure and Services:** A berth space adequacy study commissioned by the Seychelles Ports Authority in 2020 concluded that the current berth capacity for industrial fishing vessel is too limited to handle the increasing number of vessels projected to call the port. The study recommended the construction of five berths for purse seiners over the coming 30 years to keep the port efficient and unhindered. The adequacy of the chiller facilities for the export of fish at the Seychelles International Airport has also been questioned. Currently there are no centralized facilities in place for full treatment of effluent coming from fish processing plants before being discharged into the sea. In certain areas, the electricity supply is inadequate for projected use. Services such as dry docks do not exist, while services for minor hull and electronic repairs, laboratory testing are limited.

## **6.3 Governance, Administration and Regulations**

**Governance:** Despite being such an important part of the Seychelles economy, that affects and is affected by many sectors, the Seychelles tuna industry does not have a high-level structure to govern it. The sub-sectors are not well organised, and until lately stakeholders have not been

included in decision making. As a result, there has been little coordination in the development of the tuna industry across the different sub-sectors.

**Administration:** The administration of the sector is assured by the MOFBE and the SFA, but current organisation structure does not allow for focussed interventions on the tuna industry. Though there is a fisheries policy and strategy in place, this is the first time that a Tuna Industry Development Framework (this document) and a Tuna Fishery Management Plan are being put in place. There is a need for more planning in the development of the fisheries industry, particularly concerning the tuna industry.

**Regulations:** The Fisheries Act (2014) and Fisheries Regulations (1987, as amended) are inadequate to fully regulate the Seychelles tuna industry with regards to fisheries matters. The gaps and weaknesses that were identified with fisheries laws are being addressed through the gazetted Fisheries and Aquaculture Bill (2023) and the draft Fisheries and Aquaculture Regulations to support it. The laws affecting the tuna industry will need to be reviewed regularly alongside emerging issues and updated as required.

## **6.4 Economics, Finance, Investments and Markets**

**High Cost of Production and Utilities:** The high cost of production and utilities always feature at the top of the tuna industry economics and finance issues lists. The high cost of electricity makes it difficult to have competitive prices for value addition. This issue is not easy to address as it could have wide-spread socio-economic repercussions in terms of wages and government incentives.

**Access to Credit and Investment:** Difficult access to credit with high rates of borrowing have impacted the development of the Seychelles tuna industry. It has made it difficult for investors to invest in equipment upgrades, vessel maintenance, and technological advancements. This limitation can hinder their ability to expand operations, improve efficiency, and remain competitive in the market. Difficult access to credit and high rates of borrowing also increase financial vulnerability and motive for investment. New financial schemes such as the Blue Investment Fund with low interest loans and long repayment periods are helping to address the situation but uptake has been low.

**Limited Value Addition:** The post-harvest sector has a high reliance on tuna canning and the export of whole fish. In 2022, 89% of the export value of fish and fish products was made up by canned tuna. Limited local value addition has been impacted by several factors such as land availability, high rates of borrowing, inability to guarantee supply of raw materials, labour shortages and the lack of implementation of policy to support value addition.

**Market Access:** Seychelles has mostly been selling its canned and whole tuna to Europe, with some of the whole tuna going to other processing plants in the region, and elsewhere for further processing. While high end markets exist for high quality tuna, the Seychelles have not been able to supply these markets with the quality fish from its semi-industrial tuna fleet.

**Future needs analysis:** Seychelles do not currently have the required capacity to analyse the global tuna markets and make projections of future needs. This undermines the degree of advanced planning in the industry and the use of a structured approach for sector development.

## 6.5 Social and Equity

**Training and Capacity Retention:** Though the Seychelles has been providing training for youth to participate in the tuna industry, through its Maritime Academy, retention of these youth in the industry has been less than optimal. The lack of retention appears to be a complex issue that is affected by many factors including lack of further training, difficult working conditions, lack of career prospects, and social and behavioural issues such as drug use and absenteeism, etc.

**Ocean literacy:** The majority of the Seychellois people do not understand the Seychelles tuna industry. Many people think that all of the tuna that are landed or transhipped through Port Victoria are Seychelles tuna. The main source of this issue comes from a lack of publicly available information on Seychelles fisheries. Having joined the Fisheries Transparency Initiative (FiTI) and the publication of annual reports is helping to put more information in the public sector. However, there is still a need to undertake a long term and wide-scale communication campaign to educate the Seychelles public about all aspects of the tuna industry, its benefits and impacts, on the economy and the environment.

## 7. DEVELOPMENT PATHWAY OPTIONS

Development pathway options for the Seychelles tuna fishery were developed through a process that involved:

- i) Making use of outcomes from a multi-criteria analysis (MCA) focused on the harvesting component of the industry. The MCA considers the benefits and risks posed by different sub-components of the fleet of vessels that are licensed to fish in the Seychelles EEZ by mode of access (**Table 9**).

**Table 9.** Different types of access arrangements in place for allowing fishing vessels access to fish for tuna resources within the Seychelles EEZ and the number of vessels under each type of arrangement for the year 2021.

Access arrangement	No. vessels in 2021
European Union - Seychelles Sustainable Fisheries Partnership Agreement (EU-Sey SFPA)	34
Private access agreements	117
Bilateral agreements	3
Licensing	3
Flagging	77
Domestic license semi-industrial longline fishery	41
Domestic license artisanal fishery	297

The MCA analysed each access arrangements based on thirteen criteria, which included:

- **Direct Government revenue from fishing license fees:** Direct revenue collected by Seychelles in the form of license fees for access to fish in Seychelles EEZ.
- **Additional direct payments to government:** : Payments made as part of access arrangements in the form of sectoral support, catch above reference tonnage, and environmental management and ecosystem observation contributions.
- **Direct Government revenue per Mt of fish caught:** Direct state revenue generated by fishery component. Amount paid for access divide by Mt of fish caught.
- **Value added (VA):** The total revenue minus intermediate consumption.
- **Seychelles share of VA:** Percentage of value added that remains in the Seychelles economy.
- **Expenditures per Mt:** The amount of money that is spent in the Seychelles per Mt of fish caught.
- **Jobs created:** Seychellois jobs created for each component.
- **Readiness:** The relative ease of implementation for each fishery component (information from Ministry of fishery, Ministry of Finances and Ministry of Foreign Affairs).
- **Monitoring capacity:** Deliverance of reliable and accurate position and catch records.



- **Environmental impacts:** Identification of major environmental damage (mammal collision, plastic pollution, bird catches, etc.).
  - **Climate change contribution:** Assessment of the CO<sub>2</sub> equivalent contribution per ton of fish catch (carbon footprint) and other climate change effects linked to the operation of the fleet.
  - **Transaction cost:** Any additional monetary costs incurred before, during, and after the formation and engagement of a fishing agreement or to process licence fees; and
  - **Associated risks:** The likelihood of occurrences which may have adverse effects on the Seychelles fisheries sector and sustainable governance.
- ii) Inputs from key stakeholders involved in various capacities in the Seychelles tuna fishery and tuna industry. Stakeholders inputs were principally obtained through two stakeholders workshops organized on the 7<sup>th</sup> and 8<sup>th</sup> March and 21<sup>st</sup> June 2023, a questionnaire completed by purse seine vessel operators, and comments on the first draft of “Deliverable 3: Technical Report on Development Pathway Options for Stakeholder Validation & Prioritisation (Part B)” and the first draft of “Deliverable 4: Action Plan and Budget on Prioritised Development Pathway(s) (Part B)” that were circulated to stakeholders for comments by the SFA on 15<sup>th</sup> June 2023.
- iii) Other key considerations for the Seychelles tuna industry, which included considerations of a wide range of issues including environmental, financial, economic, social, legal, political, administrative, market, and governance.
- iv) Expert experiences from other countries and understanding of global economics.

A total of five development pathway options were generated and are proposed as part of this Tuna Industry Development Framework.

The development pathways include:

- **Pathway one** on *optimizing the socio-economic benefits that can be derived from foreign vessel access agreements and to retain the Seychelles industrial vessels fleet.*
- **Pathway two** on *supporting the development of the Seychelles-owned semi-industrial and industrial fleets.*
- **Pathway three** on *maintaining Port Victoria as the hub of the Western Indian Ocean tuna fishery.*
- **Pathway four** on *increasing local value addition and facilitate international trade in fish and fish products; and*
- **Pathway five** on *improving governance of the Seychelles tuna industry.*

The purpose of the development pathways is to assist with high-level decision making for the sustainable and equitable growth of the Seychelles tuna fisheries.

The development pathways are not mutually exclusive but rather complementary in allowing the Seychelles to strengthen its tuna industry and derive optimal benefit from its central location in the middle of the WIO fishing ground and as the hub of the Indian Ocean Purse seine fishing fleet. The development pathways should be applied concurrently to reduce the reliance on a single sub-



sector and diversify the tuna industry. They can be pursued independently, but one should not take preference over the others.

## 7.1 Pathway One: Optimising Socio-Economic Benefits of Fishing Access Arrangements

The objectives of development pathway one is to *optimize the socio-economic benefits that can be derived from foreign vessel access agreements and to retain the Seychelles industrial vessels fleet.*

### 7.1.1 Situational Analysis

The Seychelles tuna industry is built on providing access to foreign fishing vessels to fish in the Seychelles EEZ, and on the provision of facilities and services for the catch to be landed for local processing, transhipped, and or exported to other destinations. At present, the Seychelles domestic fleet targeting tuna is small and is not able to fully utilise the tuna resources within the Seychelles EEZ. There is a lack of Seychellois private sector investment in industrial tuna fishing and there are persistent capacity gaps that prevents Seychelles from effectively participating in industrial tuna fisheries. Based on the existing situation, Seychelles' option is to continue to provide access to DWFNs to fish in its EEZ and to obtain the best possible social and economic benefits from the access arrangements and services provided to fishing vessels making use of Port Victoria.

As detailed under [Section 3.3](#), there are currently, five different types of access arrangements that the Seychelles is using to allow DWFNs to fish for tuna resources in its EEZ. These include the SFPAs with the EU, bilateral agreements, licensing, flagging (registration of foreign owned vessels in Seychelles), and private access agreements. As indicated by the MCA, the benefits and impacts of these access arrangements to the Seychelles economy differ in various aspects e.g. in terms of total direct payment to the Seychelles government, use of land-based facilities and services and impact on the environment (see [Appendix 2](#)). As such it is important for the Seychelles to adopt a multi-dimensional approach when making decisions on the type of access arrangements that it will use in the future. The Seychelles should consider the benefits of the different access arrangements not only from the access fee that is paid but also in terms of the revenue per Mt of fish caught, as well as other spending in the Seychelles economy made by vessels under these different access arrangements such as total expenditures on shore-based services and bunkering, provision of fish to local fish processors for value addition, human capacity development potential, job creation, and associated risks, particularly with regards to IUU fishing and labour abuses.

It is not expected that there will be a large increase in new requests from DWFNs for access to fish within the Seychelles EEZ. This is principally due to TACs and annual flag state allocations for yellowfin and bigeye tuna imposed by the IOTC to cap the amount of tuna that can be caught with the objective of rebuilding the stocks of these two species. The TAC is limiting the number of vessels that can participate in the fishery as the allocation for each flag state can only be divided among a maximum number of fishing vessels before fishing operation become unprofitable. Consequently, the Seychelles focus should not be on increasing the number of vessels that it is licensing but rather on getting higher access fees and other payments such as for catch above a

certain reference tonnage, sectoral support funds, environmental management funds, etc. At the same time, Seychelles should be favouring access arrangements that stimulate local economic development such as those that sell a portion of their primary catch and by catch to local fish processors for value addition or those that set up facilities for local processing.

### **7.1.2 Priority Focus Areas**

Five priority focus areas are proposed for the implementation of this development pathway. The focus areas are targeted at (i) Increasing revenue from fishing access arrangements, (ii) retaining the Seychelles industrial vessels fleet, (iii) ensuring the transparency of industrial vessels operations, (iv) improving the assessment and monitoring capacities of fishing access arrangements, and (v) increasing Seychellois employment in the industrial fishing sector.

#### **7.1.2.1 Focus Area 1.1 (FA1.1): Increase Revenue from Fishing Access Arrangements**

At present fishing vessels in the same category are paying different amount for licenses under different access arrangements, with vessels under the EU-Seychelles SFPAs paying higher license fees, while also paying for catch above reference tonnage and an environmental management and observation fee. As part of the efforts to increase revenue from fishing access arrangements to DWFNs, the Seychelles should consider the following options.

- **Increase Annual License Fees:** There are several options that could potentially help Seychelles to increase fees collected through fishing licenses. Before any of these options or series of options are considered scenarios should be developed to investigate the cost and benefits of their implementation. The options include:
  - **Normalise Annual License Fees:** Seychelles can make use of the rationale that the same categories of fishing vessels are currently paying different license fees under different access arrangements to normalise and increase license fees (to certain fleet segments) to a level that is at or above what is currently the highest annual access fee being paid. There are, however, important issues to be considered as part of this approach including the specificities of different access arrangements and other benefits they provide as well as diplomatic relationships, regional collaborations, and the history of involvement and contributions of different operators or fleets in the development of the Seychelles tuna fisheries.
  - **Regularly Revise License Fees:** Regular revision of price is a strategy that is implemented across all businesses. As part of its licensing scheme, the Seychelles should revise the fishing access fees at least every six years (to coincide with Seychelles-EU SFPAs negotiations). Access fees can be benchmarked to reflect inflation rate and or the landed price of tuna on the international market, as well as available fishing opportunities which can be affected by Total Allowable Catch and individual species quota adopted by the IOTC.
  - **Investigate the Feasibility of Implementing a Vessel Day Scheme:** Vessel Day Scheme (VDS) have been immensely successful in the western Pacific for the eight Parties of the Nauru Agreement (PNA). As part of this agreement the VDS sets annual limits on Total Allowable Effort (TAE) in the form of the number of days that fishing vessels are permitted to fish within the signatories' (plus Tokelau)

EEZ. Restrictions in the number of fishing days created competition between DWFNs to purchase available days and have greatly increased direct income derived from fishing access rights and the sustainability of fishing in the area. After implementation of the VDS, and a subsequent benchmark price, the price of one vessel-fishing day (VFD) increased from USD 1,500 in 2010 to USD 6,000 in 2014, increasing total revenues from USD 70 million to an estimated USD 280 million (full details available at [www.pnatuna.com](http://www.pnatuna.com)). What made the PNA implementation of a VDS so successful is the interconnectedness of the EEZs of the many island states and limited areas of High Seas. Vessels that wanted to fish in the region were forced to either fish within the countries' EEZ or within the very limited high seas space for which the PNA is still able to control.

For the Seychelles, an important issue to consider with regards to this option is that the Seychelles EEZ is not connected to that of any nearby countries through an agreement. Furthermore, the economies of other coastal countries in the region are not as dependent on tuna fisheries as Seychelles' is, and fishing intensity by currently licensed fishing vessels is much higher in the Seychelles EEZ compared to the EEZ of other coastal states. As a result, there might be very little interest from other states to partner with Seychelles on a VDS. Additionally, vessels licensed to fish within the Seychelles EEZ have on average taken around 79% of their catch outside the Seychelles EEZ, and mostly on the High Seas to which access is not restricted by having the need to cross through any EEZs. When considered together, these issues create difficulties for the Seychelles to implement a VDS as industrial vessels wishing to fish in the region could increase high seas fishing activity, reducing the value of VFDs within the Seychelles EEZ. This makes it highly unlikely for a PNA-style VDS to work. The cost-benefit of alternative VDS options should however be investigated.

- **Auction Access Rights:** An alternative to the VDS is the auctioning of access rights to fish within the Seychelles EEZ. As there is the possibility for collusion among vessel operators, reserved prices should be established to set the minimum bid. The exact procedures for undertaking the auction should be determined by an auctioneering committee. It is anticipated that auctioning will increase the associated transaction cost and will remove the negotiation component in the provision of fishing license which would make this option less interesting for the Seychelles authorities.
- **Auction Fishing Quotas to Seychelles Vessels:** Another option that might increase direct revenue through licensing for the Seychelles is the auctioneering individual fishing quotas (IFQs) to Seychelles-flagged vessels. This would require that an auction market be set up and managed by an auctioneering committee who would decide on the most appropriate method to auction off quotas. Stakeholders would have to be consulted about appropriate quota package sizes including the minimum feasible quota for each species. It should also be ensured that fishing access is not concentrated to one component (Such as purse seine vessels) so as to maintain the overall attractiveness of purchasing fishing effort or quotas and the resultant desirability (Sogn-Grundvåg et al, 2021).

This could be done by limiting the amount of quota that one entity is able to bid for.

By auctioning quotas, concerns about competition, sustainability and the long-term viability of tuna fishing can all be incorporated into an appropriate design (Marszalec, 2018). In both cases the price of allocated TAC or VFD could also fluctuate depending on the impact of the fishing activity on ecosystems (environmental impact and carbon footprint). Eco-friendly and sustainable practices can be promoted. For example, free school fishing could be incentivized through a reduction in price of quotas or fishing days, or a bonus given to the amount of free fish school fishing engaged in by industrial purse seines. This could reduce the amount of DFAD use and therefore their harmful environmental impact. Although the use of non-entangling and biodegradable DFADs has increased in the last decade, practices such as these, where an effort is made to reduce harmful impacts on the environment, could also increase the bargaining power of Seychelles.

