

Promoting the Blue Economy and Fisheries Management



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PREFACE

“If the ocean were a country, it would have been the seventh largest economy in the world”- 2015 Report on Reviving the Ocean Economy

“If the ocean were a country, it would have been the seventh largest economy in the world”- 2015 Report on Reviving the Ocean Economy

“You cannot have a healthy planet without a healthy ocean”- Peter Thomson, UN Special Envoy for the Ocean, June 2021

While oceans account for 72 % of the surface of our blue planet and provide us with food and livelihoods, combining these two quotes remain an ever-evolving challenge, especially when one wishes to enhance more than 80 % of global trade, marine and coastal environments in a sustainable, inclusive, and people-centred manner.

Aware of the strategic location and possibilities provided by the Indian Ocean, the Indian Ocean Rim Association (IORA) and the Agence française de développement (AFD), with the technical support of COFREPECHE, a French consulting company, worked together on a blue economy project. This publication aims at showcasing the cooperation between France and IORA in the field of blue economy, namely on the implementation of the IORA Working Plan on Blue Economy and IORA Work Plan of the Core Group Fisheries Management. The AFD-IORA project was defined with the view of promoting smart, sustainable and inclusive growth within the region's maritime economic activities.

The total production of aquatic organisms (including aquatic plants and mammals) in IORA Member States in 2020 amounted to 50.2 million tonnes. Capture fisheries amounted to 22 million tonnes (24% of world total capture production), while the region's aquaculture production amounted to 28.2 million tonnes (23% of world total aquaculture production). (FishStatJ - FAO)

Indeed, promoting the sector on Blue Economy and Fisheries Management focuses on key initiatives, such as capacity building, transfer and sharing of technical know-how, as well as the technical studies in view of managing the ocean resources in a sustainable way. As a result, the project focused on research and development, stock assessment of marine resources and practices, fisheries management, aquaculture, and regional cooperation, amongst others.

The magazine will allow readers to take cognizance of the activities that were implemented and the results that were achieved during this 3-year project but more so, they will be able to gather knowledge from related materials that have been produced by the Technical Assistance.



Foreword from the Secretary General of IORA



H.E. Salman Al Farisi

Strengthening the blue economy in the Indian Ocean requires a balanced approach and effective collaboration.

The current project has successfully taken shape with the support of France, through the Agence française de développement (AFD), a partnership marking our collective commitment and efforts towards fostering the potential of the blue economy in the Indian Ocean.

Under the framework of the Memorandum of Understanding between IORA and AFD, executed through the support of COFREPECHE, I wish to commend the significant role of France in the implementation of capacity-building initiatives in line with the Work Plan of the IORA Working Group on the Blue Economy (WGBE), enumerated in this magazine. Through these initiatives, IORA Member States had a greater privilege to enhance their knowledge and capacities to develop and manage a sustainable blue economy sector.

This Technical Assistance offered expertise, training, networking and resource materials to decision-makers, officials, and experts to promote blue growth in the region.

Indeed, this partnership with France, through AFD and COFREPECHE, has demonstrated that the ocean economy needs a strong focus on environmental sustainability and the involvement of coastal communities. As such, technical activities related to the promotion of sustainable aquaculture development on sea cucumber seed production and seaweed tubular farming, captured the interest of our Member States.

The Indian Ocean region is rich in marine resources. Although we are well acquainted with the socio-economic benefits of our ocean, we are still facing a wide range of challenges to improve the management, restoration, and protection of these resources. The sustainable development of the blue economy is one of the key solutions.

Blue economy was introduced in IORA at the 14th IORA Council of Ministers in 2014 and since then, it has captured the attention of all IORA Member States due to its growing global interest and potential, as well as for its role in generating employment, food security, poverty alleviation and ensuring sustainability in business and economic models in the Indian Ocean. Thereafter, the first IORA Ministerial Forum on Blue Economy was held in 2015 to forge partnerships in capacity building and sharing of information and knowledge.

Substantial progress has been made in the implementation of the WGBE Work Plan with the assistance of France and I wish to reiterate that IORA is committed to building and developing partnerships in the blue economy sector, in both the Indian Ocean and in the Indo-Pacific region.

This common reflection allowed us to identify six priorities:

- **Fisheries and Aquaculture**
- **Renewable Ocean Energy**
- **Seaports and Shipping**
- **Offshore Hydrocarbons and Seabed Minerals**
- **Marine Biotechnology, Research and Development**
- **Tourism**

This magazine will highlight key data and recommendations that emanate from the blue economy-related activities implemented under the IORA-AFD collaboration, which I believe will be a steppingstone towards enhancing the capacities of the IORA Member States to further develop their blue economy sectors, and thus contribute to the overall sustainable management of the Indian Ocean marine resources. As part of the growing population in the region, we are actively ensuring the sustainable utilisation of the ocean's resources.



Foreword from the Director of AFD for Mauritius and Seychelles

In partnership with



Mrs. Laëtitia Habchi

building programmes and studies to webinars and workshops on topics like combating IUU fishing, Port State Measures, fish stock assessment, by-catch landing, traceability and quality of products, small rural aquaculture, seed production and hatcheries operations and blue carbon amongst others. The workshop on IUU fishing was an important milestone for the project.

This publication demonstrates the active participation of the Agence française de développement (AFD) in promoting the blue economy as a driver for balanced social and economic development while protecting our oceans in a sustainable way. The protection of biodiversity, a priority just as crucial as the climate, is at the heart of AFD's action. To protect ecosystems and promote sustainable fisheries, AFD supports the restoration and sustainable management of natural areas and oceans, with and for the benefit of Member States of regional organisations and their local populations. AFD integrates this dimension into all its development policies. AFD Group's mission is to help restore the balance between the ecological preservation of the ocean and its multiple uses by humans. To do this, AFD favours actions for the benefit of the most vulnerable, systematically integrating gender, climate and biodiversity issues. Focused on climate, biodiversity, peace, education, sustainable urban development, health and governance, our teams carry out more than 4,000 projects in overseas departments and territories and some 115 countries around the world as part of the commitment to support and achieve the Sustainable Development Goals (SDGs).

The project on the Blue Economy Work Plan of IORA has produced many technical reports following workshops and consultation with Member States and stakeholders in the sector. This document is therefore an important reference for the IORA Secretariat and its Member States looking for materials to harness knowledge and network for capacity building in different areas of the blue economy and to improve fisheries management systems in general.

I wish to thank IORA and its Member States, as well as the Secretary-General and his team, for their involvement and contribution to this project. France, through the Agence française de développement, looks forward to pursuing its collaboration with the Indian Ocean Rim Association.

In 2020, France joined the Indian Ocean Rim Association as a member with the view of fostering the development of regional cooperation and strengthening synergies between multilateral institutions.

France signed a Memorandum of Understanding for the grant of 1 million euros, with the Indian Ocean Rim Association to support activities in the field of blue economy (through a EUR 900 000 grant over three years dedicated to the implementation of the IORA Blue Economy Work Plan (2017-2021)) and for capacity building of the Secretariat (through a EUR 100 000 grant). The Agence française de développement (AFD) worked with the IORA Secretariat on the implementation of this project.

Expertise, training, networking and material resources were provided, with the Technical Assistance of COFREPECHE, to the IORA Secretariat and its Member States, working to promote regional cooperation with regards to Blue Economy and Fisheries Sustainable Management. The implementation of the blue economy action plan involved various assignments ranging from capacity

With more than 35 years of experience, COFREPECHE is one of the first European consulting companies specialised in the fields of fisheries, aquaculture and blue economy. COFREPECHE has developed a unique set of technical, economic and financial know-how in auditing, consulting, training, management, in support of innovative projects, as well as in the design and implementation of Technical Assistance projects.

Since its creation, COFREPECHE has implemented over 750 projects in more than 70 countries across Europe, the American continent, Asia, Africa, the Middle East, the Pacific Ocean and the Indian Ocean. COFREPECHE works for private and public clients such as international development organizations including the Agence française de développement (AFD), the European Union, the World Bank, the United Nations, the Millenium Challenge Corporation and the African Development Bank.

Testimonial from the Director of International Development at COFREPECHE

The intervention outputs of the Technical Assistance provided demonstrate a very precise form of delivery, where the initiatives adapted fully to the constraints and opportunities that arose, and gave the necessary time for the results to be achieved. The majority of the interventions were implemented during the COVID period which restricted travel and many of the activities, including workshops, were implemented remotely. During the implementation of activities, the Technical Assistance produced comprehensive reports containing important recommendations for the IORA region to achieve the objectives of the Working Group on Blue Economy's Work Plan.

Capacity was developed through online and physical trainings organised with the Technical Assistance support and transfer of knowledge to the communities and relevant stakeholders in the IORA Member States was ensured throughout the project. This was particularly the case for the aquaculture activities such as feed production, sea cucumber and seaweed farming. Equally, the training provided on Port States Measures, use of remote sensing, and blue carbon should be able to support further in-country activities based on the technical knowledge acquired during the Technical Assistance.



Mrs. Charline Gaudin-Goeser



Background of IORA and Blue Economy Work Plan

Established on the 7th of March 1997, the Indian Ocean Rim Association (IORA) is an inter-governmental organisation consisting of 23 Member States and 11 Dialogue Partners. Its main role consists of enhancing economic dialogue and regional cooperation to promote a sustainable growth and balanced development for a prosperous Indian Ocean Rim.

The inception of IORA's vision came during a visit by late President Nelson Mandela to India in 1995, where he said that "The natural urge of the facts of history and geography should broaden itself to include the concept of an Indian Ocean Rim for socio-economic cooperation and other peaceful endeavours. Recent changes in the international system demand that the countries of the Indian Ocean shall become a single platform."

Based in Mauritius, the IORA Secretariat manages, coordinates, services, and monitors the implementation of policy decisions and work programmes adopted by the Association.

IORA encompasses six key priority areas and two cross-cutting concerns. Introduced to IORA in 2014, the domain of blue economy continues to remain the main focus of most Member States who have identified six specific areas where blue economy is seamlessly integrated: **Fisheries and Aquaculture, Seaport and Shipping, Renewable Ocean Energy, Seabed Exploration and Mineral Resources, Tourism, as well as Marine Biotechnology Research and Development.**



Introduction

On the 9th of March 2020, the Indian Rim Ocean Association and France, through the Agence française de développement, signed a Memorandum of Understanding for "Strengthening the Capacities of IORA in Promoting the Blue Economy and Fisheries Management". Provided with a budget allocation of EUR 1 million over three years, this partnership was aimed to offer expertise, training, networking, and material resources to decision-makers, officials, and experts for the implementation of the IORA Action Plan (2017-2021).

The mission of the Technical Assistance (TA) was to "support IORA and its Member States in the coordination and implementation of the Working Plan on Blue Economy and IORA Work Plan of the Core Group for Fisheries Management".

The consortium COFREPECHE/SOFRECO was awarded the contract and had the task of executing the project, with the help of a Main Resident Expert (MRE) responsible for the coordination and implementation of the Working Group on the Blue Economy's Work Plan in close collaboration with the blue economy team at the IORA Secretariat.



Participants at the IORA Workshop on Blue Carbon Research, Madagascar.

Overview of the Technical Assistance

Having started on the 14th of May 2020, in the middle of the Covid-19 pandemic, all activities related to the Technical Assistance ended in May 2023.

The Technical Assistance focused on 5 objectives of the IORA WGBE's Work Plan, with a total of 26 separate activities which were planned over a period of 3 years. The main objectives were to:

- **Combat Illegal, Unreported and Unregulated (IUU) fishing in IORA region**
- **Promote sustainable fisheries management**
- **Promote sustainable aquaculture development**
- **Promote and implement open market access to fish trade, including aquaculture**
- **Standardise blue carbon assessment methods in the Indian Ocean**

Webinars, online training workshops, workshops, technical studies, and reviews were grant funded and two workshops were co-financed, namely a training workshop on 'Best practices in sea cucumber seed production and tubular seaweed farming for commercial operations' with the Republic of Tanzania and which took place in Zanzibar, Tanzania from the 7th till the 11th of November 2022, and a training on 'Research and sustainable management of the blue carbon ecosystem', with the Republic of Madagascar, and which was organised by the University of Toliara in Madagascar from the 27th of November to the 2nd of December 2022.

In total, 15 technical publications, 3 training videos, 3 technical training protocols, 11 online events, and 3 physical workshops were produced with the support of the Technical Assistance.



Aquaculture Training, Zanzibar, Tanzania - Preparing sea cucumbers for artificial spawning.

Activity overview

Activities were held in line with the five objectives of the Working Group on Blue Economy' Work Plan.

As part of the 17 Sustainable Development Goals (SDG) developed by the United Nations, Goal 14 deals with **“conserving and sustainably using the oceans, seas and marine resources. Healthy oceans and seas are essential to human existence and life on Earth as they cover 70 percent of the planet and provide food, energy and water. The ocean absorbs around one quarter of the world’s annual carbon dioxide (CO2) emissions, thereby mitigating climate change and alleviating its impacts.”**

Since it is becoming increasingly crucial to conserve and use them in a sustainable manner, the activities held during the Technical Assistance aimed at fulfilling some of the targets associated with SDG Goal 14.










Minister for Blue Economy and Fisheries of Zanzibar – Official Opening of the IORA aquaculture training workshop on seaweed and sea cucumber.



Women building a tubular net system for Seaweed farming (Zanzibar).

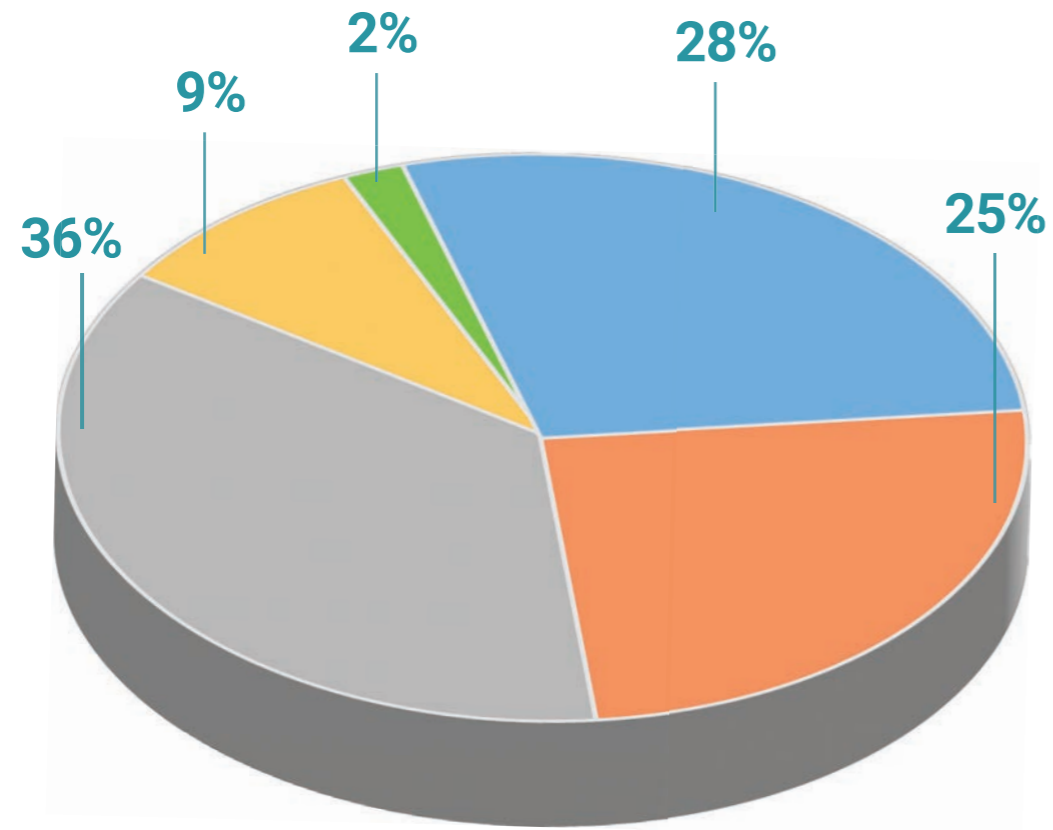


IORA, AFD and COFREPECHE staff at the Seychelles by-catch training workshop.

