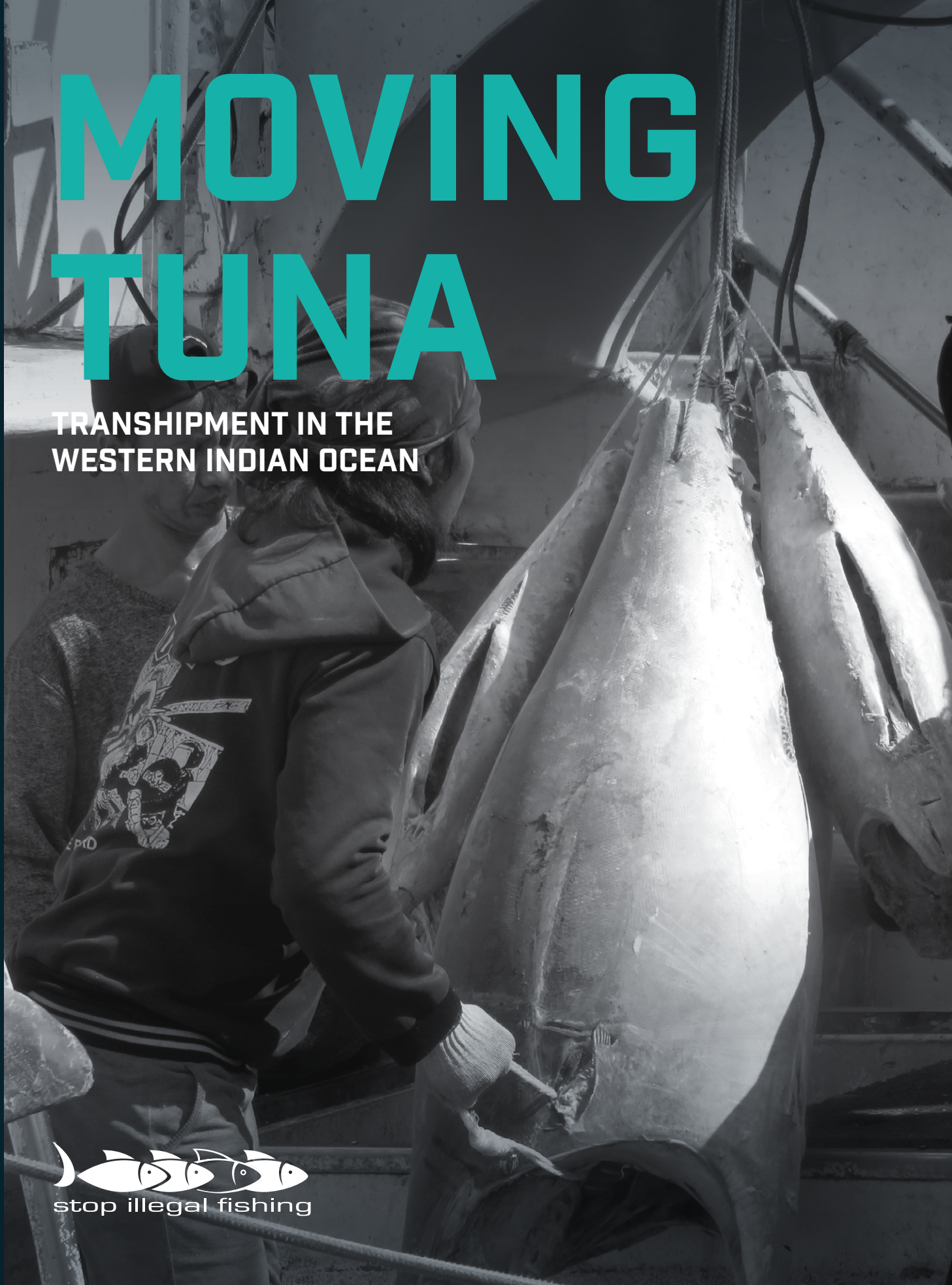

MOVING TUNA

TRANSHIPMENT IN THE WESTERN INDIAN OCEAN

stop illegal fishing

Stop Illegal Fishing is working at a practical and policy level to support coastal, flag, port, market and crew States to take action against illegal fishing. As an Africa-based, independent not for profit organisation Stop Illegal Fishing works in partnership with governments, civil society, intergovernmental organisations and the fishing industry.

The study leading to this report drew from a range of material including: analysis of the Indian Ocean Tuna Commission (IOTC) databases, lists and reports; monitoring of IHS Markit databases, automatic identification system (AIS) and port logs; reviewing published reports and information; and interviews and discussions with many people involved in the WIO tuna fisheries and the business of transhipment.

Our special thanks go to Gerard Domingue and Pierre Malan for reviewing the report.

Support for this project was provided by The Pew Charitable Trusts and the Walmart Foundation.

stop illegal fishing

NFDS

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01
ACRONYMS

AIS	Automatic identification system
C188	Work in Fishing Convention
CMM	Conservation and management measure
CPC	Contracting Party and Cooperating Non-Contracting Party
CTA	Cape Town Agreement
EEZ	Exclusive economic zone
EIO	Eastern Indian Ocean
FAO	Food and Agriculture Organization
GT	Gross tonnage
ILO	International Labor Organization
IMO	International Maritime Organization
IOTC	Indian Ocean Tuna Commission
IUU	Illegal, unreported and unregulated (fishing)
LSTLV	Large scale tuna longline vessel
MCS	Monitoring, control and surveillance
PSM	Port State measures
PSMA	Agreement on Port State Measures to Prevent, Deter and Eliminate IUU Fishing
RFMO	Regional fisheries management organisation
ROP	Regional observer programme (IOTC)
SADC	Southern African Development Community
SDG	Sustainable development goal
SWIOFC	Southwest Indian Ocean Fisheries Commission
ULT	Ultra-low temperature
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
USA	United States of America
USD	United States dollar
VMS	Vessel monitoring system
WIO	Western Indian Ocean

02
FOREWORD

DR. MOTSEKI HLATSHWAYO

At a global level, the Food and Agriculture Organization (FAO) estimates that in 2018 the total world marine catch was 96.4 million tonnes, the highest ever recorded. Fish is an important and highly traded food commodity that has significant social and economic implications in every country and across all social and economic spheres. As a renewable natural resource, fish are vulnerable to overexploitation and damage to their ecosystem can have impacts beyond the fish stock being caught.

In the Southern African Development Community (SADC) promoting sustainable, and socially and economically beneficial fisheries is a pillar in our commitment to achieve global Sustainable Development Goals (SDGs) and Africa's Agenda 2063. The recent adoption of Africa's Blue Economy Strategy 2020 cements the realisation that the blue economy is a component of the continent's development blueprint. Our vision is for 'an inclusive and sustainable blue economy that significantly contributes to Africa's transformation and growth'.

Within the SADC, guided by our 2001 SADC Protocol on Fisheries, we promote responsible and sustainable use of aquatic living resources and ecosystems to improve food security, alleviate poverty, safeguard livelihoods, and generate economic opportunities. We do this through regional cooperation to achieve integrated fisheries management that promotes economic opportunities throughout the supply chain.

A major step forward for our regional cooperation is the instigation of our SADC Regional Monitoring, Control and Surveillance (MCS) Coordination Centre, based in Maputo, Mozambique. This Centre is developing the foundations for improved cross-checking and validation of fisheries information, that we are undertaking with the support of our partners, such as Stop Illegal Fishing, and that will help to realise the recommendations made in this publication.

Moving Tuna provides us with a starting point for re-thinking the management of transhipment in fisheries. In my mind, it leaves no doubt, that we must work together to ensure that our valuable fisheries resources are managed in a manner that promotes sustainability of the resources, and economic and social prosperity for our region.

DR. MOTSEKI HLATSHWAYO
SENIOR FISHERIES ADVISOR
SOUTHERN AFRICAN DEVELOPMENT COMMUNITY SECRETARIAT

03
WELCOME

ELSA DA GLORIA PÁTRIA

Moving Tuna has been prepared to support fisheries officers, managers and decision makers with an interest in the Western Indian Ocean (WIO) to engage in the global discussion about the future of transhipment.

Transhipping fish from a fishing vessel to land – either directly or via another vessel – is required to move fish from the sea to the consumer. This transhipment of fish is an essential part of the supply chain of fish and seafood, and it signifies a critical point when the fish leaves the sphere of fisheries management and becomes a traded commodity.

Transhipment also provides an operational bottleneck, enabling authorities to check what was caught, how much, and by whom and to validate whether the fishers, vessels and catch are legal. If this opportunity is missed, information about the catch may be distorted, and if the fish was illegally caught, it may now be white-washed into the supply chain – and be identified as legal catch.

Transhipment is also an important business event. For fishing companies it often signals the sale of the catch and payment for their work. For processors, efficient transhipment ensures their product remains of a high quality and is moved swiftly to their factories. For the consumer, efficient transhipment keeps the price of their fish affordable.

The importance of transhipment has gained global attention in recent years, with differing opinions about who should authorise, manage and oversee it, and how they should do this. At-sea transhipment has generated a particularly impassioned discussion – some argue it is essential while others call for a global ban. Whichever argument you support, the ills of uncontrolled and unmonitored transhipment are evident, including options to hide illegal, unreported and unregulated (IUU) fishing, human rights abuses and unsafe fishing vessels. These environmental, social and economic implications are of great concern to us all, undermining our aspirations for safe, fair and legal fisheries and the sound basis for sustainable blue growth.

This concern inspired the FAO Committee on Fisheries to advocate for the development of global guidelines on best practices for regulating, monitoring and controlling transhipments. In 2018, the Committee called for studies to support this process and **Moving Tuna** has been developed to provide information for this process.

Building on ten years of partnership to strengthen MCS in the WIO through the FISH-i Africa Task Force, Stop Illegal Fishing with support from The Pew Charitable Trusts have prepared this study. While the study focuses on transhipment, it also reflects other relevant issues for our region: the value and role of port State measures and inspections; the challenge of at-sea MCS; the role and risks that observers and crew face; how we share and validate information; and ultimately if we are looking after and benefiting to the maximum from our fishery resources.

I would like to thank all who have assisted us in developing this report. I hope that you will find it helpful to support a well informed and balanced global discussion on transhipment.

ELSA DA GLORIA PÁTRIA
CHAIRPERSON OF STOP ILLEGAL FISHING

04
SUMMARY

Moving Tuna is a case study about the at-sea and in-port transhipment of tuna from industrial purse seine and longline fishing vessels in the WIO. About 87% of this tuna is transhipped from fishing vessels in ports with the remainder transhipped at sea to carrier vessels. Around 58% of this tuna leaves the WIO unprocessed in carrier vessels, containers or on fishing vessels, the rest is locally processed before being transported to Asia, Europe or the United States of America (USA) for consumption.

THERE ARE THREE TYPES OF TRANSHIPMENT IN THE WIO

AT-SEA TRANSHIPMENT TO CARRIER VESSELS

This is cost efficient for the fishing industry, reduces emissions and potential coastal pollution from marine traffic, but brings little benefit for the WIO port States nor for crew needing help. **All at-sea transhipments are monitored by IOTC regional observers, paid for by the industry.**

IN-PORT TRANSHIPMENT FOR LANDING

Brings the greatest benefits for WIO port States able to provide services, increase employment and taxes, and benefit from fish for consumption, while offering crew a chance to seek help, but this is balanced with greater environmental concerns for pollution and cost inefficiencies for the industry. **Around 5% of in-port transhipments for landings are monitored, with costs borne by the port State.**

IN-PORT TRANSHIPMENT FOR TRANSIT

Brings similar environmental risks and crew benefits to landing fish, but port States gain only limited social and economic benefits as the fish are not imported into the country. **Monitoring of transhipment is unlikely, as port States do not consider this type of transhipment within their mandate.**

CONCLUSIONS IN RESPECT TO ACHIEVING SDG 14 LIFE BELOW WATER'S TARGET

TARGET 14.4 TO END IUU FISHING

Transhipment, and particularly at-sea transhipment, is frequently cited as a facilitator of IUU fishing, assisting to hide other ills such as modern day slavery – **Moving Tuna** demonstrates that this perception may be misleading. Of the WIO MCS tools, while all have limitations, at-sea monitoring by independent IOTC carrier vessel observers was the most effective method to identify non-compliance while in-port transhipment monitoring was particularly poor.

TARGET 14.7 TO GROW A BLUE ECONOMY

The wealth of the oceans and their fisheries offer an opportunity for coastal States to develop blue growth – **Moving Tuna** demonstrates that today, European and Asian interests dominate the purse seine and longline tuna value chain leaving little for the WIO coastal States, with only a handful of exceptions.

RECOMMENDATIONS FOR GLOBAL GUIDELINES ON TRANSHIPMENT MANAGEMENT

TRANSPARENT TRANSHIPMENT MONITORING

All transhipments, at sea and in port should be subject to a similar independent monitoring system based on risk assessment, non-partiality and user pays principles.

COMPREHENSIVE VALIDATION OF INFORMATION

Transhipment offers an operational bottleneck for compiling information about the fishing, vessels, catch and crew, but the real benefits come when this information is pooled with other fishery information and validated regionally across MCS tools, providing a more accurate and complete picture of the fishery.

INCENTIVES ATTRACTING TRANSHIPMENT TO LOCAL PORTS

Blue growth strategies with incentives and port development to attract fishing and carrier vessels to tranship in ports near the fishing grounds, will reduce pollution and emissions, build long-term business partnerships and secure a supply of fish to drive African social and economic growth.

05
OVERVIEW

THIS REPORT

The aim of **Moving Tuna** is to provide insight into transhipment within the WIO and to support engagement in discussions on the future management of transhipment. This is achieved by constructing a picture of the movement of the main tuna species within the WIO from fishing vessels to carrier vessel, container or cold storage and analysing this in respect to improving compliance and benefits from the fishery. While this picture is known to have limitations, mainly due to the dynamic and confidential nature of fisheries business, the best effort has been made to provide an accurate snapshot.

THE REGION

The focus is on the WIO region of the Indian Ocean Tuna Commission (IOTC) area of competence or FAO Area 51. The higher concentrations of tuna in this region make it the target for industrial fleets, the location for key transhipment ports, and processing facilities for the European canning markets. It is also where the majority of at-sea transhipments take place under the IOTC Regional Observer Programme (ROP).

THE TUNA

Of the species managed by the IOTC, the tropical and temperate tunas – albacore, bigeye, skipjack and yellowfin – are the most important in respect to industrial transhipment. The distribution of these species, the catches and the gear types used to catch them are considered.

CATCHING TUNA

Two important fishing gears for catching tuna are industrial longlines and purse seines. Around 700 large scale purse seine vessels catch tropical tuna globally. Around 50 of these vessels fish in the WIO with most flagged to Spain and France. Seychelles is also an important flag State, however their vessels are Spanish owned and operated. Around 500 industrial longline vessels fish in the WIO and most are flagged outside of the region, with around 300 Taiwanese, 80 Chinese, 40 Japanese, 20 Malaysian and 10 South Korean. There are around 50 Seychelles flagged industrial longliners that are Taiwanese owned and operated.

MOVING TUNA

At-sea transhipment is permitted for IOTC authorised industrial longliners over 24 meters in length, transhipping to an IOTC authorised carrier. This almost exclusively occurs in the high seas between Asian flagged longliners and a carrier vessel owned or controlled by Asian interests. At-sea transhipment accounts for approximately 50% of the tuna caught by longliners with the rest most commonly transhipped in Port Louis, Mauritius or Cape Town, South Africa. The purse seiners mainly tranship in Port Victoria, Seychelles, with small amounts in Port Louis and Antsiranana, Madagascar: this may be to carriers, containers or cold storage. Examples of the operational movement of carrier vessels in the WIO are provided.

MANAGING TUNA

Where and how to monitor for compliance is considered, with the effectiveness, risks and costs of different MCS methods assessed to demonstrate the importance of transhipment. At-sea monitoring by an observer on the carrier vessel is found to be the most effective MCS tool currently used in the WIO to monitor transhipment. Ensuring fair sharing of benefits is a key policy ask of the coastal States and the status of current benefits on food security, employment and income generation is provided. The impacts of at-sea and in-port transhipments reveal that coastal States benefit most from transhipment for landing and importation, transhipment at sea is better for the environment, while in-port transhipment has more social advantages than at-sea transhipment.

BETTER TUNA

The information compiled in this study was analysed in respect to achieving SDG 14 life below water's targets: target 14.4 to end overfishing and IUU fishing and target 14.7 to increase the economic benefits to developing countries from the sustainable use of marine resources. Recommendations that will help the WIO region manage transhipment to achieve these goals focus on three areas: the strengthening of the regional transhipment monitoring system to provide effective monitoring for all types of transhipment, improved regional validation of transhipment monitoring with other MCS information, and increasing national incentives to attract transhipment to the ports of WIO coastal States.

DEFINING TRANSHIPMENT

Transhipment is not defined in the IOTC framework and despite its wide use, the term transhipment has a variety of applications, leading to different interpretations. The different explicit definitions and implicit meanings given amongst key IOTC States can cause challenges for discussions, decision making, MCS efforts and enforcement – because even if the same words are used, the meaning may differ.
For example:

TRANSHIPMENT OR LANDING

- The term transhipment suggests the involvement of two or more vessels, but this is not always agreed. Some interpretations include the movement of items from a vessel to or from a container or cold storage, which can also be known as landing or offloading. Interpretation of this may impact on the MCS regime that the product falls into, such as if port State measures are applicable or not, or which tax and trade tariffs are applicable to it.

FISHING OR CARRIER VESSEL

- Transhipment can involve various types of vessels, including the movement of items between one or more fishing, carrier, service or bunker vessels or any other type of vessel. Defining vessel types can also be complex. For example, while the list of IOTC authorised carrier vessels currently only includes cargo freezer vessels, nationally many States do not consider carrier and fishing vessels to be mutually exclusive and some States, including the three most important carrier flag States in the WIO – Liberia, Panama and Taiwan – do not require that a carrier vessel does not fish.

WHAT IS BEING TRANSHIPPED

- Catch is often the main item of concern in transhipment, but it may include supplies, crew, bait, fish cartons, fuel, food, water, equipment and so on.

In this report a broad application of transhipment has been used that includes any or all the options above. However, the focus is moving tuna from the fishing vessel that caught it to a carrier, cold storage or container. If the transhipment occurs in port and the fish is imported to the country of the port it is referred to as 'transhipment for landing', if the fish is transiting in the port it is referred to as 'transhipment for transit'.