To promote equity among the different fleets, the quota should first be allocated to individual fleet components (purse seiners, industrial longline, semi-industrial longline) and IFQ auctioneering should be done within each fleet component. This approach would however base quota allocation only on the highest price offered. A part of this equation should include considerations for Seychelles to make use of its quota to achieve other objectives for its tuna fishing sector such as local availability of quality tuna for local processing, availability of by-catch and creation of employment.

- **Per Vessel Annual Reference Tonnage:** The Seychelles should consider the introduction of a per vessel annual reference tonnage under future fishing access arrangements, particularly those involving purse seine fishery. At present the only access arrangement with an annual reference tonnage for tuna caught within the Seychelles EEZ is the EU-Seychelles SFPA. As part of this access arrangement, EU vessels have an overall annual reference tonnage of 50,000 Mt and an annual per vessel reference tonnage of 700 Mt per vessel for purse seiners and 90 Mt per vessel for surface longliners, for catch in the Seychelles EEZ. If the annual per vessel reference tonnage is exceeded, vessel operators are required to pay EUR 85 per Mt. If the total annual reference tonnage is exceeded, the EU is required to pay the Seychelles EUR 50 for each additional tonne caught. For the year 2020 and 2021, the Seychelles was paid just over SCR 101 million by the EU and EU vessel operators for catch above the reference tonnage. In 2022, there were 20 non-EU purse seine vessels that were licensed to fish within the Seychelles EEZ. Payments for catch above the reference tonnage by non-EU purse seiners could substantially increase direct revenue to the Seychelles government.
- **Environmental Management and Observation of Marine Ecosystems Contribution:** The Seychelles should consider expending the environmental management and observation of marine ecosystems contribution fee to cover other purse seiners licensed to fish in Seychelles waters under other access arrangements. This will complement the existing FAD recovery programme, funded by the industry and carried out by the SFA and

the program to recycle fishing nets from purse seiners (Brikole). At present an annual fee of EUR 2.25 per GT is being charged under the EU-Seychelles SFP. The additional revenue could contribute financially to Seychelles efforts to collect and dispose stranded DFADs and to fund other conservation programmes addressing environmental issues in the Seychelles tuna fisheries.

#### **7.1.2.2 Focus Area 1.2 (FA1.2): Retain the Seychelles Industrial Vessels Fleet**

It is important for the Seychelles to keep the current fleet of industrial fishing vessels under its flag even though the beneficial owners are not Seychellois. Seychelles having a fleet of industrial vessels and maintaining the amount of catch taken from the Indian Ocean is an important component for ensuring that Seychelles continues to obtain a substantial portion of the TAC for yellowfin tuna and bigeye tuna that is allocated through the IOTC based on historical catch. Measures that should be considered for retaining the Seychelles industrial vessel fleet include:

- **Involvement in Decision-Making:** Greater integration of Seychelles flag vessel operators in decision making is a strong incentive for these operators to keep their vessel under the Seychelles flag. It is important for the Ministry of Fisheries and the Blue Economy to devise a strategy for regular engagement of vessel operators and their agents and to consider their inputs as part of the decision-making process. The strategy could consider having a focal point for regular interaction with vessel operators and agents and having representative of the Seychelles-flagged industrial vessel operators in a proposed High-Level Tuna Committee for overseeing the development of the tuna industry and the Tuna Fisheries Co-management Committee proposed in the draft Seychelles Tuna Fishery Management Plan
- **Access to Quota:** Providing adequate IFQ to Seychelles flagged vessels as part of Seychelles current and future IOTC allocations is one of the best ways for retaining the Seychelles fleet of industrial vessels. Before flagging fishing vessels, the Seychelles should consider whether the IFQs would be adequate for the vessels to remain profitable and the impact of adding new vessels on operators that are already in the fishery. Access to quota can be used as a bargaining chip for the current fleet of fishing vessels to pay higher license fees as opposed to flagging new fishing vessels.
- **Economic Incentives:** Provision of economic incentives can be a good strategy for the Seychelles to maintain its fleet of industrial fishing vessels. Incentives that may be considered can include slightly preferential rates for fees such as for the use of Seychelles ports, bunkering, catch certification and shorter notification periods such as for entry into Seychelles ports.

#### **7.1.2.3 Focus Area 1.3 (FA1.3): Ensure Transparency of Industrial Vessels Operation**

To optimize the benefits of the foreign vessel access agreements and from the Seychelles fleet of industrial fishing vessels it is important to ensure that Seychelles has adequate and accurate information on the activity of foreign industrial vessels while they are in Seychelles waters, and of Seychelles vessels wherever they may be in the world. As part of the Seychelles effort to strengthen the collection, management, and dissemination of information from industrial vessels, the following measures should be considered:

- **Increase the Number of Inspections:** Inspections while fishing vessels are in port are some of the most cost-effective ways of ensuring that fishing vessels are adhering to their license conditions. As part of its effort to promote transparency of industrial fishing operation, the Seychelles should consider increasing the number of inspections that it undertakes on both Seychelles flagged vessels and foreign flagged vessels licensed to fish in Seychelles waters while they are in Port Victoria.
- **Data Collection:** Collection of accurate data on catch and effort, including for specific species of concerns and ETP species is an essential part of monitoring adherence to IFQs, fishing license conditions and laws in place. Improving data collection will help to increase the accuracy of catch data and in the assessment of the status of fish stocks. The Seychelles should implement a strategy to increase data collection from its vessels in both local and foreign ports during landing and transshipment.
- **Independent Observer Coverage:** At present all Seychelles purse seiners have 100% coverage by EMS. However, EMS coverage on industrial longliners is much lower. To better observe fishing activities on industrial longliners the Seychelles should implement a programme to increase coverage on its industrial longliners to 100% within the next three years. Greater EMS coverage should contribute to improve catch and effort monitoring on industrial longline vessels.
- **Achieve FiTI Compliance:** As one of the first country to join the FiTI the Seychelles has shown commitment to promoting transparency in its fisheries sector. The Seychelles' Report to FiTI for the calendar year 2021 indicates that the Seychelles is meeting most of the FiTI standards related to large-scale fisheries but indicates that data in the public domain regarding certain requirements, particularly those relating to the registry of fishing vessels and catch, remains partial and incomplete. For example the Seychelles 2021 FiTI Report noted that the Seychelles online vessel registry was only partially complete, as was information on the physical characteristics of fishing vessels. It also noted that the completeness of information could not be fully verified relating to: i) the quantity and names of target species, permissible by-catch and discards that the vessel is authorised to fish, if specified in the vessel's fishing authorisation; ii) the rights holder for whom the vessel is fishing, if applicable, including the name and nationality of the rights holder; and iii) The country and/or regions of the High Seas where the vessel is authorised to fish. The Seychelles should increase effort to improve the completeness of data for large-scale fisheries as part of its effort to become the first FiTI compliant country. The FiTI Compliant status would make a great contribution for the image of the Seychelles tuna fishing industry.

#### **7.1.2.4 Focus Area 1.4 (FA1.4): Improve Assessment and Monitoring Capacities of Fishing Access Arrangements**

Assessing the results and impacts of tuna fisheries access arrangements is an important tool for Seychelles to optimise benefits from fisheries access arrangements. The Seychelles should consider having periodic (e.g. every five years) assessments of the costs and benefits of every



fishing access arrangement. The proposed options that should be considered for improving assessment and monitoring capacities of fishing access arrangements include:

- **Build Capacity for Monitoring and Analysis of Access Arrangements:** It is important for the Seychelles Government to keep under review the different tuna fishing access arrangements and the benefits that accrues from them. To do, focus should be placed on building human capacity within the Seychelles Fisheries Administration to monitor the Seychelles tuna fishery as well as the global tuna industry. The training of staff to focus on and undertake such types of economic monitoring and analysis is crucial if Seychelles is to optimize the revenue that it is getting from its tuna fishing sector. At the same time, appropriate tools to facilitate monitoring and data analysis should be developed or purchased. In 2018, the Seychelles started work to launch its fisheries satellite account with the objective to improve tracking of fisheries economics contribution to national output. Data from such a national account would also help in undertaking finer-scale economic analysis of different sub-sectors within the fisheries sector. The national fisheries satellite account is however not completely set up. Emphasis should be placed on building human capacity and infrastructure on the economic side of tuna fisheries in addition to fisheries management.
- **Research on New Access Regime:** This is tied to **Priority Focus Area 1.1** on “Increase revenue from fishing access arrangements.” The Seychelles should undertake research and analysis on access regimes that optimize the national socio-economic benefits of industrial tuna fishing and the local tuna industry and if required adopt new approaches for providing access to tuna resources within its EEZ to DWFNs. The analysis should not only consider direct revenue from the payment of access fees, but also other downstream benefits generated by the different access arrangements in accordance with the achievements of the objectives of the Seychelles Fisheries Sector Policy and Strategy 2019.
- **Environmental Impact Assessments:** Limiting the environmental impact of tuna fishing activities is a crucial element in the management of the Seychelles tuna fisheries. However, the environmental impacts of the different fleet components are currently poorly understood due to a lack of comprehensive analysis having been undertaken. As part of this priority focus area, it is recommended that the Seychelles undertake a thorough environmental impact assessment of tuna fishing within its EEZ segmented by fleet components to gain an understanding of the impacts of each component. Data mining/gap analysis and strengthening of data collection should be prioritised. The impact assessment should include but not be limited to general activities, bycatch and discards, effect on ETP species, ALDFGs, FAD use, FAD stranding, and the carbon footprint.

#### **7.1.2.5 Focus Area 1.5 (FA1.5): Increase Seychellois Employment in the Industrial Fishing Sector**

One of the ways of optimizing the socio-economic benefits of industrial tuna fisheries is through job creation. At present, most jobs created by the industrial fisheries sector are through the provision of ground services to fishing vessels that making use of Port Victoria. Important considerations under this priority area include:

- **Assessment of Labour Requirements:** Annual or biennial assessment of labour requirements in the industrial fishing sector should be at the base of Seychelles strategy to build capacity of the local labour force to provide the required services to industrial fishing vessels. The “identification of manpower training requirements of Seychelles with regard to fishing and fishing industries” is one of the core functions of the SFA as per the Seychelles Fishing Authority Establishment Act (1984), but there is no unit within the SFA that is specifically handling this function. The establishment of a section or unit within the SFA to specifically collect and analyse information with regards to labour requirements in the tuna fishery and wider fishing sector should be considered. The labour requirements should focus on the needs of the operators within the tuna value chain as well as those of government entities responsible for the management and development of the sector.
- **Skills Training and Career Opportunities:** Once labour requirements are clearly identified, the Seychelles should, with the involvement of major partners in the fishing industry, devise a strategy to build required human capacity. Options for capacity development that should be considered should include specialized local short- and long-term courses, international scholarships, specialized skills training and apprenticeships for youths. As much as possible, capacity building should align with international requirements, especially with regards to market requirements (e.g. for exporting into the EU).

## 7.2 Pathway Two – Development of Seychelles-Owned Semi-Industrial and Industrial Fleets

The objectives of development pathway two is to **support the development of the Seychelles-owned semi-industrial and industrial fleets**. This development pathway is intricately linked with Development Pathway 4 to “*increase local value addition and facilitate international trade in fish and fish products*” as many of the actions that need to be implemented to develop the Seychelles fishing fleets are similar or linked to local value addition and the sale of fish and fish products on the local and international markets. As a result, many of the proposed actions proposed under this Development pathway are cross-linked to those under Development Pathway Four.

### 7.2.1 Situational Analysis

It is estimated that the Indian Ocean tuna fishery accounts for 20% of global tuna landings and a landed value of around two billion USD. At least USD 800 million worth of tuna is landed and transhipped in Port Victoria annually. In 2022, an estimated 130,540 Mt of tuna was caught by Seychelles vessels. However, only about 2,000 Mt or 1.5% of this catch was taken by Seychellois-owned vessels. Despite its key geographical location in the middle of the of the Western Indian Ocean tuna fishing ground, the Seychelles-owned fishing vessels fleet remains under-developed. This fleet however could have very high economic potential if its development is properly planned and executed.



The MCA indicates that the Seychelles semi-industrial fleet have high per unit value addition at USD 1,364 per Mt. It further indicates that the Seychelles retains 63% share of value addition from the semi-industrial fishery catch. As such, it is expected that there would be great economic advantages if the Seychelles could continue to expand its semi-industrial fishing fleet while also encouraging local investors and joint ventures to develop an industrial fleet. Issues concerning certain semi-industrial vessel owners not being able to service their vessel purchase loans with the Development Bank of Seychelles (DBS), the increase in the number of active semi-industrial vessels, and the number of trips made coupled with decreasing catch rates led the government to impose a moratorium on the import of longline fishing vessels in August of 2023. The moratorium was intended for a period of ten months and should only be used as a short-term strategy to provide the government time to determine the root causes of the problems and to identify appropriate solutions. Nevertheless, this strategy requires the support of a study that evaluates the consequences of increasing Longliner effort, on target, non-target, ETP, and other impacts that may arise. It is important that this information is available beforehand, to assist in decision-making.

In the short-term, the semi-industrial fishery offers perhaps one of the best avenues for Seychelles to increase revenue from the fishing sector and should by no means be discouraged. An efficient and expanded semi-industrial fishery could play an important role in how the Seychelles charts and develops its tuna industry in the short to medium term.

Considering catch limits for yellowfin and bigeye tuna imposed by the IOTC and the potential impacts of climate change on the predicted downward and eastwards movement of tuna, longline vessels represent a valid option for the further development of the Seychelles tuna industry. The semi-industrial longline fleet lands its entire catch in the Seychelles and the catch feeds directly into the local seafood value chains. A feasibility study (including a market study) should provide more precise information on the expansion and valorisation of the domestic longline fleet impact on the domestic seafood value chains . An opportunity exists to utilise these benefits and advantages through the further valorisation of domestic tuna production and revenue generation. Below we outline the priority focus areas and key actions that the Seychelles should consider in support of the achievement of development pathway two.

### **7.2.2 Priority Focus Areas**

Five priority focus areas are proposed for the implementation of this development pathway. The focus areas are targeted at (i) improving the quality of landed tuna from the semi-industrial longline fishery, (ii) increasing the quantity of tuna landings, (iii) increasing revenue from domestic fisheries, (iv) improving financing options and encouraging Seychellois investments, and (v) increasing stakeholders' participation in domestic fisheries.

#### **7.2.2.1 Focus Area 2.1: (FA2.1): Improve the Quality of Landed Tuna from the Semi-Industrial Longline Fishery**

Valorisation of the semi-industrial fishery can be achieved, firstly, by increasing the quality and quantity of tuna that is landed, followed by sale of this high-quality tuna on the national and international "high value" markets. To improve the quality of tuna landed in the semi-industrial fishery the following options should be explored:

- **Improve Onboard Handling and Storage:** Increasing and maintaining a high value of tuna product should start with the on-board handling of tuna. There are several tried and tested measures that are being applied in tuna fisheries throughout the world to improve onboard handling and the quality of landed tuna that Seychelles can adopt. These include:
  - **Use of Ikejime:** This is a method developed by the Japanese for the killing of fish. The method involves the quick insertion of a spike directly into the hindbrain, usually located slightly behind and above the eye, to cause immediate brain death. After spiking the brain, a thin needle or piece of wire is inserted into the spinal column to prevent any further muscle movement. This paralyzes the fish and ensures there is no lactic acid build up in the muscle when the fish is bled, thereby maintaining the freshness of the meat. If this is not done, the muscles in the fish will continue to contract and will produce lactic acid and ammonia, which will make the fish sour, soggy and less tasty.
  - **Immediate Gutting:** After ikejime, the fish should be immediately gutted, gilled, washed, and placed belly down in a seawater-ice slurry, made with two parts ice and one part seawater, so that the blood can drain out and the body temperature can be brought down just above freezing as quickly as possible. The tuna should remain in the slurry for at least one hour before storage on ice.
  - **Proper Storage:** Once removed from the slurry, tuna should be stored in the fish hold on flake ice at a consistent low temperature between 0°C and 4° C. It is important at this stage to ensure that there is enough ice between each fish as well as between the fish and the bottom and sides of the storage wells. An ice layer of 15 cm thick is recommended between the fish and the bottom and sides of the storage wells and 10 cm between any two fish.
  - **Maintain Hold Temperature:** Temperature in the holding wells should be maintained by proper closure of the hatch, addition of new ice on the surface from time to time and by limiting the length of the fishing trips.

To facilitate the implementation of these measures, standard operating procedures for handling and preserving fish will need to be drafted and training given to all crew members on every step of the process.

