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[2] PU: Public, PP: Restricted to other programme participants (including the Commission Services), RE: Restricted to a group specified by the consortium (including the Commission Services), CO: Confidential, only for members of the consortium (including the Commission Services)
[3] The initials of the revising individual in capital letters

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Deliverable D4.2

Report from the MR kick-off meeting

24/03/2019

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Executive Summary

FarFish is a H2020 project that aims to provide knowledge, tools and methods to support responsible, sustainable and profitable EU fisheries outside European waters. To achieve this, FarFish will develop practical, achievable and cost-effective fisheries management tools and advice. The work will be done in collaboration of scientists, policy makers, resource users and other stakeholders aimed to improve fisheries management competences. A key output of the project are case specific Management Recommendations (MRs) that are based on Results-Based Management (RBM) principles in line with the Responsive Fisheries Management System (RFMS) approach, which was developed in the FP7 project EcoFishMan. The fisheries included in FarFish are in the high-seas areas of the SW-Atlantic Ocean (FAO area 41) and the SE-Atlantic Ocean (FAO area 47); as well as in the waters of Cape Verde, Senegal, Mauritania and the Seychelles.

In line with the RFMS approach, the engagement of stakeholders is highly prioritized in the project. Wide variety of stakeholders have been contacted throughout the first year of the project in order to contribute to the development of the MRs. The first multi-stakeholder physical meeting was held in Vigo, Spain, on the 26th -27th of June 2018. The meeting was titled "Strengthening fisheries sustainability outside EU" and was the official MR kick-off meeting. This document reports on that meeting. The aim of the meeting was to discuss stakeholders' interests and needs, related to how they can contribute to the development of the MRs, while improving the sustainability of the fishery of the EU fleet fishing in distant waters. The current status of the work in the different FarFish working groups and case studies were presented to inform the attendants on issues like "where are we", "what are the options" and "what do we need".

Despite all challenges in culture, language and interest/needs, progress was made on important issues in the project. Having representatives from both EU and China, as well as authorities from countries that haves signed Sustainable Fisheries Partnership Agreements (SFPA) with the EU around the table was one important step towards strengthening EU fisheries sustainability outside EU waters. With relevance to the high-seas case studies, representatives from both the Chinese Academy of Fisheries Sciences (CAFS) and the Long Distance Advisory Council (LDAC) presented their views on the high-seas fisheries. LDAC emphasized the need for a level playing field for fishing operators from EU and non-EU countries, ensuring that all fleets abide by the same international rules and regulations. CAFS highlighted the challenges and main policies that apply to the Chinese distant water fleet and want to contribute actively towards goals aiming towards a more sustainable fishery.

To ensure the best utilization of stakeholders' knowledge and contribution, the participants from similar case studies separated into two working groups. In light of the communicated interests and needs of stakeholders, potential Outcome Targets (OTs) and management recommendations were drafted. Defining OTs is challenging as they are to be initially defined by authorities and implemented by operators, but through the cooperation of both authorities and operators, FarFish has now succeeded in drafting OTs that most stakeholders took part in the discussions of, which in accordance to the RFMS approach should ensure successful implementation of the MRs. The fruitful discussions in this meeting emphasize that this exercise can be thought provoking. Work Package 3 (WP3) and Work Package 4 (WP4) drafted potential alternative scenarios after the meeting, based on outcomes

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of the meeting, the MP0 (see D4.1), and OTs presented in MR Invitations (see D3.2). It is however, obvious that many management strategies will achieve a given OT, when the set indicators are yes/no or present/absent. In those cases, the need for modelling of scenarios is redundant.

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Abbreviations & concepts/definitions