Objectives	Activities	Sustainable Development Goal
 <p>1. To combat Illegal, Unreported and Unregulated (IUU) fishing in IORA region</p>	<p>Conduct an assessment of the capacity needs required (human and institutional) and the current level of implementation of Port State Measures in the IORA region</p>	<p>SDG 14.4 – By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics</p>
	<p>Support Member States to exchange information on IUU fishing vessels among Member States</p>	
	<p>Analysis of measures against IUU fishing vessels and recommendations</p>	
	<p>Promote and provide support to Member States to sign up the Port States Measures Agreement</p>	
 <p>2. To promote sustainable fisheries management</p>	<p>Provide Technical Assistance and organise capacity-building programmes for the developing of Member States of IORA to initiate remote sensing methods for identifying IUU vessels</p>	<p>SDG 14.4 - By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics</p> <p>SDG Indicator 14.4.1 – Proportion of fish stocks within biologically sustainable levels</p>
	<p>Support Member States to engage with appropriate Regional Bodies for advice</p>	
	<p>Initiate a capacity building programme in fish stock management</p>	
 <p>3. To promote sustainable aquaculture development</p>	<p>Workshop on utilisation of Satellite services for fish stock assessment and a climate warning system</p>	<p>SDG 14.7 – By 2030, increase the economic benefits to Small Island Developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism</p>
	<p>Provide a training programme on enhancing a by-catch landing, valorisation, traceability and quality, including the development of safe handling guides and species identification guides</p>	
	<p>Establish cooperation among the Member States to regulate harvesting and combat overfishing and destructive fishing practices within the spirit of SDG 14.4</p>	
	<p>Promote small-scale rural aquaculture</p>	
	<p>Sharing of knowledge and best practices on grow-out aquaculture technology for commercial scale operations</p>	
 <p>4. To promote and implement open market access to fish trade, including aquaculture</p>	<p>Undertake a review of the existing capacity of Member States and the needs across a broad range of domains including species selection, site selection, breeding, food development, husbandry, and disease</p>	<p>SDG 14.B – Provide access for small-scale artisanal fishers to marine resources and markets respectively</p>
	<p>Design of a training programme on seed production and hatcheries operations management in the Indian Ocean</p>	
	<p>Design of a training on Integrated Multi-trophic Aquaculture for maximum production</p>	
	<p>Design of a training programme on health management, disease diagnosis and treatment of cultured species in IORA region</p>	
 <p>5. To standardise Blue Carbon assessment methods in the Indian Ocean</p>	<p>Conduct a workshop on self-producing aquaculture feed techniques for traditional farmers</p>	<p>SDG 14.7 - By 2030, increase the economic benefits to Small Island Developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism</p>
	<p>Enhance the knowledge of Member States on international trade and markets for fisheries and aquaculture products</p>	
	<p>Conduct a workshop on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region</p>	
 <p>5. To standardise Blue Carbon assessment methods in the Indian Ocean</p>	<p>Undertake a Capacity Building programme on sustainable development of the fisheries and aquaculture sectors through appropriate Regional Trade Agreements</p>	<p>SDG 14.2 – By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans</p>
	<p>Conduct training on managing biosecurity for both Fisheries and Aquaculture products at entry points</p>	
	<p>Conduct a feasibility study towards certification for export market of fisheries products</p>	
 <p>5. To standardise Blue Carbon assessment methods in the Indian Ocean</p>	<p>Develop a manual of blue carbon standard methods to be used for standardised baseline data sets</p>	<p>SDG 14.2 – By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans</p>
	<p>Provide a training programme on blue carbon study and measurement</p>	

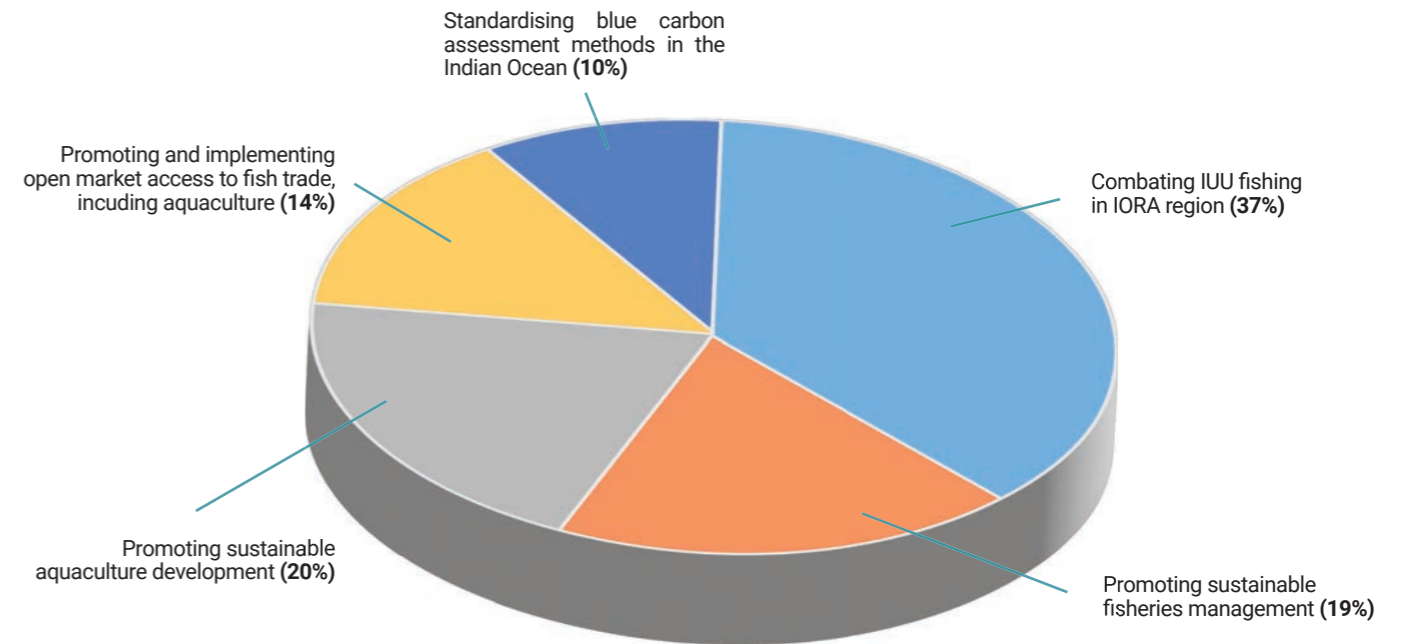
Overall performance

1. Percentage allocation of study fund budget per group of activities since May 2020

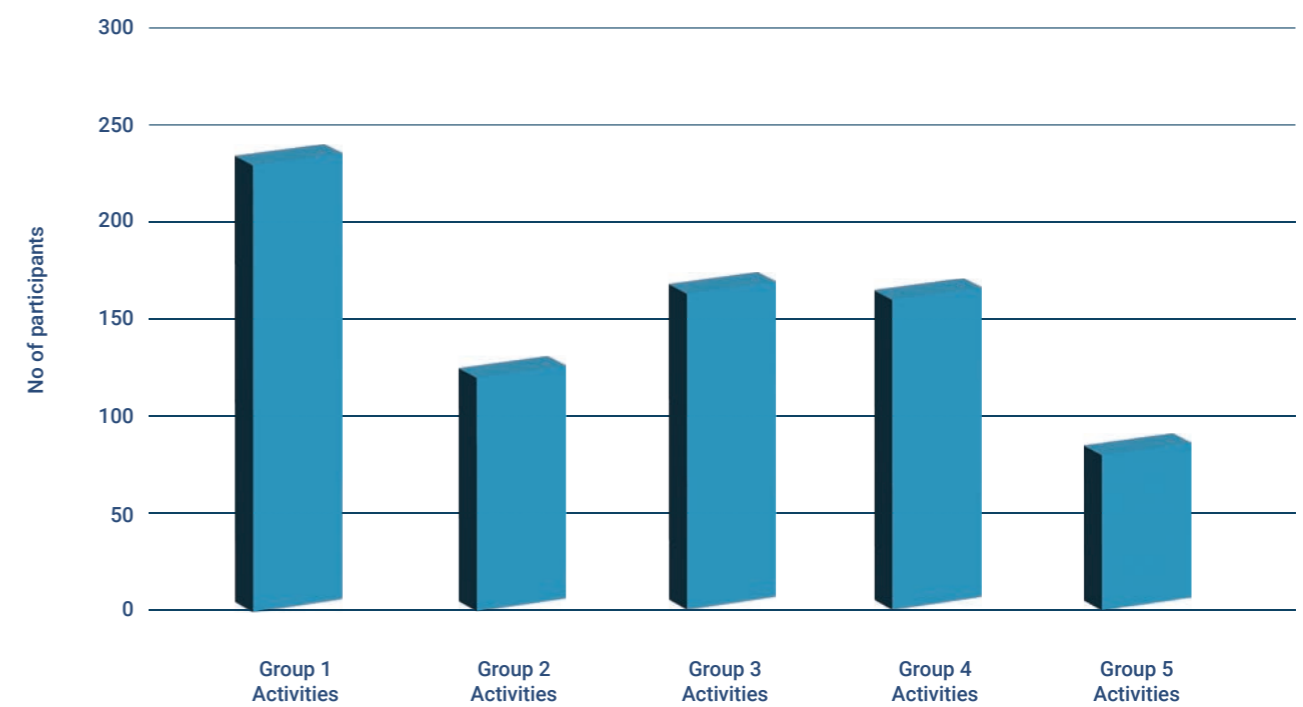


- Group 1: Combating IUU fishing in IORA Region
- Group 2: Promoting sustainable fisheries management
- Group 3: Promoting sustainable aquaculture development
- Group 4: Promoting and implementation open market access to fish trade, including aquaculture
- Group 5: Standardising blue carbon assessment methods in the Indian Ocean

2. Achievements and results of the Blue Economy Work Plan for the three years of the Technical Assistance



Total number of participants attending online events by group of activities





Group 1 of Activities

Combating Illegal, Unreported and Unregulated fishing in IORA region

Context

While the objective of Sustainable Development Goal 14 is to “conserve and sustainably use the oceans, seas and marine resources”, its key target, namely to eliminate Illegal, Unreported and Unregulated (IUU) fishing by 2020, is generally difficult to achieve.

Combating IUU fishing remains a momentous challenge at global level, including for members of the Indian Ocean Rim Association. Undermining the sustainable management and exploitation of the world’s fisheries resources, the impact of IUU fishing is rapidly driving the depletion of fish stocks while also affecting the communities depending on the fisheries sector.

As a persistent and pressing problem estimated to account for up to USD 23 billion annually in regions of the Eastern Indian Ocean alone, the effects of IUU fishing can be devastating, especially for Small Island and Coastal Developing States which rely heavily on their marine resources.

In addition, States unable to meet international obligations for fisheries management and governance, may impact on the sustainability of the fish stocks.

The following results were expected (I) the harmonisation of Port State measures among IORA Member States and (II) the reduction of IUU fishing activities in the region.

A webinar on combating illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region, as well as a Blue Economy Virtual Workshop on IUU fishing on “Moving toward the development and adoption of IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains” were held on the 16th September 2021 and on the 23rd till the 24th of March 2022.

An assessment of the capacity needs required (human and institutional) and the current level of implementation of Port State Measures in the IORA region was conducted and an analysis of measures against IUU fishing vessels and recommendations was undertaken. The results of these two technical reports were presented during the webinar on combating illegal, unreported, and unregulated fishing, where recent developments, measures, and tools to combat IUU fishing in the IORA region, with a special emphasis on Port State Measures (16th September 2021), were also showcased.

In March 2022, aided by the Technical Assistance, France held a Blue Economy Virtual Workshop on IUU fishing, “Moving towards the development and adoption of IORA Guidelines

to prevent the entry of IUU fisheries products into IORA Member States supply chains”, to draw the attention of IORA Member States to the issue of IUU fishing in the Indian Ocean region, and how the development and adoption of regional guidelines to prevent the entry of IUU fisheries products into IORA Member States supply chains can become key to contributing to the sustainable management of marine fisheries resources.

A few IORA Member States not yet party to the Port States Measures Agreement (PSMA) engaged in an online PSMA capacity building training course organised by the Food and Agriculture Organisation of the United Nations in cooperation with the IORA in April 2022.

In November of the same year, an online workshop on Remote sensing methods for identifying IUU fishing vessels was organised in collaboration with Collecte Localisation Satellites (CLS), with the inputs from several IORA Member States sharing their experiences on the subject matter. The webinar also provided an overview of the current use of remote sensing application in the IORA region in fighting against IUU fishing.

Finally, in January 2023, a draft of the IORA Guidelines to prevent the entry of IUU fisheries products into the supply chains of IORA Member States was prepared and submitted to the IORA secretariat.

Results

Out of eight IORA Member States not yet party to the Port State measures, six countries attended the PSMA Training. Moreover, the reports produced in the context of these activities provided valuable recommendations on the issues that need to be addressed for a harmonised approach in the fight against IUU fishing.

With regards to the reduction of IUU fishing activities in the region, two webinars namely ‘Combating IUU fishing through the application of the PSMA’ and ‘the online workshop on remote sensing methods’ were held. Advocating two approaches for fighting against and reducing IUU fishing, which are the application of port state measures, as well as the use of remote sensing, the cumulative impact of these two activities, while not exhaustive, encouraged IORA Member States to better engage in proven IUU detection methods and with regional bodies for a better exchange of information.



“MOVING TOWARD THE DEVELOPMENT AND ADOPTION OF IORA GUIDELINES TO PREVENT ENTRY OF IUU FISHERIES PRODUCTS WITHIN IORA MEMBER STATES’ SUPPLY CHAINS”



Speakers of the conference on Combating Illegal, Unreported and Unregulated fishing in IORA region.



A glimpse of undersea life.



Technical report No.5 - Assessment of the capacity needs required and the current level of implementation of port state measures in the IORA region.

WHAT WAS ACHIEVED

Consisted of

6 activities

4 successful online events organised

- An online workshop in collaboration with CLS on remote sensing methods for identifying IUU fishing vessels
- A webinar on combatting illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region
- An online training course organised by the FAO on Promoting the PSMA in the IORA Member States
- A Blue Economy Virtual Workshop on IUU fishing, “Moving toward the development and adoption of IORA Guidelines to prevent the entry of IUU fisheries products into IORA Member States supply chains”

3

Technical Reports produced including draft guidelines

93%

Realisation of activities

Impacts:

- Port State measures among IORA Member States harmonised
- Reduction of IUU fishing activities in the region



Group 1 of Activities

Combating Illegal, Unreported and Unregulated fishing in IORA region

Context

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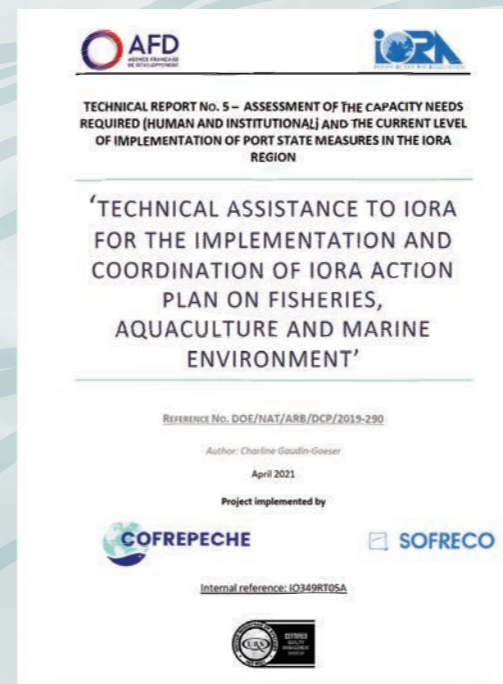
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Speakers of the conference on Combating Illegal, Unreported and Unregulated fishing in IORA region.



A glimpse of undersea life.



Technical report No.5 - Assessment of the capacity needs required and the current level of implementation of port state measures in the IORA region.

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6 activities

4 successful online events organised

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3

Technical Reports produced including draft guidelines

93%

Realisation of activities

Impacts:

- I. Port State measures among IORA Member States harmonised
- II. Reduction of IUU fishing activities in the region



Group 1 of Activities

Combating Illegal, Unreported and Unregulated fishing in IORA region

Context

While the objective of Sustainable Development Goal 14 is to “conserve and sustainably use the oceans, seas and marine resources”, its key target, namely to eliminate Illegal, Unreported and Unregulated (IUU) fishing by 2020, is generally difficult to achieve.

Combating IUU fishing remains a momentous challenge at global level, including for members of the Indian Ocean Rim Association. Undermining the sustainable management and exploitation of the world’s fisheries resources, the impact of IUU fishing is rapidly driving the depletion of fish stocks while also affecting the communities depending on the fisheries sector.

As a persistent and pressing problem estimated to account for up to USD 23 billion annually in regions of the Eastern Indian Ocean alone, the effects of IUU fishing can be devastating, especially for Small Island and Coastal Developing States which rely heavily on their marine resources.

In addition, States unable to meet international obligations for fisheries management and governance, may impact on the sustainability of the fish stocks.

The following results were expected (I) the harmonisation of Port State measures among IORA Member States and (II) the reduction of IUU fishing activities in the region.

A webinar on combating illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region, as well as a Blue Economy Virtual Workshop on IUU fishing on “Moving toward the development and adoption of IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains” were held on the 16th September 2021 and on the 23rd till the 24th of March 2022.

An assessment of the capacity needs required (human and institutional) and the current level of implementation of Port State Measures in the IORA region was conducted and an analysis of measures against IUU fishing vessels and recommendations was undertaken. The results of these two technical reports were presented during the webinar on combating illegal, unreported, and unregulated fishing, where recent developments, measures, and tools to combat IUU fishing in the IORA region, with a special emphasis on Port State Measures (16th September 2021), were also showcased.

In March 2022, aided by the Technical Assistance, France held a Blue Economy Virtual Workshop on IUU fishing, “Moving towards the development and adoption of IORA Guidelines

to prevent the entry of IUU fisheries products into IORA Member States supply chains”, to draw the attention of IORA Member States to the issue of IUU fishing in the Indian Ocean region, and how the development and adoption of regional guidelines to prevent the entry of IUU fisheries products into IORA Member States supply chains can become key to contributing to the sustainable management of marine fisheries resources.

A few IORA Member States not yet party to the Port States Measures Agreement (PSMA) engaged in an online PSMA capacity building training course organised by the Food and Agriculture Organisation of the United Nations in cooperation with the IORA in April 2022.

In November of the same year, an online workshop on Remote sensing methods for identifying IUU fishing vessels was organised in collaboration with Collecte Localisation Satellites (CLS), with the inputs from several IORA Member States sharing their experiences on the subject matter. The webinar also provided an overview of the current use of remote sensing application in the IORA region in fighting against IUU fishing.

Finally, in January 2023, a draft of the IORA Guidelines to prevent the entry of IUU fisheries products into the supply chains of IORA Member States was prepared and submitted to the IORA secretariat.

Results

Out of eight IORA Member States not yet party to the Port State measures, six countries attended the PSMA Training. Moreover, the reports produced in the context of these activities provided valuable recommendations on the issues that need to be addressed for a harmonised approach in the fight against IUU fishing.

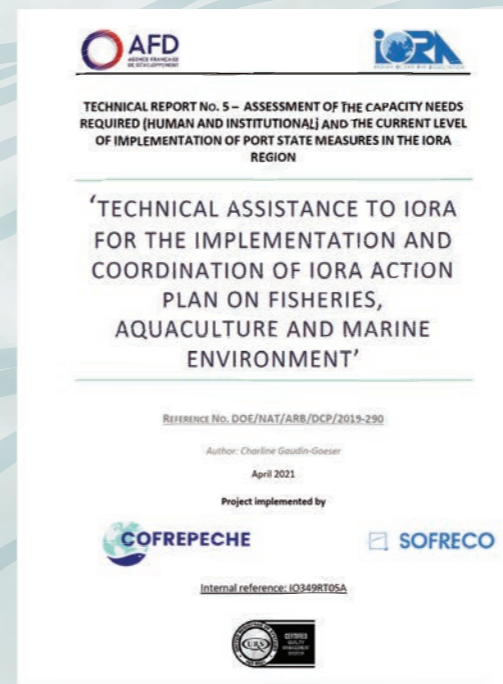
With regards to the reduction of IUU fishing activities in the region, two webinars namely ‘Combating IUU fishing through the application of the PSMA’ and ‘the online workshop on remote sensing methods’ were held. Advocating two approaches for fighting against and reducing IUU fishing, which are the application of port state measures, as well as the use of remote sensing, the cumulative impact of these two activities, while not exhaustive, encouraged IORA Member States to better engage in proven IUU detection methods and with regional bodies for a better exchange of information.



Speakers of the conference on Combating Illegal, Unreported and Unregulated fishing in IORA region.



A glimpse of undersea life.



Technical report No.5 - Assessment of the capacity needs required and the current level of implementation of port state measures in the IORA region.