- **Ensure Cold Storage Capacity:** Most vessels in the current fleet of semi-industrial longline vessels do not have an independent electricity generator. This makes it difficult for them to run freezers and ice making machines. Therefore, ensuring cold storage on board is reliant on stocking up on adequate amount of ice before leaving port and appropriate placement of tuna on ice during storage. There is however scope for new vessels to be designed and installed with an electricity generator which is autonomous of the engine to power cooling equipment. If this can be done, then two additional options can be considered for improving the situation with regards to having appropriate cold storage capacity while at sea. **Option 1** is to do a pilot trial with a vessel with inbuilt freezer holds. This would effectively improve storage of fish at sea while also making it possible for fishing vessels to increase the length of fishing trips and allow vessels to access fishing grounds that were previously considered to be out of ranged based on ice

availability. **Option 2** is to pilot trial with a vessel with ice makers on board and to assess the feasibility of this option for improving the quality of landed tuna.

- **Undertake Pilot Trials and Cost-Benefit Analysis:** The greater cost of operation associated with running cold stores and ice machines onboard and greater distances travelled could outweigh the benefits from the higher quality of fish being landed. It is therefore important that if the proposed pilot trials are undertaken that full and accurate data on catch, cost of operation and revenue is collected and analysed to determine whether freezer installation would bring net economic benefits for the vessel operators. A feasibility study on the cost-benefit of increasing trip duration and distance of fishing from Port Victoria resulting from the installation of onboard freezer storage or ice makers should be one of the starting elements before upscaling this recommendation further. Faster processing methods would undoubtedly require having larger crew onboard. The cost-benefit of this is unknown, but it is known that the availability of space onboard affects the ability of the crew to work and affects the quality of the catch. Therefore, a cost-benefit analysis should also be undertaken on the implementation of the new proposed methods for handling the catch at sea immediately after fishing. If proven to be cost effective, the installation of freezer holds, or ice makers should be encouraged, and support should be identified to facilitate vessel operators to retrofit their vessels. They should also be upscaled to gradually cover all vessels in the semi-industrial longline fishery.
- **Post-Landing Cold Chain Management:** Adequate cold management from catch to first point of sale should be regulated for all actors in the value chain from fishermen to fish processors, delivery companies and exporters to assure that quality tuna products are maintained and consistently delivered. This includes increasing the capacity of the chillers at the Seychelles International Airport where tuna can be stored before it is air couriered internationally.

The Seychelles should encourage the development of sufficient and efficient delivery mechanisms for immediate transport of catch from vessels and fish processing factories to international or domestic markets. To do this it is important to have good communication among the actors in the value chain from the fishing vessel crew, the Competent Authority, fish processors, “fishmongers”) and exporters. The fishmongers, that currently do not require a license to operate will need to be brought under a licensing framework to formalize the profession. The licensing framework should also make it easier for the authorities to know who these fish mongers are and where they are located and make it easier for their premises to be inspected for better control and data collection. Their licensing should also provide better guarantees and recourse for buyers and fishing vessel operators.

- **Adopting International Guidelines:** To promote the landing and sale of higher quality fish from the semi-industrial fishery, the Seychelles should consider the adoption, refinement (where required) and enforcing international guidelines such as the *FAO Manual of Good Hygiene Practice for Fishing Boats and Fish Landing Sites in Small Scale Fisheries*. To encourage good handling practices onboard vessels and during landing and processing, it is recommended that the FIQCU extend its inspection of the catch during

landing and export. Findings from the inspections on anything that can affect the quality of catch should be used for recommending corrective measures.

#### **7.2.2.2 Priority Area 2 (FA2.2): Increase Quantity of Landings**

The catch of the semi-industrial fleet is far below its potential. The following options for increasing the semi-industrial fishery catch rate and volume should be explored.

- **Make Use of Technology:** Making use of other technology and oceanographic proxies (e.g. (Snyder et al., 2017; Xu et al., 2017; Zainuddin et al., 2008) to identify areas where tuna could be more abundant should be investigated. Information on chlorophyll concentration, the location of warm and cold weather fronts, and wave altimeter used to be available from the SFA and were given to fishermen free of charge. This appears to have now been stopped. Making these types of data available to fishermen should be re-initiated along with training on how to interpret and make use of the information as part of the fishing strategy. Making use of technology such as EMS would be good in improving monitoring of the catch and work conditions onboard (Briand et al., 2023; Maufroy et al., 2020) as well as for improving productivity on semi-industrial vessels.
- **Explore Alternative Fishing Techniques:** Alternative fishing techniques such as deep line fishing to catch deeper level tuna (Beverly et al., 2004) where migration patterns are less affected by surface level anomalies should be explored. This would create opportunities to target tuna at depths that cannot be reached using purse seine and surface longlines with short branch lines. This might require the SFA to have an extension service to test and support the development of new fishing techniques.

#### **7.2.2.3 Priority Area 3 (FA2.3): Increase Revenue from Domestic Fisheries**

Increase in the volume and the quality of the tuna catch landed in the semi-industrial fishery would create opportunities to access new markets, increase export and increase revenue. Areas to be explored for increasing revenue include:

- **Explore Premium Markets:** Once a quality tuna product has been assured with increasing catch rates and relative advances in production capacity of the domestic fleet, markets willing to pay a premium price for high quality tuna can be exploited. Between 2017 and 2021, on average around 300,000 tourists visited the Seychelles annually (World tourism information). Tourists spend between 26 and 28% of their budget on food while in small island developing states (SIDS) (Hall and Sharples, 2003) and have high preference for seafood (Wabnitz, 2019). The opportunity for collaboration between the tourism and fisheries sector therefore exists. The tuna fisheries would have a vast range of potential buyers for their premium tuna in the form of luxury hotels, restaurants, yachts, and cruise liners while the tourism sector would have access to consistent, premium, locally caught tuna with potential to market it as such. International markets include the Japanese fresh and frozen market and the Emirate states (Middle East) where tuna is currently fetching very competitive prices.

- **Increase Marketing and Accessibility:** The Department of Fisheries of the Seychelles is undertaking efforts to develop a marketing unit which could assist in the search for international markets for Seychelles tuna products, and undertake research to improve understanding of products demand, cost-benefit scenarios, logistics, etc. It is important to have consistent, high-quality products available to export to these markets. In this regard, communication between fishermen, vessel owners, fish processors, fish mongers, exporters, and the tourism private sector is key in ensuring quality assurance and that the catch can be sold at the best price with minimal delay. Working jointly with vessel owners and exporters, the Government should research, encourage and support the use of an online system for ordering and/or paying for fish that can be used by domestic and international buyers (e.g., hotels, fish processors, restaurants) to order directly from fish suppliers. Once established, such a virtual system should be advertised widely, and buyers should be encouraged to use it. It is to be noted that such an approach has been trialled before but failed (e.g. Abalobi). A review of previous endeavours in this area should be undertaken and the cause of failures identified and addressed so that better results could be obtained this time around.
- **Branding and Labelling:** Critical to the expansion of the domestic fisheries and exploitation of other markets is the establishment of a marketable brand and label which would accompany all tuna products produced in the Seychelles including the development of food safety surety. Sustainably sourced tuna is also dominating seafood buying trends globally. For example, the International Seafood Sustainability Foundation (ISSF) has launched a five-year program to push tuna fisheries to deepen their commitment to responsibly sourced tuna (see [www.advancingsustainabletuna.org](http://www.advancingsustainabletuna.org)). An international certification of sustainability (As part of the brand) would therefore benefit the Seychelles brand and increase its competitiveness on domestic and international markets. Implementation of a Food Safety System Certification (FSSC) (For example the FSSC22000) throughout the value chain would also open extended premium market opportunities and ensure any branding and labels are backed up by food health and safety standards (AAMS, 2018). The Seychelles and partners have already embarked on marine stewardship and other fishery improvement projects for the semi-industrial and industrial fisheries (Assan *et al*, 2021). For instance, industrial purse seiners are already selling their skipjack tuna catch as MSC Certified, while the other two stocks are undergoing FIPs. Any sustainability or food safety certification should consider all stakeholders involved in the tuna fisheries in order to define unique cultural, economic, societal and behavioural factors which would affect the design and implementation such a program (Glass *et al*, 2022).

#### **7.2.2.4 Priority Area 4 (FA2.4): Improve Financing Options and Encourage Seychellois Investments**

To further develop the semi-industrial longline fishery and to promote local investment in industrial tuna fishing it is important for the Seychelles to showcase the economic potential of investing in semi-industrial and industrial tuna fisheries to Seychellois. Areas to be explored for improving the financing options and to encourage Seychellois investments include:

- **Make Available Financial Information:** Information on average expenditures and revenue from model semi-industrial or industrial vessels should be researched by the government and made readily available to interested local investors considering investing in these fisheries. Such information would help to reduce the number of unknowns and could provide investors with a higher level of confidence for investing.
- **Incentivize Investment in Industrial Vessels:** Investment in industrial fishing vessels should be incentivized by the Government to reduce the cost of investment. Incentives that could be considered include exemption of payment of different forms of taxes, duties and levies associated with the importation of fishing vessels and any items for vessel operation, including exemption of any form of income tax for vessel crews, and bunkering at cost currently offered to international shipping in Port Victoria. These tax exemptions could promote additional investment in the fishery and would create additional benefits for the country from the increase in tuna that is landed by Seychelles fleets and exported and should surpass the revenues that were not paid through taxes, duties and levies.
- **Special Loan Scheme for Industrial Fisheries:** Access to finance is an issue in the Seychelles where commercial loans are charged interest of over 10% per annum. At present the biggest loan scheme available for blue economy and fisheries development is USD 3 million, which is below what would be required for investment in industrial fishing vessels. The Government of Seychelles should consider making a special on demand loan scheme with very low interest rates for seasoned Seychellois investors who would like to invest in industrial tuna fishing.
- **Allow for all Foreign Crew:** There is a lack of interest for Seychellois to join the semi-industrial and industrial fisheries sector as vessel crew. Furthermore, there is a lack of skills required to undertake fishing trips effectively and efficiently. As a result of the lack of skills and interest from locals, the Seychelles should allow and promote employment of foreign fishers to work on semi-industrial and industrial vessels. Having experienced crew readily available and willing to work on fishing vessels would encourage local investors to invest in the semi-industrial and industrial fisheries. This policy should however be pursued alongside efforts to continuously train local crews, incentivise their employment, and improve working conditions onboard semi-industrial longliners.

#### **7.2.2.5 Priority Area 5 (FA2.5): Improve Stakeholder Participation in the Domestic Sector**

Increased participation of Seychellois in the domestic fishery sector should contribute to higher percentage of economic benefits from fishing staying in the country. Apart from investment, Seychellois participation in the domestic fishery sector would be mostly in the form of employment. Areas to be explored for increasing stakeholders' participation include:

- **Capacity Development:** There appears a lack of Seychellois skills and labour in the fisheries sector, alongside a lack of encouragement or incentives for Seychellois to join the industry. The promotion and valorisation of the domestic fisheries would create significant employment opportunities (also requirements) at multiple points of the value chain including fishers, fishmongers, technicians, researchers, business-related, etc. Adequate skills training and encouragement is paramount to developing this sector.



These could include improved quality of life on boats (better food and provisions, crew building events, rotational work system, training) and career opportunities. A survey should be conducted to determine how the domestic labour force could be grown in this regard. Biennial assessment of labour requirement of the domestic fisheries sector would inform labour and employment policy decisions and training needs. Gaps in capacity should be filled through various targeted courses at different levels from apprenticeship to university degrees. The setting up of special scholarships specifically for building capacity in the fisheries sector and associated services should be considered. As such, there should be a dedicated section at the Ministry of Employment dealing with employment issues on fishing vessels.

### **7.3 Pathway Three - Development of Port Victoria as IO Tuna Hub**

The objectives of development pathway three is to *maintain Port Victoria as the hub of the Western Indian Ocean tuna fishery.*

#### **7.3.1 Situational Analysis**

Between 2017 to 2021, an average of around 425,000 Mt of tuna and tuna like species were caught in the Western Indian Ocean by fishing vessels licensed to fish in Seychelles EEZ. Around 27% of this catch was taken by Seychelles vessels. Port Victoria has been the port of choice for the landing and transshipment of tuna caught by these vessels, with around 93% of tuna caught by fishing vessels licensed to fish in the Seychelles EEZ during this period being landed or transhipped there, with the majority of landing and transshipments being made by purse seiners. Since the start of industrial purse seine tuna fishing in the Western Indian Ocean, Port Victoria has been the hub of the purse seine fleets as a result of its strategic location in the middle of the WIO fishing ground, efficient landing and transshipment services, safety and continued investment in port infrastructure and service provisioning (Hanoomanjee, 2017).

There is fierce competition for industrial longline landings and transshipment within the Indian Ocean. Port Louis in Mauritius is the only port able to process ultra-low temperature (ULT) product at -60°C from industrial long-liners (From primarily Taiwan and China). As such Port Louis is the major landing hub for deep freeze long-liners fishing in the WIO region. The Seychelles does not possess capacity to freeze tuna to -60°C but the Central Common Cold Store have the capacity to store around 2,600 Mt of products at -40°C. The majority of industrial long-liners from Taiwan and China (which fish in the Seychelles EEZ, therefore, dock in Port Louis in Mauritius (Le Compte *et al*, 2017) with nearly half of the Taiwan industrial fleet catch being processed in Port Louis. This is a major opportunity missed by the Seychelles due to a lack of facilities and processing ability.

Seychelles need to maintain its status as the hub of the Western Indian Ocean purse seine fishery while vying for an increase share of landing and transshipments from the industrial longline vessels fishing in the Western Indian Ocean. Below we outline the priority focus areas and key actions that the Seychelles should consider in support of the achievement of development pathway three.

### 7.3.2 Priority Focus Areas

Five priority focus areas are proposed for the implementation of this development pathway. The focus areas are targeted at (i) improving the quality of landed tuna from the semi-industrial longline fishery, (ii) increasing the quantity of tuna landings, (iii) increasing revenue from domestic fisheries, (iv) improving financing options and encouraging Seychellois investments, and (v) increasing stakeholders' participation in domestic fisheries.

#### 7.3.2.1 Priority Area 1 (FA3.1): Improve Port Efficiency, Facilities, and Infrastructure

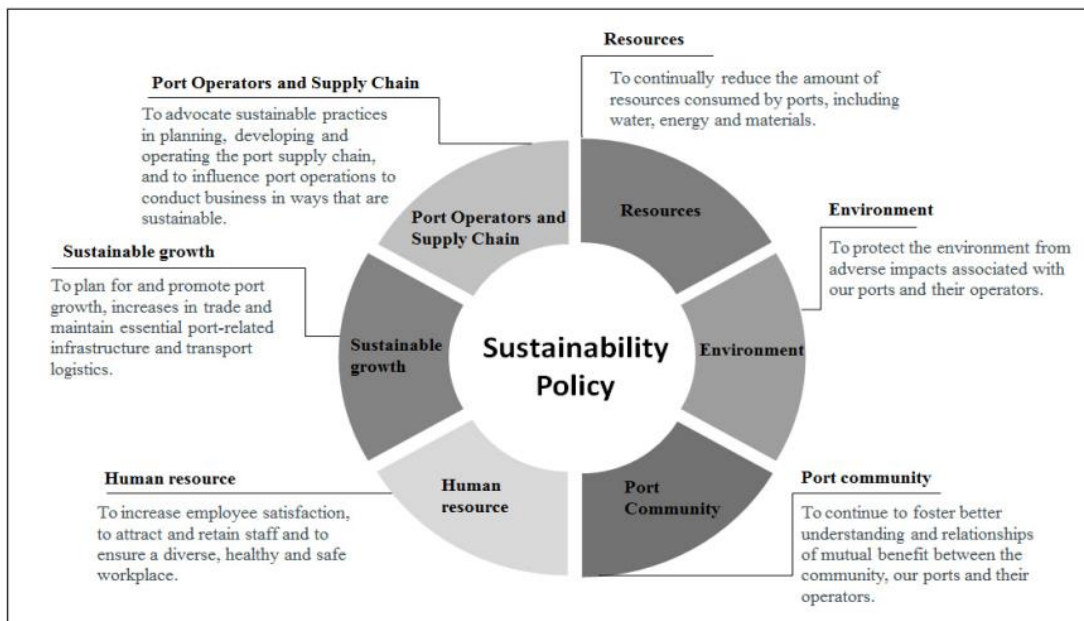
- **Implement a Port-Based Inspection Programme:** The implementation of an inspection program is a necessary step to monitor and assess the port service quality and performance of the entire Port Victoria. There are many examples for assessing port service quality which include monitoring its efficiency, effectiveness, and resilience (Ngo *et al*, 2022). Once assessments have taken place, upgrades and improvements may be carried out on existing infrastructure, service provision and capacity building based on data collected in these assessments. With the growth of trade activities and the need for Port Victoria to remain competitive on the global market, evaluations should be undertaken for all possibilities of cost reduction, optimization of current capacities and the implementation of sustainable port infrastructure, practices, and marketing (Kim and Chiang, 2014). Sustainable port infrastructure and practices necessitate the concurrent pursuit of economic prosperity, environmental quality, and social responsibility. Practices include utilizing environmental technologies (such as green energy), continuous monitoring and upgrading, increased operational efficiency throughout port measures and services and improved cooperation and communication amongst stakeholders (Pavlic *et al*, 2014). **Figure 2** provides an overview of sustainability policy used at Sydney Port in Australia.