AFAD	Anchored Fish Aggregation Device
AIS	Automatic Identification System
ANFACO	National Association of Fish and Seafood Canning Manufactures (Representing EU fishing and processing sector)
CAFS	Chinese Academy of Fishery Sciences
CCMAR	Centro de Ciencias do Mar do Algarve
CETMAR	Centro Tecnologico del mar Fundacion CETMAR
CFP	Common Fisheries Policy
COREWAM	Conservation and Research of West African Aquatic Mammals
CRODT	Oceanographic Research Centre of Dakar Thiaroye
CS	Case Study
CSIC	Agencia Estatal Consejo Superior de Investigaciones Cientíicas
DARE	Directory of Fisheries Management in Mauritania (DARE)
DFAD	Drifting Fish aggregating devices
DG MARE	Directorate-General Maritime Affairs and Fisheries, EC. This Commission department is responsible for EU policy on maritime affairs and fisheries.
DLM	Data Limited Method
DPM	Direction des pêches maritimes (Senegal)
DPSP	Direction de la protection et de la surveillance des pêches (Senegal)
EBAFM	Ecosystem Based Approach to Fisheries Management
EDF	European Development Fund
EFCA	European Fisheries Control Agency
ERS	Electronic Recording Systems
FAD	Fish Aggregation Device
FarFish RG	FarFish Reference Group
FCWC	Fisheries Committee for the West Central Gulf of Guinea
HCR	Harvest control rule
HS	High seas
ICCAT	International Commission for the Conservation of Atlantic Tunas
IMO	International Maritime Organization
IMR	Institute of Marine Research, Norway
IMROP	Mauritanian Institute for Oceanographic Research and Fisheries (responsible for the approval of licenses and fishing vessels)
INDP	National institute for Fisheries Development, Cape Verde
IOTC	The Indian Ocean Tuna Commission
ITLOS	International Tribunal for the Law of the Sea
IUU	Illegal, unreported and unregulated fishing
JDP	Joint Deployment Plans
LDAC	Long Distance Advisory council, EU fisheries body representing stakeholders of both fishing sector and other groups of interest
MATIS	Matís Ohf. – Icelandic Food & Biotech R&D (FarFish coordinating institution)

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MCS	Monitoring, Control and Surveillance
MPA	Marine Protected Area
MR	Management Recommendation
NEAFC	North East Atlantic Fisheries Commission
NOFIMA	The Norwegian Institute of Food, Fisheries and Aquaculture research
OPAGAC	Organisation of Associated Producers of Large Tuna Freezer Vessels, FarFish RG
OPRPOMAR	Organization of Fresh Fish Producers of the Port an d Ría de Marín, Spain
PESCAO	Programme de Soutien a la Peche, a sa surveillance et a son controle en Afrique de L'ouest
PGRP	Cape Verde Fisheries Management Plan
PSMA	Port State Measures
RBM	Results-Based Management
RFMS	Responsive Fisheries Management System is a fisheries management approach. The RFMS is an adaptive management system that is results-based and ecosystem-based.
SCIP	Specific Control and Inspection Programme
SEAFO	South East Atlantic Fisheries Organisation
SFA	Seychelles Fisheries Authority
SFPA	Sustainable Fisheries Partnership Agreements
SRFC	Sub Regional Fisheries Commission
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
UCAM	University of Cadiz (Morocco)
UIT	University of Tromsø
UNU-FTP	United Nations University Fisheries Training Programme
USP	University of São Paulo, Brazil
VME	Vulnerable Marine Ecosystems
VMS	Vessel Monitoring System

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1 Introduction

FarFish is a H2020 project that aims to provide knowledge, tools and methods to support responsible, sustainable and profitable EU fisheries outside European waters. To achieve this, FarFish will develop practical, achievable and cost-effective fisheries management tools and advice. The work will be done in collaboration of scientists, policy makers, resource users and other stakeholders aimed to improve fisheries management competences. A key output of the project are case specific Management Recommendations (MRs) that are based on Results-Based Management (RBM) principles in line with the Responsive Fisheries Management System (RFMS) approach, which was developed in the FP7 project EcoFishMan. The fisheries included in FarFish are in the high-seas areas of the SW-Atlantic Ocean (FAO area 41) and the SE-Atlantic Ocean (FAO area 47); as well as in the waters of Cape Verde, Senegal, Mauritania and the Seychelles.

In line with the RFMS approach, the engagement of stakeholders is highly prioritized in the project. Wide variety of stakeholders have been contacted throughout the first year of the project in order to contribute to the development of the MRs. The first multi-stakeholder physical meeting was held in Vigo, Spain, on the 26th -27th of June 2018; one year after the official start of the project. The meeting was titled "Strengthening fisheries sustainability outside EU" and was the official MR kick-off meeting. This document reports on that meeting. The aim of the meeting was to discuss stakeholders' interests and needs, related to how they can contribute to the development of the MRs, while improving the sustainability of the fishery of the EU fleet fishing in distant waters. The current status of the work in the different FarFish working groups and case studies were presented to inform the attendants on issues like "where are we", "what are the options" and "what do we need".