WHAT WAS ACHIEVED

Consisted of

6 activities

4 successful online events organised

- An online workshop in collaboration with CLS on remote sensing methods for identifying IUU fishing vessels
- A webinar on combatting illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region
- An online training course organised by the FAO on Promoting the PSMA in the IORA Member States
- A Blue Economy Virtual Workshop on IUU fishing, “Moving toward the development and adoption of IORA Guidelines to prevent the entry of IUU fisheries products into IORA Member States supply chains”

3

Technical Reports produced including draft guidelines

93%

Realisation of activities

Impacts:

- I. Port State measures among IORA Member States harmonised
- II. Reduction of IUU fishing activities in the region



Group 2 of Activities

Promoting sustainable fisheries management

Context

As a key component of the sustainable stewardship of living marine resources, stock assessments provide crucial scientific information to resource managers from IORA Member States. According to the FAO (*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO, 2022*) fishery resources continue to decline due to overfishing, pollution, poor management and other factors, but the number of landings from biologically sustainable stocks is on the rise. The fraction of fishery stocks within biologically sustainable levels decreased to 64.6 percent in 2019, 1.2 percent lower than in 2017, and rebuilding overfished stocks could increase fisheries production by 16.5 million tonnes (*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO, 2022*) and raise the contribution of marine fisheries to the food security, nutrition, economic growth and well-being of coastal communities.

While the resilience of the resources depends largely on the biological characteristics (population dynamics) of the stock, the fecundity, the intrinsic growth rate, natural mortality, and the additional mortality imposed on the fish population by fishing, other factors include vulnerability dependent on season, aggregation, as well as response to gear, etc.

As such, stock assessments provide the scientific basis for fisheries management by setting annual catch targets and limits to prevent overfishing, whilst also monitoring the current conditions of fishery resources. In addition to existing Geographical Information Systems and Remote Sensing methods, cooperation among IORA Member States is also necessary to better regulate fishing practices, especially about migratory and transboundary species like tuna or demersal stocks on the high seas.

In addition, many fisheries by-catch species are used for food by coastal communities, in processed forms such as salted, smoked, or otherwise. These value-added fish products constitute a lucrative export market, and hygiene, safe handling practices, quality control, and traceability are equally important factors that have to be taken into consideration. Hence, improving the use of the marine resources is critical for food security.

The Group 2 of activities aimed at improving: **(i) the sustainability of fisheries resource levels in the IORA region (ii) knowledge on stock assessment and sustainable fisheries management practices.**

Following a series of assessments, two technical reports, Compendium of stock assessment training and courses in the IORA region and Existing capacity, uses and needs for stock assessment training and courses in the IORA region, were produced and published on the IORA website. The results of these reports were also shared during a webinar titled Initiate a capacity building programme for fish stock assessment on the 13th of July 2021, with the help of the Food and Agriculture Organisation of the United Nations, the Commonwealth Scientific and Industrial Research Organisation, as well as the technical expert.

In November of the same year, a webinar on the *utilisation of satellite services for fish stock assessment and a climate warning system* was held, with the webinar report published on the IORA website.

Held from the 29th of March to the 1st of April 2022, a workshop was organised in collaboration with the Government of the Republic of Seychelles to train participants from Member States on enhancing by-catch landing, valorisation, traceability and quality.

In January 2023, an online workshop was held in collaboration with the Food and Agriculture Organisation (FAO) on evaluation, monitoring progress and establishing cooperation among IORA Member States, in order to address the SDG 14.4.

Results

Two events were held in line with fisheries resource levels sustained and improved in the IORA region, namely the by-catch training in Seychelles on enhancing landing and valorisation, as well as the online workshop on the promotion of the reporting and monitoring of SDG 14.4, to raise awareness and build capacity on sustainable fisheries management. With 60% of fish stock in the IORA region considered to be sustainable, compliance with the reporting and monitoring of SDG 14.4.1 indicator attained 60% through the partial contribution and work done carried out by Member States by the Technical Assistance team. Further improvement should be expected down the line.

Improved knowledge on stock assessment and sustainable fisheries management practices were achieved through a detailed assessment of existing capacity use. The needs for stock assessment training and courses for IORA Member States, as well as short-term courses for fisheries managers, were identified for further consideration by the IORA Member States.



Speakers of the webinar on Utilization of Satellite services for fish stock assessment and a climate warning system



Opening Session of IORA Training Workshop on by-catch in Seychelles.



Participants observing by-catch landing, Seychelles (By-Catch Training Workshop).



By-catch processing - Seychelles.

WHAT WAS ACHIEVED

Consisted of

4 activities

3 online events and one training

- A webinar on "Initiate a capacity building programme for fish stock assessment"
- A webinar on the utilisation of satellite services for fish stock assessment and a climate warning system
- An online workshop on promoting the SDG 14.4 monitoring and evaluation and establishing cooperation among the IORA Member States on the SDG 14.4 indicator
- A training workshop on enhancing by-catch landing, valorisation, traceability and quality in the Seychelles

2 | **96%**

Technical Reports produced

Implementation rate

Impact:

- I. Promoted sustainable fisheries management



Group 3 of Activities

Promoting sustainable aquaculture development

Context

Since 2018, the IORA Member States' aquaculture production has gradually increased to reach around 28.2 million metric tonnes in 2022, which represents approximately 23 % of global aquaculture production. (FAO 2023, FishStatJ: database accessed on 2 August 2023: <https://www.fao.org/fishery/en/topic/166235/en>). Expected to increasingly fill the shortfall in aquatic food products by sustaining global growth in the near future, the development of aquaculture in the Indian Ocean remains however hindered by several challenges.

The availability of seed stock, appropriate technology, well-defined legal and policy framework, development of value-chains, as well as long-term financing and investment, constitute some of these obstacles which need to be addressed for developing aquaculture to a scale where private sector operators can invest in it before communities can start benefiting from the sustainable aquaculture operations.

By providing a strategic focus on long-term aquaculture development in the region, IORA's Blue Economy Work Plan aims to address the challenge of the sector. As such, capacity building for IORA Member States is undoubtedly key to uplifting aquaculture practices in those countries, but it is also a long-term process, which will require significant funding resources.

Type	2018	2019	2020
Marine Aquaculture	10.84	9.19	8.81
Brackish water Aquaculture	3.51	4.67	5.12
Freshwater Aquaculture	13.13	14.12	14.31
Total (Million Tonnes)	27.48	27.98	28.23

Table 1: Aquaculture production in IORA Member States.



Participants arriving at the Zanzibar Fish Hatchery for training on sea cucumber seeding.

Results

To achieve 'A sustainable aquaculture practices implemented, focusing on rural and coastal communities in IORA Member States, including Small Island Developing States (SIDS) and Least Developing Coastal States (LDCS)', a comprehensive review of aquaculture, governance and development of small-scale aquaculture in the IORA region, and a report on existing initiatives in small-scale aquaculture based on 4 case studies, were produced and published on the IORA website. A webinar was also held to present the results of these two technical studies in August 2021.

In March 2022, following the circulation of a survey to IORA Member States, a technical report reviewed the existing capacity and needs of all members across a broad range of domains, including species selection, site selection, breeding, food development, husbandry, and disease. The results were then analysed and consolidated into a review.

An online training workshop held in July 2022 focused on self-producing aquaculture feed techniques for traditional farmers, which included a training video on How to prepare insect feed for small-scale and rural aquaculture, and a protocol for constructing a simple inset production unit.

From the 7th to 11th of November 2022, the Technical Assistance supported the organisation of a training workshop on best practices in sea cucumber seed production and tubular seaweed farming in Zanzibar, Tanzania to encourage knowledge sharing and best practices on grow-out aquaculture for commercial scale operations. Two technical protocols and two training videos on sea cucumber reproduction in Mozambique and tubular net for seaweed farming in Tanzania were also produced in this context.

The promotion of insect feed production, sea cucumber and seaweed seed production successfully contributed to the accomplishment of the "result" Sustainable aquaculture practices implemented, focusing on rural and coastal communities in IORA Member States, including SIDS and LDCs. Three training videos focusing strongly on supporting the development of sustainable aquaculture practices in rural and coastal communities were produced.



Participants - Training Workshop on best practices in sea cucumber and seaweed seeding, Zanzibar, Tanzania.



Demonstration on constructing a tubular net system for seaweed farming, Zanzibar, Tanzania.



Participants tying seaweed stems for farming in Zanzibar, Tanzania.



Participants preparing seawater tank for sea cucumber spawning, Zanzibar, Tanzania.

WHAT WAS ACHIEVED

Consisted of

7

activities

3

online events and one training

- A webinar to review the existing capacity and needs for aquaculture development in IORA Member States
- A webinar on promotion of small-scale rural aquaculture
- An online training workshop on self-producing aquaculture feed techniques for traditional farmers
- A training workshop on best practices in sea cucumber seed production and tubular seaweed farming for commercial operations in Zanzibar, Tanzania

3 Training videos and protocols

- Training video on Insect farming for small scale aquaculture operations and training protocol
- Sea cucumber seeding training video and training protocol
- Seaweed seeding and tubular farming method training video and training protocol

96%

Implementation rate

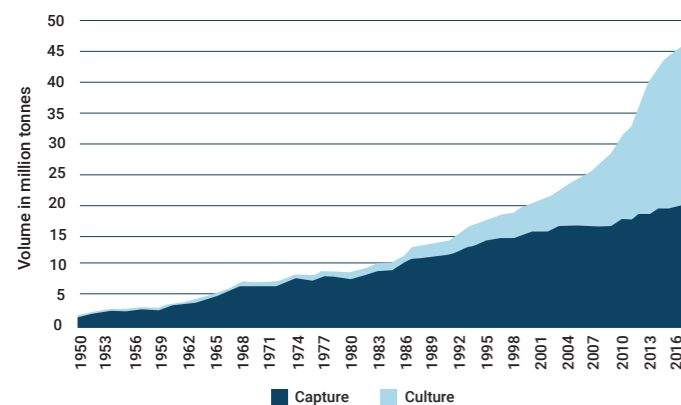
Impact:
I. Promoted sustainable aquaculture development



Group 4 of Activities

Promoting and implementing open market access to fish trade, including aquaculture

Context



Landings and aquaculture production in IORA Member States. Source: FAO FishStat, 2020

In IORA region, exports are dominated by crustaceans (shrimp), various marine fishes, and molluscs. Imports are dominated by marine fishes. International seafood trade within the IORA region has been relatively modest, while exports from the region to major markets have been significant and growing. As a region, the “seafood trade balance” is positive, i.e., the region exports more than it imports in terms of value, but this varies greatly from country to country.

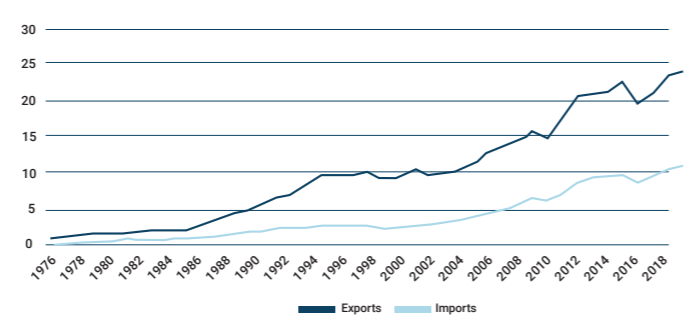
The most important export markets for the region are Asia, North America and Europe. Asian and Southeast Asian markets account for 44 % of total exports, while North America accounts for 27 % and Europe 15 %. Most of the imports come from Asia and Southeast Asia (60 % of total imports). (FAO 2023, FishStatJ: database accessed on 2 August 2023: <https://www.fao.org/fishery/en/topic/166235/en>)

Intra-regional trade in the IORA region appears to be little developed, except for the major trading countries in the region (Thailand, Australia, Malaysia, Singapore and the United Arab Emirates).

The largest fishing nations in the region are Indonesia (7.3 million tonnes in 2018), India (5.3 million tonnes), Bangladesh (1.9 million tonnes). With regards to seafood, the region as a whole is an active exporter as well as a key importer. While India, Thailand and Indonesia are some of the biggest exporters, Australia, Malaysia and Singapore constitute some of the major importers of seafood.

In terms of value, total exports amounted to USD 24.1 billion, whereas imports represented USD 11 billion, making the IORA region a net exporter of seafood. Despite being relatively stable, the gap between exports and imports has widened over the last years, as illustrated by Chart 3.

Intra-regional trade between IORA Member States is relatively low and could be enhanced with better access to market information and opportunities, including through inherent bilateral or multilateral trade arrangements.



Gap between seafood exports and imports for IORA region. Source: FAO FishStat, 2020

Results

To achieve ‘The promotion and facilitation of open market access through high quality fisheries and aquaculture products and fish trade’, studies, training and capacity building were carried out by the Technical Assistance.

To support the development of a fish trade study for the purpose of evaluating fish trade and aquaculture products among IORA Member States, a literature review and gap analysis of information on international trade and markets for fisheries and aquaculture products was undertaken.

In April 2021, a webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region was held for IORA Member States. This webinar was successfully achieved after identifying gaps and underlining the importance of safety standards, as well as the trading of high-quality fish products in the IORA region.

In addition, 23 States trade profile reports were prepared to present trade information in the fisheries sector for each IORA Member State, resulting in the production of the technical report International trade study - Review of fish trade in the IORA region. The outcomes of this study were presented in October 2021 during a webinar along with recommendations to improve fish trade. In addition to the work that was carried out concerning the level of open market accessibility and intra-regional trade in the future, the comprehensive capacity-building programme developed by the Technical Assistance should also enhance and facilitate trading in the region.

After reviewing fish trade agreements in the IORA region, a capacity building training programme was created for the sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements.

TECHNICAL ASSISTANCE TO IORA FOR THE IMPLEMENTATION AND COORDINATION OF IORA ACTION PLAN ON FISHERIES, AQUACULTURE AND MARINE ENVIRONMENT

Speakers: Marcio Castro de Souza (Senior Fisheries Officer, FAO), Erik Hempel (International Trade Expert, AFD), Shirlene Maria Anthonyvamy (Director of INFOFISH, Malaysia), Blessing Mapfumo (International Trade Expert, AFD).

12 October 2021
07:00 – 09:30 hrs GMT
11:00 – 13:30 hrs
In Mauritius

Speakers for the webinar on : Enhancing the knowledge on international trade and markets for fisheries and aquaculture products in the IORA region.

AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

TECHNICAL REPORT NO. 7 – INTERNATIONAL TRADE STUDY – REVIEW OF FISH TRADE IN THE IORA REGION

‘TECHNICAL ASSISTANCE TO IORA FOR THE IMPLEMENTATION AND COORDINATION OF IORA ACTION PLAN ON FISHERIES, AQUACULTURE AND MARINE ENVIRONMENT’

REFERENCE NO. DOE/NAT/ARB/DCP/2019-290

Authors: Blessing Mapfumo and Erik Hempel
November 2021

Project implemented by COFREPECHE and SOFRECO

Internal reference: IO349R07B

Technical report No. 7 - International Trade Study - Review of fish trade in the IORA Region.



Yellowfin tuna ready for storage - By-catch Training, Seychelles.

WHAT WAS ACHIEVED

Consisted of

5 activities

1 Online event

- A webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region

4 Technical Reports produced

Impact:

1. Promoted and implemented open market access to fish trade, including aquaculture



Group 5 of Activities

Standardising blue carbon assessment methods in the Indian Ocean

Context

Rich in blue carbon ecosystems, the tropical Western Indian Ocean (WIO) region hosts dense mangrove forests covering more than 733 000 ha (5.3% of the total mangrove cover worldwide), with diverse seagrass meadows reaching more than 40m deep. In addition, the States within and surrounding the Indian Ocean basin contain approximately 50% (an estimated 76,275 km²) of the world's mangrove forests, as well as a large, but unknown proportion of its seagrass meadows. (WIOMSA 2016, database accessed on 25 August 2023: <https://www.wiomsa.org/publications/mangroves-of-the-western-indian-ocean-status-and-management/>)

Despite their importance, coastal blue carbon ecosystems are some of the most threatened ecosystems on our planet. Indeed, since the 19th century, nearly 50% of the pre-industrial and natural extent of global coastal wetlands have been lost at four times the rate of tropical forests. With climate change threatening to accelerate these losses, the current loss rate, depending on the ecosystem type, varies between 0.5 and 3% annually, with ongoing carbon losses from blue carbon ecosystems estimated to account for up to 19% of emissions from global deforestation.

Fully recognising that healthy blue carbon ecosystems are vital for providing habitat for marine species; supporting fish stocks and food security; sustaining coastal communities and livelihoods; filtering water flowing into our oceans and reef systems; and protecting coastlines from erosion and storm surges, the working group on the blue economy is advocating for robust scientific, policy and governance frameworks with regards to the protection and restoration efforts in the development and promotion of the blue economy.

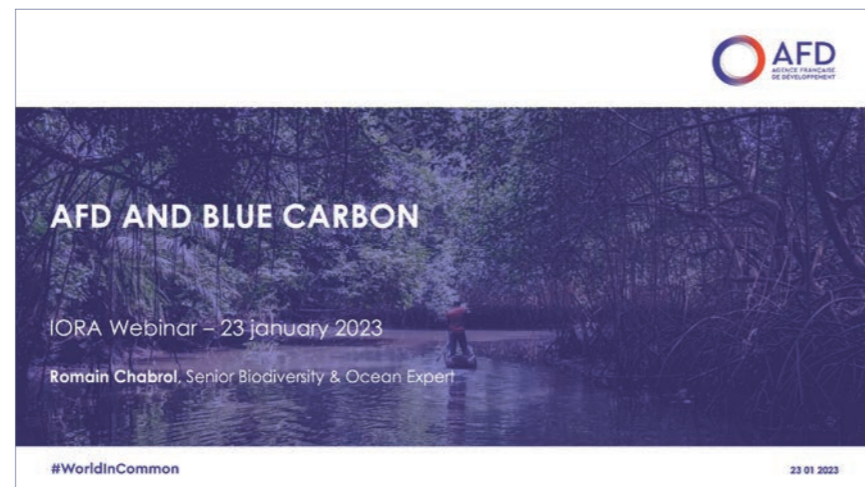


Results

With regards to the standardisation of methods for blue carbon assessment in the IORA Member States, two main outputs were achieved.

Working in collaboration with the University of Toliara (Fishery and Marine Science Institute-IHSM) from Madagascar, a training workshop on research and sustainable management of the blue carbon ecosystem was organised and co-financed with the Technical Assistance's support from the 27th of November to the 2nd of December 2022 with the aim of highlighting the importance of blue carbon assessment and advocating for the adoption of the blue carbon Initiative manual as the standard for blue carbon assessments. Capacities of Member States were also strengthened via the training workshop in Madagascar which focused on field and laboratory technical training on blue carbon measurements.