Australia provides us with valuable information and examples of port sustainability initiatives which may assist countries' alignment with United Nations Sustainable Development Goals (See <https://www.portauthoritynsw.com.au/sustainability-plan/> for the complete sustainability plan for Port Authorities of New South Wales, Australia). Development of sustainable policy could then be marketed (sustainable or green marketing) as part of the overall strategy to improve the attractiveness of Port Victoria.

- **Provision of ULT Processing Capabilities:** Ultra-low freezing to -60°C is energy intensive and costly. Additionally, Port-Louis in Mauritius is already well established as the WIO port with ULT capabilities. Before Seychelles ventures into ULT a cost-benefit analysis should be undertaken. The cost-benefit analysis should also take into account the proposals for the development of the Zone 14 Fish Processing Area and the types of services that investors intend to set up. Based on the results of the cost-benefit analysis, the scale of development of ULT processing capacity should then be considered within the port to support industrial longline vessels. If the volume of ULT storage capacity is small, the Seychelles should consider making use of Super Freezer Reefer containers that are able to store at -60°C. A study commissioned by the Seychelles Ports Authority to assess the adequacy of berth space in Port Victoria published in 2020 indicates that additional investments would be required to upgrade available cold storage into a -60-degree facility to attract industrial longliners. The study pointed out that if such cold



storage facilities were to be developed, Seychelles should aim for economies of scale to ensure feasibility of the project(s) at competitive rates.



**Figure 2.** Overview of the Sustainability Policy of Sydney Port, Australia. (Source: Sydney Port Corporation, Sustainability Report, 2011).

- **Increase Availability of Berth for Unloading:** The 2020 study to assess the adequacy of berth space in Port Victoria points out that Port Victoria still lacks berthing place and recommends the construction of 525 m of additional berthing space for industrial fishing vessels by 2050, particularly along the undeveloped Shoreline of Ile du Port Zone 14. In the meantime, to ease the problem with berthing space, making certain changes in the port operation, particularly concerning an increase in the working hour have been proposed as a solution.
- **Upgrade Basic Infrastructure:** To upgrade the services that can be offered by Port Victoria, basic infrastructure such as roads, electricity, water supply, and wastewater treatment need to be upgraded to ensure efficiency in services. The sludge from the fish waste treatment plant should also be considered as it is often dumped into the landfill. Plans are already underway to improve the infrastructure leading road, electricity and water supply infrastructure leading to the Zone 14 Fish Processing Area however there are no clear plans yet on how to address issues with wastewater. Developing a strategy on how to handle the large amount of wastewater that is expected to be produced once all of the proposed fish processing factories come online should be prioritized. The movement of shipping containers between the different ports can create traffic congestions in Victoria during certain parts of the day. A study is required on how to best address traffic issues exacerbated by the movement of heavy trucks transporting tuna between ports. An option that should be considered include the building of a bypass to directly connect the Mahe Quay, Fishing Port and IPHS Port. Overall, there is a need to benchmark Port Victoria’s cost with the competitors in the region and monitor them.

- **Provision of Dockside or Land-Based Repair Facilities:** In October 2021, the Seychelles Cabinet of Ministers approved the concept for the construction of a floating ship repair facility-dry dock facility with the capacity of servicing vessels of up to 5,000 Mt. The facility forms part of the Seychelles Ports Authority Plan to develop and modernise Port Victoria and to add value to the fishing, import and export industry. The provision of dry-docking facilities, particularly to service industrial fishing vessels would help to improve the attractiveness of Port Victoria. In many parts of the world dry docks have been associated with high level of pollution resulting from vessel cleaning and repair activities. The Seychelles government should ensure that the development of this dry dock is built and operated within the highest environmental standards since the environmental impact of its operation is some of the major concerns of stakeholders (MTBS, 2020). Other options alongside the floating drydock that should be explored include dockside or land-based repair facilities for certain components, machinery, or devices that are used for fishing.

#### **7.3.2.2 Priority Area 1 (FA3.2): Reduce Environmental Impacts of Port Operation and Improve Compliance with International Measures**

- **Implement Standards for Effluent:** There are clear standards for effluent discharge into coastal waters in the Environment Protection Act (2016). However, it appears that monitoring compliance with these standards in Port Victoria is not being undertaken, and or not being reported in a transparent manner. To strengthen compliance of Port Victoria to environmental standards it is important that effluent discharge from vessels and factories are strictly adhered to. The Seychelles should take a renewed look at the standards in place for discharging in the port area and for monitoring of the environment in the port and its vicinity. If required, the standards in place should be updated to meet international norms, while also addressing specific needs and limitations of Port Victoria and the tuna industry. Once standards are established, robust monitoring and enforcement mechanisms need to be put in place. This could involve regular inspections and audits, as well as penalties for non-compliance. Training and education is an important requirement for the implementation of standards and for monitoring and reporting on the environmental conditions within the port. Training and educational programmes should focus on educating stakeholders in the industry on the importance of effluent management and how to comply with the standards. For the port, fisheries and environment authorities training and education should focus on the setting up and implementation of a long-term environmental monitoring programme. Collaboration should be encouraged among fishing vessel operators, port operators, regulators, and environmental organisations to support the effective implementation of effluent standards.
- **Make Use of Electronic Port State Measure (ePSM):** Port Victoria should continue to make use of the IOTC ePSM application for requesting entry into port as part of overall effort for Seychelles to implement the IOTC Port State Measures. Developed as part of worldwide efforts to manage fisheries and combat Illegal, Unreported, and Unregulated Fishing (IUU), the use of ePSM application is a key component in the robust implementation of port State measures that is recognized as one of the most cost-effective means for enhancing compliance with fisheries laws and regulations. The use of the ePSM

application has several advantages including: (i) facilitating the processing of requests for entry into port and the decision-making process of the port State, (ii) reducing paperwork for the master of the vessel or the agent, and the port State, (iii) provision of a direct communication platform between the master or agent of the vessel and the Competent Authority of the port State and the flag State of the vessel.

- **Improve Monitoring of Landings and Transshipment:** Rigorous monitoring of landing and transshipment would increase scrutiny of the catch and the operations of fishing vessels making use of Port Victoria. Improved monitoring will assist Seychelles' MCS agenda. Additionally, the collection of more data on species being caught and traded should contribute to enhance the accuracy of stock assessments and quantification of ecosystem impacts of fisheries and can contribute towards improving policies, practices, and compliance of the tuna industry.
- **Improve Safety:** The transshipment of tuna has in the past been linked to accidents and in rare cases fatalities to stevedores. These accidents and fatalities can be reduced using a combination of training to stevedores, better supervision of landing and transshipment activities and the use of appropriate personal protective equipment. Safety within port areas can also be improved through strict adherence to Standard Operating Procedures, regular maintenance of equipment and facilities, frequent safety briefings and safety inspections by port operators. Seychelles should conduct a thorough assessment of safety issues within the ports and address identified issues. The use of electronic surveillance such as CCTV cameras to detect safety issues and help with the enforcement of safety requirements should be considered.

## 7.4 Pathway Four – Local Value Addition and Facilitating Trade in Fish and Fish Products

The objectives of development pathway four is to *increase local value addition and facilitate international trade in fish and fish products*. This development pathway is intricately linked with both [Development Pathway 1](#) and [Development Pathway 2](#). For this development pathway to be successful the Seychelles will need to find ways to ensure adequate supply of fish from both the industrial and semi-industrial tuna fisheries. As a result, many of the actions proposed under the different priority focus areas are those that are already identified under [Pathway 1](#) and [Pathway 2](#).

### 7.4.1 Situational Analysis

The Seychelles tuna industry is strongly focused on the transshipment and export of whole frozen tuna or fresh tuna on ice. In 2022, 109,650 Mt (86% of the tuna caught by Seychelles industrial fishing vessels were exported as whole fish. In addition, just over 216,000 Mt of whole tuna were transhipped in Port Victoria by foreign purse seiners. Based on international landed price for skipjack and yellowfin tuna, the 369,494 Mt of tuna that was landed and transhipped in Port Victoria in 2022 can be estimated to be worth around USD 800 million at first point of sale.

From the start of industrial fishing in the early 1980s, the Seychelles has continually improved services to facilitate the transshipment and the export of whole tuna through efficient stevedoring. Strong emphasis has been placed on preserving the cold chain and reducing contamination while moving fish from fishing vessels to transport vessels, and more recently from fishing vessels to 40 ft ISO freezer shipping containers, and to land-based cold stores at the CCCS. Having an

efficient system for landing and transshipping tuna from fishing vessels is an important component of the tuna industry. Seychelles has prided itself on having a pool of efficient stevedores that have played an important role in guaranteeing a fast turn-over of fishing vessels that comes into Port Victoria for landing and transshipment. However, recent problems with lack of stevedores have caused Seychelles to import stevedores, principally from Indonesia. These foreign stevedores, handles mostly frozen tuna, while Seychellois stevedores mostly handles tuna in brine.

On average 59.2% (189,703 Mt) of the annual average of tuna transhipped in Port Victoria between 2018 and 2022, has been exported through 40 ft reefer containers with the remainder exported through reefer vessels (**Table 10**). In certain years, the percentage of tuna exports via reefer containers has been above 70%. This is a major shift from a decade ago when only 17% of tuna were exported in reefer containers. Based on a maximum payload of 29.5 Mt per 40 ft container, this translates in an average of above 6,000 containers exported per year.

**Table 10.** The amount of whole tuna shipped from the Seychelles via reefer containers and reefer vessels between 2018 and 2022.

Year	Reefer containers			Reefer vessels	
	Mt	% Value	Approximate No. containers	Mt	% Value
<b>2022</b>	175,520	55.7	5,950	139,773	44.3
<b>2021</b>	237,396	72.9	8,047	88,305	27.1
<b>2020</b>	207,905	74.3	7,048	71,957	25.7
<b>2019</b>	203,668	59.8	6,904	136,769	40.2
<b>2018</b>	124,028	33.5	4,204	245,971	66.5
<b>Average</b>	<b>189,703</b>	<b>59.2</b>	<b>6,431</b>	<b>136,555</b>	<b>40.8</b>

The shipping of tuna via reefer containers has positively impacted the Seychelles economy as it has increased the demand for port calls by cargo vessels and as a result have increased cargo vessels connectivity of Seychelles to other ports in the region. The use of reefer containers has also helped to increase the amount of support activities such as transportation of containers between the cargo port and fishing ports and fish processing factories, as well as the use of other services such as clearing and forwarding, the use of reefer points on ports, increased port activity, etc. On the downside, the increased use of reefer containers appears to have contributed to an increase in road traffic from the transportation of containers between the fishing ports and the commercial ports and to fish processing facilities.

One important component in the transshipment and export of whole tuna is the efficient and timely issue of certificate and documentation. Without these certificates and documentation, fish cannot be legally transhipped and exported. In 2022, the SFA issued a total of 7,665 certificates and export documents, including different types of catch certificates, statistical certificate and non-manipulation certificates. These certificates are further accompanied by Health Certificates issued by the Fish Inspection and Quality Control Unit (FICQU) in the Seychelles Bureau of Standards (SBS), the Competent Authority for certifying all exports of fish and fishery products in accordance with the Export of Fishery Products Act (19960 and its subsidiary legislations.

While it is important to facilitate the transshipment and export in whole tuna, the Seychelles should also be looking at increasing the volume and diversifying the types of fish processing and value addition that is done locally. In the past four years, the Seychelles have exported over 60,000 Mt of value-added products from the fisheries sector annually with an export value of over SCR 4 billion per year (**Table 11**). Over 95% of the value of exported value-added fish and fisheries products are derived from industrial tuna fisheries, tuna canning and by-products from tuna canning in the form of fish oil and fish meal.

**Table 11.** Volume and value of fish and fish products exported from 2019 - 2022. Source: SFA Annual Report (2022).

Exports	2019		2020		2021		2022	
	Volume (Mt)	Value (SCR'M)	Volume (Mt)	Value (SCR'M)	Volume (Mt)	Value (SCR'M)	Volume (Mt)	Value (SCR'M)
<b>Canned tuna</b>	35,951	3,098	42,976	4,383	49,145	4,676	50,118	4,008
<b>Fish oil</b>	1,158	77	881	77	971	69	5,333	93
<b>Fish meal</b>	7,809	115	9,003	174	8,005	151	521	32
<b>Fresh and frozen fish</b>	13,886	237	11,180	274	9,957	298	13,202	298
<b>Others</b>	46	50	58	87	56	92	75	64
<b>Total</b>	<b>58,850</b>	<b>3,577</b>	<b>64,098</b>	<b>4,995</b>	<b>68,134</b>	<b>5,286</b>	<b>69,249</b>	<b>4,495</b>

Indian Ocean Tuna Ltd. (IOT) is the dominant player in the Seychelles tuna value-addition and processing sector. Between 2020 and 2022, an average of around 16% of the catch made by purse seiners licensed to fish in the Seychelles EEZ was landed in Seychelles and used for local processing by the IOT. The other smaller fish processing companies process mainly tuna from the semi-industrial vessels any bycatch from purse seiners. Local processing by these local companies includes the gutting and cleaning of tuna and export as whole tuna or parts such as loins, bullets (head removed) and v-cuts (belly removed) on ice. Certain quantity of processed tunas is specifically prepared for the local market and include different types of cuts such as loins, steaks, cubes, and belly. These Seychellois fish processing companies have exported an annual average of around 12,000 Mt of fresh and frozen between 2019 and 2022, with an average annual value of SCR 277 million (Error! Reference source not found.). Tunas not fit for human consumption are usually sold as pet food and as bait to local fishers.

There are some small producers that salt and dry some of the bycatch species from local purse seiners for sale on the local market. Some local fish processors have developed secondary value-added products like fish sausage, fish balls and fish burgers, mostly from bycatch species, but sales do not appear to be high, and could probably be the result of higher prices and lack of sustained marketing and visibility on the local market. Most of the bycatch are only sorted and exported as whole fish with minimal value addition. There is potential to clean, cut and nicely package these fish and sell them on the international markets.

The main local processing zones for tuna are located at the Victoria Fishing Port and at the Providence Fishing Port. Zone 14 on Ile du Port has been identified as a tuna processing zone for the industrial fishing sector. There are plans to build six processing plants by five local investors and one foreign investor with a footprint of over 70,000 m<sup>2</sup>. General products from these plants once completed will include frozen fish, pre-cooked fish, tuna loins, by-catch and by-product



development of pet food and fish feed. The required raw material per day for these six processing plants is estimated at around 170 Mt, to be delivered by a combination of purse seine (Tuna in brine and -60° C), industrial long-liners (-60° C) and semi-industrial long-liners (Fresh tuna on ice).

At present the cottage industry for value addition to tuna and tuna-like species is almost non-existent and its socio-economic potential is under appreciated. This is most likely to be the result of a lack of raw materials and effort by the Government to promote and facilitate the development of local value addition at this level. Though the Fisheries Sector Policy and Strategy has a strategy to “fix minimum levels of local participation for different segments of the fisheries value-chain” there has not been any measures implemented to make tuna from industrial fisheries available on the local market for value addition.

To operate in the fish processing and value addition sub-sector, individual or local companies require a manufacturing license from the Seychelles Licensing Authority (SLA) for commercial fish processing. Companies operating in the International Trade Zone require a license from the Financial Services Authority.

#### **7.4.2 Priority Focus Areas**

Two priority focus areas are proposed for the implementation of this development pathway. The focus areas are targeted at (i) facilitating whole fish transshipment and export and (ii) on increasing local value addition.

##### **7.4.2.1 Priority Area 1(FA4.1): Facilitate Whole Fish Transshipment and Export**

Several measures can be implemented by the Seychelles to facilitate the transshipment and export of whole tuna. The recommendations include:

- **Ensure availability of containers:** There was an acute shortage of shipping containers during the Covid-19 pandemic. It has been predicted that the global container shortage could last well into 2024. As the trends seems to be favouring tuna shipment through reefer containers as opposed to shipment via reefer vessels, Seychelles will need to ensure that it has the right agreements in place with major shipping lines such as Maersk and CMA-CGM to accumulate enough containers locally to fully supply the industry. In addition, the Seychelles would need to dedicate enough space for container storage close to the ports where they are being used.
- **Ensure efficient transportation of containers between ports:** One of the issues that contribute to the traffic problem in Victoria and affect the transportation of reefer containers between ports is opening and closing time of the Commercial Port. As a result, container movement have to be undertaken during daylight hours. The pros and cons of opening the Commercial Port at night for the transportation of reefer containers should be investigated as an option for improving the efficiency of container transportation and reducing traffic congestion in Victoria. Transportation via barges also needs to be considered. To make barge transportation feasible, efficient loading and unloading of barges would be required as well as efficient storage of containers away from the wharf once on the ground.