The MR kick-off meeting was organized by the FarFish partner CETMAR. The meeting agenda was distributed in advance of the meeting (see appendix). There were five sessions organised over the two days, where most sessions were plenary. However, to ensure efficient progress in the different case studies (CS), participants were split into working groups in session III.

CETMAR successfully ensured the participation of stakeholders from all CS areas, scientific institutions, business owners, fisheries organizations and authorities. The participants came from most FarFish partner institutions, some of the FarFish Reference group (RG) members, and a few external institutions with interest in the FarFish project. Initially, FarFish planned to hold separate meetings in partner countries, but it was considered disadvantageous due to potential stakeholder fatigue, especially for the operators representing the EU fleet. A common meeting for all CSs can also commence regional and international network between FarFish partners, FarFish RG members and other institutions who are interested and were invited to the meeting. Therefore, one common meeting addressing all CS replaced the separate kick-off meetings in each CS.

The aim of the meeting was to introduce and operationalize the approach for the development of MRs, namely the RFMS approach to stakeholders (Figure 1). The RFMS represents a specific approach to co-management, by which three generic agencies have specific roles:

Authorities, which define specific and measurable requirements: "Outcome Targets" (OTs). In FarFish, WP3 facilitates this role.

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Operators, which find ways to achieve requirements and provide relevant documentation. The operators have a main role in proposing MRs. In FarFish, WP1 and WP4 facilitate the role of the operators.

Auditors, which evaluate if the requirements are met. In FarFish, WP5 is facilitate this role.

The basic concept of RFMS is founded on Results-Based Management (RBM), whereby operators are invited to initiate alternative management approaches, if they can demonstrate that specific policy objectives will be achieved. The approach is incentive based, creating flexibility within defined limits. The approach is to- down as authorities set specific objectives on existing policies, but also bottom-up as it invites operators to co-operate on defining alternative ways to achieve these objectives. The management objectives form the basis for the OTs. OTs are defined as follows:

Outcome target (OT) is a specific and measurable performance goal defined for a fishery on the basis of agreed and appropriately authorized general goals, standards and principles, as defined by the authorities based on the policy objectives. The OT has an indicator value that the management actions aim to stay above or below e.g. F< Fmsy. An OT can though also a simple "Yes/No" or "present/absent" response indicating if the objective is accomplished or not.

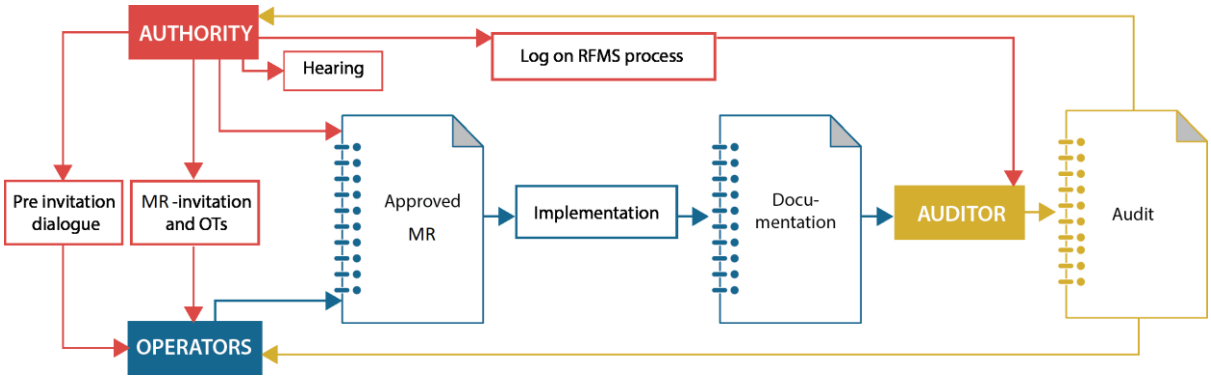

Figure 1: The RFMS process. The responsibilities of each of the three entities are demonstrated with different colours. Authority: red / Operators: blue / Auditors: yellow.