ASSESSMENT OF SELECTED STATES' LEGAL DEFINITIONS OF TRANSHIPMENT

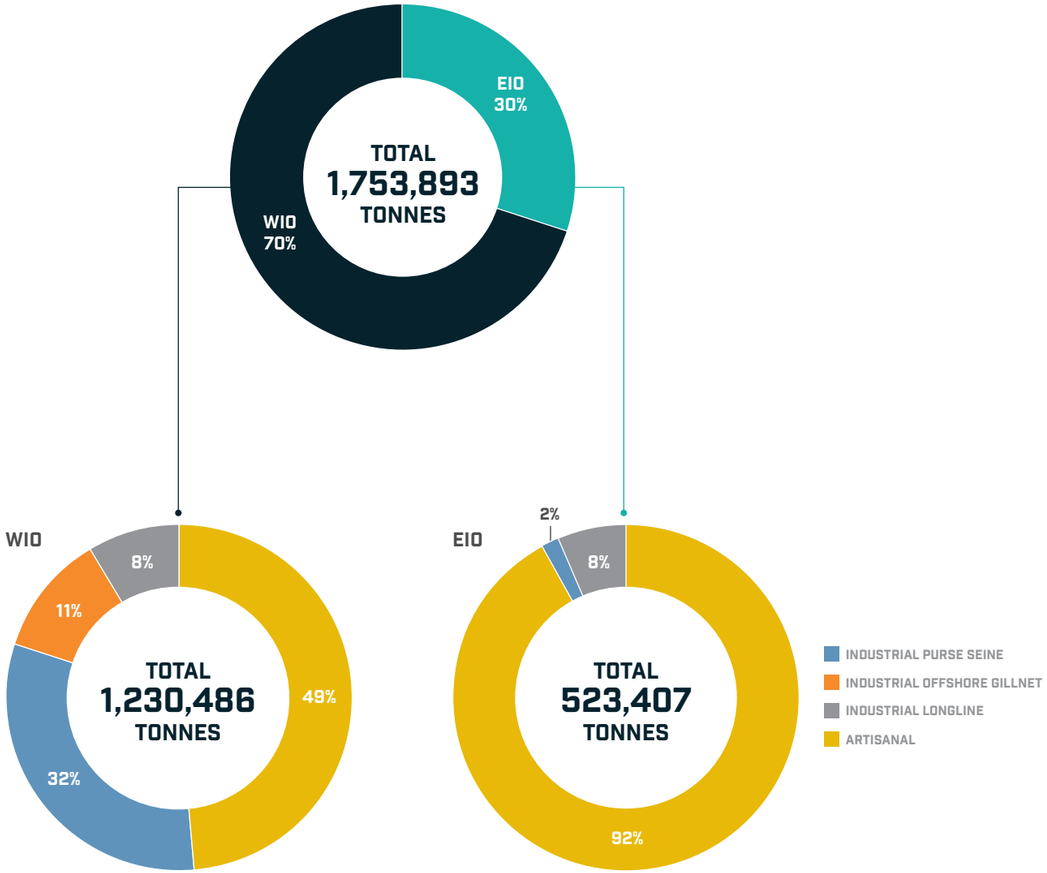
STATE (OR ENTITY)	TYPE OF IOTC STATE				DEFINITION OF TRANSHIPMENT		
	Flag State	Port State	Coastal State	Processing State	Vessel to vessel	Vessel to land to vessel	Includes containerisation
European Union	●	●		●			
Liberia	●						
Madagascar		●	●	●	At sea		At sea
Mauritius		●	●	●			
Panama	●						
Seychelles	●	●	●	●			
South Africa		●	●				
Taiwan	●	●		●			
Tanzania			●			Without importation	Without importation

NOT DEFINED IMPLICIT EXPLICIT

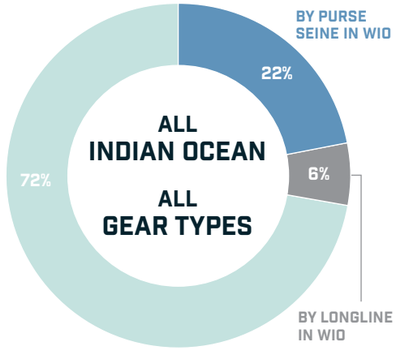
THE INDIAN OCEAN

The Indian Ocean can be divided into the Western (WIO) and Eastern (EIO) Indian Ocean. While they are similar in size, the west is far more productive than the east due to higher concentrations of tuna. In 2017, 70% of the total catch of tuna and tuna-like species (1,230,486 tonnes) were caught in the WIO compared to 30% (523,407 tonnes) in the EIO.

CATCH WITHIN THE WESTERN AND EASTERN INDIAN OCEAN BY GEAR TYPE (2017)



STUDY FOCUS SHOWN AS PART OF INDIAN OCEAN CATCH (2017)



STUDY FOCUS

This report focuses on the transhipment of tuna from industrial purse seine and longline fishing vessels in the WIO. **In 2017 this represented around:**

- 28% of the total Indian Ocean reported catch by weight; and
- 40% of the WIO reported catch.

06
THE TUNA

6.1 THE REGION

The Indian Ocean is one of the great ocean basins of the world. It covers:

70 MILLION SQUARE KM

20% OF THE EARTH'S SURFACE WATER

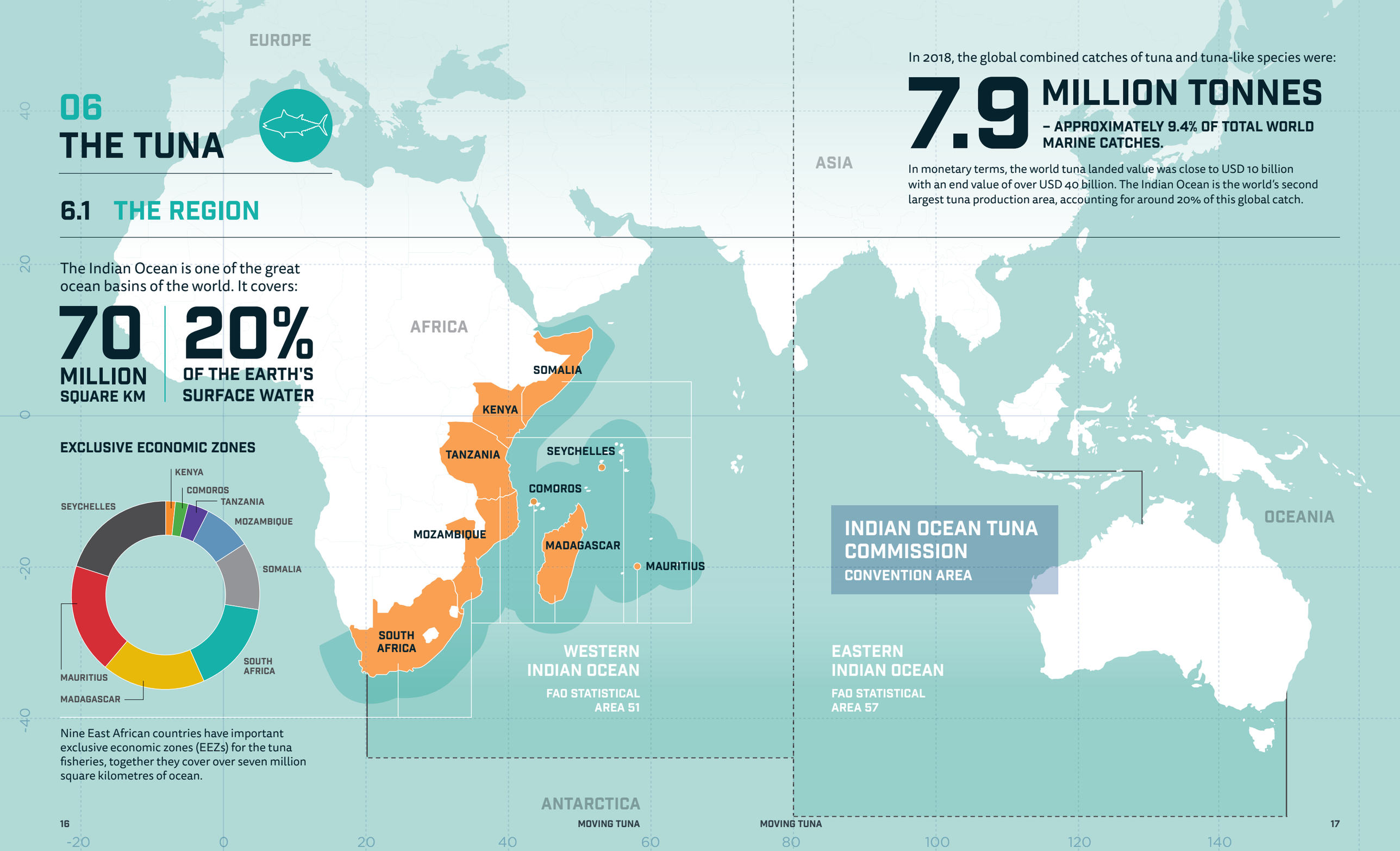
EXCLUSIVE ECONOMIC ZONES

Nine East African countries have important exclusive economic zones (EEZs) for the tuna fisheries, together they cover over seven million square kilometres of ocean.

In 2018, the global combined catches of tuna and tuna-like species were:

7.9 MILLION TONNES – APPROXIMATELY 9.4% OF TOTAL WORLD MARINE CATCHES.

In monetary terms, the world tuna landed value was close to USD 10 billion with an end value of over USD 40 billion. The Indian Ocean is the world's second largest tuna production area, accounting for around 20% of this global catch.

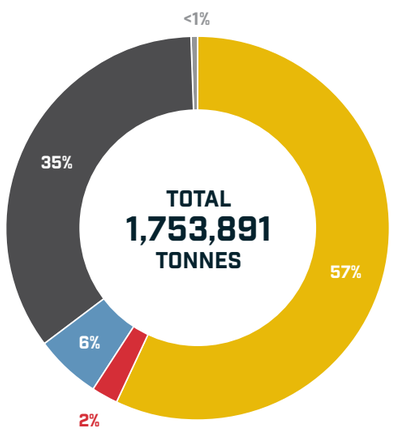


6.2 THE CATCH

Sixteen tuna and tuna-like species are managed by the IOTC and they fall into five groups. A sixth group, which is also targeted by fishing vessels is the sharks. While shark catches are not directly managed by the IOTC, their catches are reported.

- **TROPICAL TUNA** – bigeye, skipjack, yellowfin – are highly migratory and distributed ten degrees either side of the equator. Tropical tunas constitute the largest part of the total tuna world catch at around 75%, which is reflected in the WIO. They are caught both by industrial and artisanal fishers on the high seas and in the EEZs of coastal States. These species mainly supply the export industries and some local markets in the case of skipjack tuna.
- **NERITIC TUNA AND MACKERELS** – longtail, bullet, frigate, kawakawa, mackerel – are the second most important species group by catch volume. They are coastal straddling species caught by small-scale industrial and artisanal fishers mainly to supply local markets. The catch represents about one third of the catch of tuna and tuna-like species in the Indian Ocean.
- **TEMPERATE TUNA** – albacore is a highly migratory species distributed from five degrees north to forty degrees south. It is caught by industrial and artisanal fishers on the high seas and in the EEZs of coastal States, it is mainly exported.
- **BLUEFIN TUNA** – southern bluefin – is a highly valuable highly migratory species which exists in the EIO and along the southern boundary of the IOTC region, annual catches of bluefin tuna are very low and destined for foreign markets.
- **BILLFISH** – marlin, sailfish, swordfish – are tuna-like species exploited by industrial, artisanal and sport fishers throughout the Indian Ocean on the high seas and in the EEZ of coastal States. They are usually caught and retained as a bycatch for local consumption with some transhipped to Asian markets.

CATCHES OF IOTC MANAGED SPECIES IN TONNES (2017)



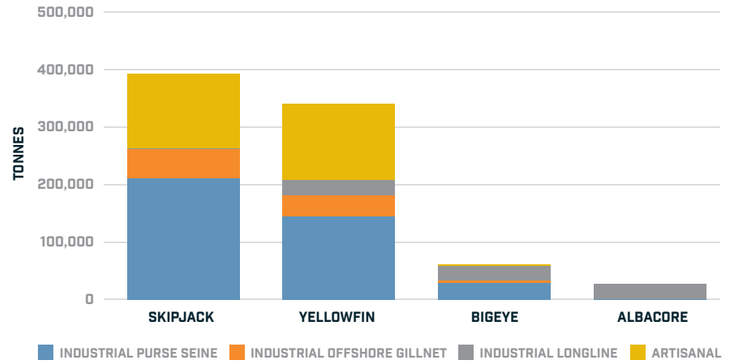
TROPICAL TUNA	999,738
TEMPERATE TUNA	38,926
BILLFISH	97,465
NERITIC TUNA AND MACKERELS	610,814
BLUEFIN TUNA	6,948

TROPICAL AND TEMPERATE TUNA CATCHES

Of the species managed by the IOTC, the tropical and temperate tunas – albacore, bigeye, skipjack and yellowfin – are the most important in respect to industrial transhipment.

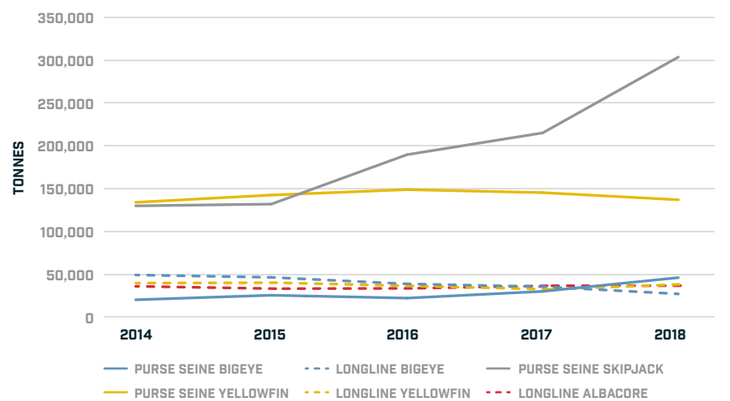
Many different types of fishing gear are used to catch the tunas, however, four are the most important: artisanal gears, industrial offshore gillnets, industrial purse seines and industrial longlines.

TROPICAL AND TEMPERATE TUNA CATCHES IN THE WIO IN TONNES BY GEAR TYPE (2017)



For the industrial purse seine and longline fishing gears the catch of these tunas has varied over the last five years, with an overall trend for an increase in catch by purse seiners and a decrease in catch by the longliners.

TROPICAL AND TEMPERATE TUNA CATCHES IN THE WIO IN TONNES BY GEAR TYPE (2014 TO 2018)



6.3 THE TUNAS

ALBACORE

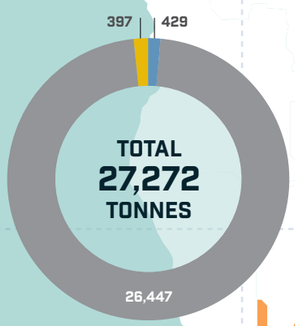
DISTRIBUTION OF IOTC CATCHES ESTIMATED BY GEAR TYPE 2017

- LONGLINE
- PURSE SEINE
- OTHER FISHING GEARS
- POLE-AND-LINE

WESTERN INDIAN OCEAN CATCH 2017
ALBACORE

MAIN PRODUCT FORMS AND MARKETS
FROZEN WHOLE (ASIA/EU)
FROZEN LOINS (USA)

- INDUSTRIAL PURSE SEINE
- INDUSTRIAL LONGLINE
- ARTISANAL
- INDUSTRIAL OFFSHORE GILLNET



SOMALIA
KENYA
TANZANIA
COMOROS
MADAGASCAR
MAURITIUS
SEYCHELLES
MOZAMBIQUE
SOUTH AFRICA
WIO
FAO STATISTICAL AREA 51
ASIA
EIO
FAO STATISTICAL AREA 57
OCEANIA
ANTARCTICA

ALBACORE

IOTC ASSESSMENT:
- NOT OVERFISHED
- NOT SUBJECT TO OVERFISHING

BIGEYE
YELLOWFIN
ALBACORE
SKIPJACK

Adult albacores migrate yearly to spawn in tropical waters and to feed in more southernly temperate waters, where they are caught mainly by industrial longliners.

Albacore tuna is used for high quality canned tuna and is becoming more common as sashimi. It is often exported from the WIO in loins or as frozen whole fish.

While there is uncertainty in the reliability of catch estimates, albacore stocks are considered sustainably fished if the fishing effort does not increase.

SKIPJACK

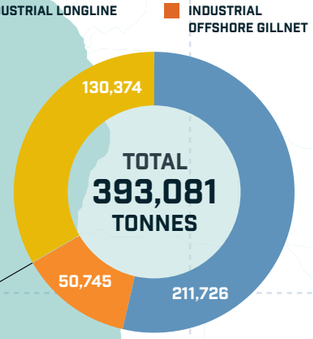
DISTRIBUTION OF IOTC CATCHES ESTIMATED BY GEAR TYPE 2017

PURSE SEINE
LONGLINE
POLE-AND-LINE
OTHER FISHING GEARS

WESTERN INDIAN OCEAN CATCH 2017
SKIPJACK

MAIN PRODUCT FORMS AND MARKETS
CANS (EU)

INDUSTRIAL PURSE SEINE
INDUSTRIAL LONGLINE
ARTISANAL
INDUSTRIAL OFFSHORE GILLNET



SOMALIA
KENYA
TANZANIA
COMOROS
MADAGASCAR
MAURITIUS
MOZAMBIQUE
SOUTH AFRICA

WIO
FAO STATISTICAL AREA 51

EIO
FAO STATISTICAL AREA 57

ASIA
OCEANIA
ANTARCTICA

SKIPJACK

IOTC ASSESSMENT:

- NOT OVERFISHED
- NOT SUBJECT TO OVERFISHING

Skipjack is highly mobile and covers large distances. It is mainly caught by industrial purse seine vessels fishing around fish aggregating devices and by artisanal fishers.

This affordable variety of tuna is the smallest and most abundant of the four major tunas in the WIO and most commonly canned and exported.

The stock is resilient and not easily prone to overfishing. Skipjack is the third most consumed marine fish in the world.

0 20 40 60 80 100 120 140

BIGEYE

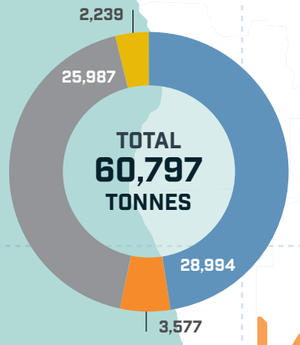
DISTRIBUTION OF IOTC CATCHES ESTIMATED BY GEAR TYPE 2017

LONGLINE
PURSE SEINE
OTHER FISHING GEARS

WESTERN INDIAN OCEAN CATCH 2017
BIGEYE

MAIN PRODUCT FORMS AND MARKETS
FROZEN WHOLE (ASIA (INCLUDING JAPAN)/EU)

INDUSTRIAL PURSE SEINE
ARTISANAL
INDUSTRIAL LONGLINE
INDUSTRIAL OFFSHORE GILLNET

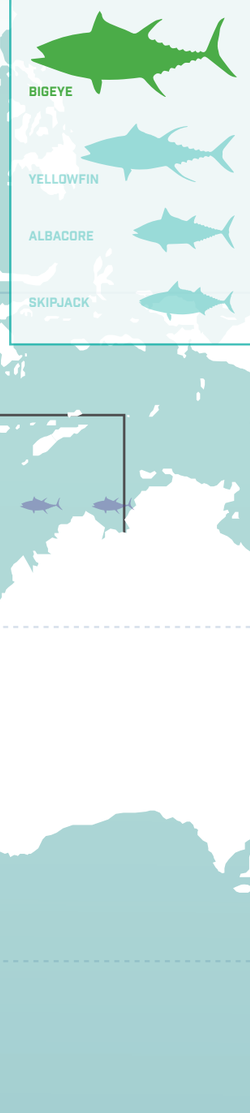


SOMALIA
KENYA
TANZANIA
COMOROS
MADAGASCAR
MOZAMBIQUE
MAURITIUS
SOUTH AFRICA
WIO
FAO STATISTICAL AREA 51
ASIA
EIO
FAO STATISTICAL AREA 57
OCEANIA
ANTARCTICA

BIGEYE

IOTC ASSESSMENT:

- NOT OVERFISHED
- NOT SUBJECT TO OVERFISHING



Bigeye tuna reproduce in tropical waters and feed in temperate waters. In the WIO the catch is caught by longline and purse seine fishing vessels.

While this is the biggest of the four tunas in size, the catch volume is considerably less that for skipjack and yellowfin. Bigeye is a popular sashimi tuna.

Bigeye stocks are considered sustainably fished and a decline in longline effort since 2007 has contributed to reduced pressure on the stock.