- **Ensure adequate availability of reefer points:** The availability of reefer points at the Commercial Port is an important consideration as it would allow full reefer containers to be transported and stored at the commercial port once they are stuffed and not have to wait for containers to be transported directly from the IPHS Port to quay side for loading when the cargo vessels come in.
- **Attract industrial longline vessels to Port Victoria:** Attracting industrial longline vessels to land and tranship their catch in Port Victoria is an important factor in the trade in whole fish in the Seychelles. These vessels could also make Sashimi grade tuna available for export from Seychelles as well as supply the local tourism trade. To attract long-liners to dock at Port Victoria, development of ULT product processing capacities is essential (which is up to ten times more valuable than catch from purse seines sold to the cannery). Industrial purse seines are also developing ULT storage capacities which further amplifies the need for Seychelles to develop these industrial fleet processing facilities including upgrades to the cold storage capacities at the airport. Alongside processing capability, the industrial long line component of Seychelles fisheries should be encouraged to land all bycatch in Port Victoria in line with the Draft Management of Bycatch Policy and further encouraged through policy and incentives to land a portion of targeted catch. Bycatch processing has also become a thriving market within the Seychelles which can also be further exploited through increasing processing capacity, skills development, and improved value addition however fisheries which already catch a large portion of bycatch, especially IOTC species of concern, should not be encouraged. Decision on this proposed strategy should be made in accordance with the results of the cost benefit analysis for the provision of ULT processing capabilities proposed under priority focus area 3.1 of [Development Pathway 3](#).
- **Ensure adequate facilities at airport:** The chiller facilities at the Seychelles International Airport are already operating above capacity. Plans are underway to renovate and expand the facility so that it can handle 25 Mt of fresh fish. As part of this renovation, it is important that the right equipment with the right specifications is installed to ensure that the quality of the fish products is maintained. It is expected that with the start of operation of the fish processing facilities planned for Zone 14 that the volume of exports via air freight will greatly increase. Chartered flights have not been profitable in the past. As a result, Seychelles will need to continue to rely on commercial flights for air freight of tuna. Now that there are 77 international flights per week from the Seychelles, it appears that air connectivity is not a problem, but that cost, especially for getting to some of the more distant destinations might be the limiting factor.
- **Ensure cold chains during transfer and transportation:** When fish are being transferred from fishing vessels to freezers and processing facilities it is important to maintain cold chain integrity. As temperature breaches could be potentially very expensive and may cause fish to reduce in quality and hence sales value or necessitate that whole consignment is barred from human consumption and can seriously reduce the shelf life of raw seafood it is important that the right containers and equipment is used during transportation of fish from vessels to processing plant and from processing plant to export facilities or retailers, and end-product users such as hotel and restaurants. Fish must be kept at temperatures between -1° and 5° C and it is important that the right containers are used for transportation and that the right temperature is maintained.

#### 7.4.2.2 Priority Area 2 (FA4.2): Increase Local Value Addition

There are enormous opportunities for growth and to reduce leakages from the tuna fisheries to be achieved through capturing more of the tuna being transhipped in Port Victoria and maximising the portion of the catch that is landed and value-added. To increase the amount and value of local value addition the following options should be explored:

- **Develop Zone 14 Fish Processing Zone:** A plan has already been outlined in II Du Port - Zone 14 to further develop the processing capacities and services provided by the Seychelles to the industrial sector which will also address any need for processing capacity outlined previously (Box 1). The Zone 14 Fish Processing Zone is dedicated to increasing fish processing and value addition. However, projects by investors interested in the development of this zone are progressing at a slow pace. The Government needs to ensure that all administrative procedures are completed with minimal delay so that construction of the facilities can start. One of the big concerns of investors on Zone 14 is whether fish would be available for their factory. In making optimal use of the IOTC quota allocation, the Seychelles should put in place different incentives involving quota allocation to encourage vessel operators to sell a greater part of their catch on the local market.
- **Develop tuna cottage industry value addition:** There is potential for tuna value addition to be done at the cottage industry level if tuna from purse seiners could be made available on the local market at the same price as is being sold to large processors like IOT. The cottage industry can go into high value products such as tuna in jars. Such preparation can be done with different types of accompaniments and sauces reflective of the creole cuisine. This would make the products truly unique and will help in giving it a higher market value. Such types of products can be packaged as gift items and sold in hotels, souvenir shops, and duty free. Training would be required to build capacity in can food preparation techniques. Trials can be done on a small scale to show the profitability of such approaches and to encourage locals to go into this line of business. This would be a great way for ensuring that the tuna industry percolates deep into the Seychellois society. The main issue for implementing this approach would be the willingness of purse seine operators to sell fish to small local businesses. This can be facilitated by the CCCS, that can act as a middlemen and locals can buy fish directly from them instead of purse seine vessel operators. As previously discussed, the Seychelles should develop incentives tied to the annual IFQ for yellowfin and bigeye tuna that it gives to industrial fishing vessels to encourage them to make target and bycatch fish available to local processors.



**Box 1: Zone 14 - upgrade and development plan**

1. The development of 6 processing plants over 70,000m<sup>2</sup>, constructed by five local investors and one foreign investor. General products will include frozen fish, pre-cooked fish, tuna loins, by-catch and by-product development of pet food and fish feed.
2. The estimated required raw material per day would be 169 Mt which would be delivered by a combination of purse seine (Tuna in brine and -60C), industrial long-liners (-60C) and semi-industrial long-liners (Fresh tuna on ice).
3. The Seychelles Infrastructure Agency has budgeted for the installation of basic public infrastructure (roads, gutter, water, electricity) for the zone. Work is planned to be completed by 2024.
4. Government is looking into the possibility of having a centralised sewerage treatment plant.
5. There will also be a new container yard in the area operated by the Seychelles Ports Authority. The SPA container yard is expected to cater principally to reefer containers (**Figure 3**).



**Figure 3.** Map of Zone 14 on Ile du Port, Victoria.

- **Create local demand:** The consumption of fresh tuna in the Seychelles is not as high as some of the other countries with large tuna fisheries. One of the main reasons is easy availability on the local market. The Seychelles should work with the industry to find ways to increase the availability of fresh and frozen tuna, including swordfish. Increased consumption of fresh and frozen tuna and associated species such as swordfish should lead to an increase in local demand and will further stimulate the semi-industrial fishery

to land more tuna and local fish processors to increase the volume of value-added products that they are able to put on the local market.

- **Labelling and marketing:** The labelling and marketing of Seychelles tuna value added products should be done in conjunction with efforts identified under [Focus Area 2.3 on improving revenue from domestic fisheries](#).
- **Access to finance:** There are already schemes that have been put in place by the Seychelles Government for promoting investment in local fish processing and value addition. This is a good way of stimulating investment in value addition. The Government should regularly review the uptake of funds from these schemes and find options for replenishing schemes such as the BIF of DBS before it dries out. It took a long time to generate interest in the BIF, but it now seems that investors are gaining more confidence to make use of this facility and as a result, available funds are being loaned out quite fast.
- **Greener and more affordable energy:** The cost of commercial electricity remains high and is argued by many as one of the main reasons for limited development of fish processing and value addition in the Seychelles. High cost of energy can affect profitability of businesses and form an integral part of the decision-making process of investors. In line with the Seychelles Fisheries Sector Policy and Strategy (2019), the Seychelles should undertake a study on the cost of electricity to companies involved in fish processing and make use of the results to find ways to provide energy to the fish processing sector at a competitive cost. The Seychelles should promote a diversified approach to generating electricity by promoting and facilitating the use of renewable energy in the sector. Another option is to allow companies that has the capacity to produce their own electricity.

## 7.5 Pathway Five – Improving Tuna Industry Governance

The objectives of development pathway five is to **improve governance of the Seychelles tuna industry**. It provides general directions for the Seychelles to ensure that its tuna industry is well governed and can effectively deliver on the socio-economic opportunities presented under Development Pathways One to Four.

### 7.5.1 Situational Analysis

Governance is the act or process of governing or overseeing the control and direction of something. In simplest terms, it is the framework of rules, systems, and processes put in place to provide guidance and ensure the delivery of agreed outcomes. Good governance is crucial for ensuring the Seychelles tuna industry is managed and operated in a manner that meets the social and economic needs of the community in an environmentally sustainable manner. The two main institutions responsible for the development and management of the fisheries sector are the Department of Fisheries (DoF) under the Ministry of Fisheries and the Blue Economy (MOFBE) and the Seychelles Fishing Authority (SFA). The DoF's mandate is to provide an enabling and legal framework for the management of the fisheries sector, including appropriate policies to ensure the sustainable development of the sector within a framework of national and international

social, economic and environmental objectives and guidelines. To outline its approach, the DoF has prepared the Seychelles Fisheries Sector Policy and Strategy in 2019.

The SFA is the lead technical executive arm for fisheries and aquaculture. It is responsible for the implementation of the policy. The DoF works in close collaboration with various other ministries, government departments, authorities and agencies, to facilitate decision-making, policy implementation processes, and efficient service delivery. A 2023 review of the implementation of the Seychelles Fisheries Sector Policy and Strategy 2019 found impressive results in the overall progress for achieving the goals of the Policy.

To guide its work, the SFA regularly updates its Strategic Plan. The development and management of the tuna industry has featured extensively in these Strategic Plans. As a contribution towards improving the management of the Indian Ocean tuna fishery, the SFA is in the process of preparing a tuna fishery management plan. The Seychelles is also considering the mariculture of tuna, with yellowfin tuna identified as the high priority candidate species for aquaculture production as part of the Seychelles Mariculture Master Plan (2019).

In the Seychelles, there are several Acts and Regulations that govern the fisheries sector. The main piece of legislation controlling the sector is the Fisheries Act (2014) and Fisheries Regulation (1987, as amended). Several concerns have been highlighted in the past concerning gaps in the Fisheries Act (2014) and Fisheries Regulation (1987, as amended) to effectively organize and control the Seychelles fishing industry. In November 2023, the new Fisheries and Aquaculture Bill, 2023 was published in the Supplement of the Official Gazette, in preparation for it to be discussed in Parliament. The Bill and its associated regulations were developed over a period of five years and have undergone extensive stakeholders' consultations. The update of Seychelles fisheries legislations was triggered by a 2014-2016 IOTC project that reviewed the fisheries legislation of 10 SWIO CPCs, including Seychelles, and made recommendations for the implementation of IOTC conservation and management measures. Gap analysis that followed pointed to inadequate provisions in the legislations for the licensing of vessels and gears, weak enforcement mechanisms and a lack of framework to implement fisheries management plans.

The 2023 Fisheries and Aquaculture Bill and Regulations have addressed the identified weaknesses and gaps and are much more comprehensive than the current Fisheries Act (2014) and Fisheries Regulations (1987, as amended). In relation to international instruments, the new Bill and Regulations contain articles to fully implement the 1982 UN Convention on the Law of the Sea, the 1995 UN Fish Stocks Agreement and the 2009 FAO Port State Measures Agreement as well as various other instruments. At the regional scale, the new Bill and Regulations have articles to domesticate current IOTC conservation and management measures designated for national implementation, require direct compliance with such measures as specified, and provide a mechanism to facilitate implementation of future measures. Additionally, they incorporate relevant provisions of the voluntary 2019 Guidelines for Minimum Terms and Conditions (MTC) for Foreign Fisheries Access in the Southwest Indian Ocean Fisheries Commission Region. Nationally, related legislation that affects fisheries has been considered to strengthen management of the fisheries sector. The governance of the Seychelles tuna fisheries and industry is also framed in context of Seychelles' international, regional, and national commitments across several areas including on the Law of the Sea, the management of straddling fish stocks,

conservation of marine biodiversity, international food standards, labour conventions, the Seychelles Constitution, etc.

Control over the fishing industry is exerted through various means including access agreements, licensing and license conditions, certification, monitoring, control and surveillance. Various other institutions apart from the DoF and SFA are involved at the local level in controlling different types of activities in the tuna industry including the Licensing Authority, Public Health Agency, FICQU, Seychelles Coast Guard, Department of Trade, Customs, Port Authority, Seychelles Maritime Safety Agency, among others.

To support the Monitoring Control and Surveillance of fisheries activities, the SFA is planning to develop a Fisheries MCS Strategy that will cover all fisheries including different types of tuna fisheries in Seychelles waters or by Seychelles vessels on the high seas or in other jurisdictions. It is expected that the proposed fisheries MCS Strategy will be implemented in conjunction with the MCS Strategy and Delivery Plan (still in draft) for Zone 1<sup>7</sup> and Zone 2<sup>8</sup> MPAs designated under the Seychelles Marine Spatial Planning initiative.

There are on-going concerns regarding the ecological impacts of tuna fishing, especially industrial fishing on the sustainability of the targeted stocks, as well as regarding the stocks of non-target species that interact or that are caught in association with tuna fisheries. These non-target species include other finfish, sharks, rays, turtles, cetaceans and seabirds. Concerns also relate to the impacts on ecosystems and habitats during fishing, from abandoned, lost, or otherwise discarded fishing gears (ALDFGs), as well as from land-based sources of pollution associated with the industry, such as the discharge of effluents with high nutrients loads in coastal waters as well as the accumulation of used fishing gears such as nets, ropes, lines and buoys on land and the breakdown of certain plastic materials to form microplastics.

In the post-harvest sector, environmental impacts have been observed in the form of pollution to coastal waters resulting from high load of nutrient inputs from fish processing facilities, as well as accumulation of fishing gears such as old nets, ropes, buoys, monofilament lines that remain exposed to the elements or dumped in landfills. Fishing gears that are exposed to the elements often degrade to form different forms of microplastics that also have severe ecological impacts on the environment.

Seychelles have recently taken certain bold steps to reduce the ecological impacts of the tuna industry on the environment. The preparation of the first Seychelles Tuna Management Plan is providing the pathway for the management of environmental impact of the harvest side of tuna fishing and seek to addresses issues of overfishing of target stocks, interactions with and the catch of non-target species, including on sharks and rays, turtles, cetaceans, seabirds in addition to finfish, as well as ecosystem and habitat impact of fishing activities and from ALDFGs.

Governance with regards to ecological impacts in the pre- and post-harvest sector has to be addressed as part of this development pathway. The most noticeable environmental impact of the tuna industry in the post-harvest sector can be observed on water quality in the Port Victoria

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<sup>7</sup> High Biodiversity Protection Zone.

<sup>8</sup> Medium Biodiversity Protection and Sustainable Use Zone.



Area. Water in Port Victoria is characterized by a deep green colour, characteristic of waterways with high nutrient loads. While the Port area has high input of nutrients through the many small rivers that drains into the area, a large proportion of the nutrient load is through effluent discharged from the IOT tuna cannery and from the discharge of nutrient loaded brine from purse seiners during the landing and transshipment of fish at the port. At present, IOT effluent are not being fed in the Greater Victoria due to its highly corrosive nature, so the effluent is only filtered to remove solids before being discharged at sea.

Under and misreporting of catch, particularly since yellowfin quota allocation was implemented in 2017, is a serious governance issue for the Indian Ocean tuna fisheries that is gaining increased attention (Peters, 2023; Rattle & Duncan-Jones, 2022). Under and misreporting of catch can lead to the underestimation of biomass in stock assessments (Rudd & Branch, 2017), and can present huge economic loss to countries giving access to their EEZ for fishing (Belhabib et al., 2014) Furthermore, there is the issue of member states of the IOTC objecting to measures that set catch limits for them. One such case is the objection to IOTC Resolution 21/01 on *An interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC area of competence* which has been objected to by six member countries. These objections and catch above proposed catch limits are affecting efforts being implemented by other member countries to ensure sustainability.

On the social level, there are concerns with regards to limited Seychellois participation in the tuna industry with many jobs that are created by the industry being filled by foreign workers. Several reasons have been cited for this limited participation of Seychellois in the industry including lack of technical capacity, low salary, difficult working conditions, substance abuse, behavioural problems and many others. As a result, there is substantial economic leakage from the industry.

Even though the Seychelles tuna industry affects and is affected by many other sectors, there is as yet no permanent or semi-permanent national coordination mechanism in place to provide oversight on the planning and development of the tuna industry. At present, the private sector has limited opportunities to participate in decision-making, but lately the amount of consultation with industry prior to decisions being made have increased substantially. The Seychelles has been taking measures to strengthen the transparency of its fisheries. It was the first country to commit to implement the Fisheries Transparency Initiative (FiTI) and is the first country to submit a national report to the initiative. By the end of 2023, the Seychelles had submitted three national reports to the FiTI detailing progress being made in 12 transparency areas according to the FiTI Standards. The Seychelles tuna industry is extensively assessed as part of these annual reports.

### **7.5.2 Priority Focus Areas**

Three priority Focus Areas are recommended for strengthening the governance of the Seychelles tuna industry. The focus areas are targeted at (i) mainstreaming the tuna industry in the national development framework and improving coordination with stakeholders and ensuring transparency; (ii) strengthening the legal, policy framework and controls; and (iii) promoting environmental sustainability across the tuna industry.