Through work package (WP) presentations and subsequent discussions, questions like "where are we", "what are the options" and "what do we need" in order to achieve outcome targets (OT) and thereby ensure sustainability were addressed. Based on the discussions, alternative management scenario strategies needed to be identified in cooperation with stakeholders. Such scenarios can be achieved by comparing status quo to suggested management recommendations, aiming to address a specific OT. The derived OTs are based on management objectives in each CS expressed by representatives for authorities in the MP0 (D4.1) and in previous meetings; such as the CS/WP meeting held in Faro Portugal in November 2017, the FarFish annual meeting held in Portsmouth England in May 2018, and various skype meetings held within the FarFish consortium.

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The development of MRs follow the MR guidelines (D3.1) and depend on the feedback from all stakeholders. The stakeholders present at the meeting were asked to express their interests and needs, which was compared to needs reported in MP0 (D4.1). The MP0 was made available in February this year, and contains the objectives, challenges for and potential improvements in each CS, based on feedback from CS leaders and discussions at a meeting in Faro in November 2017. As the operators were not involved at this early stage, the MR kick-off meeting was very important to ensure the engagement of operators and authorities. Participants representing the operators in SFPAs and high-seas CS were asked to express their interests and needs. It was very important to make progress in defining OTs for the different CS and to identify potential alternative management scenarios strategies based on communication between FarFish authorities and operators.

All authority representatives from CS countries that have signed SFPAs (in some cases represented by CS leaders) have been approached at an earlier stage in the project, except for representatives of the European Union (EU). The participation of DG Mare was therefore highly desired in order to take into account their interest and needs in the progress of this research project, especially when defining the OTs.

The need for improvements in monitoring (aim to prevent IUU fishery amongst other) has been stressed in all CSs and was therefore prioritized with a separate session during the meeting to address this special issue. How EU currently address this issue is of high interest for FarFish, in particular for the WP that will develop the tools for MRs. It was therefore highly appreciated that the European Fisheries Control Agency (EFCA) was able to attend the meeting and present their current work and priorities.

The following chapters report on the proceedings of the MR kick-off meeting, what was discussed by the attendees and what was then agreed upon in regard to upcoming work in FarFish.

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2 The progress of scientific advances in FarFish

The first session of them meeting was titled “advancing knowledge and capacities” and was primarily intended to update the stakeholders attending the meeting on the objectives of FarFish, what has been achieved until now and what is planned to do in the immediate future.

2.1 Advances in biological knowledge

All CS were presented from the perspective of advancing biological and ecological knowledge. The focus was on the current state of key stocks, the methodology used in terms of stock assessment, and the estimated surplus for these stocks for exploitation under fisheries agreements.

Considering tuna and tuna-like species, the role of tuna-RFMOs such as ICCAT and IOTC were emphasised, including their role in terms of data collection, stock assessment, and management (Cape Verde and Seychelles CS). Most of the stocks are being exploited sustainably with the notable exceptions of bigeye tuna in the Atlantic and yellowfin tuna in the Indian Ocean, both of which are considered to be overexploited. All of the key tuna and tuna like stocks (including swordfish and some sharks) specified in SFPAs in the CS are managed by ICCAT and IOTC and the issue of surplus should be seen in a regional context. Thus, fishing in the context of SFPAs take place within the context of allocation to Member States under regional frameworks.

Other key stocks were presented such as black hakes and shrimps, which are targeted in the Mauritanian and Senegal CSs. Available scientific information indicate that these stocks are exploited moderately. Although there may be room for expanding these fisheries, the species differentiation of black hakes is crucial. However, the relatively low exploitation levels appear to be driven by economic factors (e.g. prices, costs, etc.).

High seas CS were also presented with a focus on squid and hake fisheries in the Southwest Atlantic. Although there is a substantial amount of information available on the relevant stocks, this is fragmented and there is a lack of regional management framework, thus making it difficult to reach a definitive conclusion on the state of stocks.

Various proposals were presented on how FarFish can contribute to advance biological knowledge on specific issues such as hake stock discrimination, improving the quantity and quality of data, alternative methods in stock assessment, and linking environmental data to stock assessment.