In January 2023, a webinar was held in collaboration with the IORA Blue Carbon Hub, the Blue Carbon Initiative, the International Partnership for Blue Carbon, and the Great Blue Wall Initiative, to promote the Blue Carbon Initiative manual for standardised blue carbon assessment methods for IORA Member States.



Participants - IORA Training Workshop on Blue Carbon Research, Madagascar.



Participants in Session - IORA Training Workshop on Blue Carbon Research, Madagascar.



Participants taking soil core samples from the mangrove area- IORA Training Workshop on Blue Carbon Research, Madagascar.



Preparing collected soil core samples collected in the laboratory - IORA Training Workshop on Blue Carbon Research, Madagascar.

WHAT WAS ACHIEVED

Consisted of

2 activities

1 **1**

Online event

Workshop

- A webinar promoting the Blue Carbon Initiative (BCI) manual for standardised blue carbon assessment methods in the Indian Ocean
- A training workshop on research and sustainable management of the blue carbon ecosystem, in Madagascar, Toliara

100% Completed

Impact:

1. Standardised blue carbon assessment methods in the Indian Ocean

Cooperation and synergies with stakeholders

The project was quite successful in fostering the cooperation with several intergovernmental agencies by involving them in online events and trainings hosted by the IORA such as the:



Notwithstanding, many IORA Member States actively participated in the activities by sharing their challenges and experiences on various blue economy topics.

Synergies were developed with stakeholders namely with private, non-governmental and government-related institutions such as Stop Illegal Fishing, Commonwealth Scientific and Industrial Research Organisation, Collecte Localisation Satellites, TM-Tracking, INFOFISH Malaysia, Institut de Recherche pour le Développement, OLSPS Marine Fisheries Management Solutions, Oceanographic Research Institute, IORA Blue Carbon Hub, ICAR Central Institute of Fisheries Technology India, National Remote Sensing Centre India, CSIRO - Commonwealth Scientific and Industrial Research Organisation (Australia) as well as the Indian Space Research Organisation India. In addition, entrepreneurs and companies were also able to participate in the implementation of the Working Group for the Blue Economy Work Plan through knowledge sharing and the bonding of existing networks.

As a result, the effective collaboration supported three key areas:

Knowledge: Increased awareness, knowledge and know-how used by IORA national experts and organisations (including communities and practitioners in fisheries and aquaculture) on addressing issues in the management of the fisheries and aquaculture resources.

Policy: Increasing awareness of the blue economy agenda of the IORA translated into methods and guidance, as well as capacity in managing the blue economy space within the Member States.

Capacity building: The capacity building activities addressed opportunities to empower communities and livelihoods, and to increase national capacity in areas such as Illegal, Unreported and Unauthorised fishing, aquaculture development and fisheries management.

List of events, technical reports and training videos prepared with the support of AFD-IORA Technical Assistance

List of webinars and workshops organised	List of Technical Reports produced by the AFD- IORA TA
A webinar on combatting illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region (16 September 2021)	Technical Report No. 01 – Compendium of stock assessment training and courses in the IORA region
A webinar on the utilisation of satellite services for fish stock assessment and a climate warming system (30 November 2021)	Technical Report No. 02 – Literature review and gap analysis of information on international trade and markets for fisheries and aquaculture products
A webinar on promotion of small-scale rural aquaculture (31 August 2021)	Technical report No. 03 – Review of aquaculture, governance and development of small-scale aquaculture in the IORA region
A webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region (27 April 2021)	Technical report No. 04 – Analysis of measures to combat IUU fishing in the IORA region
A webinar promoting the Blue Carbon Initiative (BCI) manual for standardised blue carbon assessment methods in the Indian Ocean (23 January 2023)	Technical report No. 05 – Assessment of the capacity needs required (human and institutional) and the current level of implementation of port state measures in the IORA region.
A webinar for review on the existing capacity and needs for aquaculture development (15 March 2022)	Technical report No. 06 – Existing capacity, uses and needs for stock assessment training and courses in the IORA region
An online workshop on promoting the SDG 14.4 monitoring and evaluation and establishing cooperation among the IORA Member States on the SDG 14. 4 indicator with the participation of FAO (25 January 2023)	Technical report No. 07 – International trade study – Review of fish trade in the IORA region, including 23 IORA Member States’ trade profile in the fisheries sector
An online training course to raise awareness of the benefits of the PSMA delivered by FAO (25 – 29 April 2022)	Technical report No. 08 – Examples of existing initiatives in small-scale rural aquaculture in the IORA region
An online workshop in collaboration with CLS on remote sensing methods for identifying IUU fishing vessels (15th November 2022)	Technical Report No. 09 – Review of the existing capacity of IORA member states and the needs across a broad range of domains, including species selection, site selection, breeding, food development, husbandry, and disease
An online training workshop on self-producing aquaculture feed techniques for traditional farmers was carried out (7 July 2022)	Technical Report No. 10 – Undertake a capacity building programme on sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements – review of fish trade agreements in the IORA region
A Blue Economy Virtual Workshop on IUU fishing on “Moving toward the development and adoption of IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains”, 23-24 March 2022	Technical Report No. 11 – Undertake a capacity building programme on sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements – Capacity Building Programme
A training workshop on enhancing by-catch landing, valorisation, traceability and quality (29 March to 1 April 2022) in Seychelles	Draft IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains
A training workshop on best practices in sea cucumber seed production and tubular seaweed farming for commercial operations in Zanzibar, Tanzania (7 – 11 November 2022)	Sea Cucumber Seeding training video and training protocol
A training workshop on research and sustainable management of the blue carbon ecosystem, in Madagascar, Toliara (28 November – 2 December 2022)	Seaweed seeding and tubular farming method training video and training protocol
	Training video on Insect farming for small scale aquaculture operations and training protocol

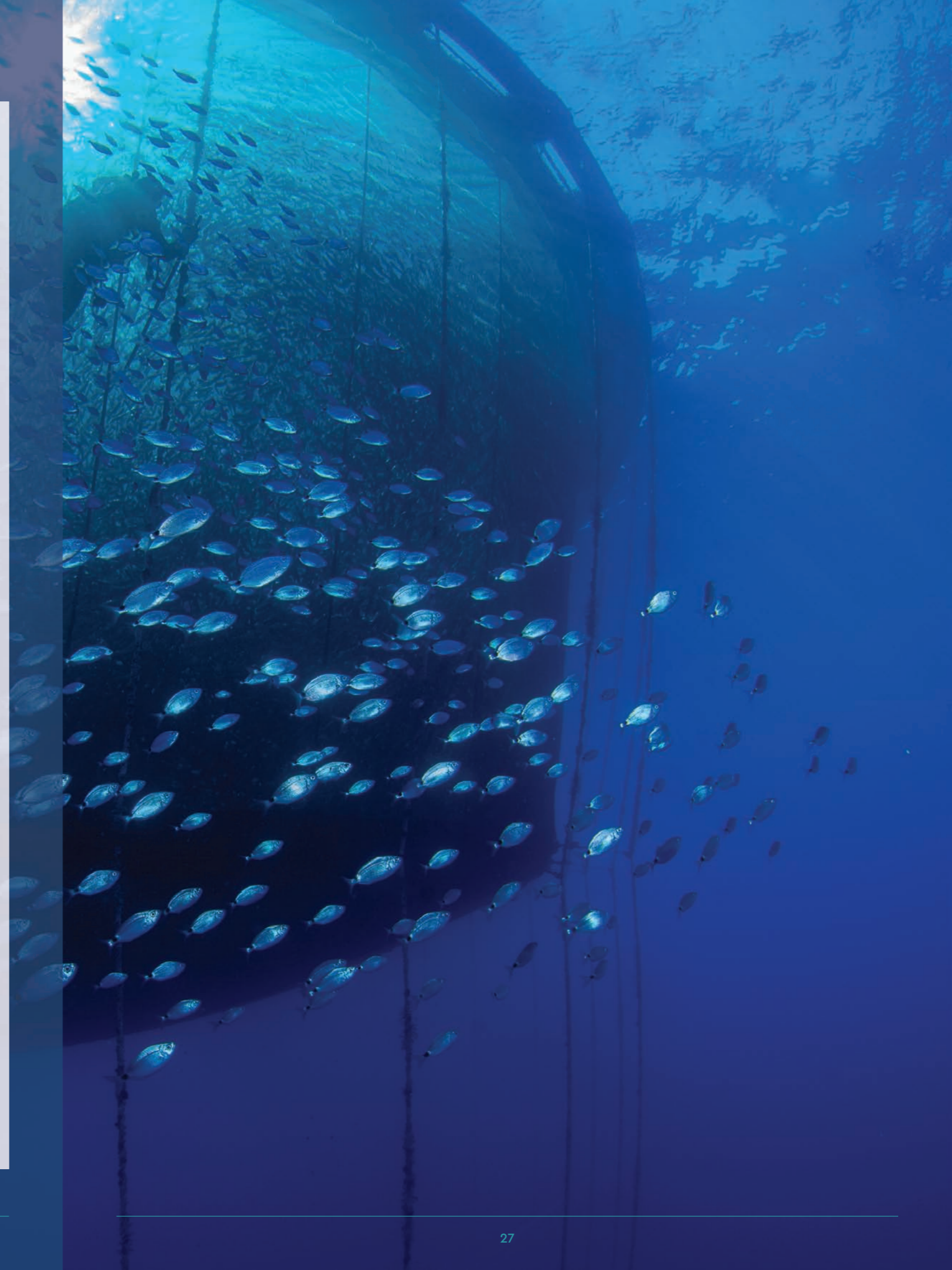
Conclusion

Many technical reports were produced during this project, leveraging productive stakeholder discussions, promoting shared experiences and positive inter-organisational relationships developed within and outside the IORA region. This Technical Assistance provided a platform to foster knowledge exchange and sharing of experiences among its Member States in various fields of the blue economy. The high level of attendance to the events and positive feedback have paved the way for organising more events of that kind.

Overall, it is worth to note that, through the implementation of the Technical Assistance, related to the IORA Blue Economy Work Plan as well as AFD mandate, several SDG 14 goals were achieved, namely, improving livelihoods, knowledge and fostering deep cooperation among the IORA Member States in various fields such as fisheries and aquaculture.



Drying seaweed after harvest in Zanzibar.



Promoting
the Blue Economy and
Fisheries Management



In partnership
with





Group 2 of Activities Promoting sustainable fisheries management

Context

As a key component of the sustainable stewardship of living marine resources, stock assessments provide crucial scientific information to resource managers from IORA Member States. According to the FAO (*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO, 2022*) fishery resources continue to decline due to overfishing, pollution, poor management and other factors, but the number of landings from biologically sustainable stocks is on the rise. The fraction of fishery stocks within biologically sustainable levels decreased to 64.6 percent in 2019, 1.2 percent lower than in 2017, and rebuilding overfished stocks could increase fisheries production by 16.5 million tonnes (*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO, 2022*) and raise the contribution of marine fisheries to the food security, nutrition, economic growth and well-being of coastal communities.

While the resilience of the resources depends largely on the biological characteristics (population dynamics) of the stock, the fecundity, the intrinsic growth rate, natural mortality, and the additional mortality imposed on the fish population by fishing, other factors include vulnerability dependent on season, aggregation, as well as response to gear, etc.

As such, stock assessments provide the scientific basis for fisheries management by setting annual catch targets and limits to prevent overfishing, whilst also monitoring the current conditions of fishery resources. In addition to existing Geographical Information Systems and Remote Sensing methods, cooperation among IORA Member States is also necessary to better regulate fishing practices, especially about migratory and transboundary species like tuna or demersal stocks on the high seas.

In addition, many fisheries by-catch species are used for food by coastal communities, in processed forms such as salted, smoked, or otherwise. These value-added fish products constitute a lucrative export market, and hygiene, safe handling practices, quality control, and traceability are equally important factors that have to be taken into consideration. Hence, improving the use of the marine resources is critical for food security.

The Group 2 of activities aimed at improving: **(i) the sustainability of fisheries resource levels in the IORA region (ii) knowledge on stock assessment and sustainable fisheries management practices.**

Following a series of assessments, two technical reports, Compendium of stock assessment training and courses in the IORA region and Existing capacity, uses and needs for stock assessment training and courses in the IORA region, were produced and published on the IORA website. The results of these reports were also shared during a webinar titled Initiate a capacity building programme for fish stock assessment on the 13th of July 2021, with the help of the Food and Agriculture Organisation of the United Nations, the Commonwealth Scientific and Industrial Research Organisation, as well as the technical expert.

In November of the same year, a webinar on the *utilisation of satellite services for fish stock assessment and a climate warning system* was held, with the webinar report published on the IORA website.

Held from the 29th of March to the 1st of April 2022, a workshop was organised in collaboration with the Government of the Republic of Seychelles to train participants from Member States on enhancing by-catch landing, valorisation, traceability and quality.

In January 2023, an online workshop was held in collaboration with the Food and Agriculture Organisation (FAO) on evaluation, monitoring progress and establishing cooperation among IORA Member States, in order to address the SDG 14.4.

Results

Two events were held in line with fisheries resource levels sustained and improved in the IORA region, namely the by-catch training in Seychelles on enhancing landing and valorisation, as well as the online workshop on the promotion of the reporting and monitoring of SDG 14.4, to raise awareness and build capacity on sustainable fisheries management. With 60% of fish stock in the IORA region considered to be sustainable, compliance with the reporting and monitoring of SDG 14.4.1 indicator attained 60% through the partial contribution and work done carried out by Member States by the Technical Assistance team. Further improvement should be expected down the line.

Improved knowledge on stock assessment and sustainable fisheries management practices were achieved through a detailed assessment of existing capacity use. The needs for stock assessment training and courses for IORA Member States, as well as short-term courses for fisheries managers, were identified for further consideration by the IORA Member States.



Speakers of the webinar on Utilization of Satellite services for fish stock assessment and a climate warning system



Opening Session of IORA Training Workshop on by-catch in Seychelles.



Participants observing by-catch landing, Seychelles (By-Catch Training Workshop).



By-catch processing - Seychelles.

WHAT WAS ACHIEVED

Consisted of

4 activities

3 online events and one training

- A webinar on "Initiate a capacity building programme for fish stock assessment"
- A webinar on the utilisation of satellite services for fish stock assessment and a climate warning system
- An online workshop on promoting the SDG 14.4 monitoring and evaluation and establishing cooperation among the IORA Member States on the SDG 14.4 indicator
- A training workshop on enhancing by-catch landing, valorisation, traceability and quality in the Seychelles

2 | **96%**

Technical Reports produced

Implementation rate

Impact:

- I. Promoted sustainable fisheries management



Group 3 of Activities

Promoting sustainable aquaculture development

Context

Since 2018, the IORA Member States' aquaculture production has gradually increased to reach around 28.2 million metric tonnes in 2022, which represents approximately 23 % of global aquaculture production. (FAO 2023, FishStatJ: database accessed on 2 August 2023: <https://www.fao.org/fishery/en/topic/166235/en>). Expected to increasingly fill the shortfall in aquatic food products by sustaining global growth in the near future, the development of aquaculture in the Indian Ocean remains however hindered by several challenges.

The availability of seed stock, appropriate technology, well-defined legal and policy framework, development of value-chains, as well as long-term financing and investment, constitute some of these obstacles which need to be addressed for developing aquaculture to a scale where private sector operators can invest in it before communities can start benefiting from the sustainable aquaculture operations.

By providing a strategic focus on long-term aquaculture development in the region, IORA's Blue Economy Work Plan aims to address the challenge of the sector. As such, capacity building for IORA Member States is undoubtedly key to uplifting aquaculture practices in those countries, but it is also a long-term process, which will require significant funding resources.

Type	2018	2019	2020
Marine Aquaculture	10.84	9.19	8.81
Brackish water Aquaculture	3.51	4.67	5.12
Freshwater Aquaculture	13.13	14.12	14.31
Total (Million Tonnes)	27.48	27.98	28.23

Table 1: Aquaculture production in IORA Member States.



Participants arriving at the Zanzibar Fish Hatchery for training on sea cucumber seeding.

Results

To achieve 'A sustainable aquaculture practices implemented, focusing on rural and coastal communities in IORA Member States, including Small Island Developing States (SIDS) and Least Developing Coastal States (LDCS)', a comprehensive review of aquaculture, governance and development of small-scale aquaculture in the IORA region, and a report on existing initiatives in small-scale aquaculture based on 4 case studies, were produced and published on the IORA website. A webinar was also held to present the results of these two technical studies in August 2021.

In March 2022, following the circulation of a survey to IORA Member States, a technical report reviewed the existing capacity and needs of all members across a broad range of domains, including species selection, site selection, breeding, food development, husbandry, and disease. The results were then analysed and consolidated into a review.

An online training workshop held in July 2022 focused on self-producing aquaculture feed techniques for traditional farmers, which included a training video on How to prepare insect feed for small-scale and rural aquaculture, and a protocol for constructing a simple inset production unit.

From the 7th to 11th of November 2022, the Technical Assistance supported the organisation of a training workshop on best practices in sea cucumber seed production and tubular seaweed farming in Zanzibar, Tanzania to encourage knowledge sharing and best practices on grow-out aquaculture for commercial scale operations. Two technical protocols and two training videos on sea cucumber reproduction in Mozambique and tubular net for seaweed farming in Tanzania were also produced in this context.

The promotion of insect feed production, sea cucumber and seaweed seed production successfully contributed to the accomplishment of the "result" Sustainable aquaculture practices implemented, focusing on rural and coastal communities in IORA Member States, including SIDS and LDCs. Three training videos focusing strongly on supporting the development of sustainable aquaculture practices in rural and coastal communities were produced.



Participants - Training Workshop on best practices in sea cucumber and seaweed seeding, Zanzibar, Tanzania.



Demonstration on constructing a tubular net system for seaweed farming, Zanzibar, Tanzania.



Participants tying seaweed stems for farming in Zanzibar, Tanzania.



Participants preparing seawater tank for sea cucumber spawning, Zanzibar, Tanzania.