YELLOWFIN

DISTRIBUTION OF IOTC CATCHES ESTIMATED BY GEAR TYPE 2017

- LONGLINE
- OTHER FISHING GEARS
- PURSE SEINE
- POLE-AND-LINE

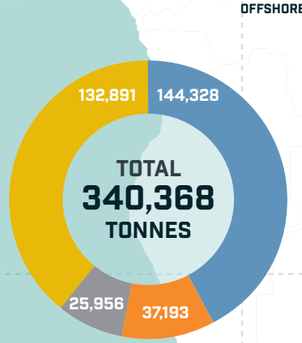
WESTERN INDIAN OCEAN CATCH 2017
YELLOWFIN

MAIN PRODUCT FORMS AND MARKETS

CANS (EU)

FROZEN WHOLE (ASIA (INCLUDING JAPAN)/EU)

- INDUSTRIAL PURSE SEINE
- INDUSTRIAL LONGLINE
- ARTISANAL
- INDUSTRIAL OFFSHORE GILLNET



SOMALIA
KENYA
TANZANIA
COMOROS
MADAGASCAR
MAURITIUS
MOZAMBIQUE
SOUTH AFRICA
WIO
FAO STATISTICAL AREA 51
ASIA
EIO
FAO STATISTICAL AREA 57
OCEANIA
ANTARCTICA

YELLOWFIN

IOTC ASSESSMENT:

- **OVERFISHED**
- **SUBJECT TO OVERFISHING**

Yellowfin form schools on fish aggregating devices causing small yellowfin tuna to be caught in association with skipjack and bigeye, while in free swimming schools larger yellowfin are caught.

The catch is evenly split between industrial and artisanal fisheries. The longline catch, while smaller in volume is important as a high quality tuna that is popular for sashimi.

Yellowfin stocks are in a dangerous state, being overfished and with overfishing. The IOTC has an interim plan in place to rebuild the yellowfin stock.

07
CATCHING TUNA

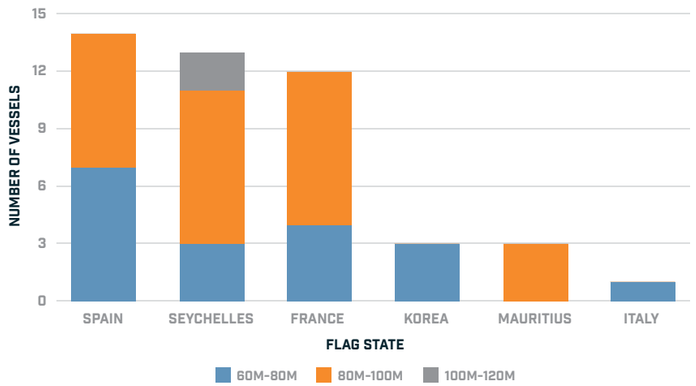
Tunas swim large distances moving between feeding and breeding grounds resulting in tuna migrating between EEZs and the high seas throughout the year, closely followed by fishing vessels that track and catch them in the different fishing grounds. Two important fishing gears for catching tuna are industrial longlines and purse seines.

7.1 INDUSTRIAL PURSE SEINE VESSELS

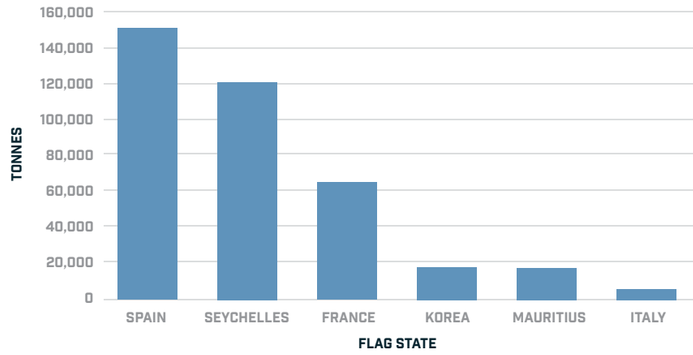
Around 700 large-scale purse seine vessels catch tropical tuna globally. Around 50 of these vessels fish in the WIO with most flagged to Spain and France. Seychelles is also an important flag State, however their vessels are Spanish owned and operated.

About 66% of the global tuna catch each year is caught by purse seine vessels. They entrap aggregations of fish into an encircling net that is set using a small boat often called a skiff. The net is closed underneath the fish, called pursing, and the slack net is hauled back onto the vessel until only the fish are concentrated in the end of the net, still in the sea. The fish are scooped out of the sea using a brailer. Once onboard the fish are either placed on the deck or into a sorting bin, called a hopper, and unwanted bycatch, damaged catch and high value bycatch are removed. In some modern vessels this high value, large bigeye, yellowfin or billfish can be blast frozen and stored at -40°C to -60°C. The main catch is then lowered into a loading hatch and moved below deck via conveyor belts or chutes and stored in wells with brine freezing at -14°C to -20°C.

ESTIMATE OF PURSE SEINERS ACTIVE IN THE WIO BY FLAG STATE AND LENGTH (2017)



ESTIMATE OF PURSE SEINER CATCH IN THE WIO BY FLAG STATE (2017)



7.2 INDUSTRIAL LONGLINE VESSELS

Roughly 10% of tuna caught globally each year is caught by longline vessels. Around 500 industrial longline vessels fish in the WIO and most are flagged to countries outside of the WIO region, with around 300 Taiwanese, 80 Chinese, 40 Japanese, 20 Malaysian and 10 South Korean. There are around 50 Seychelles flagged industrial longliners which are Taiwanese owned and operated.

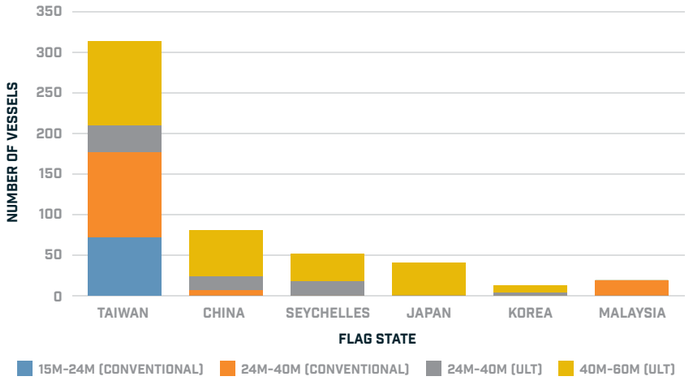
Longline fishing involves setting a main fishing line with buoys and weights and many branched lines each with a baited hook. When the line is retrieved each fish is removed from the hook one-at-a-time by hand and the live catch lifted onto the deck. It is then killed, the caudal fin removed, the fish gutted and washed before being placed in a cooler room.

The fish are blast frozen using one of two methods. The ultra-low temperature (ULT) or sashimi grade vessels, blast freeze to between -50°C to -60°C, the product is called frozen or ULT. These vessels are usually 100 to 800 gross tonnes (GT) and they form around 60% of the longliners active in the WIO. The conventional or non-sashimi grade vessels freeze to between -30°C to -35°C using a cooling system of refrigerated seawater and ice, their product is often called fresh tuna, which can be confusing as it is frozen! Around 40% of the longliners in the WIO are conventional longliners and they are usually below 100 GT.

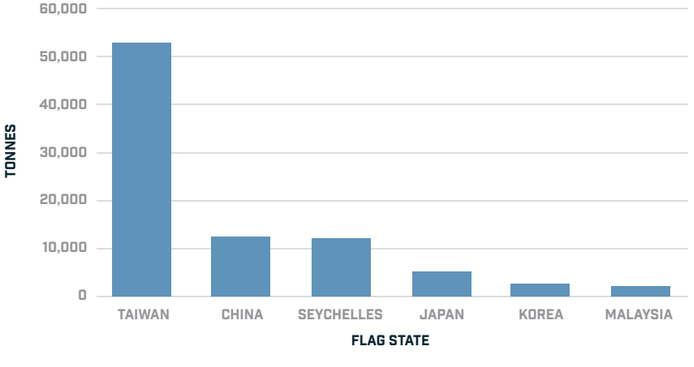
Longline vessel length varies, vessels between 15 and 24 meters in length form 14%, between 24 and 40 meters form 39% and 40 to 60 meters form 47% of the industrial vessels operating in the WIO. In the IOTC, longliners of 24 meters and above can tranship at sea within the regional observer programme (ROP) and are called large scale tuna longline vessels (LSTLVs), while those below are small scale tuna longline vessels. Longliners above 100 GT are often referred to as large scale vessels and those below 100 GT small scale vessels, this can sometimes cause confusion with the length classification.

While for many vessels it can be difficult to identify their capacity, the Taiwanese vessels allocate a CT number within the vessels callsign that identifies this. For example, CT-2, CT-3 and CT-4 are vessels under 100 GT while those CT-5 and above are over 100 GT and their capacity become progressively greater up to CT-7.

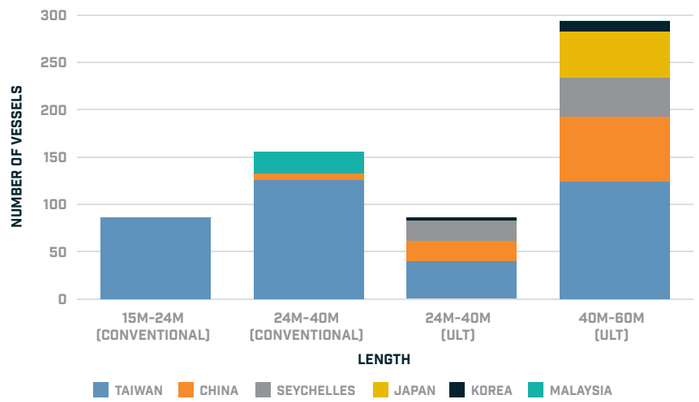
ESTIMATE OF THE NUMBER OF LONGLINERS IN THE WIO BY FLAG STATE, LENGTH AND FREEZING CAPACITY (2017)



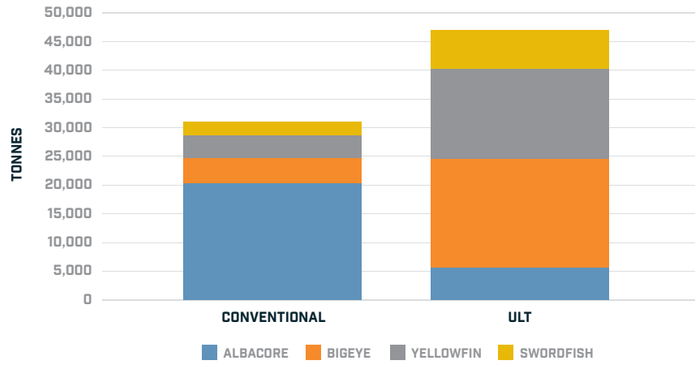
ESTIMATE OF LONGLINER CATCH IN THE WIO BY FLAG STATE (2017)



ESTIMATE OF NUMBER OF LONGLINERS IN THE WIO BY LENGTH, FREEZING CAPACITY AND FLAG STATE (2017)



ESTIMATE OF LONGLINER CATCH IN THE WIO BY FREEZING CAPACITY AND SPECIES (2017)



08
MOVING TUNA

8.1 WHERE TRANSHIPMENT HAPPENS

AT-SEA TRANSHIPMENT

Only industrial longliners over 24 meters in length are permitted to tranship at sea in the Indian Ocean. This almost exclusively occurs in the high seas in:

- a northern belt for tropical tuna.
- a southern belt for temperate tuna.
- a middle belt which can be for either temperate or tropical tuna.

IN-PORT TRANSHIPMENT

Vessels use ports for transhipment, bunkering, maintenance, crew changes and other services. There are four main ports in the region that are of importance to the tuna fishing vessels.

PORT VICTORIA, SEYCHELLES

- Over 700 port visits a year by fishing vessels engaged mainly in the purse seine fishery.
- Main port for purse seine transhipment to carriers, containers or cold storage.
- Location of Indian Ocean Tuna cannery for processing tuna.
- Provision of logistics including bunkering, crew change and supply services mainly for purse seine vessels, carriers and supply vessels.

PORT LOUIS, MAURITIUS

- Over 900 port visits a year by fishing vessels engaged mainly in the longline fishery.
- Main port for longline transhipment from vessels to carriers, containers or cold storage and for carriers to offload to containers and cold storage.
- Location of Princes Tuna's two factories for canning and processing tuna and by-products.
- Provision of dry docking, vessel repairs and maintenance.
- Provision of logistics including bunkering, crew change and supply services mainly for longline vessels and carriers.

ANTSIRANANA, MADAGASCAR

- Around 20 port visits a year by fishing vessels engaged mainly in the purse seine fishery.
- Smaller port for purse seine transhipments to cold storage and occasionally carriers or containers.
- Pêche et Froid de l'Océan Indien cannery for processing tuna and by-products.
- Provision of limited logistics including bunkering, crew change and supply services.

CAPE TOWN, SOUTH AFRICA

- Around 500 port visits a year by fishing vessels engaged mainly in the longline fishery from the Atlantic and Indian Oceans.
- Important port for longline transhipments to cold storage and containers, occasional transhipments to carriers.
- Provision of logistics including bunkering, crew change, dry-docking and supply services.

8.2 HOW TRANSHIPMENT HAPPENS

REFRIGERATED CARGO CARRIER VESSELS

Since the 1960s refrigerated cargo carrier vessels, that are also be called reefers or carriers, have been carrying perishable products that need to be stored at specific temperatures. Around 500 of these vessels are operating globally.

Within the IOTC region, carrier vessels operating within the ROP need to be authorised by the flag State of the fishing vessels they transhipto to and included on the IOTC authorised carrier list. The ROP applies to carriers that transhipat sea with the large scale tuna longliner vessels. Those that transhipin port with either purse seiners or longliners do not need to be authorised. The number of authorised carrier vessels within the IOTC region varies each year. In 2019 80 were authorised, however, being authorised does not indicate that they were active in the ROP.

OPERATIONAL LOGISTICS

Carrier vessels transhipping tuna in the WIO operate through a range of different, and often complex and dynamic, business mechanisms that include:

- **SHIPPING AND LOGISTICS SERVICE PROVIDERS** – who own and operate carrier vessels and provide a commercial service to transport fish. Using this type of carrier service is popular for the Korean, Taiwanese, Chinese and Japanese longline vessels. For example, the Korean company Green World own and operate the Korean flagged SEIHO, SEIWA, SEI SHIN, SEIBU, SEIYU, and the Japanese owned Toei Reefer Line operates the Japanese flagged GOUTA MARU, and the Liberian flagged GENTA MARU and MEITA MARU.
- **INTEGRATED FISHING CARRIER COMPANIES** – is when fishing companies own and operate their own carriers as part of an integrated supply chain. The carriers receive fish from their company's fishing vessels by preference but will also source from other company's vessels if they have space available. The fishing vessels will generally tranship to their company's carriers by preference but use other carriers if this is more practical. For example, Kha Yang Marine owns Malaysian flagged KHA YANG 333 and this carrier collects fish from the Malaysian longliners owned by the same company as well as Taiwanese longliners.
- **CHARTERING** – a carrier vessel may be chartered from the owner for a period, such as a year, or for a specific voyage, usually arranged by a shipping broker. This system is popular to transport purse seine caught tuna, for example the Spanish flagged and owned IZAR ARGIA transports fish between Port Victoria and Las Palmas stopping at ports such as Lagos in Nigeria, or the Bahama flagged, Norwegian owned and Belgium operated GREEN MALOY. The two carriers AUXIS and AFFINIS carry purse seine tuna from Seychelles to Mauritius, are flagged to Mauritius and operated by IBL Shipping which has strong links to Princes Tuna who charter these vessels.

TRADERS AND BROKERS

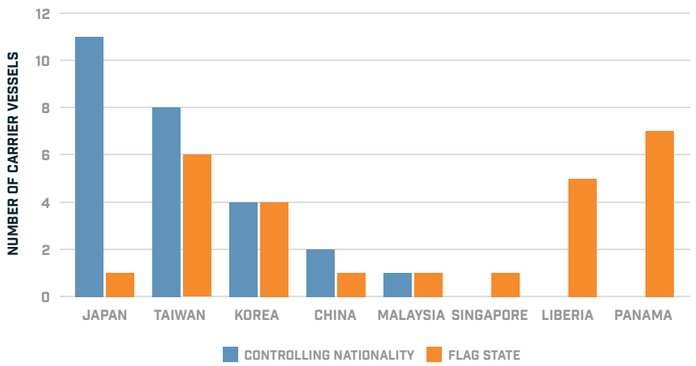
Traders and brokers operate within the business model of tuna transhipment and are used to negotiate the price of the fish and for its transport. The price for transferring the fish is usually paid to the traders or brokers and relates to the volume of fish transported and the collection and destination locations. Payment between the parties is agreed and paid on delivery or sometimes with a proportion up-front. The payment for the fish is negotiated between the fishing company and the trader or broker and the price paid is far more open to negotiation than the price of transport, this negotiation often happens when the fish is still in the water and related to market price and volume of fish available. A range of payment models exist and these depend on the relationship between those buying and selling.

CARRIER VESSELS TRANSHIPPING AT SEA WITH THE LONGLINE FLEET

IOTC publishes a list of carriers involved in the ROP and the at-sea transhipment of tuna from longliners. In the last five years, 39 different carrier vessels have been involved in the programme, ranging from 18 to 27 vessels per year.

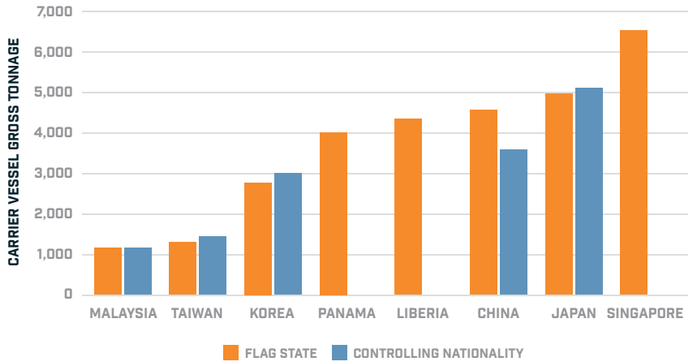
In 2018, 26 carriers were operational, flying eight different flags. Five of these flags – Japan, Taiwan, Korea, China and Malaysia correspond to the flag States of longline vessels operating in the region, while three – Panama, Liberia and Singapore do not. Controlling links between these carriers and the fishing vessels were tentatively identified, related to a combination of the flag, owner or operator for each carrier. The only significant longline fishing vessel flag State in the WIO without any controlling stake in carriers is the Seychelles.

CARRIER VESSELS FLAG STATE AND CONTROLLING NATIONALITY (2018)



The size range of carriers transhipping with the longliners varies from around 1,000 to 6,500 GT with an average of 3,700 GT and the lengths ranging from 70 to 134 meters. The average age of the carriers is 26 years and the newer carriers have up to six times greater capacity than the older ones. The newer, larger vessels tend to service the ULT fishing vessels, while the smaller, older carriers service the conventional freezing longliners.

CARRIER VESSELS AVERAGE GROSS TONNAGE BY FLAG STATE AND CONTROLLING NATIONALITY (2018)



CARRIER FLEETS

- **JAPAN** – owns and/or operates eleven of the newest and largest carrier vessels and most of the ULT cold chain in the WIO, however, only the TAISEI MARU NO. 15 was flagged to Japan in 2018 with most vessels controlled by Japanese interests, flagged to Liberia or Panama. CHIKUMA, CHITOSE and IBUKI were built in 2013, at around 6,500 GT and 130 meters in length and HARIMA, the newest vessel operating in the WIO was built in 2018 and flies the Panamanian flag. These carriers mainly operate in the tropical zone but at times also in the temperate zone. Changes in flag State are not uncommon, for example, in 2015 the TAISEI MARU NO. 15 changed flag from Vanuatu to Japan and in 2014 IBUKI changed from the Vanuatu to Panama. Panama and Liberia are known as flags of convenience States because they offer owners lower taxes, lower compliance costs and less oversight, this is attractive for Japanese owners and operators to avoid higher costs operating under the Japanese flag.
- **TAIWAN** – the Taiwanese flagged carriers are generally the smallest and oldest vessels, with all being over 30 years. HO YUAN is the oldest at 51 years. These vessels are often between 1,000 and 2,000 GT and tranship with the conventional longline vessels often operating out of Port Louis catching mainly temperate tuna. Most Taiwan controlled carriers fly the Taiwanese flag, with six or seven flagged carriers active in the WIO each year. In recent years, Taiwan companies have also owned and operated foreign flagged carriers, for example in 2018 two carriers (PONTOS and ORIENTAL CHILAN) flagged to Panama were operated by Taiwanese interests.
- **KOREA** – the Korean carriers are the mid-size carriers in the WIO (2,500 to 3,500 GT) and mainly built in the 1980's and 1990's, although Korea has one new vessel (SEIBU) built in 2014. The Korean flagged carriers are all owned and operated by Korean companies and they tranship with the Korean, Chinese and Taiwanese longline fleets.
- **CHINA** – has relatively few flagged or controlled carriers in the WIO compared to the size of their flagged longline fleet. The relatively new (2017) and large (4,571 GT) PING TAI RONG LENG 2 first appeared in the region in 2018, and a second carrier vessel, the BAO WIN flies the Panama flag but has a Chinese company as the owner and operator. These vessels tranship mainly with the Chinese and other ULT longline vessels in the tropical zone.
- **MALAYSIA** – the KHA YANG 333, which is Malaysian owned and flagged, and Mauritian operated was built in 1980, is 1,153 GT and 70 meters in length. It operates out of Port Louis and tranships with mainly the Malaysian and Taiwanese conventional longline vessels.