**7.5.2.1 Focus Area 1(FA5.1): Mainstream the Tuna Industry in the National Development Framework, Improve Coordination with Stakeholders, and Ensure Transparency**

As a major economic driver that affects and is affected by many other sectors, the Seychelles tuna industry needs to be mainstream in the national development framework and better coordinated to optimise socio-economic benefits. Areas to be explored for achieving this include:

- **Adopting a Whole of Government Approach:** Activities performed in, and services provided to, the Seychelles tuna industry are controlled by multiple ministries and public agencies. Many sectors in the Seychelles economy such as environment, ports, land transport, air transport, foreign relations, labour, manufacturing, etc affects and are affected by the tuna industry. To ensure the development of coherent and integrated policies and decision-making process a Whole-of-Government (WGA) approach should be considered. The key step that would be required in implementing a WGA is the setting up and operationalisation of a High-Level Committee (HLC) to oversee and coordinate the development of this sector. The HLC could have membership from pertinent (Ministries, Department and Agencies) MDAs and key stakeholders in the tuna value chain. A key tole of the HLC would include investigating options for the coordination of port and fisheries needs. This should include any lessons learned from the old Fisheries and Port Development Committee (FPDC) or any similar body. Since there are lots of concerns on the environmental impacts of the tuna industry, considerations should also be given to setting up a sub-committee to specifically address sustainability concerns, including those related to climate change.
- **Fisheries Transparency:** The Seychelles is on a good path to strengthening transparency in its fisheries sector in accordance with the FiTI Standards. The Seychelles should continue to make use of the FiTI model to make as much information as possible about the tuna fisheries and tuna industry available online to the public in easily retrievable formats. This would increase access to information and should improve public perception on the governance of the fisheries sector. At the same time the Seychelles should continue to work towards full compliance with domestic and international requirements and regularly release information about its performance to the public.

**7.5.2.2 Priority Area (FA5.2): Strengthen the Legal, Policy Framework and Controls**

The tuna fishing industry is very dynamic. As a result, it is important to ensure that the legal and policy framework in place as well as controls of economic activities within the industry remains dynamic and can quickly be updated to appropriately guide the development of the industry. Areas that should be explored include:

- **Legislative Strengthening:** Areas for which the strengthening of the legislative framework should be considered include sustainability labelling, foreign and local investment, and widening the mandates of the SFA. The latter is already being updated as part of the new SFA Establishment Bill. While eco-labels play a crucial role in promoting sustainable consumption and production, currently the use of eco-labels are largely voluntary. At this stage Seychelles should investigate legislating the use of eco-labels to give visibility to fisheries that are eco-certified or those participating in FIPs and going towards eco-certification. A new Fisheries Bill have been gazetted and Regulations have been drafted to replace the Fisheries Act (2014) and Fisheries Regulations (1987). Once

approved, the new legislations will fill many of the gaps that were identified in the fishery's legislative framework. It would be important for the DoF to continually follow development in the sector and when the need arises, to quickly update the legislative framework in place so that it remains relevant and continues supporting the development of the tuna industry while maintaining appropriate control.

- **Policy Review:** The Seychelles Fisheries Sector Policy and Strategy 2019 was reviewed in 2023. The review report described progress in the achievement of the Policy's objectives as impressive and highlighted the areas where additional focus was required. This approach of regular review of progress being made in the achievement of fisheries policies should be maintained to allow bottle necks in achievements to be identified early and for remedial measures to be proposed. It must be noted that a lot of this implementation happened with support from the World Bank financed Third South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish3), which will come to an end in 2024, and from the long-term technical assistance to support the Economic Partnership Agreement (EPA) implementation in Seychelles financed under 11th European Development Fund (EDF), which was completed in 2023. It is thus necessary for the Seychelles to identify other sources of funding to support the implementation of strategic priorities identified in the Policy and in its Strategic Plan. In addition to keeping the Seychelles Fisheries Sector Policy and Strategy 2019 under regular review the Seychelles need to clearly outline a policy on fishing quota allocation (see Section 5.9) as well as on the management of bycatch as a matter of priority. A draft management of bycatch policy has been drafted but is yet to be officially endorsed by the Government.
- **Sector Planning:** Appropriate planning of the different sub-sectors within the Seychelles Tuna Industry should be at the top of the Fisheries Administration Priority. The draft Tuna Fisheries Management Plan should be implemented with minimal delay and sub-sector plans and annual work plans based on the upcoming Tuna Industry Development Framework should be formulated, financed, implemented, and kept under regular review to ensure that they are current and are able to address current challenges in the different sub-sectors of the tuna industry. Oversight of the implementation of the different plans should be the responsibility of the proposed High Level Tuna Committee.
- **Institutional Strengthening of Fisheries Administration:** Both the DoF and the SFA needs to be strengthened to effectively implement the proposed development pathways. The SFA should consider the creation of a structure [possibly a unit] to work exclusively on the tuna fisheries and industry. This structure will serve to ensure that the necessary planning and coordination are being undertaken in the implementation of both plans and to support the work of the Tuna Fisheries Co-management Committee proposed in the draft Tuna Fishery Management Plan as part of **Strategy S2.2.3** on *Ensure [ing that] adequate infrastructure and institutional arrangements are in place to implement the management plan* and the High Level Committee to oversee the development of the tuna industry proposed as part of this plan. One of the tasks of the structure that is to be created would be to research, compile, and disseminate information on what is happening in the global tuna trade to stakeholders, and to operationalise a tuna documentation centre that can be used as a repository for tuna research and other information related to the tuna industry.

The FIQCU is the Seychelles Competent Authority (CA) which performs all the official controls on fish and fishery products sanitary conditions for export purposes and issues



health certificates for every consignment of fish and fishery products exported from the Seychelles. If Seychelles is to increase its export of fish and fishery products, the FIQCU will also need to increase its human capacity.

### **7.5.2.3 Priority Area 3 (FA5.3): Promote Environmental Sustainability Across the Tuna Industry**

Promoting environmental sustainability in the Seychelles tuna industry is imperative if the industry is to continue to contribute to the socio-economic development of the country. Measures that should be implemented to contribute to environmental sustainability include:

- **Active Involvement in Regional Tuna Fishery Management:** The Seychelles should continue to be actively involved in the IOTC for the management of the IO tuna stocks. The Seychelles focus should be on long-term sustainability of the resources as opposed to short-term loss, economic hardship or diplomatic tension or disagreement with the industry. A key aspect of this contribution should be through the continued involvement and capacity building of personnel involved in the tuna industry. Frequent consultation with the industry and other stakeholders such as environmental NGOs is required to inform decision-making and for information sharing.
- **Strengthen Controls Across the Industry:** The Seychelles should give due considerations to keeping strong controls in place over its tuna industry through measures that are already in place such as annual licensing of fishing vessels, MCS of fishing and land-based activities, having dedicated fish processing zones, undertaking Social and environmental impact assessments for development projects.
- **Reduce Waste and Promote the Circular Economy:** The tuna industry generates large amounts of waste and byproducts in the form of old fishing gears (nets, fishing lines, ropes, buoys, radio beacons) and fish processing scraps. To reduce waste and make the industry more sustainable considerations should be given to greater adoption of a circular economy approach that will encourage the industry to generate revenue from waste, discards and scraps from the fishing industry. It should promote the reuse, recycling and or export of old fishing gears and the full utilization of fish in processing facilities to generate revenue and reduce the amount of waste from the fishing industry that are discarded at sea or are disposed in landfills. This should build on top of on-going initiatives to export old nets for recycling, the reuse of instrumented buoys, and components of DFADs that can still be used in the construction of new DFADs. The use of biodegradable fishing lines and fishing nets will be encouraged, as well as the construction of FADs from biodegradable materials such as bamboo and jute. The feasibility of providing locally grown bamboo should be studied. If found to be feasible, their planting should be encouraged and integrated in efforts to combat terrestrial invasive species like creepers (e.g. Santerre and Dine, 2022), especially since bamboo are not invasive species in Seychelles. If the supply of local bamboo is not enough to meet the needs of the industry, a study should be undertaken to identify countries with the lowest level of phytosanitary risks from which bamboo poles could be imported for the construction of FADs, and protocols should be put in place for their import.
- **Certification:** The Seychelles should consider further encouraging the fisheries undertaken by its fleets and foreign fleets fishing within its EEZ to achieve “certified

sustainable” status such as the MSC Blue Fish label, and for industries to seek for ISO 14001 environmental management system and ISO 9001 quality certification. These labels come with their own checks and balances and should serve to improve the environmental sustainability of the tuna industry. It is to be noted that Seychelles will not be starting from zero in this endeavour as several skipjack purse seine fisheries undertaken by ANABAC, Echebatar, CFTO and SAPMER, some of which have Seychelles registered vessels, are currently MSC certified.

## 8. ADMINISTRATIVE FRAMEWORK AND PERFORMANCE EVALUATION

The Seychelles tuna industry is a key component of the Seychelles economy. The industry affects and is affected by many other sectors. Due to the penetration of the tuna industry into these other sectors, a Whole of Government Approach is recommended for the implementation of this Tuna Industry Development Framework to ensure policy coherence and effective decision making. A first step in adopting the Whole of Government Approach is to set up a High-Level Tuna Committee. Membership in this committee should include high level officials from different Government MDAs that deal with aspects of the tuna industry, as well as stakeholders' representatives from different sub-sectors of the tuna industry. The High-Level Tuna Committee should meet at least every quarter. Its mandates will need to be defined in a Terms of Reference approved by the Seychelles Government.

To support the work of the High-Level Committee and the Implementation of this Tuna Industry Development Framework and the and the Seychelles Tuna Fisheries Management Plan, a structure should be set-up within the SFA. This structure should act as the secretariat for the High-Level Committee and the Tuna Fishery Co-Management Committee, recommended in the Seychelles Tuna Fishery Management Plan. The structure should also be responsible for undertaking the required work planning, budgeting, and coordination with partners involved in the implementation of the two plans.

The roles and responsibilities of each institution that is to be involved with the implementation of this Development Framework should be formalised through the signing of an Implementation Agreement.

### 8.1 Annual Work Planning

A list of key actions and tasks are defined as part of the 10-year [Implementation Plan and Budget](#). Annual work planning should be results-based and should be led by the SFA. The process should involve the preparation of detailed annual workplans based on the Implementation Plan and Budget and newly emerged priority issues concerning the Seychelles tuna industry. SFA should be responsible for preparing the original draft of the annual work plans and for coordinating its revision and finalisation with the other implementation partners. Planning should start at the start of the preceding year to allow for timely integration of implementation costs in the budget of implementation partners.

### 8.2 Budgeting

The 10-year [Implementation Plan and Budget](#) provide budget estimates for each of the priority tasks identified for the implementation of this Development Framework. Most of the tasks have implementation periods of longer than one year and hence will necessitate annual appropriations to be calculated. Annual budget for implementation of the Plan should be done as part of annual work planning, should be results-based, and should be integrated into the institutional budget of implementation partners. Budgeting should be done in a way to allow tracking of expenses down to specific pre-identified results.

### **8.3 Monitoring and Evaluation**

Evaluation of this Development Framework’s effectiveness will be undertaken on an annual basis. The annual evaluation will be done by the SFA and will be restricted to evaluating the proposed actions based on pre-determined action level SMART process and output indicators detailed in the [Implementation Plan and Budget](#). Results from annual evaluation should contribute to the preparation of the annual work plans.

A mid-term evaluation should be undertaken after five years of implementation. An end of term evaluation should be undertaken in the ninth year of this plan’s implementation. Both the mid-term and end of term evaluations will assess the effectiveness of tasks implemented and the scope for the achievement of the plan’s objectives. The evaluations should be undertaken by an external evaluator recruited by the SFA and vetted by the proposed High-Level Committee. The evaluation should be based on the process and outcome indicators for the strategies and objectives and should consider feedback from stakeholders as well as the results of annual evaluations. As many of the indicators for the strategies and objectives can be abstract in nature, the use of a structured survey to gauge and quantify stakeholders’ perception of their achievement is also recommended.

### **8.4 Revision and Update**

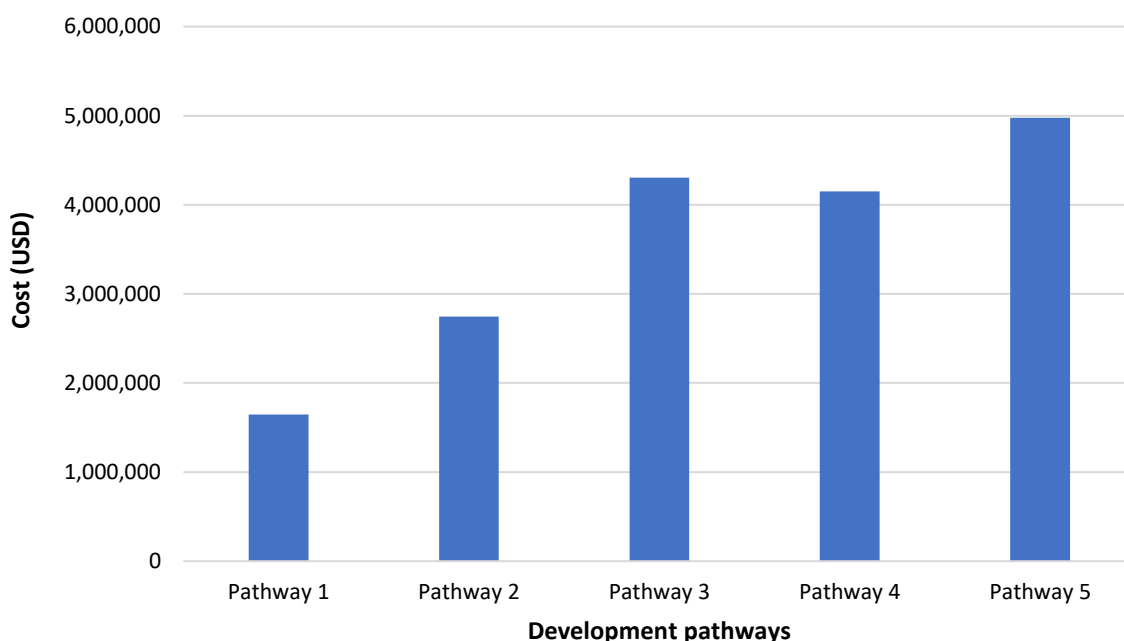
The process to update this development framework should begin at the start of its ninth year of implementation. The early start is recommended so that there is no lag between the end of this plan and the start of the other, and to provide ample time to fit into the annual budget exercise. The update of the plan should be done with input from stakeholders and should make use of findings from the mid-term evaluation and the annual evaluations of the [Implementation Plan and Budget](#).

## **9. RESOURCES REQUIRED TO IMPLEMENT THE FRAMEWORK**

The implementation of measures proposed as part of this development framework is calculated to cost a total of USD 17,820,000 over the next ten years. These are incremental costs and are above what the Seychelles is already doing as part of the development of its tuna industry. Costs provided here are only estimates and do not consider inflation over time.

It is expected that the implementation of this development framework will be funded principally through the SFA’s recurrent revenues that it obtains from the payment of fishing licenses and permits and other types of fees and rent that it charges. This will be supplemented by funding from the sectoral support programme under the EU/Seychelles Fisheries Partnership Agreement. Where relevant implementation will also be funded through the budgets of other agencies, such as the FICQU, Seychelles Land Transport Authority, Public Utilities Corporation, etc, depending on the issue being addressed.

Adequate arrangements need to be made within the SFA to oversee the implementation of this development framework.



## **10. IMPLEMENTATION PLAN AND BUDGET**

Please see the next page.