WHAT WAS ACHIEVED

Consisted of

7

activities

3

online events and one training

- A webinar to review the existing capacity and needs for aquaculture development in IORA Member States
- A webinar on promotion of small-scale rural aquaculture
- An online training workshop on self-producing aquaculture feed techniques for traditional farmers
- A training workshop on best practices in sea cucumber seed production and tubular seaweed farming for commercial operations in Zanzibar, Tanzania

3 Training videos and protocols

- Training video on Insect farming for small scale aquaculture operations and training protocol
- Sea cucumber seeding training video and training protocol
- Seaweed seeding and tubular farming method training video and training protocol

96%

Implementation rate

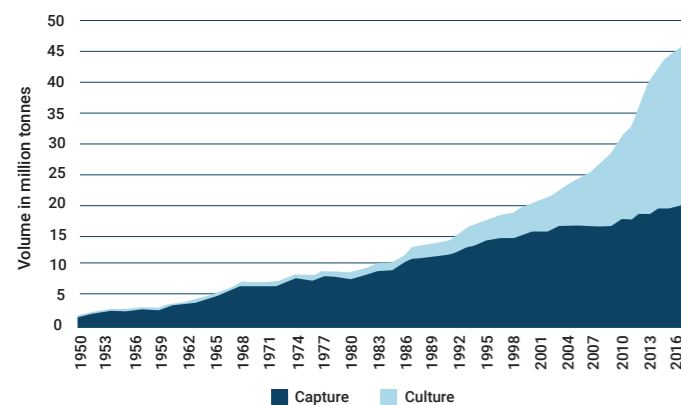
Impact:
I. Promoted sustainable aquaculture development



Group 4 of Activities

Promoting and implementing open market access to fish trade, including aquaculture

Context



Landings and aquaculture production in IORA Member States. Source: FAO FishStat, 2020

In IORA region, exports are dominated by crustaceans (shrimp), various marine fishes, and molluscs. Imports are dominated by marine fishes. International seafood trade within the IORA region has been relatively modest, while exports from the region to major markets have been significant and growing. As a region, the “seafood trade balance” is positive, i.e., the region exports more than it imports in terms of value, but this varies greatly from country to country.

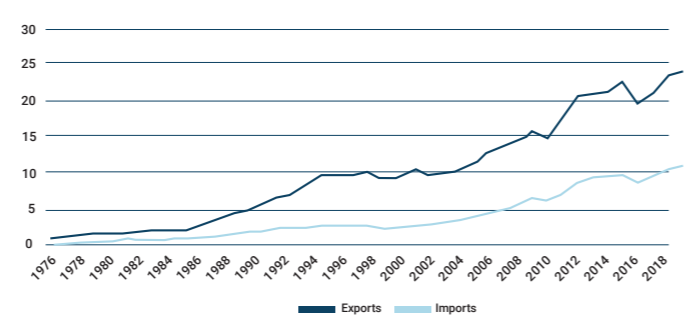
The most important export markets for the region are Asia, North America and Europe. Asian and Southeast Asian markets account for 44 % of total exports, while North America accounts for 27 % and Europe 15 %. Most of the imports come from Asia and Southeast Asia (60 % of total imports). (FAO 2023, FishStatJ: database accessed on 2 August 2023: <https://www.fao.org/fishery/en/topic/166235/en>)

Intra-regional trade in the IORA region appears to be little developed, except for the major trading countries in the region (Thailand, Australia, Malaysia, Singapore and the United Arab Emirates).

The largest fishing nations in the region are Indonesia (7.3 million tonnes in 2018), India (5.3 million tonnes), Bangladesh (1.9 million tonnes). With regards to seafood, the region as a whole is an active exporter as well as a key importer. While India, Thailand and Indonesia are some of the biggest exporters, Australia, Malaysia and Singapore constitute some of the major importers of seafood.

In terms of value, total exports amounted to USD 24.1 billion, whereas imports represented USD 11 billion, making the IORA region a net exporter of seafood. Despite being relatively stable, the gap between exports and imports has widened over the last years, as illustrated by Chart 3.

Intra-regional trade between IORA Member States is relatively low and could be enhanced with better access to market information and opportunities, including through inherent bilateral or multilateral trade arrangements.



Gap between seafood exports and imports for IORA region. Source: FAO FishStat, 2020

Results

To achieve ‘The promotion and facilitation of open market access through high quality fisheries and aquaculture products and fish trade’, studies, training and capacity building were carried out by the Technical Assistance.

To support the development of a fish trade study for the purpose of evaluating fish trade and aquaculture products among IORA Member States, a literature review and gap analysis of information on international trade and markets for fisheries and aquaculture products was undertaken.

In April 2021, a webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region was held for IORA Member States. This webinar was successfully achieved after identifying gaps and underlining the importance of safety standards, as well as the trading of high-quality fish products in the IORA region.

In addition, 23 States trade profile reports were prepared to present trade information in the fisheries sector for each IORA Member State, resulting in the production of the technical report International trade study - Review of fish trade in the IORA region. The outcomes of this study were presented in October 2021 during a webinar along with recommendations to improve fish trade. In addition to the work that was carried out concerning the level of open market accessibility and intra-regional trade in the future, the comprehensive capacity-building programme developed by the Technical Assistance should also enhance and facilitate trading in the region.

After reviewing fish trade agreements in the IORA region, a capacity building training programme was created for the sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements.

TECHNICAL ASSISTANCE TO IORA FOR THE IMPLEMENTATION AND COORDINATION OF IORA ACTION PLAN ON FISHERIES, AQUACULTURE AND MARINE ENVIRONMENT

Speakers for the webinar:

- Marcio Castro de Souza: Senior Fisheries Officer, FAO
- Erik Hempel: International Trade Expert, AFD Technical Assistance to IORA
- Shirlene Maria Anthonyvamy: Director of INFOFISH, Malaysia
- Blessing Mapfumo: International Trade Expert, AFD Technical Assistance to IORA

12 October 2021
07:00 – 09:30 hrs GMT
11:00 – 13:30 hrs
In Mauritius

Speakers for the webinar on : Enhancing the knowledge on international trade and markets for fisheries and aquaculture products in the IORA region.

AFD **IOIRA**

TECHNICAL REPORT NO. 7 – INTERNATIONAL TRADE STUDY – REVIEW OF FISH TRADE IN THE IORA REGION

‘TECHNICAL ASSISTANCE TO IORA FOR THE IMPLEMENTATION AND COORDINATION OF IORA ACTION PLAN ON FISHERIES, AQUACULTURE AND MARINE ENVIRONMENT’

REFERENCE NO. DOE/NAT/ARB/DCP/2019-290

Authors: Blessing Mapfumo and Erik Hempel
 November 2021

Project implemented by **COFREPECHE** and **SOFRECO**

Internal reference: IO349R07B

Technical report No. 7 - International Trade Study - Review of fish trade in the IORA Region.



Yellowfin tuna ready for storage - By-catch Training, Seychelles.

WHAT WAS ACHIEVED

Consisted of

5 activities

1 Online event

- A webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region

4 Technical Reports produced

Impact:

1. Promoted and implemented open market access to fish trade, including aquaculture



Group 5 of Activities

Standardising blue carbon assessment methods in the Indian Ocean

Context

Rich in blue carbon ecosystems, the tropical Western Indian Ocean (WIO) region hosts dense mangrove forests covering more than 733 000 ha (5.3% of the total mangrove cover worldwide), with diverse seagrass meadows reaching more than 40m deep. In addition, the States within and surrounding the Indian Ocean basin contain approximately 50% (an estimated 76,275 km²) of the world's mangrove forests, as well as a large, but unknown proportion of its seagrass meadows. (WIOMSA 2016, database accessed on 25 August 2023: <https://www.wiomsa.org/publications/mangroves-of-the-western-indian-ocean-status-and-management/>)

Despite their importance, coastal blue carbon ecosystems are some of the most threatened ecosystems on our planet. Indeed, since the 19th century, nearly 50% of the pre-industrial and natural extent of global coastal wetlands have been lost at four times the rate of tropical forests. With climate change threatening to accelerate these losses, the current loss rate, depending on the ecosystem type, varies between 0.5 and 3% annually, with ongoing carbon losses from blue carbon ecosystems estimated to account for up to 19% of emissions from global deforestation.

Fully recognising that healthy blue carbon ecosystems are vital for providing habitat for marine species; supporting fish stocks and food security; sustaining coastal communities and livelihoods; filtering water flowing into our oceans and reef systems; and protecting coastlines from erosion and storm surges, the working group on the blue economy is advocating for robust scientific, policy and governance frameworks with regards to the protection and restoration efforts in the development and promotion of the blue economy.

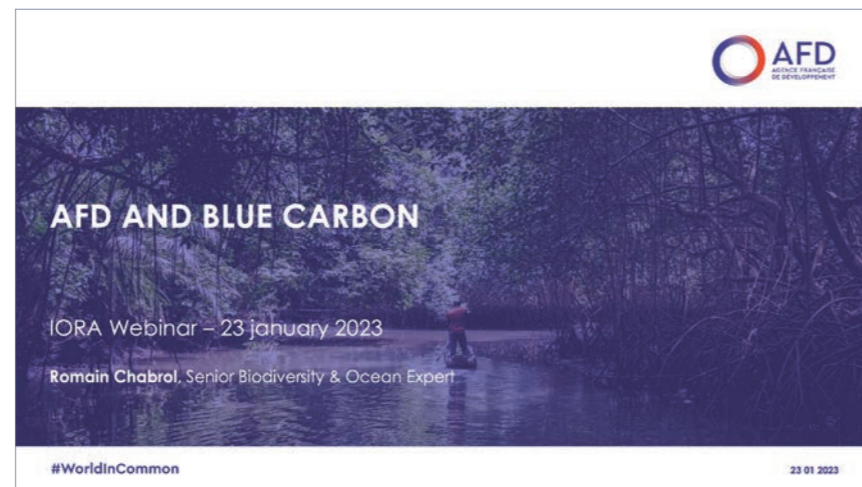


Results

With regards to the standardisation of methods for blue carbon assessment in the IORA Member States, two main outputs were achieved.

Working in collaboration with the University of Toliara (Fishery and Marine Science Institute-IHSM) from Madagascar, a training workshop on research and sustainable management of the blue carbon ecosystem was organised and co-financed with the Technical Assistance's support from the 27th of November to the 2nd of December 2022 with the aim of highlighting the importance of blue carbon assessment and advocating for the adoption of the blue carbon Initiative manual as the standard for blue carbon assessments. Capacities of Member States were also strengthened via the training workshop in Madagascar which focused on field and laboratory technical training on blue carbon measurements.

In January 2023, a webinar was held in collaboration with the IORA Blue Carbon Hub, the Blue Carbon Initiative, the International Partnership for Blue Carbon, and the Great Blue Wall Initiative, to promote the Blue Carbon Initiative manual for standardised blue carbon assessment methods for IORA Member States.



Participants - IORA Training Workshop on Blue Carbon Research, Madagascar.



Participants in Session - IORA Training Workshop on Blue Carbon Research, Madagascar.



Participants taking soil core samples from the mangrove area- IORA Training Workshop on Blue Carbon Research, Madagascar.



Preparing collected soil core samples collected in the laboratory - IORA Training Workshop on Blue Carbon Research, Madagascar.

WHAT WAS ACHIEVED

Consisted of

2 activities

1 **1**

Online event

Workshop

- A webinar promoting the Blue Carbon Initiative (BCI) manual for standardised blue carbon assessment methods in the Indian Ocean
- A training workshop on research and sustainable management of the blue carbon ecosystem, in Madagascar, Toliara

100% Completed

Impact:

1. Standardised blue carbon assessment methods in the Indian Ocean

Cooperation and synergies with stakeholders

The project was quite successful in fostering the cooperation with several intergovernmental agencies by involving them in online events and trainings hosted by the IORA such as the:



Notwithstanding, many IORA Member States actively participated in the activities by sharing their challenges and experiences on various blue economy topics.

Synergies were developed with stakeholders namely with private, non-governmental and government-related institutions such as Stop Illegal Fishing, Commonwealth Scientific and Industrial Research Organisation, Collecte Localisation Satellites, TM-Tracking, INFOFISH Malaysia, Institut de Recherche pour le Développement, OLSPS Marine Fisheries Management Solutions, Oceanographic Research Institute, IORA Blue Carbon Hub, ICAR Central Institute of Fisheries Technology India, National Remote Sensing Centre India, CSIRO - Commonwealth Scientific and Industrial Research Organisation (Australia) as well as the Indian Space Research Organisation India. In addition, entrepreneurs and companies were also able to participate in the implementation of the Working Group for the Blue Economy Work Plan through knowledge sharing and the bonding of existing networks.

As a result, the effective collaboration supported three key areas:

Knowledge: Increased awareness, knowledge and know-how used by IORA national experts and organisations (including communities and practitioners in fisheries and aquaculture) on addressing issues in the management of the fisheries and aquaculture resources.

Policy: Increasing awareness of the blue economy agenda of the IORA translated into methods and guidance, as well as capacity in managing the blue economy space within the Member States.

Capacity building: The capacity building activities addressed opportunities to empower communities and livelihoods, and to increase national capacity in areas such as Illegal, Unreported and Unauthorised fishing, aquaculture development and fisheries management.

List of events, technical reports and training videos prepared with the support of AFD-IORA Technical Assistance

List of webinars and workshops organised	List of Technical Reports produced by the AFD- IORA TA
A webinar on combatting illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region (16 September 2021)	Technical Report No. 01 – Compendium of stock assessment training and courses in the IORA region
A webinar on the utilisation of satellite services for fish stock assessment and a climate warming system (30 November 2021)	Technical Report No. 02 – Literature review and gap analysis of information on international trade and markets for fisheries and aquaculture products
A webinar on promotion of small-scale rural aquaculture (31 August 2021)	Technical report No. 03 – Review of aquaculture, governance and development of small-scale aquaculture in the IORA region
A webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region (27 April 2021)	Technical report No. 04 – Analysis of measures to combat IUU fishing in the IORA region
A webinar promoting the Blue Carbon Initiative (BCI) manual for standardised blue carbon assessment methods in the Indian Ocean (23 January 2023)	Technical report No. 05 – Assessment of the capacity needs required (human and institutional) and the current level of implementation of port state measures in the IORA region.
A webinar for review on the existing capacity and needs for aquaculture development (15 March 2022)	Technical report No. 06 – Existing capacity, uses and needs for stock assessment training and courses in the IORA region
An online workshop on promoting the SDG 14.4 monitoring and evaluation and establishing cooperation among the IORA Member States on the SDG 14. 4 indicator with the participation of FAO (25 January 2023)	Technical report No. 07 – International trade study – Review of fish trade in the IORA region, including 23 IORA Member States’ trade profile in the fisheries sector
An online training course to raise awareness of the benefits of the PSMA delivered by FAO (25 – 29 April 2022)	Technical report No. 08 – Examples of existing initiatives in small-scale rural aquaculture in the IORA region
An online workshop in collaboration with CLS on remote sensing methods for identifying IUU fishing vessels (15th November 2022)	Technical Report No. 09 – Review of the existing capacity of IORA member states and the needs across a broad range of domains, including species selection, site selection, breeding, food development, husbandry, and disease
An online training workshop on self-producing aquaculture feed techniques for traditional farmers was carried out (7 July 2022)	Technical Report No. 10 – Undertake a capacity building programme on sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements – review of fish trade agreements in the IORA region
A Blue Economy Virtual Workshop on IUU fishing on “Moving toward the development and adoption of IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains”, 23-24 March 2022	Technical Report No. 11 – Undertake a capacity building programme on sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements – Capacity Building Programme
A training workshop on enhancing by-catch landing, valorisation, traceability and quality (29 March to 1 April 2022) in Seychelles	Draft IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains
A training workshop on best practices in sea cucumber seed production and tubular seaweed farming for commercial operations in Zanzibar, Tanzania (7 – 11 November 2022)	Sea Cucumber Seeding training video and training protocol
A training workshop on research and sustainable management of the blue carbon ecosystem, in Madagascar, Toliara (28 November – 2 December 2022)	Seaweed seeding and tubular farming method training video and training protocol Training video on Insect farming for small scale aquaculture operations and training protocol

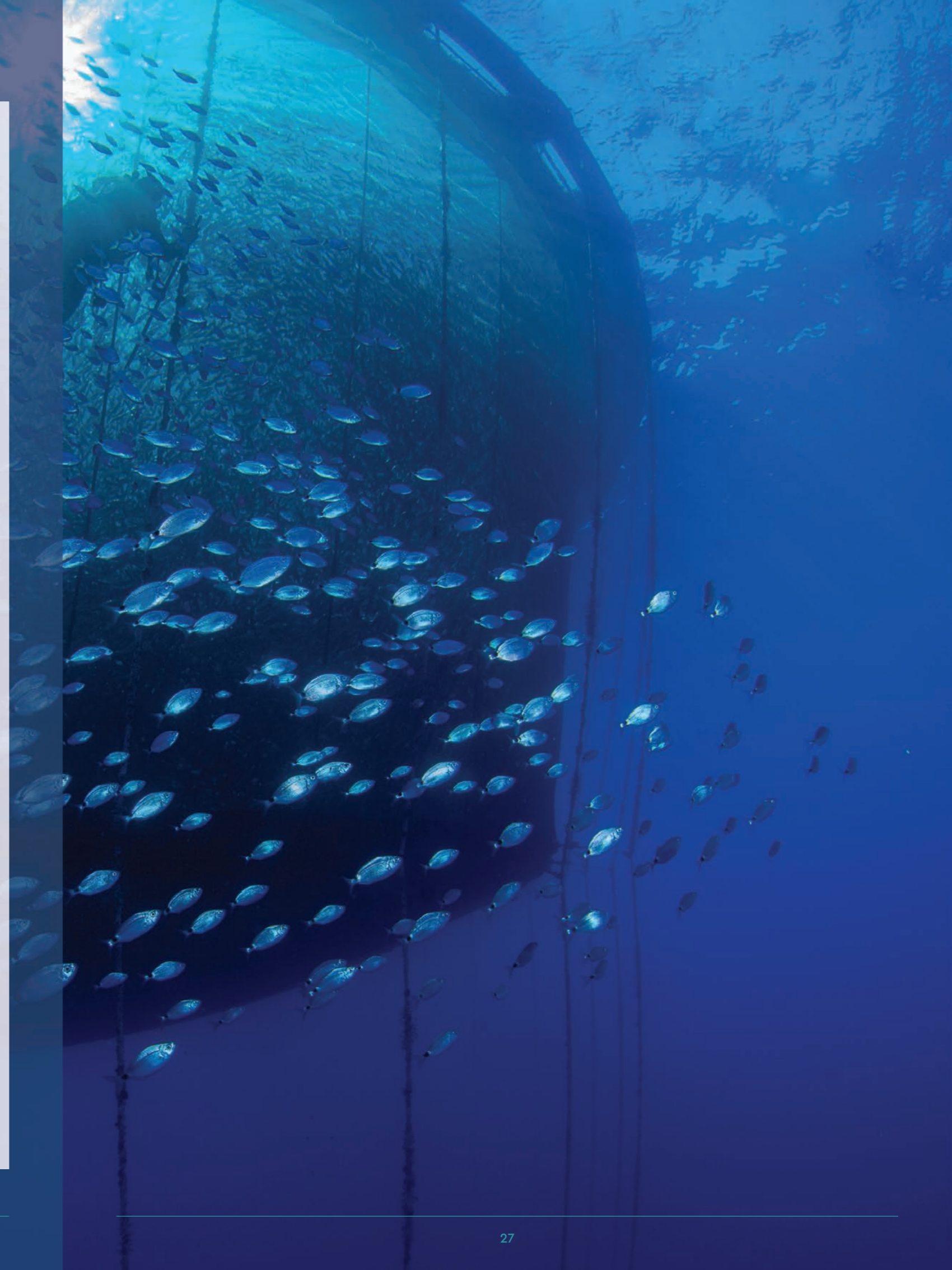
Conclusion

Many technical reports were produced during this project, leveraging productive stakeholder discussions, promoting shared experiences and positive inter-organisational relationships developed within and outside the IORA region. This Technical Assistance provided a platform to foster knowledge exchange and sharing of experiences among its Member States in various fields of the blue economy. The high level of attendance to the events and positive feedback have paved the way for organising more events of that kind.