REFRIGERATED CONTAINER VESSELS

In the last two decades, advances in technology have increased the availability and use of refrigerated containers for transporting temperature sensitive products by sea. In the WIO, the Danish company Maersk and the French company CMA CGM, are the main container transportation companies. Both companies use and transport containers at various temperatures including at –20 to – 30°C and –50 to –60°C as required for transporting frozen tuna. Refrigerated containers have a cooling unit and are plugged into the dockside or on-board power supply of the container ship that transports them. An average container is 40 feet long and can hold around 26 tonnes of frozen whole tuna.

While comprehensive information on the amount of tuna transhipped into containers is not available, in 2016 the Taiwanese longliners operating in the WIO made 564 transhipments to carrier vessels and 280 transhipments into containers: a ratio of 66% to carriers and 33% to containers. Purse seiners tranship 90% to 95% of their catch in Port Victoria. Of the catch that was not landed directly to cold storage 55% was transhipped to carriers and 45% to containers. This shows that while carrier vessels are still the main mode of transporting frozen tuna in the WIO, containers are becoming an important competitor. In addition to direct fishing vessel to container transhipment, carriers also use ports to offload into containers. This often confounds figures for the volume of fish being transported by containers, and generally the trade figures will not differentiate between fish that came directly from a fishing vessel or via a carrier.

CARRIERS OR CONTAINERS?

When a company decides which type of cold chain transport to use – carriers or containers – aspects of the operating cost and efficiency, the business environment and the fishing company's strategy will all play a role in the decision. For example:

- Regulatory restrictions may limit possible options (e.g. purse seiners not being permitted to tranship to carriers at sea).
- Authorisations and monitoring that apply to different options (e.g. choosing containers because they are not subject to fisheries inspections).
- Business strategy of the company and associations with carrier vessels (e.g. whether the company is integrated and has its own carrier vessels).
- Location of the fishing vessel and proximity to suitable ports (e.g. ports that have containers available).
- Location and availability of suitable carrier vessels (e.g. seasonal changes in availability).
- Type and amount of catch on board and the capacity of the fishing vessel (e.g. if a fishing vessel is near a carrier or port transhipping may occur even if the vessel is not full).
- Market price of tuna and recent changes in price (e.g. to tranship to release cash flow or to wait in hope of better prices).
- Estimation of transhipment costs, considering cost of resupplying (e.g. to find the cheapest option considering that container vessels are more fuel efficient if available for the correct route).
- Temperature control requirements (e.g. industry using the ULT cold chain consider carriers more reliable for temperature control than containers).
- Specific demands of the client (e.g. containers allow greater flexibility for the sorting of fish into size and species grades that can be transported to different destinations).

LONGLINE TRANSHIPMENT

Longline fishing vessels spend up to two years away from their home ports per fishing trip. During this time, they tranship either in port or at sea to offload catch and re-supply with food, water, gear, bait and fuel. Large scale longline vessels are likely to have hold capacity for 200 to 400 tonnes of frozen tuna. On average, a longline vessel targeting bigeye and yellowfin tuna will catch one to two tonnes of tuna per fishing day, and around 200 to 300 tonnes per year. While transhipment is only necessary in respect to storage capacity once or twice per year, AIS tracks and port visit information from the region indicate that longliners generally tranship more frequently, sometimes as often as twice a month. This is likely to be because the vessel needs to increase its cash flow by getting the fish to market, has had large catches or needs other provisions or services.

AT-SEA TRANSHIPMENT

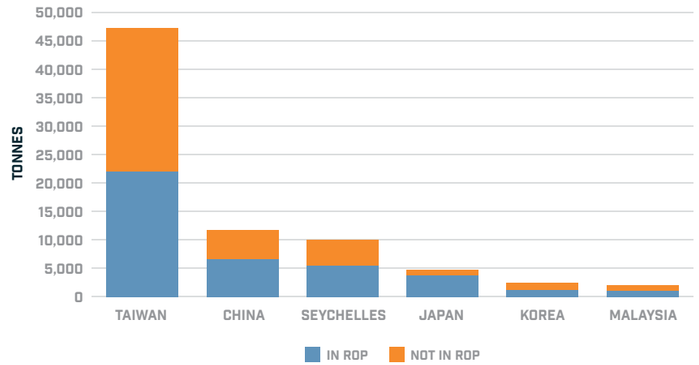
OVERVIEW

Transhipment activities at sea are concentrated in the WIO and take place almost exclusively in the high seas. The number of at-sea transhipments has almost doubled in the last five years to 1,370 in 2018, however in 2009 the number was also over 1,200, showing a somewhat variable trend.

NUMBER OF TRANSHIPMENTS IN THE REGIONAL OBSERVER PROGRAMME (2009 TO 2018)

In 2017, the total of yellowfin, albacore, bigeye and swordfish transhipped under the ROP was roughly 40,000 tonnes, which is estimated to be almost entirely from the WIO. The total catch of these same species for the whole industrial longline fleet targeting tuna in the WIO was approximately 86,000 tonnes and for the fleets participating in the ROP 80,000 tonnes.

PARTICIPATING STATES LONGLINER CATCH TRANSHIPPED IN THE ROP (2017)



These figures exclude approximately 9,000 tonnes of catch taken from longliners that target swordfish (not tuna) as these vessels are almost exclusively flagged by States not participating in the ROP using port in Réunion. Seychelles has flagged longliners targeting swordfish but their catch does not have a significant impact on the overall estimates. Oman is excluded from the graph due to the very low and relatively insignificant figures.

AT-SEA TRANSHIPMENT OPERATIONS

Before a carrier trip, the vessel's company prepares a manifest for the planned transhipments, including longline vessel details, expected volume and species of catch to be transhipped. This is arranged well in advance so that the carrier can load the required provisions (bait, gear, food, water, documents) for each longliner. Sometimes ad-hoc transhipments may occur once a trip is underway, but these are still arranged through the carrier vessel's company.

Carrier vessels spend long periods of time steaming from their home ports to fishing grounds, and will generally tranship with four to eight vessels in one location with the fishing vessels sailing to the carrier. Before the transhipment, the carrier vessel will communicate with the fishing vessel to arrange the location and time for meeting, once agreed they will confirm with their respective companies to ensure that pre-transhipment formalities take place.

Transhipments take place mainly during the day, with several longline vessels transhipping in each 24 hour period. The length of transhipment events can vary but are usually between one to eight hours with around 100 tonnes being transhipped in a day.

Once a fishing vessel is tied alongside the carrier, if the weather permits, the IOTC transhipment observer will transfer to the fishing vessel to make preliminary checks before the transhipment is permitted to start. These include checking the fishing licence and logbook, checking if the vessel monitoring system (VMS) is present and powered, and checking the quantity of catch on board. If any indication of a violation is detected it is reported to the carrier vessel's master and noted in the observer's report.

Before the carrier starts the transhipment, one fish is taken to the carrier and the core temperature is taken to confirm that the temperature is correct, if it is not the transhipment will not go ahead.

During the transhipment a crane on the carrier lifts the string of tuna or net for some species between the vessels, usually taking less than a minute, to ensure that temperature remains low. Usually, the crane's electric scale can be read by the observer and the operator to confirm their estimate of the weight of the load. Each tuna is counted and recorded and the carrier crew will organise storing the fish, ensuring that each vessels product is separated using nets. The observer monitors, records and reports detail and verifies the transhipped product details, if all is in order the observer countersigns the transhipment declaration and includes the information in their report to IOTC.

The fishing vessel will usually be resupplied after the fish have been transhipped, this can take several hours. Carriers may meet up with fishing vessels only to resupply them with provisions, although longliners will also take supplies from a carrier to transfer to another longliner if required.

IN-PORT TRANSHIPMENT

Port Louis in Mauritius is the primary port in the WIO used for transhipment by industrial longliners, particularly for Taiwanese, Chinese, Seychelles, Korean and Malaysian longliners. Transhipment activities in Port Louis are busiest in December to March and again around September. The quietest months are April to August and October to November. The Japanese longliners use Cape Town in South Africa, as do other flag States such as the Taiwanese if they are fishing closer to Cape Town than to Port Louis. Other ports in the region may receive port visits related to pre-fishing inspections or occasionally for transhipping or collecting supplies, but these are limited.

IN-PORT TRANSHIPMENT OPERATIONS

Transhipments in port can physically include fishing vessels transhipping to carrier vessels that can take place at anchorage or alongside the dock, or transhipment to cold storage or container at the dock. This is most commonly transiting transhipment, either into the cold storage in the Port Louis free zone for onward transport or to containers for direct transport; only a limited amount of mainly albacore tuna is transhipped for landing.

Transhipment in a foreign port requires an agent to organise all aspects of a vessel arriving including immigration, health and customs. In respect to the transhipment, the agent may need to arrange the anchorage or berthing with associated port tariffs, possible provision of containers, portable generator or electricity, crane, forklifts, and stevedores and to arrange provisions for the vessel.

A ships agent will request permission for port entry from the Port Authority at least 48 hours before intended entry, in compliance with the IOTC Port State Measures Resolution. Internal interagency checks will occur between the port and fisheries authorities to confirm that the vessel is permitted to enter port and tranship.

If the vessel is transhipping into a carrier, the carrier crane will operate in a similar manner to at-sea transhipments. Transhipments from the vessel to either containers or cold storage may be overseen by a trader or a representative of the company buying the fish. The fish will be lifted from the holds on a string or net using either the vessel crane or a shore crane and then moved via a conveyor or slide to the deck where stevedores or crew manually place the fish into the containers, or bins if the fish is going to cold storage. Efforts will be made to maintain the temperature of the fish, and sometimes the fish will be covered with a temporary movable roof to maintain the cold chain.

PURSE SEINE TRANSHIPMENT

Industrial purse seine catch is only transhipped in port in the Indian Ocean, not at sea. Port Victoria in the Seychelles is the primary operational port used by purse seiners, handling over 90% of the transhipments. Port Victoria is located five degrees south of the equator, out of the cyclone pathway but in the pathway for the tropical tuna migration, making it a practical operational port for the fleet.

Transhipment in Port Victoria can include landing into cold storage for the processing factory, or transhipment to carriers or to containers for transiting to other ports. Port Victoria offers most basic provisions that the vessels require such as food, water, salt for brine and basic repairs. Port Victoria lacks a dry-dock, so for major repairs vessels often use Port Louis and the Chantier Naval de l'Océan Indien Shipyard, in Mauritius. Whilst there, they may transhipment their catch for landing to the cannery or for transit into containers. During April to June, the purse seiners may also transhipment in Antsiranana, Madagascar, due to their fishing location in the more southerly Mozambique Channel, the catch may be imported for processing in the Madagascan cannery or transhipped for transit and onward transport to ports outside of the region.

An average daily purse seine catch is 20 to 25 tonnes, with vessels catching between 5,000 and 10,000 tonnes per year and vessels generally have capacity to store between 500 and 2,000 tonnes of tuna. As a result, purse seiners generally tranship more regularly than longliners, every four to six weeks, depending on catch rates and logistical aspects such as space at the dockside or buyer demands.

Local fishing agents organise the transhipment requirements. Berthing spaces can be limited and advance booking is required to berth at the dock or to double bank with a carrier vessel, depending on the schedule of carrier and container vessels. The agent will also arrange for cranes, stevedores, containers, fork lifts, loaders and the ordering of supplies.

To discharge the fish from the frozen brine vessels, the holds are either flooded and the fish float to the surface, or low power explosives are used to free the fish. The fish are then placed on conveyor belts leading to one of the two hatches, where the fish are loaded into nets that hold two to three tonnes of fish. The net is lifted by a crane and transferred into a carrier vessel or ashore to be loaded into containers or cold storage bins. Purse seiners can tranship from both hatches at the same time if there are adequate stevedores and cranes. In some vessels the fish are flooded directly onto the conveyor and onto the shore-side loader to be transferred into containers or bins without a net lifting them. If a star loader is available, two containers can be loaded at once. The catch is weighed using an electronic scale and recorded by the companies or agent and correlated.

The catch may have been partially sorted, but further sorting can occur either in the hold, when the fish is on the loaders and conveyors or once on the dock. For fish being transhipped into carriers, often the entire catch has been pre-bought and only the damaged fish will be removed or any bycatch. For fish going into containers, further sorting into size and species and removal of damaged fish will occur and while this slows the operation it increases the value of the catch and the possibility to sell a specific product to a specific buyer.

A loader transhipping directly from a carrier or fishing vessel can transfer up to 25 tonnes of fish into the container in an hour. Transhipping from a purse seiner is likely to take three or four days with 200 to 400 tonnes of tuna being moved in one day.

8.3 WHERE THE TUNA GOES

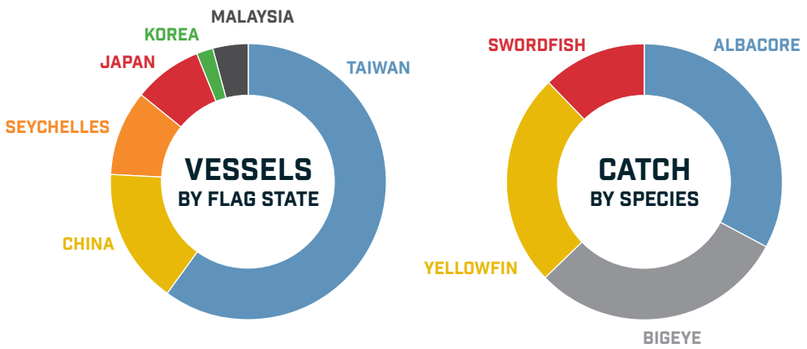
Different tuna species have different characteristics that impact on their value and use, this is also affected by the gear used to catch them and the temperature at which they are stored. Therefore, some tuna is destined for higher value sashimi and some into lower value canned tuna. Tuna leaving the WIO is mainly whole frozen or canned.

LONGLINE CATCH

ULT longline catch is high-grade sashimi tuna, with bigeye and yellowfin providing the top-grade sashimi caught in the WIO and destined mainly to Japan and other Asian countries. ULT albacore and swordfish are also mainly sold to Asia for sashimi.

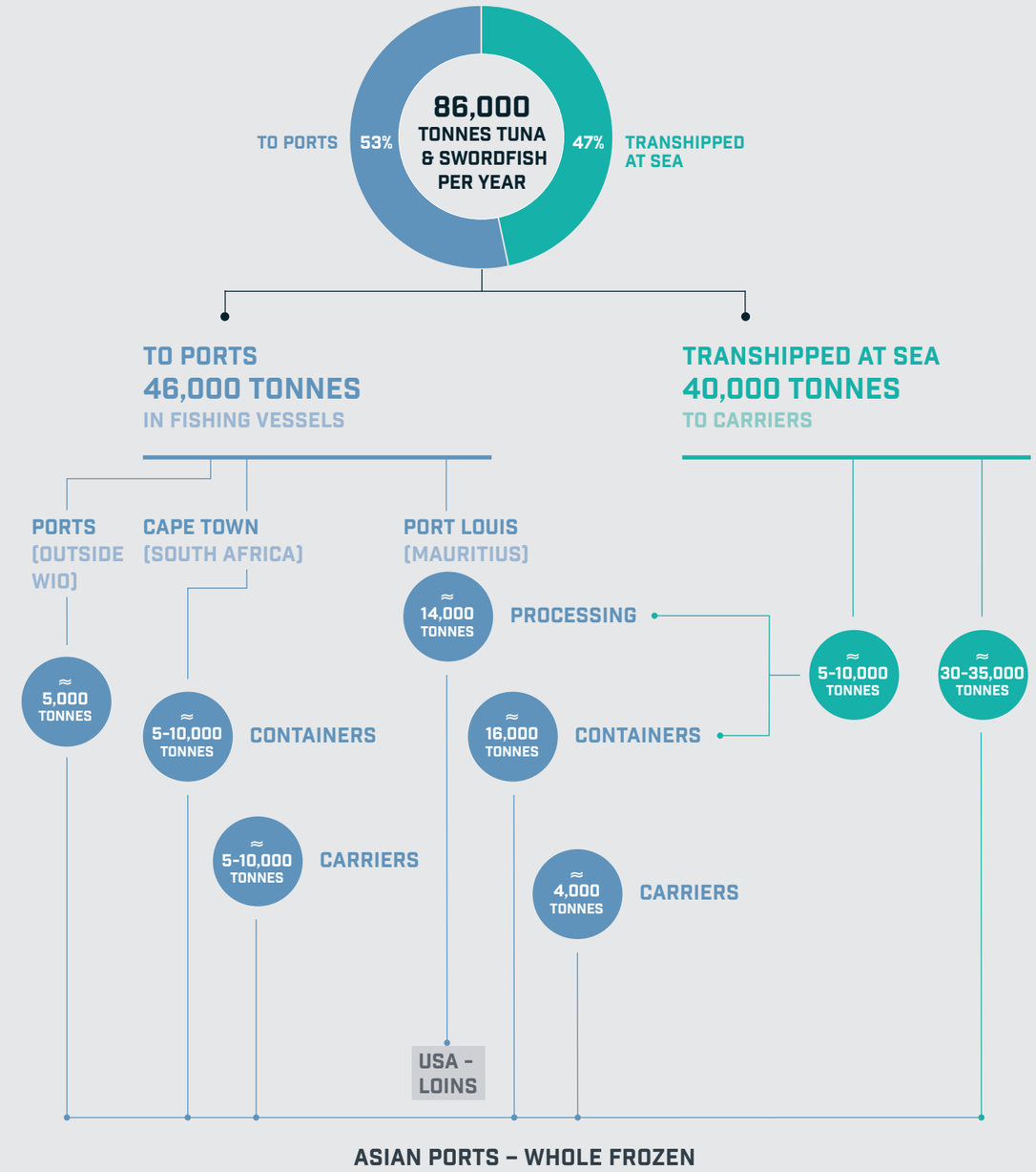
Conventional longliners targeting tuna mainly catch albacore, a popular and versatile product supplied to the USA market part-processed into loins, or frozen whole to Europe, Thailand, Taiwan, China and other emerging markets. Its main use is low-grade sashimi or high-grade canned tuna, loins and fillets. The bycatch of bigeye, yellowfin and swordfish is sold for use in low-grade sashimi, loins and fillets to Europe, USA and Asia.

VESSEL FLAG STATES AND CATCH SPECIES FOR INDUSTRIAL LONGLINE CAUGHT TUNA IN THE WIO



These six flag States have the majority of conventional and ULT longline vessels in the WIO. Other flag States are excluded because they are less significant and longliners targeting swordfish are excluded as they are less relevant for discussions on transhipment.