<b>Development Pathway One: Optimising Socio-Economic Benefits from Fisheries Access Arrangements</b>								
<b>Objective:</b> Optimize the socio-economic benefits that can be derived from foreign vessel access agreements and to retain the Seychelles industrial vessels fleet.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/Partners	Objectives contribution
				1-3	4-6	7-10		
Focus Area 1.1 (FA1.1): Increase revenue from fishing access arrangements.	1 - Research into the most appropriate framework from which the Seychelles can appropriate fishing rights to DWFNs.	250,000	Results of research				SFA, Scientific research committee, MOFBE	Obj. 2.1
	2 - Implementation of transparent framework	125,000	Implementation procedure.				SFA, government authorities	Obj. 2.1
	3 - Define and incentivize sustainable fishing practices such as free school operations which help to reduce the environmental impact of industrial fishing activity.	75,000	List of incentivized fishing practices.				SFA, MOFBE, DWFNs	Obj. 2.4
	4 - Ensure catch allocation to domestic fisheries (not considering the Sey-flagged industrial vessels).	30,000	Yearly catch allocated to domestic fisheries.				SFA, domestic fishery authorities.	Obj. 2.2 Obj. 2.4
	5 - Regular review of transparent access system including its monitoring capacity for all fleets not flagged in the Seychelles.	75,000	Results of reviews.				SFA	Obj. 2.1
	6 - Analysis of the performance of the DWF activity in Seychelles waters and on the high seas	75,000	Catch data and movement of vessels on the high seas.				SFA, government authorities	Obj. 2.1
Focus Area 1.2 (FA1.2): Retain the Seychelles industrial vessels fleet.	1 - Increase involvement of Seychelles industrial vessel operators in decision making and come up with a mechanism for their involvement in the proposed High Level Tuna Committee (HLTC) and	50,000	Level of participation in HLTC and TFCC.				SFA, MOFBE, Seychelles Flagged vessel operators	Obj. 3.1 Obj. 3.2



	Tuna Fishery Co-Management Committee (TFCC).							
	2 - Through inputs from stakeholders come up with a system for allocating fleet and Individual Fishing Quotas (IFQs)	100,000	Clear methods for allocating quotas.				MOFBE, SFA	Obj. 2.1, Obj. 2.2, Obj. 3.1, Obj. 3.2,
	3 - Undertake analysis to look at range of incentives that can be provided to Seychelles flagged industrial vessels.	25,000	Report on strategy for supporting Seychelles flagged industrial vessels.				MOFBE, SFA	Obj. 2.2 Obj.2.4
Focus Area 1.3 (FA1.3): Ensure transparency of industrial vessels operation.	1 - Ensure sufficient data collection as a prerequisite to appropriation of fishing access including accurate catch records, VMS, onboard independent observers, etc. This includes collaboration with the IOTC compliance committee.	75,000	Historical catch and monitoring records of fleets. List and accuracy of methods used per DWF.				SFA, Scientific research committee	Obj. 2.1
	2 - Annual review of regulation and policy standards so as to ensure they're in line with fishing opportunities, global standards, IOTC measures and any other regulatory measures in place.	75,000	Results of review.				SFA	Obj. 3.2 Obj. 3.4 Obj. 4.4
	3 - Improve independent observer coverage - Research into and use of other monitoring technologies such as drone monitoring or satellite monitoring technology to consolidate VMS and catch records.	75,000	List of technologies used.				SFA, Scientific research committee	Obj. 3.2
	4 - Increase stakeholder involvement in the decisions making process. This can be through the establishment of chief stakeholder officers (CSOs) to assist with representation or the assemblage of tuna committee.	30,000	List of meetings with community members present. List of CSOs				SFA, MOFBE, stakeholder representatives	Obj. 3.1 Obj.3.2 Obj. 4.1

	5 - Achieve FiTI compliance status.	25,000	FiTI Status.				SFA	Obj. 3.2 Obj. 4.3
Area 1.4 (FA1.4): Improve assessment and monitoring capacities of fishing access arrangements.	1 - Perform a thorough environmental impact assessment (EIA) of all fleet components operating within Seychelles EEZ as a prerequisite to access including bycatch, equipment loss, FAD use, general activities, and carbon footprint.	125,000	Results of the EIA				SFA, MOFBE, scientific research committee, DWFNs.	Obj. 1.3 Obj. 2.3 Obj. 4.1
	2 - Undertake surveys of local communities on the effects of industrial fisheries (as well as other Seychelles' tuna fisheries).	25,000	Compilation of impacts on local communities.				SFA, MOFBE, local communities	Obj. 4.1
	3 - Train Seychellois economic analysts to conduct industry and value chain analysis and projections	75,000	List of training opportunities. List of trainees and attendants.				SFA, MOFBE, Seychelles ministry of education.	Obj. 3.3 Obj. 4.1
Focus Area 1.5 (FA1.5): Increase Seychellois employment in the industrial fishing sector.	1 - Annual Assessment of labour requirements related to the industrial fishery.	35,000	List of requirements				SFA	Obj. 2.2 Obj. 4.2
	2 - Based on the labour assessment, offer skills training and career opportunities to locals. This includes fisheries studies incentivized through scholarships and specialized skills training.	100,000	Skills training offered and how it's incentivized.				SFA	Obj. 2.2 Obj. 4.2
	3- Include an apprenticeship program for youths.	50,000	List of apprenticeship programs.				SFA, MOFBE, Ministry of education	Obj. 2.2 Obj. 4.2
	4 - Develop and train companies which are certified EU compliant for fishing	100,000	List of companies which are EU certified compliant.				SFA, MOFBE	Obj. 2.2 Obj. 4.2

	landings (fish quality, EU control regulation, etc.).							Obj. 4.3 Obj. 4.4.
	5- Ensure equitable access to resources for small-scale fisheries in relation to industrial sector.	50,000	List of monthly meetings/calls with local fishing authorities on the state of local fishing.				SFA, MOFBE, community leaders	Obj. 2.2 Obj. 4.4.

Development Pathway Two: Valorisation of the Domestic Fisheries								
<b>Objective:</b> Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/Partners	Objectives contribution
				1-3	4-6	7-10		
1 Priority Focus Area 2.1: (FA2.1): Improve the quality of landed tuna from the semi-industrial longline fishery.	1 - Train crew in onboard personal hygiene, fish handling techniques & gutting (Immediate removal of spine and cooling). <sup>9</sup> Also training of those involved in grading of the catch.	40,000	List of workshops held. End product verification.				SFA, MOFBE, FICQU, fishermen, Fishmongers, Exporters, Processors	Obj. 2.1 Obj.4.3
	2 - Create understanding of the importance of immediate cold storage of catch from catch to first point of sale. <sup>10</sup> This includes harvest, post-harvest, and service subsectors.	35,000	List of workshops held.					Obj. 2.1

<sup>9</sup> See for information on handling sashimi-grade sushi <https://pacificdata.org/data/dataset/oai-www-spc-int-36f77671-f40a-4e81-92dc-5d2f5ee2cfd1>

<sup>10</sup> See Kang, T., Shafel, T., Lee, D., Lee, C.J., Lee, S.H. and Jun, S., 2020. Quality retention of fresh tuna stored using supercooling technology. *Foods*, 9(10), p.1356.

Development Pathway Two: Valorisation of the Domestic Fisheries								
<b>Objective:</b> Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/P partners	Objectives contribution
				1-3	4-6	7-10		
	3 - Ensure quality of the on-board fish holding area meets standards needed to ensure a high quality of fish (For example adequate cold storage).	50,000	List of vessels, fish hold status and cold storage ability and capacity.					Obj. 2.1 Obj. 4.3
	4 - Feasibility study of increasing the trip length and duration of domestic longline vessels through addition of freezer storage or ice makers on board.	75,000	Results of feasibility study.					Obj. 2.1 Obj. 2.4
	5 - Cost benefit analysis of number of fishers onboard versus the catch. (Space on board affects quality ability to work and therefore quality of catch.	25,000	Results of the cost-benefit analysis.					Obj. 2.1 Obj. 2.4 Obj. 4.3
	6 - Adopt, refine, and enforce international guidelines (e.g., FAO manual of good hygiene practise for fishing boats and fish landing sites for small scale fisheries) for fish handling, landing sites etc.	75,000	The refined set of guidelines. A detailed implementation procedure.					Obj.4.3
	7 - Ensure Seychelles Bureau of Standards (SBS) inspections of catch upon landing and export.	35,000	Results of each inspection.					Obj. 2.1 Obj. 4.3
	8 - Recording of SBS catch inspections over time (including anything which affects the quality of catch). Based on recordings, make recommended corrective measures.	25,000	List of recommended corrective solutions.					Obj. 2.1 Obj. 4.3

Development Pathway Two: Valorisation of the Domestic Fisheries								
<b>Objective:</b> Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/P partners	Objectives contribution
				1-3	4-6	7-10		
	9 - Ensure sufficient and efficient delivery mechanisms are in place for immediate transport of catch from vessels to international or domestic markets (including communication between vessels, exporters, processors, and “fishmongers”).	25,000	List of; transport routes (land, sea, and air routes), fish mongers, processors, exporters, or fish buyers (tourist sector), fishing vessel to fish monger communicators, transport mechanisms (i.e., The delivery trucks, cold storage facilities, air freight, etc.), labour requirements, volume of fish and time required to move through this value chain (from boat to buyer).					Obj. 2.1 Obj. 4.3
	10 - Feasibility study and possible implementation of a licensing framework for fish mongers to enable authorities to check premises for health reasons, data collection, the number of fish mongers and location is known and so that there may be a form of recourse for sellers or boat owners.	50,000	The licensing framework. List of Fish mongers and their status.				SFA, SBS, MOFBE	Obj. 3.4 Obj. 4.3
	11 - Research and possible implementation of a system for ordering	250,000	Research conducted. List of possible options.				SFA, MOFBE	Obj. 2.1 Obj. 2.3

Development Pathway Two: Valorisation of the Domestic Fisheries								
<b>Objective:</b> Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/Partners	Objectives contribution
				1-3	4-6	7-10		
	fish that can be used by domestic and international markets (e.g., Tourist sector, from Seychelles to US or Japan) to order directly from fish suppliers. Such as a virtual system or fish auction house or just a database of registered fish mongers, contacts, location, and status. Note a review of previous endeavours and their failures should also be conducted including Abalobi.							Obj. 4.4
	12 - Consult stakeholders about upgrading the cold and frozen storage capacity at the airports.	100,000	List of upgrades.				SFA, Relevant government authorities	Obj. 2.1 Obj. 3.1
2. Priority Focus Area 2 (FA2.2): Increase quantity of landings.	1 - Research into the cost and potential for increasing the landings of the domestic fleet (e.g., AFADs, crew fishing efficiency and techniques, fishing areas, anchored inshore FADs including types of FADs, potential locations, and necessary resources (boats, skills, funding, labour, etc) to create/import, implement and maintain (See the new anchored FAD in Mauritius).	75,000	List of FAD options for domestic fisheries use.				SFA, MOFBE, community leaders	Obj. 2.1 Obj. 2.2
	2 - If AFADs are chosen as an option, optimise AFAD use through use of	75,000	List of optimizations.				SFA	Obj. 2.1

Development Pathway Two: Valorisation of the Domestic Fisheries								
Objective: Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/P partners	Objectives contribution
				1-3	4-6	7-10		
	echosounders to determine fish volume underneath.							
	3 - Establishment of maintenance crew and schedule for anchored FADs.	60,000	A maintenance schedule and list of technicians responsible.				SFA, MOFBE, community leaders	Obj. 2.2 Obj. 4.1
	4 - Fishermen are familiar with any methods used to increase landings (e.g., new fishing routes, AFADs use, functioning and efficiency)	25,000	List of workshops or talks. Compliance list of each registered domestic vessel.				SFA, MOFBE, community leaders	Obj. 2.1 Obj. 2.2.
	5 - If FADs are implemented - introduce catch size quotas around FADs to reduce pressure on juveniles.	50,000	Quota limit.				SFA	Obj. 2.1 Obj.4.1
	6 - Explore alternative fishing techniques such as deep line fishing to catch deeper level tuna where migration patterns are less affected by surface level anomalies.	50,000	List of workshops (exploratory fishing trips, collaborative meetings) held.				SFA, MOFBE, community leaders	Obj. 2.1
3. Priority Area 3 (FA2.3): Increase revenue from domestic fisheries.	1 - Synergize with the DOF market research team to research the possibility, demand, and income potential of national and international markets for high value tuna including information from established local fishmongers. (E.g., hotels, restaurants, yachts, Emirates states, Japan, EU etc.).	75,000	List of potential markets with the demand and income potential.				SFA	Obj. 2.1 Obj. 2.2



Development Pathway Two: Valorisation of the Domestic Fisheries								
<b>Objective:</b> Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/P partners	Objectives contribution
				1-3	4-6	7-10		
	2 - Establish connections and network with private tourist sector (for example, hotels, restaurants, yachts, etc.) for potential tuna markets.	50,000	List of possibilities.				Tuna sector committee or CSOs, Fish mongers, exporters, processors, Fishermen	Obj. 2.1 Obj. 2.2
	3 - Diversification of Seychelles tuna product including for fish which does not meet standards for human consumption. For example, fish oil, baby food, etc. Included in this step is to contact and synergise with the new SWIOFISH project as they are already looking into using waste product.	350,000	List of diversified products. Details of diversification of production facilities.				SFA, fisheries value-added private sector	Obj. 2.1 Obj. 2.2 Obj. 4.5
	4 - Ensure delivery mechanisms are in place to supply consistent, quality products to these tourist markets.	75,000	Compilation of contacts of delivery companies.				Fishmongers, chief stakeholders, domestic fisheries	Obj. 2.1 Obj. 2.2 Obj. 4.5
	5 - Research and develop infrastructure to support delivery mechanisms (Roads, electricity, effluent treatment, water).	200,000	List of infrastructure needed. Development progress.				SFA, fishmongers, domestic fisheries, government, PUC...others.	Obj. 1.2

Development Pathway Two: Valorisation of the Domestic Fisheries								
<b>Objective:</b> Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/P partners	Objectives contribution
				1-3	4-6	7-10		
							(treatment might be private sector)	
	6 - Annual or biannual study of quantity of output that the domestic tuna fisheries can supply to these markets.	50,000	Report of supply potential of tuna from domestic fisheries and potential demand of other markets.				SFA, fishmongers, domestic fisheries, processors/association	Obj. 1.1 Obj. 2.1 Obj. 2.2 Obj. 4.3
	7 - Ensure adequate communication between domestic fisheries and fishmongers, exporters, processors, etc..	25,000	List of meetings or contact sharing between fishmongers and fishermen				Tuna committee or chief stakeholders, Fishmongers, fishermen leaders	Obj. 3.1 Obj. 4.3
	8 - Further research into the development of a high-quality Seychelles tuna brand and label to coincide with international market exploitation.	75,000	Documented brand and label.				SFA, relevant experts	Obj. 2.1 Obj. 2.2.
	9 - Research and apply for Sustainability and food safety system certification (FSSC).	75,000	List of requirements for certifications. Actual certificates once applied for.				Public health authority	Obj. 2.1 Obj. 2.2
	10 - Research and develop policy, environment, and incentives for tuna processing in the Seychelles.	125,000	List of possible policies and incentives.				SFA, MOFBE	Obj. 2.1 Obj. 2.2 Obj. 2.4

Development Pathway Two: Valorisation of the Domestic Fisheries								
<b>Objective:</b> Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/P partners	Objectives contribution
				1-3	4-6	7-10		
4. Priority Area 4 (FA2.4): Improve financing options and encourage Seychellois investments.	1 - Promote financing initiatives developed in the Blue Economy Roadmap including the Seed Capital Grant Scheme, Small business start-up loan, Fisheries Development Fund, Blue Bond financing, etc.	30,000	List of options.				SFA, Commercial banks, Ministry of Finance	Obj. 2.4 Obj. 4.5
	2 - Research and establishment of framework to incentivize domestic investment into the tuna fishing industry	50,000	List of options. Established framework				SFA	Obj. 2.1 Obj. 2.2 Obj. 2.4 Obj. 4.5
Priority Area 5 (FA2.5): Improve stakeholder participation in the domestic sector.	1 -Research steps to make employment in the fishery sector more attractive for locals. For example, in the form of a survey to be completed by nationwide by individuals involved in the fishing industry.	25,000	Results of surveys.				SFA, local inhabitants/auth orities	Obj. 2.2. Obj. 4.2
	2 - Annual assessment of labour requirement of the domestic fisheries sector.	50,000	Results of assessment				SFA	Obj. 2.2. Obj. 4.2
	3 - Based on the labour assessment; offer short courses, diplomas, or practical skills to Seychellois in order to fill these roles. This coincides with the Blue Economy Roadmap and could either be undertaken in unison with the Seychelles Maritime	125,000	Number of community meetings. List of areas protected by what community				Seychelles Maritime Academy, MOFBE, chief stakeholders	Obj. 2.2 Obj. 4.2

Development Pathway Two: Valorisation of the Domestic Fisheries								
<b>Objective:</b> Support the development of the Seychelles-owned semi-industrial and industrial fleets.								
Priority Focus Areas	Key Actions	Budget (USD)	Performance Indicator	Time period (years)			Coordination/Partners	Objectives contribution
				1-3	4-6	7-10		
	University (SAM) or with the development of practical skills training centre.							
	4 - Involvement of local communities in the MCS of tuna fisheries, especially with the suggested 30% protected area management outline in the Seychelles Marine Spatial Plan (SeyMSP).	25,000	Number of workshops held.				Ocean Agency & Ministry of Environment, MOFBE, community leaders	Obj. 3.1 Obj. 3.2 Obj. 4.1 Obj. 4.3
	5 - Provide training incentives based on the results of the annual labour assessments such as scholarships.	35,000	Trainings provided.				Ministry of education, Tuna committee	Obj. 2.2 Obj. 2.4 Obj. 4.2
	6 - Include an apprenticeship program for youths to join the industry.	50,000	List of apprenticeships.				SMA & industry	Obj. 2.2 Obj. 2.4 Obj. 4.2
	7 - Ensure Seychelles population is informed of the importance of the tuna fisheries.	25,000	Advertising campaigns.				SFA, Ministry, FiTI	Obj. 4.3
	8 - Invest in ocean literacy levels at all levels of education.	35,000	Methods by which ocean literacy is included in education.				SFA, ministry of education	Obj. 4.3
	9 - Establish sector representatives (chief stakeholder officers) who are actively involved in policy and decision-making processes. This can include the development of a tuna committee which is made up of the chosen CSOs.	75,000	List of representatives. Meetings held with representatives.				SFA, stakeholder representatives	Obj. 3.1 Obj. 3.2