Overall, it is worth to note that, through the implementation of the Technical Assistance, related to the IORA Blue Economy Work Plan as well as AFD mandate, several SDG 14 goals were achieved, namely, improving livelihoods, knowledge and fostering deep cooperation among the IORA Member States in various fields such as fisheries and aquaculture.



Drying seaweed after harvest in Zanzibar.





Group 1 of Activities

Combating Illegal, Unreported and Unregulated fishing in IORA region

Context

While the objective of Sustainable Development Goal 14 is to “conserve and sustainably use the oceans, seas and marine resources”, its key target, namely to eliminate Illegal, Unreported and Unregulated (IUU) fishing by 2020, is generally difficult to achieve.

Combating IUU fishing remains a momentous challenge at global level, including for members of the Indian Ocean Rim Association. Undermining the sustainable management and exploitation of the world’s fisheries resources, the impact of IUU fishing is rapidly driving the depletion of fish stocks while also affecting the communities depending on the fisheries sector.

As a persistent and pressing problem estimated to account for up to USD 23 billion annually in regions of the Eastern Indian Ocean alone, the effects of IUU fishing can be devastating, especially for Small Island and Coastal Developing States which rely heavily on their marine resources.

In addition, States unable to meet international obligations for fisheries management and governance, may impact on the sustainability of the fish stocks.

The following results were expected (I) the harmonisation of Port State measures among IORA Member States and (II) the reduction of IUU fishing activities in the region.

A webinar on combating illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region, as well as a Blue Economy Virtual Workshop on IUU fishing on “Moving toward the development and adoption of IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains” were held on the 16th September 2021 and on the 23rd till the 24th of March 2022.

An assessment of the capacity needs required (human and institutional) and the current level of implementation of Port State Measures in the IORA region was conducted and an analysis of measures against IUU fishing vessels and recommendations was undertaken. The results of these two technical reports were presented during the webinar on combating illegal, unreported, and unregulated fishing, where recent developments, measures, and tools to combat IUU fishing in the IORA region, with a special emphasis on Port State Measures (16th September 2021), were also showcased.

In March 2022, aided by the Technical Assistance, France held a Blue Economy Virtual Workshop on IUU fishing, “Moving towards the development and adoption of IORA Guidelines

to prevent the entry of IUU fisheries products into IORA Member States supply chains”, to draw the attention of IORA Member States to the issue of IUU fishing in the Indian Ocean region, and how the development and adoption of regional guidelines to prevent the entry of IUU fisheries products into IORA Member States supply chains can become key to contributing to the sustainable management of marine fisheries resources.

A few IORA Member States not yet party to the Port States Measures Agreement (PSMA) engaged in an online PSMA capacity building training course organised by the Food and Agriculture Organisation of the United Nations in cooperation with the IORA in April 2022.

In November of the same year, an online workshop on Remote sensing methods for identifying IUU fishing vessels was organised in collaboration with Collecte Localisation Satellites (CLS), with the inputs from several IORA Member States sharing their experiences on the subject matter. The webinar also provided an overview of the current use of remote sensing application in the IORA region in fighting against IUU fishing.

Finally, in January 2023, a draft of the IORA Guidelines to prevent the entry of IUU fisheries products into the supply chains of IORA Member States was prepared and submitted to the IORA secretariat.

Results

Out of eight IORA Member States not yet party to the Port State measures, six countries attended the PSMA Training. Moreover, the reports produced in the context of these activities provided valuable recommendations on the issues that need to be addressed for a harmonised approach in the fight against IUU fishing.

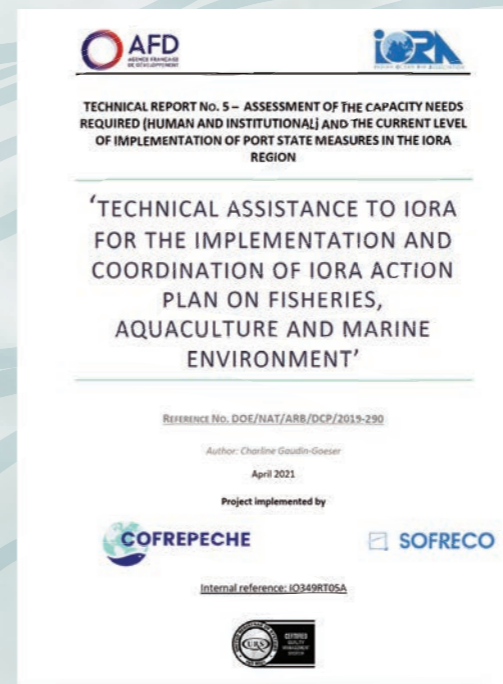
With regards to the reduction of IUU fishing activities in the region, two webinars namely ‘Combating IUU fishing through the application of the PSMA’ and ‘the online workshop on remote sensing methods’ were held. Advocating two approaches for fighting against and reducing IUU fishing, which are the application of port state measures, as well as the use of remote sensing, the cumulative impact of these two activities, while not exhaustive, encouraged IORA Member States to better engage in proven IUU detection methods and with regional bodies for a better exchange of information.



Speakers of the conference on Combating Illegal, Unreported and Unregulated fishing in IORA region.



A glimpse of undersea life.



Technical report No.5 - Assessment of the capacity needs required and the current level of implementation of port state measures in the IORA region.

WHAT WAS ACHIEVED

Consisted of

6

 activities

4

 successful online events organised

- An online workshop in collaboration with CLS on remote sensing methods for identifying IUU fishing vessels
- A webinar on combatting illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region
- An online training course organised by the FAO on Promoting the PSMA in the IORA Member States
- A Blue Economy Virtual Workshop on IUU fishing, “Moving toward the development and adoption of IORA Guidelines to prevent the entry of IUU fisheries products into IORA Member States supply chains”

3

Technical Reports produced including draft guidelines

93%

Realisation of activities

Impacts:

- I. Port State measures among IORA Member States harmonised
- II. Reduction of IUU fishing activities in the region



Group 2 of Activities Promoting sustainable fisheries management

Context

As a key component of the sustainable stewardship of living marine resources, stock assessments provide crucial scientific information to resource managers from IORA Member States. According to the FAO (*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO, 2022*) fishery resources continue to decline due to overfishing, pollution, poor management and other factors, but the number of landings from biologically sustainable stocks is on the rise. The fraction of fishery stocks within biologically sustainable levels decreased to 64.6 percent in 2019, 1.2 percent lower than in 2017, and rebuilding overfished stocks could increase fisheries production by 16.5 million tonnes (*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO, 2022*) and raise the contribution of marine fisheries to the food security, nutrition, economic growth and well-being of coastal communities.

While the resilience of the resources depends largely on the biological characteristics (population dynamics) of the stock, the fecundity, the intrinsic growth rate, natural mortality, and the additional mortality imposed on the fish population by fishing, other factors include vulnerability dependent on season, aggregation, as well as response to gear, etc.

As such, stock assessments provide the scientific basis for fisheries management by setting annual catch targets and limits to prevent overfishing, whilst also monitoring the current conditions of fishery resources. In addition to existing Geographical Information Systems and Remote Sensing methods, cooperation among IORA Member States is also necessary to better regulate fishing practices, especially about migratory and transboundary species like tuna or demersal stocks on the high seas.

In addition, many fisheries by-catch species are used for food by coastal communities, in processed forms such as salted, smoked, or otherwise. These value-added fish products constitute a lucrative export market, and hygiene, safe handling practices, quality control, and traceability are equally important factors that have to be taken into consideration. Hence, improving the use of the marine resources is critical for food security.

The Group 2 of activities aimed at improving: **(i) the sustainability of fisheries resource levels in the IORA region (ii) knowledge on stock assessment and sustainable fisheries management practices.**

Following a series of assessments, two technical reports, Compendium of stock assessment training and courses in the IORA region and Existing capacity, uses and needs for stock assessment training and courses in the IORA region, were produced and published on the IORA website. The results of these reports were also shared during a webinar titled Initiate a capacity building programme for fish stock assessment on the 13th of July 2021, with the help of the Food and Agriculture Organisation of the United Nations, the Commonwealth Scientific and Industrial Research Organisation, as well as the technical expert.

In November of the same year, a webinar on the *utilisation of satellite services for fish stock assessment and a climate warning system* was held, with the webinar report published on the IORA website.

Held from the 29th of March to the 1st of April 2022, a workshop was organised in collaboration with the Government of the Republic of Seychelles to train participants from Member States on enhancing by-catch landing, valorisation, traceability and quality.

In January 2023, an online workshop was held in collaboration with the Food and Agriculture Organisation (FAO) on evaluation, monitoring progress and establishing cooperation among IORA Member States, in order to address the SDG 14.4.

Results

Two events were held in line with fisheries resource levels sustained and improved in the IORA region, namely the by-catch training in Seychelles on enhancing landing and valorisation, as well as the online workshop on the promotion of the reporting and monitoring of SDG 14.4, to raise awareness and build capacity on sustainable fisheries management. With 60% of fish stock in the IORA region considered to be sustainable, compliance with the reporting and monitoring of SDG 14.4.1 indicator attained 60% through the partial contribution and work done carried out by Member States by the Technical Assistance team. Further improvement should be expected down the line.

Improved knowledge on stock assessment and sustainable fisheries management practices were achieved through a detailed assessment of existing capacity use. The needs for stock assessment training and courses for IORA Member States, as well as short-term courses for fisheries managers, were identified for further consideration by the IORA Member States.



Speakers of the webinar on Utilization of Satellite services for fish stock assessment and a climate warning system



Opening Session of IORA Training Workshop on by-catch in Seychelles.



Participants observing by-catch landing, Seychelles (By-Catch Training Workshop).



By-catch processing - Seychelles.

WHAT WAS ACHIEVED

Consisted of

4 activities

3 online events and one training

- A webinar on "Initiate a capacity building programme for fish stock assessment"
- A webinar on the utilisation of satellite services for fish stock assessment and a climate warning system
- An online workshop on promoting the SDG 14.4 monitoring and evaluation and establishing cooperation among the IORA Member States on the SDG 14.4 indicator
- A training workshop on enhancing by-catch landing, valorisation, traceability and quality in the Seychelles

2 | **96%**

Technical Reports produced

Implementation rate

Impact:

- I. Promoted sustainable fisheries management



Group 3 of Activities

Promoting sustainable aquaculture development

Context

Since 2018, the IORA Member States' aquaculture production has gradually increased to reach around 28.2 million metric tonnes in 2022, which represents approximately 23 % of global aquaculture production. (FAO 2023, FishStatJ: database accessed on 2 August 2023: <https://www.fao.org/fishery/en/topic/166235/en>). Expected to increasingly fill the shortfall in aquatic food products by sustaining global growth in the near future, the development of aquaculture in the Indian Ocean remains however hindered by several challenges.

The availability of seed stock, appropriate technology, well-defined legal and policy framework, development of value-chains, as well as long-term financing and investment, constitute some of these obstacles which need to be addressed for developing aquaculture to a scale where private sector operators can invest in it before communities can start benefiting from the sustainable aquaculture operations.

By providing a strategic focus on long-term aquaculture development in the region, IORA's Blue Economy Work Plan aims to address the challenge of the sector. As such, capacity building for IORA Member States is undoubtedly key to uplifting aquaculture practices in those countries, but it is also a long-term process, which will require significant funding resources.

Type	2018	2019	2020
Marine Aquaculture	10.84	9.19	8.81
Brackish water Aquaculture	3.51	4.67	5.12
Freshwater Aquaculture	13.13	14.12	14.31
Total (Million Tonnes)	27.48	27.98	28.23

Table 1: Aquaculture production in IORA Member States.



Participants arriving at the Zanzibar Fish Hatchery for training on sea cucumber seeding.

Results

To achieve 'A sustainable aquaculture practices implemented, focusing on rural and coastal communities in IORA Member States, including Small Island Developing States (SIDS) and Least Developing Coastal States (LDCS)', a comprehensive review of aquaculture, governance and development of small-scale aquaculture in the IORA region, and a report on existing initiatives in small-scale aquaculture based on 4 case studies, were produced and published on the IORA website. A webinar was also held to present the results of these two technical studies in August 2021.

In March 2022, following the circulation of a survey to IORA Member States, a technical report reviewed the existing capacity and needs of all members across a broad range of domains, including species selection, site selection, breeding, food development, husbandry, and disease. The results were then analysed and consolidated into a review.

An online training workshop held in July 2022 focused on self-producing aquaculture feed techniques for traditional farmers, which included a training video on How to prepare insect feed for small-scale and rural aquaculture, and a protocol for constructing a simple inset production unit.

From the 7th to 11th of November 2022, the Technical Assistance supported the organisation of a training workshop on best practices in sea cucumber seed production and tubular seaweed farming in Zanzibar, Tanzania to encourage knowledge sharing and best practices on grow-out aquaculture for commercial scale operations. Two technical protocols and two training videos on sea cucumber reproduction in Mozambique and tubular net for seaweed farming in Tanzania were also produced in this context.

The promotion of insect feed production, sea cucumber and seaweed seed production successfully contributed to the accomplishment of the "result" Sustainable aquaculture practices implemented, focusing on rural and coastal communities in IORA Member States, including SIDS and LDCs. Three training videos focusing strongly on supporting the development of sustainable aquaculture practices in rural and coastal communities were produced.



Participants - Training Workshop on best practices in sea cucumber and seaweed seeding, Zanzibar, Tanzania.



Demonstration on constructing a tubular net system for seaweed farming, Zanzibar, Tanzania.



Participants tying seaweed stems for farming in Zanzibar, Tanzania.



Participants preparing seawater tank for sea cucumber spawning, Zanzibar, Tanzania.

WHAT WAS ACHIEVED

Consisted of

7

activities

3

online events and one training

- A webinar to review the existing capacity and needs for aquaculture development in IORA Member States
- A webinar on promotion of small-scale rural aquaculture
- An online training workshop on self-producing aquaculture feed techniques for traditional farmers
- A training workshop on best practices in sea cucumber seed production and tubular seaweed farming for commercial operations in Zanzibar, Tanzania

3 Training videos and protocols

- Training video on Insect farming for small scale aquaculture operations and training protocol
- Sea cucumber seeding training video and training protocol
- Seaweed seeding and tubular farming method training video and training protocol

96%

Implementation rate

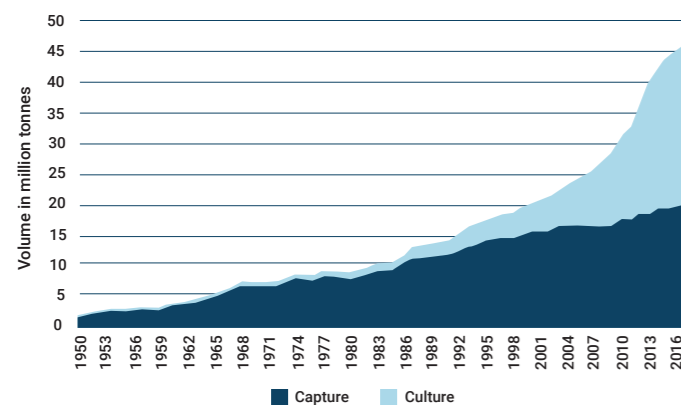
Impact:
I. Promoted sustainable aquaculture development



Group 4 of Activities

Promoting and implementing open market access to fish trade, including aquaculture

Context



Landings and aquaculture production in IORA Member States. Source: FAO FishStat, 2020

In IORA region, exports are dominated by crustaceans (shrimp), various marine fishes, and molluscs. Imports are dominated by marine fishes. International seafood trade within the IORA region has been relatively modest, while exports from the region to major markets have been significant and growing. As a region, the “seafood trade balance” is positive, i.e., the region exports more than it imports in terms of value, but this varies greatly from country to country.

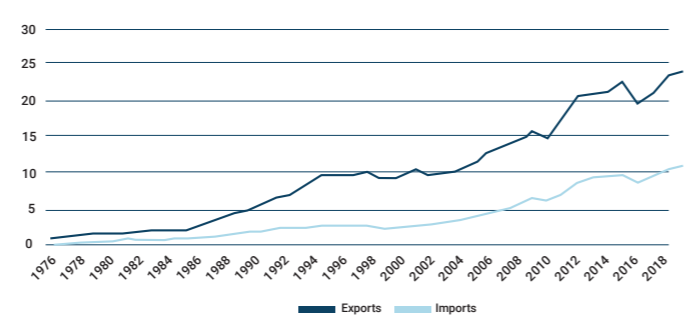
The most important export markets for the region are Asia, North America and Europe. Asian and Southeast Asian markets account for 44 % of total exports, while North America accounts for 27 % and Europe 15 %. Most of the imports come from Asia and Southeast Asia (60 % of total imports). (FAO 2023, FishStatJ: database accessed on 2 August 2023: <https://www.fao.org/fishery/en/topic/166235/en>)

Intra-regional trade in the IORA region appears to be little developed, except for the major trading countries in the region (Thailand, Australia, Malaysia, Singapore and the United Arab Emirates).

The largest fishing nations in the region are Indonesia (7.3 million tonnes in 2018), India (5.3 million tonnes), Bangladesh (1.9 million tonnes). With regards to seafood, the region as a whole is an active exporter as well as a key importer. While India, Thailand and Indonesia are some of the biggest exporters, Australia, Malaysia and Singapore constitute some of the major importers of seafood.

In terms of value, total exports amounted to USD 24.1 billion, whereas imports represented USD 11 billion, making the IORA region a net exporter of seafood. Despite being relatively stable, the gap between exports and imports has widened over the last years, as illustrated by Chart 3.

Intra-regional trade between IORA Member States is relatively low and could be enhanced with better access to market information and opportunities, including through inherent bilateral or multilateral trade arrangements.