APPROXIMATED TRANSHIPMENT OF INDUSTRIAL LONGLINE CAUGHT TUNA IN THE WIO

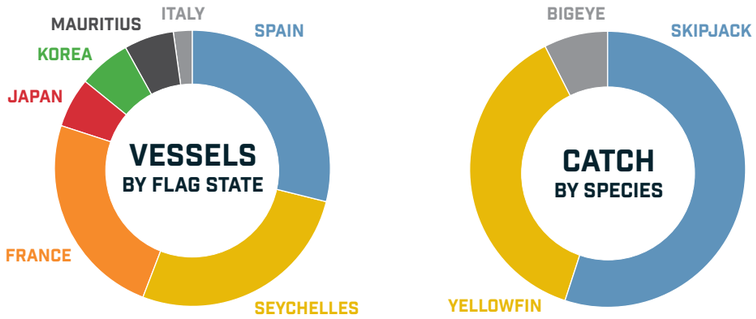


The figures used in this approximation are based on estimates from 2017.

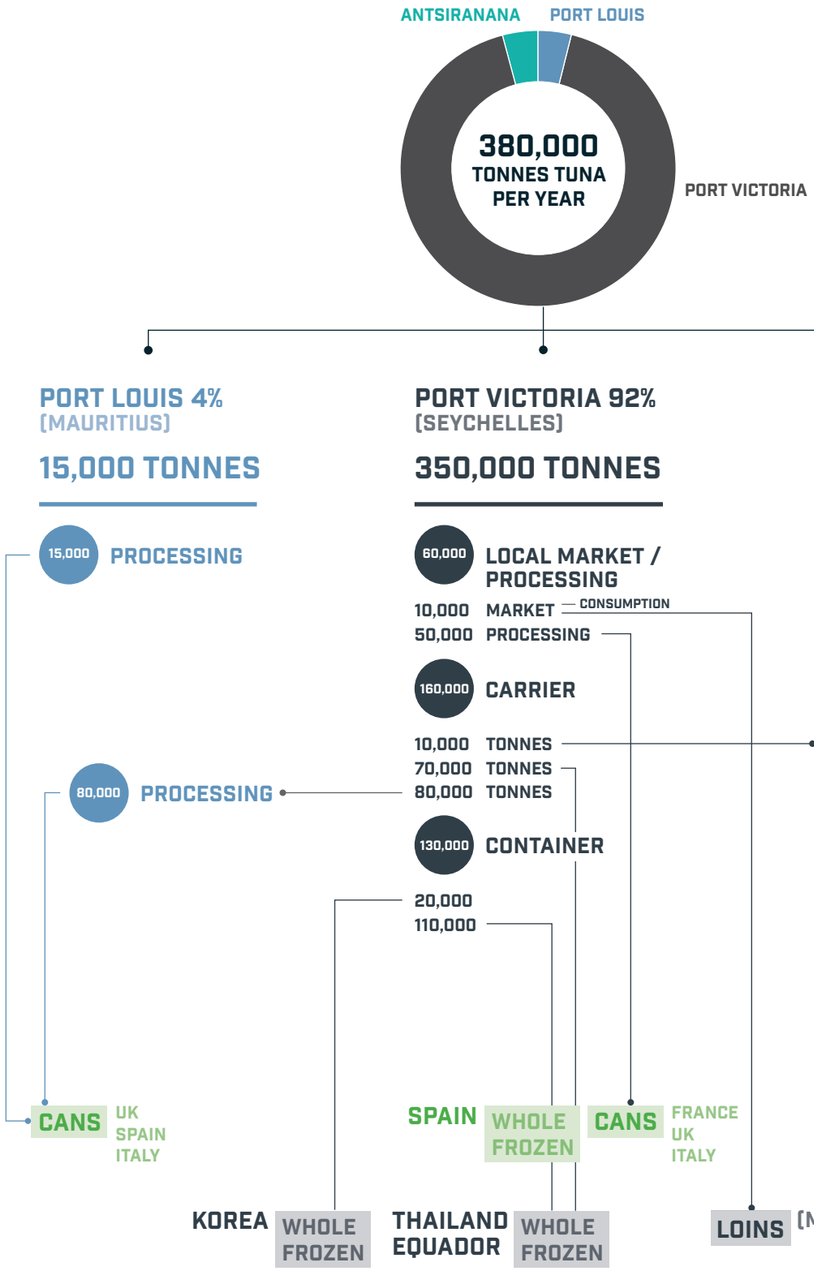
PURSE SEINE CATCH

The Korean vessels tranship their catch into carriers or containers and transport it directly to Korea for processing. The owners of European and Seychelles flagged vessels sell their fish to the regional canning factories or transfer it in carriers or containers to Spain, Italy, Portugal and Thailand. Particularly high value large yellowfin tuna, above 20 kilograms, are likely to be transported for canning in Spain. The regional factories source their product from fishing companies through traders, often having long-term relationships with the fishing companies or vertically integrated company structures, ensuring their supply and the ease of working with regular clients. If needed they will use suppliers such as Tri Marine or FCF to source additional tuna from alternative fishing companies.

VESSEL FLAG STATES AND CATCH SPECIES FOR INDUSTRIAL PURSE SEINE CAUGHT TUNA IN THE WIO



APPROXIMATED TRANSHIPMENT OF INDUSTRIAL PURSE SEINE CAUGHT TUNA IN THE WIO



The figures used in this approximation are based on estimates from 2017.

CARRIER VESSEL PATTERNS

Through AIS tracking and port log monitoring between December 2019 and June 2020 around 20 carriers were observed servicing the squid fishery in the north west Indian Ocean and around 30 carriers were seen passing through the WIO but with no apparent links to fisheries. Carrier vessels observed which appeared linked to the tuna fishery included: 23 carriers transhipping tuna from longliners and transporting it directly to ports, three carriers transhipping tuna from purse seiners in Port Victoria, Seychelles and transporting it to cold storage in Port Louis, Mauritius, and a few carriers thought to be transhipping fish between international ports, including some in the WIO.

Examples of the operations of vessels linked to the WIO tuna fishery are provided in the following pages and summarised here:

CARRIERS TRANSHIPPING TUNA DIRECTLY FROM LONGLINERS AND TRANSPORTING THIS TO PORT

CARRIERS					FISHING VESSELS						ACTIVITY			
Name	Flag	Owner/ operator	GT	Year built	Gear		Flag				Transhipment zone		Offloading ports	
					Longline	Purse seine	China	Malaysia	Seychelles	Taiwan	Tropical	Temperate	Asia	Mauritius
SEIBU	Korea	Korea	3,350	2014	●		●		●	●	●		●	
SEIYU	Korea	Korea	2,713	1997	●		●		●	●	●		●	
SEI SHIN	Korea	Korea	2,426	1988	●		●		●	●	●		●	
YACHIYO	Panama	Japan	6,607	2019	●				●	●	●		●	
BAO WIN	Panama	China	2,596	1994	●	●	●				●	●	●	
CHEN YU NO. 7	Taiwan	Taiwan	1,872	1980	●					●	●	●	●	●
SHENG HONG	Taiwan	Taiwan	1,866	1980	●					●		●		●
KHA YANG 333	Malaysia	Malaysia/ Mauritius	1,153	1980	●			●		●		●		●

CARRIERS TRANSHIPPING TUNA FROM PURSE SEINERS IN VICTORIA, SEYCHELLES AND TRANSPORTING IT TO COLD STORAGE IN PORT LOUIS, MAURITIUS

CARRIERS					FISHING VESSELS				ACTIVITY	
Name	Flag	Owner/ operator	GT	Year built	Gear		Flag		Transhipment zone	Offloading ports
					Longline	Purse seine	Spain	France	Seychelles	Mauritius
AFFINIS	Mauritius	British Virgin Islands subsidiary of IBL	5,100	1997		●	●	●	●	●
AUXIS	Mauritius	British Virgin Islands subsidiary of IBL	5,084	1991		●	●	●	●	●
SALGIR	Panama	Singapore	3,767	1996		●	●	●	●	●

CARRIERS THOUGHT TO BE TRANSHIPPING TUNA AND TRANSPORTING TO INTERNATIONAL PORTS

CARRIERS					FISHING VESSELS		ACTIVITY					
Name	Flag	Owner/ operator	GT	Year built	Gear	Flag	Transhipment zone		Offloading ports			
					Not known	Not known	Atlantic	WIO	Asia	Central and South America	Europe	Africa
GREEN MALOY	Bahamas	Norway/Belgium	5,084	1990	●	●	●	●			●	●
IZAR ARGIA	Spain	Spain	4,263	1990	●	●	●				●	●
ORANGE STRAIT	Curaçao	Netherlands	6,088	2019	●	●		●	●	●	●	●

GREEN WORLD FLEET

The SEI SHIN, SEIBU, SEIYU are, South Korean flagged carriers, owned and operated by Green World Co Ltd. Between January and July 2020 they made four voyages to the northern part of the WIO to transhipment.

The tuna migration means that fishing activity in this area is highest during the period January to April and target species in this region are yellowfin and bigeye.

The carriers have ULT capacity and transport sashimi grade tuna, based on their area of operation and their port destinations.

CARRIERS Korean flagged and owned
FISHING VESSELS Longliners flagged to China, Seychelles and Taiwan
TRANSHIPMENT ZONE Tropical
OFFLOADING Asia

VESSEL TRACKS

Broken lines indicate gaps in AIS transmission

SEI SHIN SEIYU SEIBU

VOYAGE OVERVIEW INFORMATION

SEIBU

OUTBOUND VOYAGE 20
TRANSHIPPING 14
RETURN VOYAGE 19

SEIYU

OUTBOUND VOYAGE 18
TRANSHIPPING 16
RETURN VOYAGE 19

SEI SHIN

OUTBOUND VOYAGE 25
TRANSHIPPING 17
RETURN VOYAGE 31

EUROPE
ASIA
AFRICA
OCEANIA
ANTARCTICA

SOMALIA
KENYA
TANZANIA
SEYCHELLES
COMOROS
MOZAMBIQUE
MADAGASCAR
MAURITIUS
SOUTH AFRICA
SINGAPORE
DALIAN, CHINA
QINGDAO, CHINA
GAMCHEON, SOUTH KOREA
BUSAN, SOUTH KOREA
TSUSHIMA, JAPAN
SHIMIZU, JAPAN
KAOHSIUNG, TAIWAN

VOYAGE DETAILS SEI SHIN

Start date	**14.03.20**
Start ports	**Busan, South Korea**
Transit port	**Ningbo, China**
Transhipment	**17 days**
Return date	**14.05.20**
Return ports	**Dalian, China** **Qingdao, China**

VOYAGE DETAILS SEIYU

Start date	**11.02.20**
Start port	**Busan, South Korea**
Transhipment	**16 days**
Return date	**04.04.20**
Return port	**Busan, South Korea**

VOYAGE DETAILS SEIBU

Start date	**09.03.20**
Start port	**Busan, South Korea**
Transit port	**Kaohsiung, Taiwan** **Singapore**
Transhipment	**14 days**
Return date	**08.05.20**
Return port	**Shimizu, Japan**

40 20 0 -20 -40

-20 0 20 40 60 80 100 120 140

YACHIYO

The YACHIYO is the newest and amongst the largest active carriers operating in the WIO.

The carrier has ULT capacity and transports sashimi grade tuna, based on its area of operation and destination ports.

The YACHIYO is listed under the ownership of Star Navigation S.A., the owners of four carrier vessels that have links to Mitsubishi.

CARRIER Panama flagged, Japanese owned and operated
FISHING VESSELS Longliners flagged to Taiwan and Seychelles
TRANSHIPMENT ZONE Tropical
OFFLOADING Asia

VESSEL TRACKS

Broken lines indicate gaps in AIS transmission

YACHIYO

VOYAGE OVERVIEW INFORMATION

YACHIYO

OUTBOUND VOYAGE	33
TRANSHIPPING	51
RETURN VOYAGE	32

AREA OF ACTIVITY FOR FISHING VESSELS SUSPECTED OF TRANSHIPPING WITH YACHIYO

EUROPE
ASIA
AFRICA
OCEANIA
ANTARCTICA

SOMALIA
KENYA
TANZANIA
COMOROS
MOZAMBIQUE
MADAGASCAR
MAURITIUS
SEYCHELLES
SOUTH AFRICA

BUSAN, SOUTH KOREA
YOKOSUKA, JAPAN
SHIMIZU, JAPAN
KAOHSIUNG, TAIWAN
SINGAPORE

FISHING AREA

VOYAGE DETAILS YACHIYO

Start date	17.04.20
Start port	Shimizu, Japan
Transit port	Yokosuka, Japan Shimizu, Japan Busan, South Korea Kaohsiung, Taiwan Singapore
Transhipment	51 days
Transit port	Singapore
Return date	27.07.20
Return port	Shimizu, Japan

FISHING VESSELS WITH SUSPECTED TRANSHIPMENT WITH YACHIYO

Transhipment activity took place between the 20 May and 25 June 2020, with 16 encounters identified between YACHIYO and Taiwanese and Seychelles flagged fishing vessels.

DATE	VESSEL	FLAG STATE
20.05.20	HSIANG FA NO. 26	Seychelles
22.05.20	HUNG SHENG NO. 212	Taiwan
23.05.20	HUNG HUI NO. 112	Taiwan
24.05.20	HUNG CHING NO. 212	Taiwan
25.05.20	HUNG CHEN NO. 212	Taiwan
26.05.20	Unknown vessel	Taiwan
27.05.20	YI LONG	Taiwan
31.05.20	NF ALPHA GOLD	Taiwan
02.06.20	TOYO MARU No. 28	Japan
08.06.20	HSIANG FA NO. 26	Seychelles
09.06.20	SHYE CHAN NO.6	Taiwan
09.06.20	SHYE SHIN NO.31	Taiwan
12.06.20	LONG YIELD NO. 3	Seychelles
22.06.20	HSIANG FA NO. 16	Taiwan
24.06.20	YUAN TAI	Taiwan
25.06.20	JIN HONG NO. 308	Seychelles

BAO WIN

Owned by Chinese registered company Bao Power Shipping Co., Ltd. the BAO WIN is an ULT carrier supporting Chinese flagged fishing vessels operating in both the tropical and temperate zones of the WIO.

A number of interactions between BAO WIN and ten vessels with the name LU RONG YUAN YU indicate repeated interactions between and amongst the carrier and fishing vessels over a two-week period.

CARRIER Panama flagged, Chinese owned and operated
FISHING VESSELS Longliners flagged to China
TRANSHIPMENT ZONE Tropical and temperate zones
OFFLOADING Asia

VESSEL TRACKS

Broken lines indicate gaps in AIS transmission

BAO WIN

VOYAGE OVERVIEW INFORMATION

BAO WIN

OUTBOUND VOYAGE	12
VOYAGE BETWEEN ZONES	8
TRANSHIPPING	32
RETURN VOYAGE	22

AREA OF ACTIVITY FOR FISHING VESSELS SUSPECTED OF TRANSHIPPING WITH YACHIYO

EUROPE
ASIA
AFRICA
OCEANIA
ANTARCTICA
SOMALIA
KENYA
TANZANIA
SEYCHELLES
COMOROS
MOZAMBIQUE
MADAGASCAR
MAURITIUS
SOUTH AFRICA
SINGAPORE
SHIDAO, CHINA
QINGDAO, CHINA
SHIMIZU, JAPAN
KAOHSIUNG, TAIWAN
FISHING AREA
MOVING TUNA
MOVING TUNA

VOYAGE DETAILS BAO WIN

Start date	**02.20**
Start port	**Shidao, China**
Transit port	**Singapore**
Transhipping tropical zone	
Voyage to temperate zone	
Transhipping temperate zone	
Transit port	**Singapore**
Return date	**16.05.20**
Return ports	**Qingdao, China** **Shidao New Port, China** **Shimizu, Japan** **Kaohsiung, Taiwan**

FISHING VESSELS WITH SUSPECTED TRANSHIPMENT WITH BAO WIN

A number of interactions between BAO WIN and ten vessels with the name LU RONG YUAN YU indicate repeated interactions between and amongst the carrier and fishing vessels over a two-week period.

DATE	VESSEL	FLAG STATE
22.03.20	LU QING YUAN YU 119	China
23.04.20	LU RONG YUAN YU 877	China
10.04.20	LU RONG YUAN YU 877	China
11.04.20	LU RONG YUAN YU 877	China
23.04.20	LU RONG YUAN YU 875	China
23.04.20	LU RONG YUAN YU 880	China
10.04.20	LU RONG YUAN YU 880	China
11.04.20	LU RONG YUAN YU 880	China
10.04.20	LU RONG YUAN YU 879	China
18.04.20	LU RONG YUAN YU 879	China
22.04.20	LU RONG YUAN YU 879	China
18.04.20	LU RONG YUAN YU 878	China
09.04.20	LU RONG YUAN YU 878	China
22.04.20	LU RONG YUAN YU 878	China
	LU RONG YUAN YU 876	China
18.04.20	LU RONG YUAN YU 599	China
18.04.20	LU RONG YUAN YU 588	China
18.04.20	LU RONG YUAN YU 267	China

CHEN YU NO. 7

Owned by Taiwanese company, Chen Fu Oceanic Enterprise Co, the CHEN YU No. 7 is one of the oldest carrier vessels operating in the WIO.

Believed to tranship primarily with Taiwanese flagged vessels. Details have been difficult to verify as there are significant gaps in the carrier AIS signal and vessels transhipped with have not been transmitting on AIS.

CARRIER Taiwan flagged, owned and operated
FISHING VESSELS Longliners identity not known, likely Taiwan flagged
TRANSHIPMENT ZONE Tropical and temperate zones
OFFLOADING Asia

VESSEL TRACKS

Broken lines indicate gaps in AIS transmission

VOYAGE 1 VOYAGE 2

VOYAGE OVERVIEW INFORMATION

VOYAGE 1		VOYAGE 2	
TOTAL 54 DAYS		TOTAL 77 DAYS	
OUTBOUND VOYAGE	19	OUTBOUND VOYAGE	13
VOYAGE BETWEEN ZONES	–	VOYAGE BETWEEN ZONES	12
TRANSHIPPING	19	TRANSHIPPING	26
RETURN VOYAGE	16	RETURN VOYAGE	26

EUROPE
ASIA
AFRICA
OCEANIA
ANTARCTICA
SOMALIA
KENYA
TANZANIA
SEYCHELLES
COMOROS
MOZAMBIQUE
MADAGASCAR
PORT LOUIS
MAURITIUS
SOUTH AFRICA
SINGAPORE
KAOHSIUNG, TAIWAN

VOYAGE 1 DETAILS

Start date	**06.02.20**
Start ports	**Kaohsiung, Taiwan**
Transit port	**Singapore**
Transhipping	**19 days**
Return date	**31.03.20**
Return port	**Kaohsiung, Taiwan**

VOYAGE 2 DETAILS

Start date	**16.04.20**
Start port	**Kaohsiung, Taiwan**
Transit port	**Singapore**
Transhipping	
Port call	**Port Louis 16.05.20**
Transhipping	
Return date	**02.07.20**
Return port	**Kaohsiung, Taiwan**

SHENG HONG

SHENG HONG is a Taiwanese flagged carrier with a –30°C (conventional) freezing capacity.

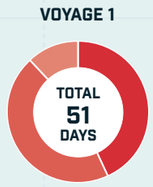
CARRIER Taiwan flagged, owned and operated
FISHING VESSELS Longliners flagged to Taiwan
TRANSHIPMENT ZONE Temperate
OFFLOADING Mauritius

VESSEL TRACKS

Broken lines indicate gaps in AIS transmission

SHENG HONG

VOYAGE OVERVIEW INFORMATION



VOYAGE 1	
OUTBOUND VOYAGE	22
TRANSHIPPING	23
VOYAGE TO PORT	6

VOYAGE 2	
OUTBOUND VOYAGE	3
TRANSHIPPING	20
RETURN VOYAGE	6

OFFLOADING PORTS

SHENG HONG spent nine days in Port Louis, Mauritius and is thought to have offloaded at the Froid des Mascareignes, which is in the freeport area of Port Louis and is a cold-storage company exclusively dedicated to seafood product storage which also offers packing and export services.