<b>Development of Port Victoria into the Tuna Hub of the Indian Ocean.</b>								
Victoria as the hub of the Western Indian Ocean tuna fishery.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
Priority Area 1 (FA3.1): Improve port efficiency, facilities, and infrastructure.	1 - Implement a port-based inspector programme:	100,000	Observer reports				SFA, SFA, MOFBE, CSO	Obj. 3.2 Obj. 3.3 Obj. 3.5 Obj. 4.2
	2 - Cost-benefit analysis of introducing ULT processing capabilities (to be synergized with zone 14 plans).	50,000	Results of analysis.				SFA	Obj. 1.1 Obj. 1.2 Obj. 2.1
	3 -Based on the cost-benefit analysis; possible development of processing capacities of Ultra-Low Temperatures (ULT) within the port to support industrial longline vessels	500,000	List of facilities implemented				SFA, government authorities	Obj. 1.1 Obj. 1.2 Obj. 2.1
	4 - Research and develop further processing capabilities and value addition of bycatch and by-products such as fish oil, pet food, fish feed etc. This can occur on an annual basis. To be coordinated with the MRAG project which seeks to identify waste and byproducts.	75,000	List of facilities researched and implementation program				SFA, Scientific committee	Obj. 1.1 Obj. 2.1 Obj. 2.2. Obj. 4.5
	5 - Upgrade basic infrastructure such as roads, electricity, wastewater treatment and water to support upgrades to the Port.	300,000	List of infrastructure added and its influence.				SFA, MOFBE, government authorities	Obj. 1.1 Obj.1.2
	6 - Compare and where required adjust port and service duties to align with or	35,000	List of required adjustments. List of implemented adjustments				SFA, SPA	Obj. 1.2

<b>Development of Port Victoria into the Tuna Hub of the Indian Ocean.</b>								
Victoria as the hub of the Western Indian Ocean tuna fishery.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
	improve competitiveness with other ports in the region.							
	7 - Conduct assessment of safety issues within the Port and address these issues with possible implementation of CCTV cameras.	35,000	Issues identified. List of steps taken to address issues.				Seychelles Port Authority, Seychelles planning Authority.	Obj. 4.1 Obj. 4.4
	8 - Simplify the process of port entry and departure by using electronic means.	50,000	Working manual of the implemented system and its results.				SFA, SPA	Obj. 3.4
	9 - Increase dry dock space and provide services for dry dock work.	To be determined	List of upgrades undertaken				SFA, SPA	Obj. 1.2 Obj. 2.1 Obj. 2.2 Obj. 4.1 Obj. 4.2
	10 - Increase availability of berth for unloading.	To be determined	List of upgrades undertaken				SFA, SPA	Obj. 1.1 Obj. 1.2
	11 - Develop dFAD construction and storage facilities including means of recycling and reusing dFADs and fishing gear.	75,000	List of developments.				SFA, SPA	Obj. 1.2 Obj. 2.1 Obj. 4.1
	12 - Promotion of facilities on the international market.	75,000	List of advertising campaigns				SFA	Obj. 2.1

<b>Development of Port Victoria into the Tuna Hub of the Indian Ocean.</b>								
Victoria as the hub of the Western Indian Ocean tuna fishery.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
	13 - Research into and implementation of Sustainable Port measures including utilizing environmental technologies (such as clean and green energy), continuous monitoring and upgrading, increased operational efficiency throughout port measures and services and improved cooperation and communication amongst stakeholders.	250,000	List of potential sustainable port measures. List of upgrades.				SFA, MOFBE	Obj. 1.2 Obj. 1.3
	14 - Promotion of sustainable port measures on global market. <sup>[1]</sup>	25,000	List of promotional content.				SFA, MOFBE	Obj. 2.1
	15 - Research and develop means of assessing current port service quality and performance. For example, reviewing its efficiency, effectiveness, and resilience. <sup>[2]</sup>	35,000	The performance of port facilities. Allocated list of improvements.				SFA, Port authorities, Relevant experts	Obj. 1.1 Obj. 1.2 Obj. 3.4
	16 - Develop Port services in line with port service quality review for example improvement in accuracy, consistency and detailing of vessel schedules.	75,000	Suggested developments.				SFA, Port authorities	Obj. 1.2
	17 - Monitor all cost/revenue related to the tuna fishery and regularly compare the competitiveness of Port Victoria with other regional competitors.	40,000 per year	Benchmark of port development, costs, revenues, etc.				SFA, Port Authorities, and relevant experts	Obj. 1.2
Priority Area 1 (FA3.2): Reduce environmental	1 - Thorough assessment of the impact of dredging and hazardous waste emissions during construction and daily activity.	75,000	Results of the Environmental impact assessment (EIA)				SFA, MOFBE, relevant	Obj.4.1



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Victoria as the hub of the Western Indian Ocean tuna fishery.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
impacts of port operation and improve compliance with international measures.							experts, Port Authorities	
	2 - Develop a monitoring framework to survey and track the sources of wastewater, environmental modification, harmful chemicals, and the impact of dredging and daily activities, etc.	75,000	Established monitoring framework.				SFA, MOFBE, Port Authorities	Obj. 1.3 Obj.4.1
	3 - Based on the assessment and monitoring data, develop means for treatment of harmful waste product (Environmental technology, treatment plants, etc.).	150,000	Treatment methods.				SFA, Port Authorities	Obj. 1.3 Obj. 4.1 Obj. 4.3
	4 - Improve monitoring of landings and transhipment:	600,000	At least 15% of landings and transhipments monitored.				SFA	Obj. 3.2
	5 - Improve safety in the port area	1,500,000	No. of injuries and fatalities reported in port linked with the tuna industry.				SPA	Obj. 4.1 Obj.4.4.
<b>Development Pathway Four: Value Addition and Sale of Fish and Fish Products</b>								
<b>Objective:</b> Increase local value addition and facilitate international trade in fish and fish products.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
Priority Area 1(FA4.1):	1 -Undertake negotiations with shipping lines to ensure availability of reefer containers:	15,000	Agreement with shipping lines to store adequate				Shipping lines agents/SFA	Obj. 1.1 Obj. 1.2 Obj. 2.1

<b>Development of Port Victoria into the Tuna Hub of the Indian Ocean.</b>								
Victoria as the hub of the Western Indian Ocean tuna fishery.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
Facilitate whole fish transshipment and export.			amount of reefer containers in Seychelles					
	2 – Identify area for reefer container storage,	20,000	New area for reefer container storage identified				SPA/SFA	Obj. 1.1 Obj. 1.2 Obj. 4.5
	3 – Undertake study to come up with options for efficient transportation of containers between ports:	150,000	Availability of inter-quay transportation plan.				SPA/SIA/SLTA /SFA/MOFBE	Obj. 1.1 Obj. 1.2 Obj. 4.1
	4 – Undertake study to determine number of container reefer points required to cater for increased transportation via reefer containers.	25,000	Study finding on required reefer container points.				SPA/LML/Shipping agents	Obj. 1.1 Obj. 1.2 Obj. 2.1
	5 – Build on existing strategy to attract industrial longline vessels to Port Victoria.	75,000	Percentage change in number of longliners coming into Port Victoria.				MOFBE/SFA/SPA/ vessel agents	Obj. 1.1 Obj. 1.2 Obj. 2.1
	6 - Ensure adequate facilities at airport for export of fish and value-added products.	250,000	New dedicated fish chiller at the airport.				SFA/Air Seychelles	Obj. 1.1 Obj. 1.2 Obj. 2.1
	7 - Introduce measures to ensure cold chain maintenance during transfer and transportation of fish products,	40,000	Availability of guidelines, No. of trainings and awareness sessions organised.				SFA	Obj. 1.1 Obj. 1.2 Obj. 2.1
Priority Area 2 (FA4.2):	1 -Develop Zone 14 Fish Processing Zone	2,000,000	Number of public facilities completed.				MOFBE/SFA	Obj. 1.1 Obj. 1.2 Obj. 2.1

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Victoria as the hub of the Western Indian Ocean tuna fishery.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
Increase local value addition.								Obj. 2.2
	2 - Put in place measures to support the development of tuna cottage industry value addition.	50,000	No. of value-added tuna products from cottage industry				SFA/MOFBE	Obj. 2.1 Obj. 2.2 Obj. 4.1
	3 - Devise and implement a strategy to create local demand for tuna products.	200,000	Local demand strategy and implementation reports.				SFA	Obj. 2.2
	4 - Create a Seychelles label and increase marketing of Seychelles tuna products	1,000,000	Local label in use and being marketed. Marketing plan for Seychelles tuna.				SFA	Obj. 2.1 Obj. 2.2 Obj. 4.1
	5 - Identify new sources of finance and set up new schemes to provide access to finance for local value addition ventures.	125,000	New schemes set up or old schemes replenished to support fish processing and value addition.				MOFBE/SFA	Obj. 2.2. Obj. 4.1 Obj. 4.5
	6 - Promote the use of renewable energy in the fish processing and value addition sub-sector as means of reducing costs of operations.	200,000	Percentage annual change in uptake of green energy in fish processing sector.				SFA/PUC/Energy Commission	Obj. 2.4 Obj. 4.1 Obj. 4.5
<b>Development Pathway Five: Tuna Industry Governance</b>								
<b>Objective:</b> Improve governance of the Seychelles tuna industry.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		

<b>Development of Port Victoria into the Tuna Hub of the Indian Ocean.</b>								
Victoria as the hub of the Western Indian Ocean tuna fishery.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
Focus Area 1(FA5.1): Mainstream the tuna industry in national development framework, improve coordination with stakeholders, and ensure transparency	1. Adopting a Whole of Government Approach as a way of promoting the development of coherent and integrated policies and decision-making in the tuna industry.	500,000	National announcement on Whole of Government Approach for the Seychelles Tuna Industry development.				MOFBE/President's Office	Obj. 3.1 Obj. 3.2
	2 - Set up and operationalise a High-Level Tuna Committee	150,000	No. of planned meetings held annually.				MOFBE/SFA	Obj. 3.1 Obj. 3.2
	3 - Promote further cooperation and transparency in the fisheries sector through continued engagement with the Fisheries Transparency Initiative.	400,000	Record of NMSG meetings held, No. of Annual FiTI reports produced.				MOFBE	Obj. 3.2
Priority Area (FA5.2): Strengthen the legal, policy framework and controls.	1 -Continually strengthen the tuna fishery and industry legal framework to support the development of the tuna industry while maintain appropriate controls.	200,000	Number of updates to fisheries and tuna industry related regulations.				MOFBE/SFA	Obj. 3.3
	2 - Regularly review and update the Seychelles Fisheries sector Policy and Strategy and finalise the Management of bycatch Policy.	250,000	New iterations of Seychelles Fisheries sector Policy and Strategy and implementation of Bycatch management policy.				MOFBE/SFA	Obj. 3.3 Obj. 3.4

<b>Development of Port Victoria into the Tuna Hub of the Indian Ocean.</b>								
Victoria as the hub of the Western Indian Ocean tuna fishery.								
Priority Focus Areas	Key Actions	Budget	Performance Indicator	Time period (years)			Coordination/ Partners	Objectives contribution
				1-3	4-6	7-10		
	3 – Regular review of Seychelles Tuna Fishery Management Plan.	100,000	Regular five-year review of Seychelles Tuna Fishery Management Plan.				SFA/ MOFBE	Obj. 3.3
	4 – Develop tuna industry sub-sector plans to improve planning and development.	500,000	Sub-sector plans available and under implementation.				MOFBE/SFA	Obj. 3.3
	5 – Implement programme to continually strengthen the staff of the MOFBE and SFA to implement adopted development pathway options.	1,000,000	No. of staff benefitting from training and capacity building initiatives.				MOFBE/SFA	Obj. 3.3
	6 – Undertake a gap analysis of human capacity requirements for Seychelles to become a tuna centre of excellence in the region	25,000	Report on human capacity gap analysis				MOFBE/SFA	Obj. 3.3 Obj. 4.2
Priority Area 3 (FA5.3): Promote environmental sustainability across the tuna industry.	1- Active involvement in regional tuna fishery management, especially with the IOTC.	1,000,000	Attendance in IOTC meetings and workshops.				MOFBE/SFA	Obj. 3.5
	2 – Update the legal framework and strengthen controls across the industry	75,000	Records of new control measures implemented.				MOFBE/SFA/S PA	Obj. 3.3
	3 – Build upon existing initiatives to reduce waste and promote the circular economy	300,000	Initiatives implemented to reduce waste and promote the circular economy.				MOFBE/SFA/S PA	Obj. 1.3 Obj. 4.1 Obj. 4.5
	4 – Promote certification of yet uncertified Seychelles tuna fisheries.	500,000	No. of initiatives implemented by the Seychelles promoting fisheries certification.				SFA	Obj. 3.2 Obj. 4.1



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## 12. APPENDICES

### Appendix 1. Goals and Objectives of the Seychelles Fisheries Sector Policy and Strategy (2019).

#### GOAL

The overall goal of the policy is: To provide effective, efficient, transparent, and accountable service delivery through a participatory approach to ensure long-term sustainable fisheries and aquaculture management and conservation so that the sector continues to play a key role in the sustainable development of the country and the socio-economic well-being of the Seychellois nation.

#### OBJECTIVES

The policy has the following objectives:

- Manage fisheries resources through ecosystem-based approaches and ensure that policies, legislations and infrastructure development are aligned towards achieving sustainability, taking into account climate change, international commitments and global developments;
- Stimulate economic growth and transformation of the economy to create decent work, and vibrant, equitable and sustainable livelihoods contributing towards food security for all;
- Foster optimum utilisation of fisheries and aquaculture resources to ensure ecological and socioeconomic sustainability in resource-use and domestic developments, while recognising traditional norms;
- Maximise net economic benefits from resource use in all waters under national jurisdiction and across all value chains and reinvest the benefits nationally, including among other things, in the modernisation of the local fisheries and development of the aquaculture sector;
- Promote the use of rights-based management approaches supported by best available scientific research and industry practices across fisheries and aquaculture; Promote the principles of visibility, transparency, participation and inclusivity in decision-making processes which will enable the industry to develop to its full potential within a supportive regulatory framework;
- Safeguard the welfare of current and future generations, recognising gender equity and vulnerable groups, and protecting the country's sovereignty and jurisdiction;
- Reinforce the development of human resources through effective capacity programmes and training certification for marine fisheries education for the future growth of the fisheries and aquaculture sectors;

- Develop an enabling institutional environment that facilitates investment in fisheries and aquaculture and promotes Seychellois ownership and stakeholding in the sector;
- Improve public awareness of the benefits and potential of fisheries and aquaculture for the country.



## Appendix 2. Summary of Scores from the Multicriteria Component Analysis per Access Arrangement based on Annual Averages 2017-2021.

Lighter shades indicate more favourable for Seychelles and deeper shades mean less favourable.

Criteria	EU Agreement	Bilateral agreements	TFI and TTA Private access agreements	Licensing	Flagging	Semi-industrial fleet	Artisanal
License fee <sup>11</sup>	4,507,542	1,123,200	3,418,800	579,000	3,495,600	2,083	-
Additional direct payment <sup>12</sup>	8,655,940	-	-	-	-	-	-
Direct Revenue generation (USD/Mt)	154	53	176	69	54	1	-
Value added per ton (USD/Mt)	PS: 657 LL: 551	671	2,643	633	671	1,364	-
Seychelles percent share of VA	28	12	6	15	13	63	--
Expenditures in Sey per Mt <sup>13</sup>	1,382	1,423	200	1,423	1,675	402	-
Jobs created (#)	70	22	0	12	37	42	361
Readiness	High	Moderate	Moderate	High	Moderate	High	Low
Monitoring capacity	High	Moderate	Low	Moderate	High	High	Moderate
Environmental impact	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low
Climate change contribution	High	High	High	High	High	Moderate	Low
Transaction cost	High	Moderate	Moderate	Moderate	Moderate	Low	Low
Associated risks	Low	Low	High	Moderate	Moderate	Low	Low

<sup>11</sup> License fee estimate is based on the number of vessels licensed for the year 2022 only and on a scenario in which all licenses were for a full year.

<sup>12</sup> Additional payment figures is for the year 2021 only as published in the year 2021 Seychelles FiTI Report. As from 2023 purse seiners under the Mauritius-Seychelles Bilateral Agreement started paying the environmental management and observation of marine ecosystems contribution of Euro 2.25 per GT. As from 2023, Seychelles purse seiners have also started paying the environmental management and observation of marine ecosystems contribution of Euro 2.25 per GT and excess catch after the reference tonnage of 700 Mt per vessel is exceeded.

<sup>13</sup> The expenditures for private access agreements excludes Chinese long-liners (TFI agreement) as they do not dock in Port Victoria. Due to data restrictions, the expenditure and jobs created from licensing and bilateral agreements have been grouped together.



**Note:** This Table appear as Table 19 in Deliverable 3 IOS (2024). Technical Report on Development Pathway Options for Stakeholder Validation & Prioritisation (Part B), Seychelles National Tuna Development and Management Plan. Ministry of Fisheries and Blue Economy, 123 pp.