Gap between seafood exports and imports for IORA region. Source: FAO FishStat, 2020

Results

To achieve ‘The promotion and facilitation of open market access through high quality fisheries and aquaculture products and fish trade’, studies, training and capacity building were carried out by the Technical Assistance.

To support the development of a fish trade study for the purpose of evaluating fish trade and aquaculture products among IORA Member States, a literature review and gap analysis of information on international trade and markets for fisheries and aquaculture products was undertaken.

In April 2021, a webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region was held for IORA Member States. This webinar was successfully achieved after identifying gaps and underlining the importance of safety standards, as well as the trading of high-quality fish products in the IORA region.

In addition, 23 States trade profile reports were prepared to present trade information in the fisheries sector for each IORA Member State, resulting in the production of the technical report International trade study - Review of fish trade in the IORA region. The outcomes of this study were presented in October 2021 during a webinar along with recommendations to improve fish trade. In addition to the work that was carried out concerning the level of open market accessibility and intra-regional trade in the future, the comprehensive capacity-building programme developed by the Technical Assistance should also enhance and facilitate trading in the region.

After reviewing fish trade agreements in the IORA region, a capacity building training programme was created for the sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements.

TECHNICAL ASSISTANCE TO IORA FOR THE IMPLEMENTATION AND COORDINATION OF IORA ACTION PLAN ON FISHERIES, AQUACULTURE AND MARINE ENVIRONMENT

Speakers for the webinar:

- Marcio Castro de Souza: Senior Fisheries Officer, FAO
- Erik Hempel: International Trade Expert, AFD Technical Assistance to IORA
- Shirlene Maria Anthonyvamy: Director of INFOFISH, Malaysia
- Blessing Mapfumo: International Trade Expert, AFD Technical Assistance to IORA

12 October 2021
07:00 – 09:30 hrs GMT
11:00 – 13:30 hrs
in Mauritius

Speakers for the webinar on : Enhancing the knowledge on international trade and markets for fisheries and aquaculture products in the IORA region.

AFD **IOIRA**

TECHNICAL REPORT NO. 7 – INTERNATIONAL TRADE STUDY – REVIEW OF FISH TRADE IN THE IORA REGION

‘TECHNICAL ASSISTANCE TO IORA FOR THE IMPLEMENTATION AND COORDINATION OF IORA ACTION PLAN ON FISHERIES, AQUACULTURE AND MARINE ENVIRONMENT’

REFERENCE NO. DOE/NAT/ARB/DCP/2019-290

Authors: Blessing Mapfumo and Erik Hempel
 November 2021

Project implemented by

COFREPECHE **SOFRECO**

Internal reference: IO349R07B

Technical report No. 7 - International Trade Study - Review of fish trade in the IORA Region.



Yellowfin tuna ready for storage - By-catch Training, Seychelles.

WHAT WAS ACHIEVED

Consisted of

5 activities

1 Online event

- A webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region

4 Technical Reports produced

Impact:

1. Promoted and implemented open market access to fish trade, including aquaculture



Group 5 of Activities

Standardising blue carbon assessment methods in the Indian Ocean

Context

Rich in blue carbon ecosystems, the tropical Western Indian Ocean (WIO) region hosts dense mangrove forests covering more than 733 000 ha (5.3% of the total mangrove cover worldwide), with diverse seagrass meadows reaching more than 40m deep. In addition, the States within and surrounding the Indian Ocean basin contain approximately 50% (an estimated 76,275 km²) of the world's mangrove forests, as well as a large, but unknown proportion of its seagrass meadows. (WIOMSA 2016, database accessed on 25 August 2023: <https://www.wiomsa.org/publications/mangroves-of-the-western-indian-ocean-status-and-management/>)

Despite their importance, coastal blue carbon ecosystems are some of the most threatened ecosystems on our planet. Indeed, since the 19th century, nearly 50% of the pre-industrial and natural extent of global coastal wetlands have been lost at four times the rate of tropical forests. With climate change threatening to accelerate these losses, the current loss rate, depending on the ecosystem type, varies between 0.5 and 3% annually, with ongoing carbon losses from blue carbon ecosystems estimated to account for up to 19% of emissions from global deforestation.

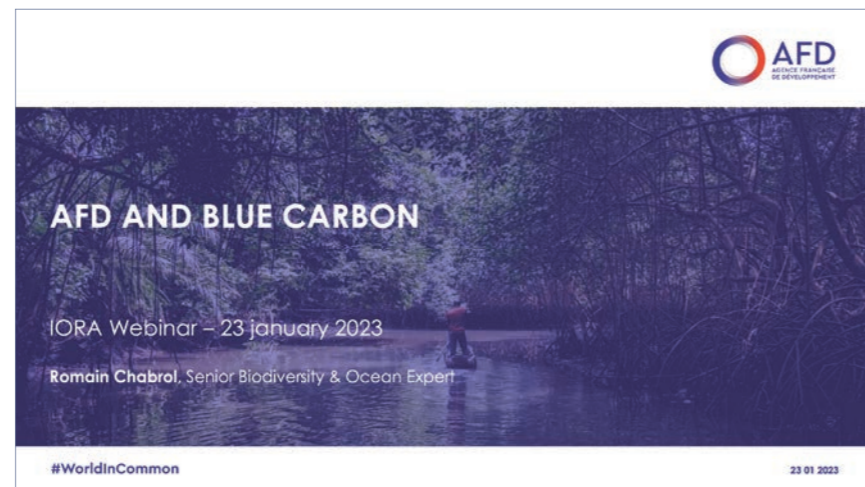
Fully recognising that healthy blue carbon ecosystems are vital for providing habitat for marine species; supporting fish stocks and food security; sustaining coastal communities and livelihoods; filtering water flowing into our oceans and reef systems; and protecting coastlines from erosion and storm surges, the working group on the blue economy is advocating for robust scientific, policy and governance frameworks with regards to the protection and restoration efforts in the development and promotion of the blue economy.

Results

With regards to the standardisation of methods for blue carbon assessment in the IORA Member States, two main outputs were achieved.

Working in collaboration with the University of Toliara (Fishery and Marine Science Institute-IHSM) from Madagascar, a training workshop on research and sustainable management of the blue carbon ecosystem was organised and co-financed with the Technical Assistance's support from the 27th of November to the 2nd of December 2022 with the aim of highlighting the importance of blue carbon assessment and advocating for the adoption of the blue carbon Initiative manual as the standard for blue carbon assessments. Capacities of Member States were also strengthened via the training workshop in Madagascar which focused on field and laboratory technical training on blue carbon measurements.

In January 2023, a webinar was held in collaboration with the IORA Blue Carbon Hub, the Blue Carbon Initiative, the International Partnership for Blue Carbon, and the Great Blue Wall Initiative, to promote the Blue Carbon Initiative manual for standardised blue carbon assessment methods for IORA Member States.



Participants - IORA Training Workshop on Blue Carbon Research, Madagascar.



Participants in Session - IORA Training Workshop on Blue Carbon Research, Madagascar.



Participants taking soil core samples from the mangrove area- IORA Training Workshop on Blue Carbon Research, Madagascar.



Preparing collected soil core samples collected in the laboratory - IORA Training Workshop on Blue Carbon Research, Madagascar.

WHAT WAS ACHIEVED

Consisted of

2

 activities

1

Online event

1

Workshop

- A webinar promoting the Blue Carbon Initiative (BCI) manual for standardised blue carbon assessment methods in the Indian Ocean
- A training workshop on research and sustainable management of the blue carbon ecosystem, in Madagascar, Toliara

100%

 Completed

Impact:

1. Standardised blue carbon assessment methods in the Indian Ocean

Cooperation and synergies with stakeholders

The project was quite successful in fostering the cooperation with several intergovernmental agencies by involving them in online events and trainings hosted by the IORA such as the:



Notwithstanding, many IORA Member States actively participated in the activities by sharing their challenges and experiences on various blue economy topics.

Synergies were developed with stakeholders namely with private, non-governmental and government-related institutions such as Stop Illegal Fishing, Commonwealth Scientific and Industrial Research Organisation, Collecte Localisation Satellites, TM-Tracking, INFOFISH Malaysia, Institut de Recherche pour le Développement, OLSPS Marine Fisheries Management Solutions, Oceanographic Research Institute, IORA Blue Carbon Hub, ICAR Central Institute of Fisheries Technology India, National Remote Sensing Centre India, CSIRO - Commonwealth Scientific and Industrial Research Organisation (Australia) as well as the Indian Space Research Organisation India. In addition, entrepreneurs and companies were also able to participate in the implementation of the Working Group for the Blue Economy Work Plan through knowledge sharing and the bonding of existing networks.

As a result, the effective collaboration supported three key areas:

Knowledge: Increased awareness, knowledge and know-how used by IORA national experts and organisations (including communities and practitioners in fisheries and aquaculture) on addressing issues in the management of the fisheries and aquaculture resources.

Policy: Increasing awareness of the blue economy agenda of the IORA translated into methods and guidance, as well as capacity in managing the blue economy space within the Member States.

Capacity building: The capacity building activities addressed opportunities to empower communities and livelihoods, and to increase national capacity in areas such as Illegal, Unreported and Unauthorised fishing, aquaculture development and fisheries management.

List of events, technical reports and training videos prepared with the support of AFD-IORA Technical Assistance

List of webinars and workshops organised	List of Technical Reports produced by the AFD- IORA TA
A webinar on combatting illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region (16 September 2021)	Technical Report No. 01 – Compendium of stock assessment training and courses in the IORA region
A webinar on the utilisation of satellite services for fish stock assessment and a climate warming system (30 November 2021)	Technical Report No. 02 – Literature review and gap analysis of information on international trade and markets for fisheries and aquaculture products
A webinar on promotion of small-scale rural aquaculture (31 August 2021)	Technical report No. 03 – Review of aquaculture, governance and development of small-scale aquaculture in the IORA region
A webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region (27 April 2021)	Technical report No. 04 – Analysis of measures to combat IUU fishing in the IORA region
A webinar promoting the Blue Carbon Initiative (BCI) manual for standardised blue carbon assessment methods in the Indian Ocean (23 January 2023)	Technical report No. 05 – Assessment of the capacity needs required (human and institutional) and the current level of implementation of port state measures in the IORA region.
A webinar for review on the existing capacity and needs for aquaculture development (15 March 2022)	Technical report No. 06 – Existing capacity, uses and needs for stock assessment training and courses in the IORA region
An online workshop on promoting the SDG 14.4 monitoring and evaluation and establishing cooperation among the IORA Member States on the SDG 14. 4 indicator with the participation of FAO (25 January 2023)	Technical report No. 07 – International trade study – Review of fish trade in the IORA region, including 23 IORA Member States’ trade profile in the fisheries sector
An online training course to raise awareness of the benefits of the PSMA delivered by FAO (25 – 29 April 2022)	Technical report No. 08 – Examples of existing initiatives in small-scale rural aquaculture in the IORA region
An online workshop in collaboration with CLS on remote sensing methods for identifying IUU fishing vessels (15th November 2022)	Technical Report No. 09 – Review of the existing capacity of IORA member states and the needs across a broad range of domains, including species selection, site selection, breeding, food development, husbandry, and disease
An online training workshop on self-producing aquaculture feed techniques for traditional farmers was carried out (7 July 2022)	Technical Report No. 10 – Undertake a capacity building programme on sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements – review of fish trade agreements in the IORA region
A Blue Economy Virtual Workshop on IUU fishing on “Moving toward the development and adoption of IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains”, 23-24 March 2022	Technical Report No. 11 – Undertake a capacity building programme on sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements – Capacity Building Programme
A training workshop on enhancing by-catch landing, valorisation, traceability and quality (29 March to 1 April 2022) in Seychelles	Draft IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains
A training workshop on best practices in sea cucumber seed production and tubular seaweed farming for commercial operations in Zanzibar, Tanzania (7 – 11 November 2022)	Sea Cucumber Seeding training video and training protocol
A training workshop on research and sustainable management of the blue carbon ecosystem, in Madagascar, Toliara (28 November – 2 December 2022)	Seaweed seeding and tubular farming method training video and training protocol Training video on Insect farming for small scale aquaculture operations and training protocol

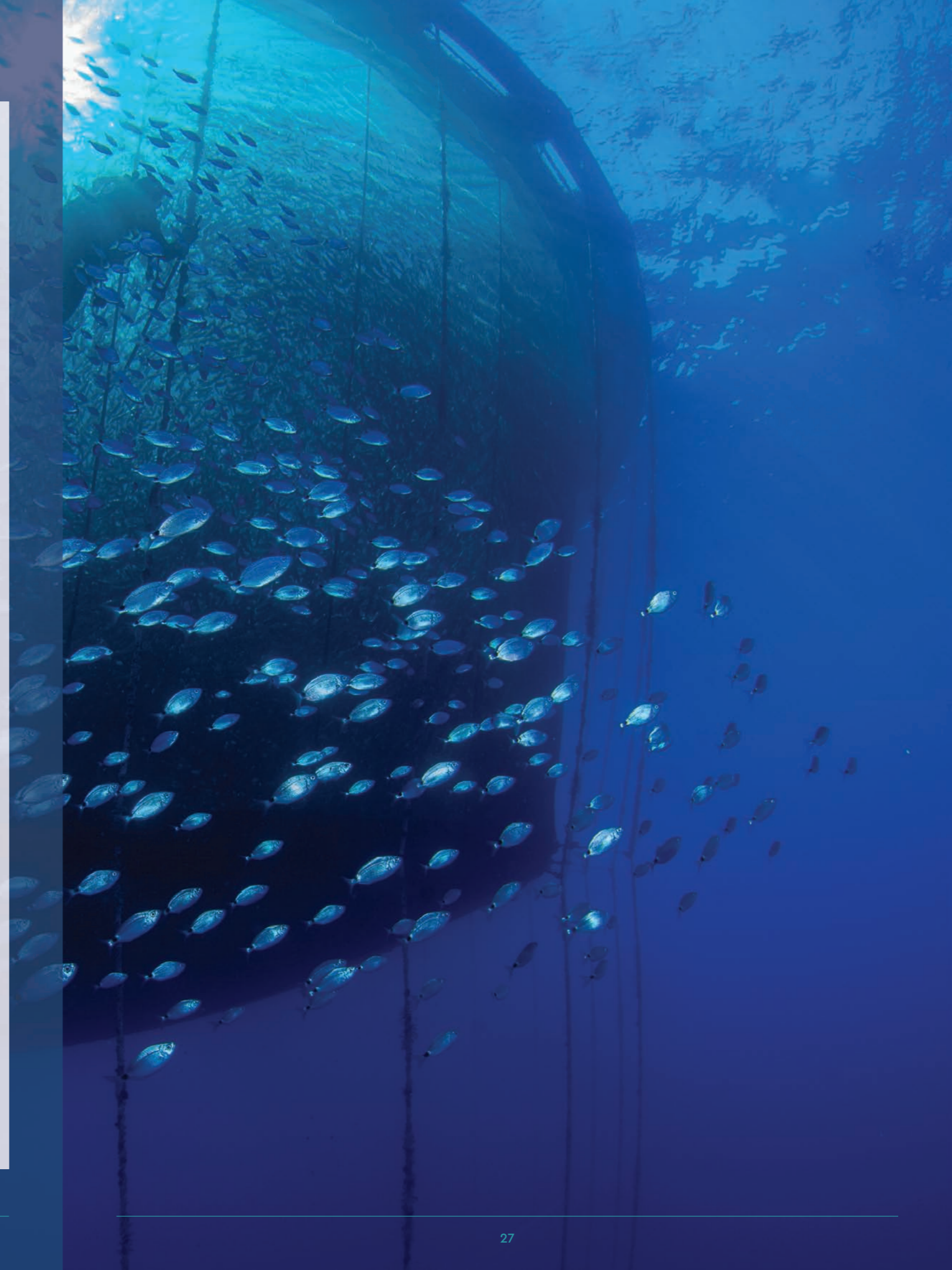
Conclusion

Many technical reports were produced during this project, leveraging productive stakeholder discussions, promoting shared experiences and positive inter-organisational relationships developed within and outside the IORA region. This Technical Assistance provided a platform to foster knowledge exchange and sharing of experiences among its Member States in various fields of the blue economy. The high level of attendance to the events and positive feedback have paved the way for organising more events of that kind.

Overall, it is worth to note that, through the implementation of the Technical Assistance, related to the IORA Blue Economy Work Plan as well as AFD mandate, several SDG 14 goals were achieved, namely, improving livelihoods, knowledge and fostering deep cooperation among the IORA Member States in various fields such as fisheries and aquaculture.



Drying seaweed after harvest in Zanzibar.





Group 2 of Activities Promoting sustainable fisheries management

Context

As a key component of the sustainable stewardship of living marine resources, stock assessments provide crucial scientific information to resource managers from IORA Member States. According to the FAO (*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO, 2022*) fishery resources continue to decline due to overfishing, pollution, poor management and other factors, but the number of landings from biologically sustainable stocks is on the rise. The fraction of fishery stocks within biologically sustainable levels decreased to 64.6 percent in 2019, 1.2 percent lower than in 2017, and rebuilding overfished stocks could increase fisheries production by 16.5 million tonnes (*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO, 2022*) and raise the contribution of marine fisheries to the food security, nutrition, economic growth and well-being of coastal communities.

While the resilience of the resources depends largely on the biological characteristics (population dynamics) of the stock, the fecundity, the intrinsic growth rate, natural mortality, and the additional mortality imposed on the fish population by fishing, other factors include vulnerability dependent on season, aggregation, as well as response to gear, etc.

As such, stock assessments provide the scientific basis for fisheries management by setting annual catch targets and limits to prevent overfishing, whilst also monitoring the current conditions of fishery resources. In addition to existing Geographical Information Systems and Remote Sensing methods, cooperation among IORA Member States is also necessary to better regulate fishing practices, especially about migratory and transboundary species like tuna or demersal stocks on the high seas.

In addition, many fisheries by-catch species are used for food by coastal communities, in processed forms such as salted, smoked, or otherwise. These value-added fish products constitute a lucrative export market, and hygiene, safe handling practices, quality control, and traceability are equally important factors that have to be taken into consideration. Hence, improving the use of the marine resources is critical for food security.

The Group 2 of activities aimed at improving: **(i) the sustainability of fisheries resource levels in the IORA region (ii) knowledge on stock assessment and sustainable fisheries management practices.**

Following a series of assessments, two technical reports, Compendium of stock assessment training and courses in the IORA region and Existing capacity, uses and needs for stock assessment training and courses in the IORA region, were produced and published on the IORA website. The results of these reports were also shared during a webinar titled Initiate a capacity building programme for fish stock assessment on the 13th of July 2021, with the help of the Food and Agriculture Organisation of the United Nations, the Commonwealth Scientific and Industrial Research Organisation, as well as the technical expert.