EUROPE
ASIA
AFRICA
OCEANIA
ANTARCTICA
SOMALIA
KENYA
TANZANIA
SEYCHELLES
COMOROS
MOZAMBIQUE
MADAGASCAR
PORT LOUIS
MAURITIUS
SOUTH AFRICA
KAOHSIUNG, TAIWAN
SINGAPORE

VOYAGE 1 DETAILS

Start date	**25.04.20**
Start port	**Kaohsiung, Taiwan**
Transit port	**Singapore**
Transhipping	**23 days**
Offloading port	**Port Louis, Mauritius**
Offloading port	**15.06.20**

VOYAGE 2 DETAILS

Start date	**25.06.20**
Start port Port	**Port Louis, Mauritius**
Transhipping	**20 days**
Offloading port	**Port Louis, Mauritius**
Offloading port	**23.07.20**

FISHING VESSELS WITH SUSPECTED TRANSHIPMENT WITH SHENG HONG

DATE	VESSEL	FLAG STATE	
23.05.20	8791368	LONG WANG HSIN	Taiwan
23.05.20	8791394	LONG WANG CHIN	Taiwan
28.05.20	8778914	RUEY I SHYANG NO. 6	Taiwan
28.05.20	8789195	LIAN CHI SHENG NO. 62	Taiwan
29.05.20	8778823	TENN MING YANG NO. 101	Taiwan
29.05.20	8778835	TENN MING YANG NO. 168 (Transmitting on AIS as TENN MING YANG NO 160]	Taiwan
29.05.20	8778861	TENN MING YANG NO. 888	Taiwan
29.05.20	8778873	TENN MING YANG NO. 889 (Transmitting on AIS as TENN MING YANG NO882)	Taiwan
01.06.20	8778926	RUEY I SHYANG NO. 7	Taiwan
03.07.20	8778914	RUEY I SHYANG NO. 6	Taiwan
05.07.20	8778823	TENN MING YANG NO. 101	Taiwan
06.07.20	8791356	LONG WANG CHANG	Taiwan
06.07.20	8791394	LONG WANG CHIN	Taiwan
06.07.20	8791368	LONG WANG HSIN	Taiwan
06.07.20		FWU TSAIR YIH NO. 2	Taiwan

KHA YANG 333

The vessel operates in the subtropical area of the WIO, where temperate species such as albacore and southern bluefin can be harvested by longliners.

These trips are far shorter than other carriers' trips, typically lasting between 15 and 22 days, of which between seven and ten days are spent transhipping. KHA YANG 333 is the only carrier that has its operational base within the WIO.

KHA YANG 333 primarily supports the KHA YANG fleet, which are a mix of Malaysian and Taiwanese flagged longliners, but also sources from other Taiwanese longliners. KHA YANG 333 freezes at –35°C, albacore makes up 80% of the fish handled and this is mainly exported by container to Thailand, Taiwan and China.

CARRIERS Malaysia flagged, Malaysia/Mauritius owned and operated
FISHING VESSELS Longliners flagged to Malaysia and Taiwan
TRANSHIPMENT ZONE Temperate
OFFLOADING Mauritius

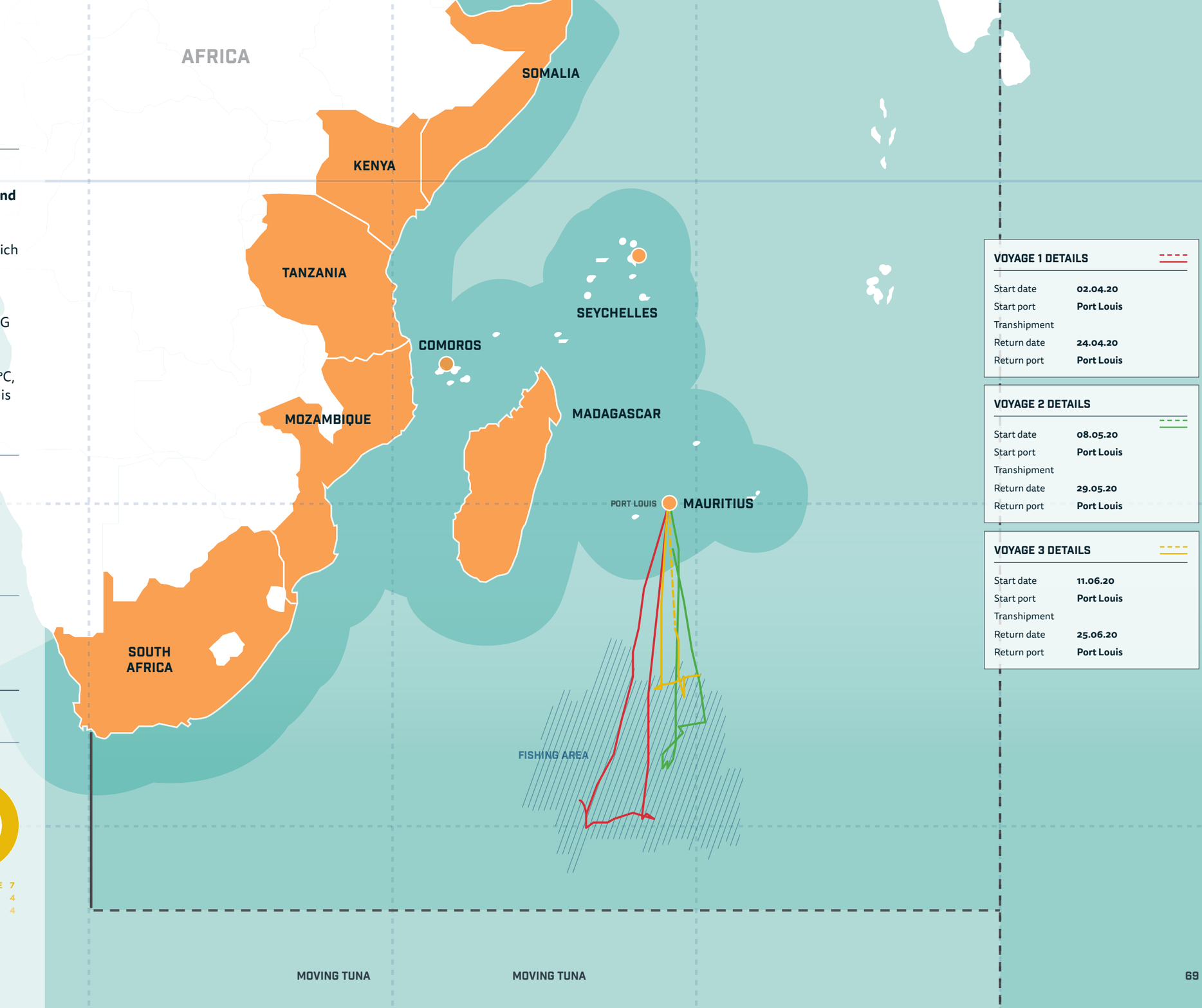
VESSEL TRACKS

Broken lines indicate gaps in AIS transmission

VOYAGE 1 VOYAGE 2 VOYAGE 3

VOYAGE OVERVIEW INFORMATION

VOYAGE 1		VOYAGE 2		VOYAGE 3	
TOTAL 22 DAYS		TOTAL 21 DAYS		TOTAL 15 DAYS	
OUTBOUND VOYAGE	6	OUTBOUND VOYAGE	4	OUTBOUND VOYAGE	7
TRANSHIPPING	10	TRANSHIPPING	13	TRANSHIPPING	4
RETURN VOYAGE	6	RETURN VOYAGE	4	RETURN VOYAGE	4



VOYAGE 1 DETAILS

Start date	**02.04.20**
Start port	**Port Louis**
Transhipment	
Return date	**24.04.20**
Return port	**Port Louis**

VOYAGE 2 DETAILS

Start date	**08.05.20**
Start port	**Port Louis**
Transhipment	
Return date	**29.05.20**
Return port	**Port Louis**

VOYAGE 3 DETAILS

Start date	**11.06.20**
Start port	**Port Louis**
Transhipment	
Return date	**25.06.20**
Return port	**Port Louis**

AFFINIS, AUXIS AND SALGIR

All three carriers transport purse seine-caught skipjack and yellowfin from Port Victoria in the Seychelles to Port Louis in Mauritius for processing at the Princes Tuna factory.

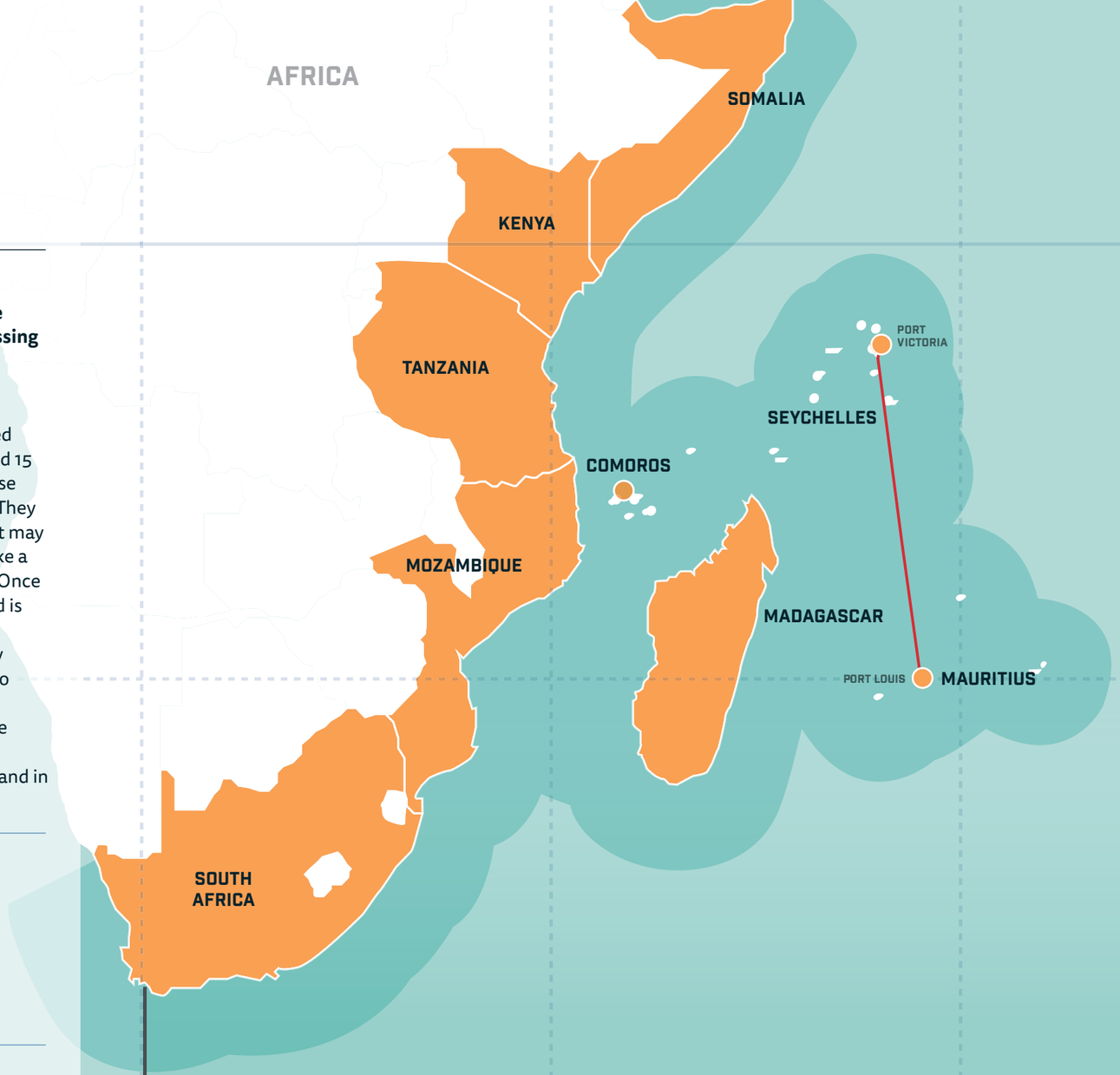
The fish is never landed in Seychelles as it transhipps directly onto the carrier.

Between 300 and 500 tonnes can be offloaded daily, so offloading generally takes between 10 and 15 days. The carriers wait in Port Victoria for the purse seiners to offload directly into the carrier vessel. They wait in Victoria until they are full before leaving, it may take up to a month to load the carrier as it will take a purse seiner around four or five days to tranship. Once full the carrier makes the voyage to Mauritius and is empty on its return voyage.

AFFINIS and AUXIS are owned by a subsidiary of IBL, the major Princes stakeholder. SALGIR also supplies Princes Tuna, but is chartered.

These vessels have less fluctuation than those using different operational patterns. The route is essentially fixed, with the variation being in time and in the vessels interacted with in port.

AFFINIS AND AUXIS Mauritius flagged, owned by a British Virgin Islands subsidiary of IBL
SALGIR Panama flagged with a Singapore operator
FISHING VESSELS Purse seiners flagged to Spain and France.
TRANSHIPMENT ZONE Port Victoria, Seychelles
OFFLOADING Mauritius

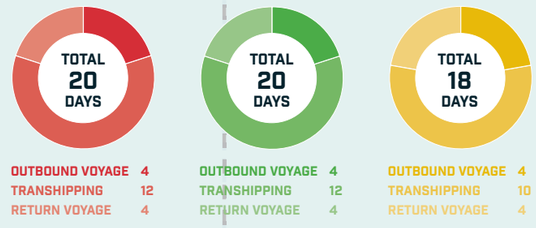


VESSEL TRACKS

Broken lines indicate gaps in AIS transmission

AFFINIS, AUXIS AND SALGIR (SAME ROUTE)

VOYAGE OVERVIEW INFORMATION



* All voyage information is approximate based on information supplied by Princes Tuna (rather than tracking information)

INTERNATIONAL CARRIERS

During 2019 these three European owned and operated carrier vessels were active in both the Indian and Atlantic oceans and transported fish between ports in Europe, South and Central America, Africa and Asia.

These carriers are not participating in the IOTC ROP and two use flags from Non-Contracting Parties. Any at-sea transhipment taking place in the IOTC area of competence should be for non-IOTC species.

CARRIERS European owned and operated
FISHING VESSELS None identified
TRANSHIPMENT ZONE International

VESSEL TRACKS

Vessel tracks are shown for 01.01.2019 to 31.12.2019
Broken lines indicate gaps in AIS transmission

GREEN MALOY IZAR ARGIA ORANGE STRAIT

PORT VISIT LOITERING EVENT

EUROPE
ASIA
OCEANIA
AFRICA
SOUTH AMERICA
TEMA, GHANA
WALVIS BAY, NAMIBIA
CAPE TOWN, SOUTH AFRICA
BEIRA, MOZAMBIQUE
MAPUTO, MOZAMBIQUE
PORT VICTORIA, SEYCHELLES
ANTSIRANANA, MADAGASCAR
PORT LOUIS, MAURITIUS

09
MANAGING TUNA

Setting rules for sustainable harvesting and ensuring they are followed is an essential element of fisheries management. Overseeing compliance is one of the main pillars of the IOTC and a key concern for the coastal States of the WIO. Compliance and the role that transhipment plays are discussed here in section 9.1 Legal tuna.

Many would also agree that ensuring fair sharing of benefits is an essential element of fisheries management. This is particularly important for the WIO coastal States who generally do not have capacity to fish the tuna themselves. The distribution of benefits and the role that transhipment plays are considered here in section 9.2 Fair tuna.

9.1 LEGAL TUNA

Globally, international instruments have built on The United Nations Convention on the Law of the Sea (UNCLOS) to establish powers, responsibilities and controls that govern the ocean and fishing activity. These include a range of instruments from different United Nations organisations that are relevant for transhipment, including:

- UN Fish Stocks Agreement (UNFSA)
- FAO Agreement on Port State Measures to Prevent, Deter and Eliminate IUU Fishing (PSMA)
- International Labor Organization (ILO) Work in Fishing Convention (C188)
- International Maritime Organization (IMO) Cape Town Agreement (CTA)

The IOTC is the intergovernmental regional fisheries management organisation (RFMO) responsible for the management of tuna and tuna-like species in the Indian Ocean. Its 31 members, called contracting parties, work together with two cooperating non-contracting parties, altogether called CPCs, to ensure the conservation and appropriate utilisation of fish stocks under the mandate of the IOTC and to encourage the sustainable development of the fisheries that target them.

IOTC members make the rules that govern the fisheries of the IOTC region, these are called conservation and management measures (CMM) and they are either binding resolutions or voluntary recommendations. States national legislation may place additional requirements on fishing vessel, carriers and transhipment activity.

IOTC TRANSHIPMENT RULES

TRANSHIPMENT AT SEA

Resolution 19/06 prohibits transhipment of tuna, tuna-like species and shark at sea within the IOTC area, except between LSTLVs and carrier vessels authorised to receive transhipments from these vessels at sea.

	FISHING VESSEL	CARRIER VESSELS
REQUIREMENTS FOR TRANSHIPMENT	Be included on the IOTC list of authorized vessels	Be included on the IOTC list of authorized carrier vessels (informed by the fishing vessels flag State
	Be flagged to a State which permits its LSTLVs to tranship at sea under the ROP	Maintain and operate a VMS
		Have a ROP observer onboard
BEFORE	Receive prior authorisation from its flag State for each operation, at least 24 hours in advance	Confirm that the LSTLV concerned is participating in the ROP
	Receive prior authorisation from the coastal State if transhipping in waters under its jurisdiction	Confirm LSTLV is participating in the ROP and has prior authorisation from its flag State for each at-sea transhipment operation
	Observer performs some pre-transhipment checks, boarding the LSTLV if conditions permit	Receive prior authorisation from the coastal State if transhipping in waters under its jurisdiction
DURING		Observer checks that transhipped quantities are consistent with the declared species and amount to be transhipped
AFTER: WITHIN 24 HOURS		Submit the IOTC transhipment declaration to the IOTC Secretariat and the flag State of the LSTLV
AFTER: WITHIN 15 DAYS	Submit IOTC transhipment declaration to its flag State within 15 days of transhipping	
LANDING		48 hours prior to landing the transhipped catch, submit the same IOTC transhipment declaration to the port State concerned along with the carrier vessel's IOTC number
		The declaration must accompany a consignment that is imported or landed in a CPC until the first point of sale

TRANSHIPMENT IN PORT

Resolution 19/06 provides conditions relating to in-port transhipment for all large scale fishing vessels transhipping tuna, tuna like species or sharks caught in association with such species. While fishing and carrier vessels' flag States have reporting requirements, there are no observer requirement and the carrier vessels do not need to be authorised. The port State could permit or deny the transhipment, however no authorisation is required from the flag State(s).

	FISHING VESSEL	CARRIER VESSELS
REQUIREMENTS FOR TRANSHIPMENT	Be included on the IOTC list of authorized fishing vessels	
BEFORE	Notify the port State at least 48 hours in advance of transhipping, providing specified information	Notify the port State at least 24 hours in advance of transhipping, providing specified information
	At the time of transhipment, submit specified information to its flag State	
DURING	Inform its flag State of details of the transhipment	Monitoring required for 5% of in-port transhipments
	Monitoring required for 5% of in-port transhipments	
IMMEDIATELY AFTER		Report to the port State the quantities of tuna, tuna-like species and shark received during the transhipment
AFTER: WITHIN 24 HOURS		Complete and submit the IOTC transhipment declaration to the competent authorities
AFTER: WITHIN 15 DAYS	Complete the IOTC transhipment declaration and send to its flag State, along with its IOTC number, no later than 15 days after transhipping	
LANDING		48 hours ahead of landing submit the IOTC transhipment declaration to the landing State

IDENTIFYING NON-COMPLIANCE

The main areas of non-compliance targeted by the IOTC CMMs and identified through the FISH-i Africa investigations are examined to better understand which MCS tools are best able to identify non-compliance.

FISHING

Fishing activity is governed by laws and regulations applied by the flag State of the vessel, the coastal State (if fishing within an EEZ) as well as international law. Non-compliance is linked to fishing or transhipping in the wrong place, at the wrong time or without the necessary permission.

CATCH

The volume, species, and discarded catch are controlled by national laws and regulations and IOTC CMMs. Catch may be mis-recorded by volume of species, for example over catching the limit for yellowfin tuna. Sharks may be targeted by longline vessels and high value fins retained in contravention of the 5% fin to carcass ratio set by IOTC Resolution 17/05.

VESSEL

Violations linked to the fishing vessel may fall under fisheries regulations, for example the definition of IUU fishing used by the IOTC includes fishing by a vessel without nationality. Gear and equipment violations may be part of flag or coastal State controls with the use of VMS or AIS being mandated for certain types of vessels, or areas of operation. Efforts to hide or misuse vessel identity is often linked to vessels without authorisation to fish or hiding their IUU fishing status. Vessel safety lies within the mandate of the IMO.

CREW

The treatment of crew on board fishing vessels falls outside of the primary responsibility of IOTC, falling to flag States who have jurisdiction over their vessels and an obligation to exercise control over them. International human rights law prohibits certain treatment, while ILO C188 provides labour standards for crew which national legislation needs to implement or give effect to.

MCS tools are used to monitor fisheries related activity, identify infractions and support enforcement or deterrent actions against illegal activities. Here, the table identifies non-compliant activities related to the fishing, catch, vessel and crew and compares how the different MCS tools can, when adequately applied, identify the non-compliance of the fishing vessel(s) they are monitoring.

NON-COMPLIANT ACTIVITY	MCS TOOLS					
	AT-SEA FISHING VESSEL OBSERVER	AT-SEA FISHING VESSEL INSPECTION	IN-PORT TRANSHIPMENT MONITORING OR INSPECTION	AT-SEA TRANSHIPMENT OBSERVER	REMOTE AIR PATROL	REMOTE TRACKING
FISHING						
Fishing in prohibited areas	●	●			●	●
Fishing during closed periods	●	●			●	●
Fishing without a licence	●	●	●	●	●	●
Illegal transhipment	●	●	●	●	●	●
CATCH						
Exceeding catch limits	●	●	●	●		
Under-reporting catch	●		●	●		
Shark finning	●	●	●	●		
Bycatch retention	●	●	●	●		
High grading/discards	●	●				
VESSEL						
Vessel identity fraud	●	●	●	●		●
Document forgery	●	●	●	●		
Gear violations	●	●	●	●	●	●
Equipment violations	●	●	●	●	●	●
Fishing without nationality	●	●	●	●	●	●
Vessel safety	●	●	●	●		
CREW						
Forced labour	●	●	●	●		●
Living conditions	●	●	●	●		
Working conditions	●	●	●	●		
POTENTIAL FOR COMPLIANCE MONITORING	HIGH	MODERATE	MODERATE	MODERATE	LOW	LOW

● LIKELY ● POSSIBLY ● A SMALL CHANCE ○ NOT POSSIBLE

EFFECTIVENESS OF MCS TOOLS

It is important from a legal perspective that MCS tools are assessed for their potential to detect non-compliance, how risky these are and whether they are currently effective in the WIO tuna fishery or not.

AT-SEA FISHING VESSEL OBSERVER

- HIGH
- MODERATE
- LOW

POTENTIAL EFFECTIVENESS: HIGH
LEVEL OF SAFETY: LOW
CURRENT EFFECTIVENESS: LOW

COMPLIANCE OBSERVERS PLACED ON FISHING VESSELS PROVIDE AN OPPORTUNITY TO MONITOR ACTIVITY RELATING TO FISHING, CATCH, VESSEL AND CREW

ADVANTAGES	They see what is happening all the time – e.g. illegal transhipments or other legal encounters at sea. Observer placement can be undertaken through regional cooperation to increase coverage and mitigate corruption.
COVERAGE	Low. Some WIO coastal States require compliance observers for licensed vessels in their EEZ – but rarely implemented due to challenges of embarking them when the vessels do not visit port in the coastal State. Observers are required by some flag States but usually only for scientific monitoring.
COST	Low to medium.
CAPACITY REQUIRED	Skilled and knowledgeable observers and supervisors. Supporting MCS officers with the ability and will to act on reports of non-compliance. Regional cooperation to deal with the migratory nature of foreign fishing vessels.
LIMITATIONS	Due to lack of port calls by foreign vessels in coastal States it is difficult to place and retrieve observers – therefore very few compliance observers on tuna fishing vessels in the WIO. Observers need to be rotated between vessels to avoid over familiarity. IOTC observer coverage levels only directly applicable to CPC vessels. No ability to arrest.
RISKS	Observers are extremely vulnerable especially on the vessels that most need monitoring. Corruption. Intimidation. Safety and security. COVID-19 has impacted on the placement of observers.

AT-SEA FISHING VESSEL INSPECTION

- HIGH
- MODERATE
- LOW

POTENTIAL EFFECTIVENESS: MODERATE
LEVEL OF SAFETY: HIGH
CURRENT EFFECTIVENESS: LOW

AT-SEA PATROLS CAN TARGET HIGH-RISK VESSELS AND HAVE AN ELEMENT OF SURPRISE. THE PATROL VESSELS ALSO HAVE A DETERRENCE BY BEING PRESENT IN AN AREA

ADVANTAGES	Vessels cannot prepare for inspections so the opportunity to identify non-compliance is greater. Limited opportunity to hide or cover up non-compliance or the living and working conditions of the crew. Ability to arrest and take a vessel to port. Patrols can be undertaken through regional cooperation to reduce costs, mitigate corruption and patrol the high seas.
COVERAGE	Low. Few coastal States have the resources to conduct regular at-sea patrols. Regional patrols take place only occasionally covering the high seas.
COST	High.
CAPACITY REQUIRED	Ocean going patrol vessel and fuel. Competent seafarers. Inspectors trained to board and inspect fishing vessels. Multiagency teams involving relevant authorities such as navy/coastguard, and police. Intelligence and risk assessment procedures to target and direct patrols.
LIMITATIONS	High cost means that the price per inspection is very high. Generally, only occurs in EEZs for national patrols. Relatively small ocean areas can be patrolled. Weather limitations and possible night-time limitations. Difficulty detecting fishing vessels not transmitting on AIS or VMS. Communication between fishing vessels may forewarn that a patrol is taking place.
RISKS	Corruption. Poor intelligence leads to wasted effort and resources. If operated by Navy or Coastguard limited knowledge about fisheries and catch.

IN-PORT TRANSHIPMENT MONITORING

- HIGH
- MODERATE
- LOW

POTENTIAL EFFECTIVENESS: ● ◉ ●
LEVEL OF SAFETY: ◉ ● ●
CURRENT EFFECTIVENESS: ● ● ◉

PORTS ARE A CRITICAL POINT FOR THE ENTRY OF FISH TO THE SUPPLY CHAIN AND PROVIDE THE OPPORTUNITY FOR 100% MONITORING OF ALL FISH LANDED OR TRANSHIPPED

ADVANTAGES	Resources are focussed in one location. Vessels are required to give advance notice of entry into port, this enables advance crosschecking of information to confirm the vessel identity, review fishing activity using remote monitoring tools, and assess the vulnerability of crew. Limited opportunity to hide or cover up the living and working conditions of the crew.
COVERAGE	Low. Limited monitoring takes place in WIO ports.
COST	Low.
CAPACITY REQUIRED	Trained fisheries inspectors working in cooperation with relevant agencies e.g. port authorities, police, customs to undertake thorough and systematic checks and inspections on vessels that are transhipping including to carrier vessels, cold storage and containers.
LIMITATIONS	Transhipment to containers are often not monitored or inspected and PSM do not apply. Transhipment at anchor (e.g. Port Louis) is often not monitored or inspected. Monitoring or inspections often take place at the most accessible dock or the easiest one to work at. Illegal operators target ports with the weakest monitoring and inspection regimes. Inadequate numbers of inspectors mean that not all offloading can be monitored. Fisheries inspectors are often not informed before vessels enter port, or before offloading and require the support of port authorities to deny access to port or port services for vessels suspected of fishing or transhipping illegally. Only what is onboard can be checked – e.g. not what was actually fished or with what gear.
RISKS	Corruption. Intimidation. Familiarity between inspectors, agents and operators can lead to limited monitoring or inspection.

AT-SEA TRANSHIPMENT OBSERVER

- HIGH
- MODERATE
- LOW

POTENTIAL EFFECTIVENESS: ● ◉ ●
LEVEL OF SAFETY: ● ◉ ●
CURRENT EFFECTIVENESS: ● ◉ ●

OBSERVERS PLACED ON CARRIER VESSELS UNDER THE ROP CAN MONITOR AUTHORISED TRANSHIPMENTS BUT CATCH MAY ALREADY HAVE BEEN TRANSHIPPED BETWEEN LONGLINE VESSELS HIDING VESSEL IDENTITY, LACK OF AUTHORISATIONS, PROHIBITED CATCH

ADVANTAGES	Oversight of transhipment of around 50% of industrial longline caught tuna. Cost covered by industry payments. Monitoring of transhipment provides some monitoring of the fish caught from coastal States EEZs and the high seas.
COVERAGE	Medium.
COST	Low to medium.
CAPACITY REQUIRED	Observers trained by service providers to a high standard and overseen by professional supervisors.
LIMITATIONS	Only one observer is present, so opportunities to transfer illegal catch are possible. Reporting of possible infractions by observers is descriptive and the flag State provides a response that is recorded in a summary report, for example in 2018, 235 possible infractions reported to IOTC. Illegal transhipments may take place with carrier vessels that are not participating in the ROP and do not have an observer on board.
RISKS	Observers are potentially vulnerable. Corruption. Intimidation. Safety and security. COVID-19 has caused the suspension of the ROP.

REMOTE AIR PATROL

HIGH
MODERATE
LOW

POTENTIAL EFFECTIVENESS:
LEVEL OF SAFETY:
CURRENT EFFECTIVENESS:

MARITIME AIR PATROLS CAN TARGET AREAS AND HAVE AN ELEMENT OF SURPRISE. PLANES HAVE A LARGE AREA OF COVERAGE AND CAN IDENTIFY FISHING ACTIVITY

ADVANTAGES	Vessels unaware of air patrol presence – high element of surprise. Able to identify and geographically define the position of any vessels. Able to secure evidence such as photographs and video of fishing activity. Can be undertaken in regional cooperation to help reduce costs and mitigate corruption.
COVERAGE	Low. Few coastal States have the resources to conduct regular maritime air patrols.
COST	Medium to high.
CAPACITY REQUIRED	Maritime patrol planes (civilian or military) with crew. Inspectors trained to observe and secure evidence if illegal activity is identified. Intelligence and risk assessment procedures to target and direct patrols. Limited monitoring of the catch, crew or fishing gear is possible.
LIMITATIONS	Flight time and generally only patrol in EEZs. Weather limitations and possible night-time limitations. No ability to arrest.
RISKS	Poor intelligence leads to wasted effort and resources.

REMOTE TRACKING

HIGH
MODERATE
LOW

POTENTIAL EFFECTIVENESS:
LEVEL OF SAFETY:
CURRENT EFFECTIVENESS:

VESSELS TRANSMIT THEIR POSITION USING AIS AND VMS SYSTEMS. REMOTE MONITORING REQUIREMENTS ARE LINKED TO COASTAL AND FLAG STATE AUTHORISATIONS WITH VESSELS OPERATING IN NATIONAL EEZS GENERALLY REQUIRED TO TRANSMIT ON VMS

ADVANTAGES	An effective means of overseeing aspects of fishing activity and interactions between vessels. The increasing use of AIS provides public oversight of the activity of fishing vessels and carrier vessels. Can be integrated with radar satellite to increase value. Regional VMS can greatly enhance the effectiveness of monitoring.
COVERAGE	Medium.
COST	Low.
CAPACITY REQUIRED	Dedicated personnel conducting 24 hour monitoring of all vessel movement. Analytical skill to interpret information and identify anomalies.
LIMITATIONS	AIS is not mandatory for fishing vessels and is regularly turned off before transhipment. Even when flag States require vessels to use AIS there is little follow up action against vessels when they routinely turn off. VMS is not regional – limitation to enable crosschecking between EEZs and on high seas. Most useful as an identification tool. Often not accepted as proof of illegal activity. Almost no information on catch or crew is obtained by remote monitoring. Limited monitoring of the catch, crew or fishing gear is possible.
RISKS	Operators may not be aware of system limitations – e.g. that AIS and VMS only monitors vessels transmitting their position.

EFFECTIVENESS OF TRANSHIPMENT MONITORING

While the WIO has a range of MCS tools available, the practical effectiveness of these are limited. The two MCS tools relating directly to transhipment – in-port transhipment monitoring and at-sea transhipment observers – are assessed to potentially be moderately effective in detecting fisheries violations. Their strength being their ability to monitor aspects of fishing, catch, vessel and crew, and their weakness being that the fishing has taken place and violations in respect to fishing in closed or prohibited areas or high grading (throwing away less profitable catch) cannot be detected. With respect to safety, port monitoring has the advantage of being safer for inspectors, while transhipment observers are exposed to a moderate risk level, although this risk is not as high as that for fishing vessel observers.

ACTUAL EFFECTIVENESS OF AT-SEA TRANSHIPMENT MONITORING

The ROP transhipment observers monitor 13% of all tuna caught in the WIO. This monitoring takes place at sea when the tuna and other species are transhipped from a longline fishing vessel to a carrier vessel. The ROP observers monitor all the tuna transhipped within the ROP, so this is all the tuna that is transhipped legally at sea.

This method of MCS is considered moderately effective at monitoring non-compliance in the longline fishery. The limitations are inherent in this type of monitoring rather than being because observers are being individually ineffective. However, illegal at-sea transhipments may occur to unauthorised carriers outside of the ROP (without observers) from either authorised or unauthorised fishing vessels. These suspicions are difficult to validate, mainly due to limitations in remote monitoring, a lack of compulsory AIS and VMS on all vessels, and poor flag State reporting.

ACTUAL EFFECTIVENESS OF IN-PORT TRANSHIPMENT MONITORING

The low number of inspections and monitoring of transhipment in ports, especially with respect to transhipments from foreign vessels when the fish is transiting in the ports, and being transported to ports outside of the region in carriers, containers or temporarily being stored in cold storage (in free zones) makes port inspections ineffective as an MCS tool. None of the ports in the WIO with high levels of transhipment from industrial purse seine or longline fishing vessels have adequate numbers of fisheries inspectors to fully monitor all the transhipments.

In prioritising which transhipments to monitor to achieve the minimum IOTC requirement of monitoring 5%, the authorities will prioritise monitoring their own vessels to fulfil their flag State reporting responsibility, and transhipment for offloading to fulfil traceability requirements. This is concerning as 87% of the WIO tuna is transhipped from fishing vessels through ports and the majority of this only transiting in the port. An example, demonstrating these challenges, is the 13,000 tonnes of yellowfin tuna that Spanish purse seiners caught in excess of the Spanish quota in 2018 that was identified after transhipment in the region. Port Victoria handles the transhipment of roughly 95% of purse seine catch so it is likely that this catch was transhipped from the foreign fishing vessels in the Seychelles to carrier vessels for onward transport to ports outside of the region. As this catch slipped under the radar of the monitoring authorities, it provides a good demonstration that monitoring 5% of transhipments is inadequate to ensure compliance to important CMMs.

Another concern with such low levels of transhipment monitoring in port is that purse seiners, while being fewer in numbers, if non-compliant have the potential to make significant negative impacts. For example, in 2017, on average each purse seiner caught in the region of 7,000 to 8,000 tonnes and each longliner in the region of 150 to 200 tonnes. In the same year, the purse seiners caught an average of approximately 2,500 to 3,000 tonnes yellowfin per vessel while longliners caught an average of approximately 40 to 50 tonnes per vessel. This demonstrates that a single non-compliant purse seiner is more likely to have a drastic impact than a single non-compliant longliner on the vulnerable yellowfin stocks.

9.2 FAIR TUNA

Currently, 40% of the total IOTC reported catch from the WIO is caught by industrial purse seine and longline vessels. However, the longline vessels are all controlled by Asian interests, with Taiwan controlling 70%, and the purse seine vessels are controlled 87% by EU interests, mainly Spanish. This control of fishing activities – predominantly by non-WIO coastal States – is reflected in where this fish is eaten – almost exclusively in Asia and Europe.

The WIO coastal States are reassessing the management of their tuna fisheries to consider how it is supporting them in achieving their commitments to the global SDGs and to developing their blue economies. This approach has been central to the recently developed Southwest Indian Ocean Fisheries Commission's (SWIOFC) guidelines for minimum terms and conditions for foreign fisheries access in the WIO. These regionally agreed guidelines advocate for greater cooperation to improve the social and economic benefits that coastal States gain for the fisheries of the WIO and this is not a new cry. It reiterates similar calls reflected, for example, in the 2001 SADC Protocol of Fisheries and the 2014 Maputo Declaration.

The development of global guidelines on transhipment provides a tool and opportunity to consider how different forms of transhipment influence the distribution of benefits and how adjusting transhipment options may influence future benefit sharing.

COMPARING BENEFITS FOR THE WIO FROM LONGLINERS AND PURSE SEINERS

CURRENT BENEFIT TO WIO STATES: LOW

BENEFITS TO THE WIO STATES
- HIGH
- MODERATE
- LOW OR NONE

FOOD SECURITY

POLICY AIMS FOR WIO COASTAL STATES:
- All catch taken in a WIO States' EEZ to be landed in a port of that State.
- All bycatch is destined for consumption in the WIO region.

	PURSE SEINE	LONGLINE
CATCH	Around 50% of the catch is processed regionally and consumed in Europe, the rest is transported whole to Europe or Asia.	Around 15% of the catch is processed regionally and consumed in the USA, the remainder is consumed in Asia.
LOW VALUE BYCATCH AND DISCARD	Around 5% of the purse seine catch rejected due to damage or being too small and usually sorted and transhipped in Port Victoria is consumed locally or processed for export.	There is less low value bycatch from longline fishing gear, but several coastal States require bycatch to be landed in their ports. This rarely occurs.
BY-PRODUCTS	Around 40% of the weight of the tuna, consisting of the head, bones, skin and organs is used for fishmeal, which is produced where the canning takes place. However, this is mainly used in Asia and the EU for feed to aquaculture and animal production, contributing significantly to food security in those locations.	The fishmeal produced from the fish processed in the region is mainly exported as with the purse seine fishmeal. However, the majority of the fish are transported whole to Asia where the fishmeal is processed.
	Fish oil is produced as a rich source of omega-3 fatty acids for dietary supplement. This is produced where the fish are processed and mainly exported to Europe.	
BAIT		Longliners use huge amounts of bait, which is usually squid, saury, mackerel or sardine. This fish is usually imported into the region, but as a low value fish, it may otherwise have been destined for potential food security in low-income countries.

CURRENT BENEFIT TO WIO STATES: MODERATE

BENEFITS TO THE WIO STATES
- HIGH
- MODERATE
- LOW OR NONE

EMPLOYMENT

POLICY AIMS FOR WIO COASTAL STATES:
- 10% employment of regional crews on foreign fishing vessels.
- ILO C188 standards applicable to all vessels operating in the fishery.
- For the industry to cover costs related to observers on fishing vessels.
- Appointment of a local agent by all foreign fishing vessels.