In November of the same year, a webinar on the *utilisation of satellite services for fish stock assessment and a climate warning system* was held, with the webinar report published on the IORA website.

Held from the 29th of March to the 1st of April 2022, a workshop was organised in collaboration with the Government of the Republic of Seychelles to train participants from Member States on enhancing by-catch landing, valorisation, traceability and quality.

In January 2023, an online workshop was held in collaboration with the Food and Agriculture Organisation (FAO) on evaluation, monitoring progress and establishing cooperation among IORA Member States, in order to address the SDG 14.4.

Results

Two events were held in line with fisheries resource levels sustained and improved in the IORA region, namely the by-catch training in Seychelles on enhancing landing and valorisation, as well as the online workshop on the promotion of the reporting and monitoring of SDG 14.4, to raise awareness and build capacity on sustainable fisheries management. With 60% of fish stock in the IORA region considered to be sustainable, compliance with the reporting and monitoring of SDG 14.4.1 indicator attained 60% through the partial contribution and work done carried out by Member States by the Technical Assistance team. Further improvement should be expected down the line.

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Speakers of the webinar on Utilization of Satellite services for fish stock assessment and a climate warning system



Opening Session of IORA Training Workshop on by-catch in Seychelles.



Participants observing by-catch landing, Seychelles (By-Catch Training Workshop).



By-catch processing - Seychelles.

WHAT WAS ACHIEVED

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4 activities

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Group 3 of Activities

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By providing a strategic focus on long-term aquaculture development in the region, IORA's Blue Economy Work Plan aims to address the challenge of the sector. As such, capacity building for IORA Member States is undoubtedly key to uplifting aquaculture practices in those countries, but it is also a long-term process, which will require significant funding resources.

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Participants - Training Workshop on best practices in sea cucumber and seaweed seeding, Zanzibar, Tanzania.



Demonstration on constructing a tubular net system for seaweed farming, Zanzibar, Tanzania.



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Participants preparing seawater tank for sea cucumber spawning, Zanzibar, Tanzania.

WHAT WAS ACHIEVED

Consisted of

7

activities

3

online events and one training

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- A webinar on promotion of small-scale rural aquaculture
- An online training workshop on self-producing aquaculture feed techniques for traditional farmers
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3 Training videos and protocols

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- Sea cucumber seeding training video and training protocol
- Seaweed seeding and tubular farming method training video and training protocol

96%

Implementation rate

Impact:

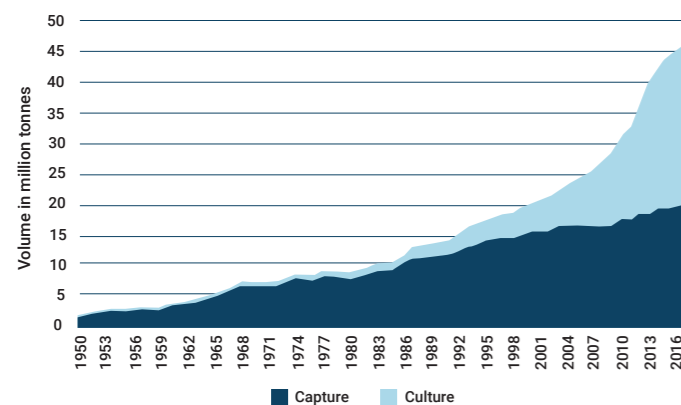
I. Promoted sustainable aquaculture development



Group 4 of Activities

Promoting and implementing open market access to fish trade, including aquaculture

Context



Landings and aquaculture production in IORA Member States. Source: FAO FishStat, 2020

In IORA region, exports are dominated by crustaceans (shrimp), various marine fishes, and molluscs. Imports are dominated by marine fishes. International seafood trade within the IORA region has been relatively modest, while exports from the region to major markets have been significant and growing. As a region, the “seafood trade balance” is positive, i.e., the region exports more than it imports in terms of value, but this varies greatly from country to country.

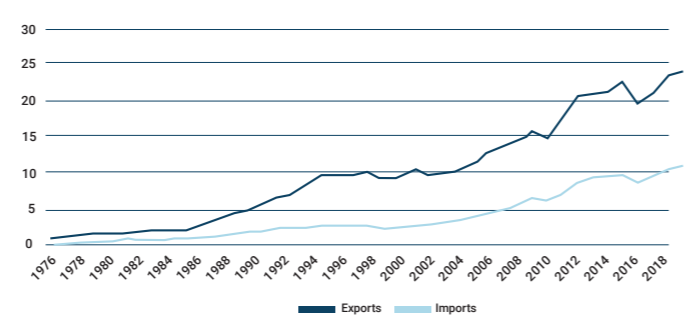
The most important export markets for the region are Asia, North America and Europe. Asian and Southeast Asian markets account for 44 % of total exports, while North America accounts for 27 % and Europe 15 %. Most of the imports come from Asia and Southeast Asia (60 % of total imports). (FAO 2023, FishStatJ: database accessed on 2 August 2023: <https://www.fao.org/fishery/en/topic/166235/en>)

Intra-regional trade in the IORA region appears to be little developed, except for the major trading countries in the region (Thailand, Australia, Malaysia, Singapore and the United Arab Emirates).

The largest fishing nations in the region are Indonesia (7.3 million tonnes in 2018), India (5.3 million tonnes), Bangladesh (1.9 million tonnes). With regards to seafood, the region as a whole is an active exporter as well as a key importer. While India, Thailand and Indonesia are some of the biggest exporters, Australia, Malaysia and Singapore constitute some of the major importers of seafood.

In terms of value, total exports amounted to USD 24.1 billion, whereas imports represented USD 11 billion, making the IORA region a net exporter of seafood. Despite being relatively stable, the gap between exports and imports has widened over the last years, as illustrated by Chart 3.

Intra-regional trade between IORA Member States is relatively low and could be enhanced with better access to market information and opportunities, including through inherent bilateral or multilateral trade arrangements.



Gap between seafood exports and imports for IORA region. Source: FAO FishStat, 2020

Results

To achieve ‘The promotion and facilitation of open market access through high quality fisheries and aquaculture products and fish trade’, studies, training and capacity building were carried out by the Technical Assistance.

To support the development of a fish trade study for the purpose of evaluating fish trade and aquaculture products among IORA Member States, a literature review and gap analysis of information on international trade and markets for fisheries and aquaculture products was undertaken.

In April 2021, a webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region was held for IORA Member States. This webinar was successfully achieved after identifying gaps and underlining the importance of safety standards, as well as the trading of high-quality fish products in the IORA region.

In addition, 23 States trade profile reports were prepared to present trade information in the fisheries sector for each IORA Member State, resulting in the production of the technical report International trade study - Review of fish trade in the IORA region. The outcomes of this study were presented in October 2021 during a webinar along with recommendations to improve fish trade. In addition to the work that was carried out concerning the level of open market accessibility and intra-regional trade in the future, the comprehensive capacity-building programme developed by the Technical Assistance should also enhance and facilitate trading in the region.

After reviewing fish trade agreements in the IORA region, a capacity building training programme was created for the sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements.

– Webinar –
Enhancing the knowledge on international trade and markets for fisheries and aquaculture products in the IORA region
12 October 2021
07:00 – 09:30 hrs GMT
11:00 – 13:30 hrs
in Mauritius

Speakers for the webinar on : Enhancing the knowledge on international trade and markets for fisheries and aquaculture products in the IORA region.

Speakers for the webinar on : Enhancing the knowledge on international trade and markets for fisheries and aquaculture products in the IORA region.

AFD
AGENCE FRANÇAISE DE DÉVELOPPEMENT

IORA
INTERNATIONAL ORGANIZATION OF REGIONAL AGENCIES FOR DEVELOPMENT

TECHNICAL REPORT NO. 7 – INTERNATIONAL TRADE STUDY – REVIEW OF FISH TRADE IN THE IORA REGION

‘TECHNICAL ASSISTANCE TO IORA FOR THE IMPLEMENTATION AND COORDINATION OF IORA ACTION PLAN ON FISHERIES, AQUACULTURE AND MARINE ENVIRONMENT’

REFERENCE NO. DOE/NAT/ARB/DCP/2019-290

Authors: Blessing Mapfumo and Erik Hempel
November 2021

Project implemented by
COFREPECHE SOFRECO

Internal reference: IO349R07B

Technical report No. 7 - International Trade Study - Review of fish trade in the IORA Region.



Yellowfin tuna ready for storage - By-catch Training, Seychelles.

WHAT WAS ACHIEVED

Consisted of

5 activities

1 Online event

- A webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region

4 Technical Reports produced

Impact:

1. Promoted and implemented open market access to fish trade, including aquaculture



Group 5 of Activities

Standardising blue carbon assessment methods in the Indian Ocean

Context

Rich in blue carbon ecosystems, the tropical Western Indian Ocean (WIO) region hosts dense mangrove forests covering more than 733 000 ha (5.3% of the total mangrove cover worldwide), with diverse seagrass meadows reaching more than 40m deep. In addition, the States within and surrounding the Indian Ocean basin contain approximately 50% (an estimated 76,275 km²) of the world's mangrove forests, as well as a large, but unknown proportion of its seagrass meadows. (WIOMSA 2016, database accessed on 25 August 2023: <https://www.wiomsa.org/publications/mangroves-of-the-western-indian-ocean-status-and-management/>)

Despite their importance, coastal blue carbon ecosystems are some of the most threatened ecosystems on our planet. Indeed, since the 19th century, nearly 50% of the pre-industrial and natural extent of global coastal wetlands have been lost at four times the rate of tropical forests. With climate change threatening to accelerate these losses, the current loss rate, depending on the ecosystem type, varies between 0.5 and 3% annually, with ongoing carbon losses from blue carbon ecosystems estimated to account for up to 19% of emissions from global deforestation.

Fully recognising that healthy blue carbon ecosystems are vital for providing habitat for marine species; supporting fish stocks and food security; sustaining coastal communities and livelihoods; filtering water flowing into our oceans and reef systems; and protecting coastlines from erosion and storm surges, the working group on the blue economy is advocating for robust scientific, policy and governance frameworks with regards to the protection and restoration efforts in the development and promotion of the blue economy.

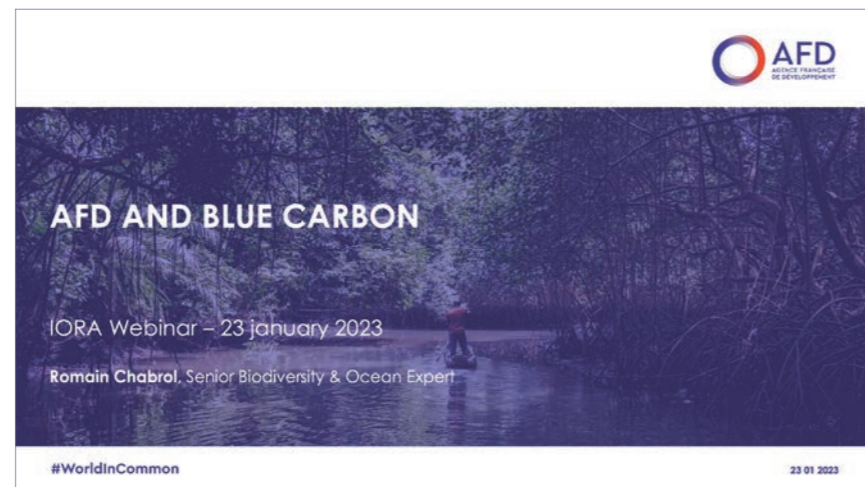


Results

With regards to the standardisation of methods for blue carbon assessment in the IORA Member States, two main outputs were achieved.

Working in collaboration with the University of Toliara (Fishery and Marine Science Institute-IHSM) from Madagascar, a training workshop on research and sustainable management of the blue carbon ecosystem was organised and co-financed with the Technical Assistance's support from the 27th of November to the 2nd of December 2022 with the aim of highlighting the importance of blue carbon assessment and advocating for the adoption of the blue carbon Initiative manual as the standard for blue carbon assessments. Capacities of Member States were also strengthened via the training workshop in Madagascar which focused on field and laboratory technical training on blue carbon measurements.

In January 2023, a webinar was held in collaboration with the IORA Blue Carbon Hub, the Blue Carbon Initiative, the International Partnership for Blue Carbon, and the Great Blue Wall Initiative, to promote the Blue Carbon Initiative manual for standardised blue carbon assessment methods for IORA Member States.



Participants - IORA Training Workshop on Blue Carbon Research, Madagascar.



Participants in Session - IORA Training Workshop on Blue Carbon Research, Madagascar.



Participants taking soil core samples from the mangrove area- IORA Training Workshop on Blue Carbon Research, Madagascar.



Preparing collected soil core samples collected in the laboratory - IORA Training Workshop on Blue Carbon Research, Madagascar.

WHAT WAS ACHIEVED

Consisted of

2 activities

1 **1**

Online event

Workshop

- A webinar promoting the Blue Carbon Initiative (BCI) manual for standardised blue carbon assessment methods in the Indian Ocean
- A training workshop on research and sustainable management of the blue carbon ecosystem, in Madagascar, Toliara

100% Completed

Impact:

1. Standardised blue carbon assessment methods in the Indian Ocean

Cooperation and synergies with stakeholders

The project was quite successful in fostering the cooperation with several intergovernmental agencies by involving them in online events and trainings hosted by the IORA such as the:



Notwithstanding, many IORA Member States actively participated in the activities by sharing their challenges and experiences on various blue economy topics.

Synergies were developed with stakeholders namely with private, non-governmental and government-related institutions such as Stop Illegal Fishing, Commonwealth Scientific and Industrial Research Organisation, Collecte Localisation Satellites, TM-Tracking, INFOFISH Malaysia, Institut de Recherche pour le Développement, OLSPS Marine Fisheries Management Solutions, Oceanographic Research Institute, IORA Blue Carbon Hub, ICAR Central Institute of Fisheries Technology India, National Remote Sensing Centre India, CSIRO - Commonwealth Scientific and Industrial Research Organisation (Australia) as well as the Indian Space Research Organisation India. In addition, entrepreneurs and companies were also able to participate in the implementation of the Working Group for the Blue Economy Work Plan through knowledge sharing and the bonding of existing networks.

As a result, the effective collaboration supported three key areas:

Knowledge: Increased awareness, knowledge and know-how used by IORA national experts and organisations (including communities and practitioners in fisheries and aquaculture) on addressing issues in the management of the fisheries and aquaculture resources.

Policy: Increasing awareness of the blue economy agenda of the IORA translated into methods and guidance, as well as capacity in managing the blue economy space within the Member States.

Capacity building: The capacity building activities addressed opportunities to empower communities and livelihoods, and to increase national capacity in areas such as Illegal, Unreported and Unauthorised fishing, aquaculture development and fisheries management.

List of events, technical reports and training videos prepared with the support of AFD-IORA Technical Assistance

List of webinars and workshops organised	List of Technical Reports produced by the AFD- IORA TA
A webinar on combatting illegal, unreported and unregulated fishing and especially through PSMA application in the IORA region (16 September 2021)	Technical Report No. 01 – Compendium of stock assessment training and courses in the IORA region
A webinar on the utilisation of satellite services for fish stock assessment and a climate warming system (30 November 2021)	Technical Report No. 02 – Literature review and gap analysis of information on international trade and markets for fisheries and aquaculture products
A webinar on promotion of small-scale rural aquaculture (31 August 2021)	Technical report No. 03 – Review of aquaculture, governance and development of small-scale aquaculture in the IORA region
A webinar on strengthening regional safety standards and quality assurance of aquaculture products in the IORA region (27 April 2021)	Technical report No. 04 – Analysis of measures to combat IUU fishing in the IORA region
A webinar promoting the Blue Carbon Initiative (BCI) manual for standardised blue carbon assessment methods in the Indian Ocean (23 January 2023)	Technical report No. 05 – Assessment of the capacity needs required (human and institutional) and the current level of implementation of port state measures in the IORA region.
A webinar for review on the existing capacity and needs for aquaculture development (15 March 2022)	Technical report No. 06 – Existing capacity, uses and needs for stock assessment training and courses in the IORA region
An online workshop on promoting the SDG 14.4 monitoring and evaluation and establishing cooperation among the IORA Member States on the SDG 14. 4 indicator with the participation of FAO (25 January 2023)	Technical report No. 07 – International trade study – Review of fish trade in the IORA region, including 23 IORA Member States’ trade profile in the fisheries sector
An online training course to raise awareness of the benefits of the PSMA delivered by FAO (25 – 29 April 2022)	Technical report No. 08 – Examples of existing initiatives in small-scale rural aquaculture in the IORA region
An online workshop in collaboration with CLS on remote sensing methods for identifying IUU fishing vessels (15th November 2022)	Technical Report No. 09 – Review of the existing capacity of IORA member states and the needs across a broad range of domains, including species selection, site selection, breeding, food development, husbandry, and disease
An online training workshop on self-producing aquaculture feed techniques for traditional farmers was carried out (7 July 2022)	Technical Report No. 10 – Undertake a capacity building programme on sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements – review of fish trade agreements in the IORA region
A Blue Economy Virtual Workshop on IUU fishing on “Moving toward the development and adoption of IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains”, 23-24 March 2022	Technical Report No. 11 – Undertake a capacity building programme on sustainable development of the fisheries and aquaculture sectors through appropriate regional trade agreements – Capacity Building Programme
A training workshop on enhancing by-catch landing, valorisation, traceability and quality (29 March to 1 April 2022) in Seychelles	Draft IORA Guidelines to prevent entry of IUU fisheries products into IORA Member States supply chains
A training workshop on best practices in sea cucumber seed production and tubular seaweed farming for commercial operations in Zanzibar, Tanzania (7 – 11 November 2022)	Sea Cucumber Seeding training video and training protocol
A training workshop on research and sustainable management of the blue carbon ecosystem, in Madagascar, Toliara (28 November – 2 December 2022)	Seaweed seeding and tubular farming method training video and training protocol Training video on Insect farming for small scale aquaculture operations and training protocol

Conclusion

Many technical reports were produced during this project, leveraging productive stakeholder discussions, promoting shared experiences and positive inter-organisational relationships developed within and outside the IORA region. This Technical Assistance provided a platform to foster knowledge exchange and sharing of experiences among its Member States in various fields of the blue economy. The high level of attendance to the events and positive feedback have paved the way for organising more events of that kind.

Overall, it is worth to note that, through the implementation of the Technical Assistance, related to the IORA Blue Economy Work Plan as well as AFD mandate, several SDG 14 goals were achieved, namely, improving livelihoods, knowledge and fostering deep cooperation among the IORA Member States in various fields such as fisheries and aquaculture.



Drying seaweed after harvest in Zanzibar.