	PURSE SEINE	LONGLINE
FISHING VESSELS	Most are foreign operated and use foreign crews.	
	In some cases, regional crew are embarked on vessels, but usually with minimal wages.	
	In some countries when embarking crew is a requirement as part of the access conditions (such as in the sustainable fisheries partnership agreements between the European Commission and Seychelles and Mauritius) a fee of 20 USD per day is paid to the coastal State if no crew is embarked or a monthly equivalent.	Cases of poor living and working conditions for regional crew are increasing.
PROCESSING	Employment in the cannery in Mauritius is 6,000. In addition, secondary industries are likely to create significant employment such as those producing cans and boxes.	An amount of the employment in the cannery in Mauritius (6,000 people) is related to the albacore processed into loins.
	Employment in the cannery in Madagascar is 1,500.	
	Employment in the cannery in Seychelles is 2,500.	
	Some bycatch is processed by small factories in the Seychelles.	
PORT SERVICES	Employment in Mauritius in the port and ship repair is estimated at 10,400 (tuna vessels account for 20% of port traffic).	
	Employment in Madagascar in the port and ship repair is estimated at 1,700 (which is only partially related to the tuna fishing vessels).	
	Employment in Seychelles in the port is estimated at 1,000 (which is significantly related to the purse seine vessels).	
ON-SHORE SERVICES, E.G. AGENTS, BROKERS	Agents are usually employed in the vessel's main operational port to organise provisioning of the vessels and to deal with crew logistics.	
	The main tuna traders are globally located such as FCF (Taiwan), Tri Marine (Italy) and Itochu (Japan).	
GOVERNMENT OFFICIALS	All coastal States of the WIO have fisheries authorities requiring licensing, MCS, scientific, and management staff.	
	Most fisheries departments report a lack of adequate human capacity to fulfil their duties. This is particularly problematic in the locations of the main ports.	
	Coastal States whose ports are used by the fishing vessels will also require port officials, maritime, customs, health, immigration and other officials to support the fishing vessels using port.	

CURRENT BENEFIT TO WIO STATES: LOW

BENEFITS TO THE WIO STATES
- HIGH
- MODERATE
- LOW OR NONE

INCOME GENERATION

POLICY AIMS FOR WIO COASTAL STATES:
- Minimum 12% of the value of the catch taken in their EEZs.
- Require a fee for transhipment.

	PURSE SEINE	LONGLINE
GDP	GDP derived from fishing related activity was 20% in the Seychelles, 6% in Madagascar.	GDP derived from fishing related activity was 1% in Mauritius.
IMPORT AND EXPORT TAXES	Import and export taxes are charged on product that is imported into a coastal State country for processing, such as the canneries, this is about 50% of the tuna caught from purse seiners, in 2017: Madagascar imported USD 25 million and exported USD 45 million. Mauritius imported USD 220 million and exported USD 340 million. Seychelles imported USD 240 million and exported USD 480 million.	Only 15% of the catch is imported to Mauritius for processing into loins for export to USA, the rest is not imported within the region.
	Freeports are used for the transhipment of tuna into containers and carriers and no taxes are paid to the coastal States.	
PORT AND TRANSHIPMENT FEES AND SERVICES	In Seychelles, transhipments in port cost a freezer carrier or fishing vessel USD 3.6 per 100 GT for 4 days and USD 1.4 per 100 GT for each additional day. A container carrier in port pays USD 2.5 per 100 GT for the first day and USD 2.0 per 100 GT for each additional day. Therefore, an average carrier of 5,000 GT would pay USD 320 for 6 days. Additionally, the vessel would pay USD 112 to berth and again to unberth.	In Mauritius, transhipments at anchorage cost USD 5 per 100 GT for 6 days, and USD 6 per 100 GT for each additional day for each vessel. Therefore, an average carrier of 5,000 GT would pay USD 250 for 6 days. An average longliner of 500 GT would pay USD 25 for 6 days and USD 30 for every additional day.
	Payments for logistical services such as cranes, loaders, and cold storage or container storage.	
FISHING ACCESS	The coastal States access fees vary depending on the size and productivity of their EEZs, but these often equate to around 5% or less of the value of the catch.	

COMPARING TRANSHIPMENT OPTIONS

Approximately 50% of the tuna caught by industrial vessels is caught in the EEZs of WIO coastal States, however, the benefits accruing to the coastal States, in terms of food security, jobs or income are inadequate. Increasing and diversifying the benefits from the tuna fishery to include all WIO coastal States will take time, policy and legal adjustments, investment, building new partnerships, capacity and skills development and more. It also requires that each opportunity to adjust the 'playing field' to make it fairer is taken. Here, the impact, in terms of costs and benefits of the three transhipment options are considered in respect to their impact on: the WIO port States, the foreign fishing industry, the environment and socially.

AT-SEA TRANSHIPMENT TO CARRIER VESSELS

Transhipment at sea from a fishing vessel to carrier significantly benefits the foreign fishing industry through cost efficiency and logistical benefits. Control remains with industry players, determining when and with whom the transhipment takes place. The delays and potential corruption involved in port visits are avoided and there is minimal down time for crew or fishing. There are also environmental benefits with reduced fuel consumption and avoidance of marine traffic in sensitive coastal areas. The real losers in this scenario are the WIO coastal and port States who gain few economic or development benefits from their fisheries resources. Without the need to visit ports crew lose a valuable opportunity to seek help, if needed. The cost of the ROP for monitoring at-sea transhipment is borne by the fishing vessel flag States.

IN-PORT TRANSHIPMENT FOR LANDING

Transhipment in a regional port for landing of catch moves the tuna from fishing vessel to cold storage for processing or for the local market and the fish is imported to the country. This method offers the greatest benefits for WIO port States with opportunity to provide services, add value, increase employment and taxes, and benefit from fish for local consumption. It provides more environmental concerns due to increased traffic in port and the emissions from steaming to port. Crew have an opportunity to seek help more easily in port, but the risk of smuggled goods into the port State increase. The cost of monitoring and inspection in port is borne by the port State.

IN-PORT TRANSHIPMENT FOR TRANSIT

Transhipment in a regional port for transit takes place when the fishing vessel offloads to a container, carrier or free zone cold storage. The port States achieves some of the benefits from landing with the development of port services and possibly storage facilities, and the opportunity for bycatch to be transhipped for landing for local use. However, the benefits in respect to importing the fish are lost, these include employment and taxes. The environmental and social impacts of landing and transit are very similar. Monitoring of the transhipment is unlikely, as port States do not prioritise foreign vessels transhipping for transit as many do not consider it within their mandate.

WIO PORT STATE IMPACTS

	IMPACTS	AT SEA TO CARRIER	IN PORT LANDING	IN PORT TRANSIT
ECONOMIC	Cost of inspection and monitoring.	●●	●●	●●
	Import and/or export taxes and duties.	●●	●●	●
	Port fees and transhipment.	●●	●●	●●
	Potential uptake of fishing licences in port State EEZ.	●●	●	●
SERVICE PROVISION AND EMPLOYMENT	Services to support transhipment including cranes, stevedores, loaders, storage bins, and containers.	●●	●●	●
	Re-supply of vessel creating income, jobs and availability of goods in local market.	●●	●●	●
	Vessel maintenance and repairs.	●●	●	●
	Revenue and employment from container, cold storage business.	●●	●●	●●
	Crew use of local facilities.	●●	●	●
	Employment of local agent.	●●	●●	●●
CATCH	Locally processed catch enables by-products, e.g. fishmeal to contribute to food security.	●●	●●	●●
	Catch processed locally generates income, material for the value chain, employment, and supporting industries.	●●	●●	●●
	Bycatch enters local market for consumption and /or for processing.	●●	●●	●
DEVELOPMENT	Opportunity for local and foreign partnerships to develop value chain.	●●	●●	●
	Demand for infrastructure and equipment may drive development and investment.	●●	●●	●
	Benefits from a multi-purpose cold storage if available.	●●	●●	●
COMPLIANCE AND OVERSIGHT	PSMA applies.	●●	●●	●
	Monitoring of transhipment.	●●	●	●
RISKS	If IUU activity detected port State may be responsible to take action and incur costs of that action.	●●	●	●
	Crew may need support, including repatriation.	●●	●	●
	Vessel may be abandoned.	●●	●	●

●● DEFINITE BENEFIT OR POSITIVE IMPACT ● POTENTIAL BENEFIT OR POSITIVE IMPACT
●● DEFINITE COST OR NEGATIVE IMPACT ● POTENTIAL COST OR NEGATIVE IMPACT

FOREIGN FISHING INDUSTRY IMPACTS

	IMPACTS	AT SEA TO CARRIER	IN PORT LANDING	IN PORT TRANSIT
ECONOMIC	Cost of inspection and monitoring.	●●	●●	●●
	Customs and tax requirements.	●●	●●	●●
	Port fees.	●	●●	●●
	Fuel costs involved in steaming to port.	●●	●●	●●
	Decreased fishing time.	●●	●●	●●
	Delays due to local bureaucracy, inspections or port traffic.	●●	●	●
	Bribes paid to facilitate offloading.	●●	●	●
	Frequent transhipment opportunities result in good cash flow.	●●	●	●
SERVICE PROVISION	Repairs and maintenance can be undertaken, if available.	●●	●	●
	Re-provisioned with supplies from homeport via carrier.	●●	●	●
	Cold chain quality.	●●	●	●
PROCESSING AND HANDLING	Bycatch can be separated.	●	●●	●●
	Sorting fish into size and species grades that can be transported to different destinations.	●●	●	●●
DEVELOPMENT	Engagement in local WIO partnerships that may ensure business partnership and future access and quota.	●●	●●	●
COMPLIANCE AND OVERSIGHT	Having been monitored by the ROP, the catch is considered legal.	●●	●	●
	Low levels or inadequate inspection may enable transhipment of illegal catch.	●	●	●●
RISKS	Crew may jump ship.	●●	●	●
	Vessel may be detained.	●●	●	●

●● DEFINITE BENEFIT OR POSITIVE IMPACT ● POTENTIAL BENEFIT OR POSITIVE IMPACT
●● DEFINITE COST OR NEGATIVE IMPACT ● POTENTIAL COST OR NEGATIVE IMPACT

ENVIRONMENTAL IMPACTS

	IMPACTS	AT SEA TO CARRIER	IN PORT LANDING	IN PORT TRANSIT
ECOSYSTEM	Vessel traffic in sensitive coastal ecosystems.	●●	●	●
CATCH	No or limited levels of transhipment oversight meaning that CMMs could be undermined.	●●	●	●
POLLUTION AND EMISSIONS	Emissions and pollution due to increased steaming.	●●	●●	●●
	Vessel traffic creating pollution in port.	●●	●	●
	Discharge of waste at sea.	●	●	●

SOCIAL IMPACTS

	IMPACTS	AT SEA TO CARRIER	IN PORT LANDING	IN PORT TRANSIT
MODERN DAY SLAVERY AND WORKING CONDITIONS	Identify persons who are subject to abuse or poor working conditions.	●	●	●
	Persons who are subject to abuse or poor working conditions can seek assistance.	●	●●	●●
	Wages and safety reduced due to increased costs related to in port transhipment.	●	●	●
	Crew able to rest.	●●	●	●
SAFETY	Maritime safety checks made for fishing vessels by maritime authorities.	●●	●	●
	Conflict with smaller-scale vessels due to increase in vessel traffic.	●●	●	●
	Safety and security issues linked to foreign fishing vessels using ports (drugs, people smuggling).	●●	●	●

●● DEFINITE BENEFIT OR POSITIVE IMPACT
●● DEFINITE COST OR NEGATIVE IMPACT
● POTENTIAL BENEFIT OR POSITIVE IMPACT
● POTENTIAL COST OR NEGATIVE IMPACT

10 BETTER TUNA

Moving Tuna has been developed in response to a call for studies to be developed to support the FAO led process to formulate global guidelines on best practices for regulating, monitoring and controlling transhipments. **Moving Tuna** is a case study about the at-sea and in-port transhipment of tuna from industrial purse seine and longline fishing vessels in the WIO.

To make useful recommendations, the compiled information in the study – the tuna, catching tuna and moving tuna – was analysed in respect to achieving SDG 14 life below water's targets: target 14.4 aiming to end overfishing and IUU fishing and target 14.7 aiming to increase the economic benefits to developing countries from the sustainable use of marine resources.

10.1 TRANSHIPMENT TO END IUU FISHING

Transhipment, and particularly at-sea transhipment, is frequently cited as a facilitator of IUU fishing enabling the laundering of illegally caught fish into the legitimate supply chain as well as assisting to hide other ills such as modern day slavery. This report demonstrates that this perception may be misleading. Fish must be transhipped from the fishing vessel, providing a perfect opportunity to monitor and validate what fish and how much is being moved, and to check other aspects related to the legality of the fishing, catch, vessel and crew. For this opportunity to be fully used, the transhipment monitoring must be high quality, systematic, non-partial, validated and safe.

Of the MCS tools used to identify non-compliant activities in the WIO, while all have limitations, at-sea monitoring by independent IOTC carrier vessel observers was assessed to be more effective than other methods including in-port monitoring by fisheries inspectors. In-port transhipment monitoring was particularly poor in respect to foreign fishing vessels that are transiting their fish (via carrier, container, or cold storage) without it legally entering the port State, providing little incentive for already overstretched port States to prioritise monitoring these significant transhipments.

EFFECTIVENESS OF MCS TOOLS

● HIGH
● MEDIUM
● LOW

	AT-SEA FISHING VESSEL OBSERVER	AT-SEA FISHING VESSEL INSPECTION	IN-PORT TRANSHIPMENT MONITORING AND INSPECTION	AT-SEA TRANSHIPMENT OBSERVER	REMOTE AIR PATROL	REMOTE TRACKING
Potential effectiveness of MCS tool	●	●	●	●	●	●
Effectiveness in WIO tuna fishery of MCS tool	●	●	●	●	●	●
Level of safety for those conducting the MCS	●	●	●	●	●	●

10.2 TRANSHIPMENT TO GROW A BLUE ECONOMY

The wealth of the oceans and their fisheries potentially offer an opportunity for coastal States to develop blue growth that provides economic income, food security and social wellbeing while also maintaining a healthy environment. For this to materialise the coastal States of the WIO have all developed strategies to increase their benefits from the tuna fishery, by not only selling access but also engaging in the value chain, in catching, processing and marketing the fish.

Today, European interests dominate the value chain of purse seine caught tuna and Asian interests dominate the value chain of longline caught tuna. They control the vessels, the catching, the transhipping, the transport, the processing and the markets. Most of the benefits accrue to foreign interests, with only a handful of exceptions in the WIO. The benefits from the fishery need to be shared so that it can contribute in a more meaningful way to African long-term wellbeing. To do this, things need to change, and one significant option is to attract a supply of raw material – fish – to be transhipped and imported into a wider range of coastal States, to increase the possibility for benefiting from taxes, value addition, job creation, and selling the product to emerging African markets.

● HIGH
● MEDIUM
● LOW

LEVEL OF BENEFIT

	WIO STATE	FOREIGN FISHING INDUSTRY	ENVIRONMENT	SOCIAL
At-sea transhipment	●	●	●	●
In-port for landing	●	●	●	●
In-port for transit	●	●	●	●

10.3 RECOMMENDATIONS

Three transhipment recommendations are proposed to ensure a legal and fair fishery in the WIO. While these are tuned towards the WIO, they will serve to inform the process of developing global guidelines on transhipment management.

REGIONAL TRANSHIPMENT MONITORING SYSTEM

Monitor all at-sea and in-port transhipments from industrial fishing vessels within the same regional or fisheries based system, using independent professionally trained and supervised observers, indirectly paid for by the fishing vessel owners. Use a non-partial system that subjects all vessel, gear types and flag States to monitoring based on a transparent risk assessment that balances the likelihood of non-compliance with the potential impact of non-compliance on the applicable CMMs.

POTENTIAL BENEFITS:

- Enable a greater number of transhipments to be monitored.
- Balance the monitoring between at-sea and in-port transhipments.
- Enable all vessel and gear types to be adequately monitored.
- Remove the financial and capacity burden from port States.
- Remove bias from port inspections that focus on national vessels and imported fish.
- Implement the user pays concept across all transhipments.
- Improve the monitoring and logging of infractions.
- Improve PSM application in the whole region.
- Improve the professionalism and safety of all observers.
- Provide all States with a better system for monitoring compliance to catch limits.
- Employ and train regional observers.

REGIONAL VALIDATION OF TRANSHIPMENT MONITORING

Validate the information gained from monitoring of transhipment. Pool information and resources between flag, port or coastal States and across MCS tools. While States can complete some elements of validation alone the real benefit is in sharing and cross checking information with others. For example, dedicated pre-fishing vessel inspections can confirm vessel identity, check gear, check vessel safety and ensure adequate crew and observer working conditions, these inspections can take place in any port in the region with the outcome shared between countries. Remote monitoring by a regional VMS and AIS for fishing and carrier vessels provides an effective system to monitor for illegal at-sea transhipment if obligatory for all vessels. Develop a system of regional validation through regional MCS Centres, Secretariats or Task Forces that connect national MCS officers and regional experts to share and validate information.

POTENTIAL BENEFITS:

- Improve information included on authorised vessel lists.
- Facilitate wider access to information and reports.
- Provide all crew and observers with greater security and safety.
- Enable vessel safety and crew issues to be integrated into fisheries inspections.
- Support broader application of critical tracking events within the MCS system.
- Develop more use of technology such as electronic smart tracking and remote cameras.
- Facilitate the development of shared definitions of transhipment.
- Facilitate more action against violations due to information sharing.

NATIONAL INCENTIVES TO ATTRACT TRANSHIPMENT

Include requirements or incentives in national blue economy and fisheries development strategies or plans, to attract foreign fishing and carrier vessels to tranship in WIO ports, taking advantage of the proximity to the different fishing grounds, and the availability of services including containers, carriers and cold storage. Increase incentives applied for transhipping fish for landing, including all or some of the catch or bycatch and to building longer term partnerships with local companies to secure a supply of fish and related economic activities. Match incentives with suitable port facilities, which may need development, including provision of gear, food and supplies, services and repairs, and fuel.

POTENTIAL BENEFITS:

- Secure fish for developing a value chain and food security.
- Create employment through servicing the fishing vessels.
- Expand ports to offer more options for transhipment and other businesses.
- Develop new regional markets requiring different types and quality of products.
- Increase of port traffic will develop new business opportunities.
- Diffuse environmental risks by spreading transhipment around the region.
- Reduce fuel emissions by using the closest ports to fishing grounds.

11
AFTERWORD

SANDY DAVIES

Most industrial fishing activity takes place out of sight. Officials and scientists rely on a patchwork of control and reporting mechanisms to provide information on what has been caught and, where and how this catch moves from the fishing vessel into the supply chain. This data is vital for management decisions that determine the sustainability of stocks, underpin control measures and develop blue economies.

Moving Tuna draws on research, industry engagement, and knowledge from decades of fisheries engagement. Our aim, to explore the role transhipment plays in the WIO and to truth test the assertion that it facilitates illegal fishing and other ills, has led to some key findings. Critical is the approximate transhipment ratio – at-sea one: in-port landing three: in-port transit six – the implications of this are significant.

Firstly, in respect to ending IUU fishing, this highlights an imbalance in scrutiny and oversight. While all at-sea transhipments are monitored, they only account for 10% of the tuna catch. The other 90% is transhipped in port, landing to canneries, or transiting into carriers, containers or free-zone cold stores: this tuna is far less likely to be monitored, if at all. This has implications for vulnerable fish stocks – we must urgently and systematically implement port State measures.

Secondly, it raises real issues for African coastal States as they move to domesticate and benefit from the industry. With only 30% of the tuna being imported into these States, opportunities to build local supply chains, add value and feed local demand, are limited. As agendas change and the fishing industry evolves, understanding how transhipment brings costs and rewards is essential – we must work to ensure these are fairly reflected.

Thirdly, fairness must also be considered in relation to the burden for fisheries protection and monitoring. Today, while flag States pay for monitoring at-sea transhipments, port States pay for monitoring in-port transhipments – we must change this: the user must pay.

As we all turn our attention to possible global guidelines for transhipment, there is an opportunity to build strong links to the ILO to identify and prevent modern day slavery and to the IMO to improve safety and prevent pollution. We must also think regionally. The development of a regional SADC MCS Coordination Centre provides a solid foundation for partnership, for fairness and for ocean optimism.

Let's work together to make these changes happen.

SANDY DAVIES
ON BEHALF OF THE STOP ILLEGAL FISHING SECTRETARIAT

stop illegal fishing

Stop Illegal Fishing is working at a practical and policy level to support coastal, flag, port, market and crew States to take action against illegal fishing. As an independent, Africa-based not for profit organisation Stop Illegal Fishing works in partnership with governments, civil society, intergovernmental organisations and the fishing industry.

Find out more about Stop Illegal Fishing at **www.stopillegalfishing.org**