2.2 Value chains and governance in the SFPA and the High Seas

The value chains and governance within the CSs were presented. FarFish will analyse for each CS, the (main) flow of volumes and values between links in each value chain, identify the (main) actors in and between links in each value chain, the profitability and value creation in each value chain, as well as the structure, governance and relationships in (intermediate) markets. The framework intended to be used for analysing the governance of the selected SFPAs and high-seas fisheries was presented; which will include mapping of the legal framework, the division of authority and separation of responsibility of work between different institutions and available resources. Conditions for facilitating good governance will be identified, as well as the main barriers thereof. The analysis will be based on

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publicly available knowledge and is dependent on input from stakeholders in the project for more in-depth analysis.

2.3 Management Recommendations

The RFMS approach (Figure 1) was introduced describing the process of engaging the stakeholders in the formulation of OTs and in the development of MRs according to the guidelines (D3.1). It was pinpointed where we are in the RFMS process at the moment. The audit process in RFMS was exemplified by a summary of the Ex-post evaluation on SFPA for Cape Verde (Amador et al., 2018), which also suggests which SFPA issues need to be addressed and some of them may be relevant for FarFish. Potential OTs based on this evaluation were presented. Suggested OTs based on the MP0 (D4.1) were also presented for the Senegal CS. Potential management strategies under different scenarios were exemplified and the dependence on other WPs, especially WP6 and WP2, was highlighted.

2.4 What tools for management, monitoring and cooperation can be designed?

The tools to be designed within FarFish are to be selected on the bases of three criteria's, which are that they should provide added value, relevance and usefulness in support of management and decision making for the actors involved in each of the CSs. To accomplish this requirement consultation was conducted in WP2 and WP4 to avoid redundancies and to summarize the particular needs of each CS. As consequence, the choice of the tools has been made in coordination with the production of MP0 and its evolving MR1 (D4.1 and D6.4).

The tools that have been identified can be divided in five groups:

1. Model implementation to evaluate stocks: An automatic tool that provides the output of several data limited methods according to data availability.
2. Big Data analysis from satellite in support of compliance: Analysis and visualization of satellite data that records the fishing activity of vessels through the Automatic Identification System (AIS) and through the Visible Infrared Imaging Radiometer Suite (VIIRS). A contrast between AIS and VIIRS information has the potential to assess fishing effort on both legal and illegal activities at sea, diagnosing the existence of dark fishing activities, i. e. activities that occur with the AIS transmitter switched off.
3. Oceanographic support to stock dynamics: Providing the knowledge mainly for short-lived species where their dynamics can be understood in the oceanographic frame of the region and where vulnerabilities can be assessed.
4. Tools to differentiate hake stocks in NW Africa: Development of a template for self-sampling (in coordination with WP2) and training to relevant actors to perform this stock identification (in coordination with WP7)

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5. Visualization tools: A tool to make easier the message got from CECAF's model outputs and to focus GLOBAL AIS data into CS areas of interest.

2.5 Capacity building

United Nations University - Fisheries Training Programme (UNU-FTP) completed a Training Needs Assessments in relation to the FarFish project in the four SFPA CS countries, as outlined in D7.4. The primary aim of these assessments was to determine mutually agreed upon capacity building priorities to form the basis for training administered through WP7 in the FarFish project. These Training Needs Assessments targeted institutions collaborating in the FarFish project within the CS countries and were conducted through site visits during which key staff were interviewed by the UNU-FTP team. The initial results of these assessments were presented to FarFish partners on site at the end of the field visits, and input from FarFish partners were incorporated in the final Training Needs Assessment report.

Institutional arrangement, management structure, data collection strategies, priorities, and wider fisheries development context in each CS country is unique. In Mauritania, given the importance of pelagic fisheries, the team identified the specific need to develop capacity in the field of acoustic surveys for stock assessment. Also, considering the importance of the upwelling system in total production, a closer cooperation within the IMROP department researching Oceanography and the Stock Assessment department could yield higher resolution analysis required for predictive modelling of stocks. In Senegal, the CRODT scientists are each tasked with a specific area of study, but lack research support staff to successfully complete their mandate to provide scientific advice to fisheries policy makers. In this case, institutional constraints have led to an overworked and overcommitted core team of researchers who heavily rely on doctoral students to complete basic research. In the Senegalese context, there is one species allocated TAC, shrimp, and while other stocks are monitored through significant data collection efforts, there is no predictive modelling taking place. It was determined that stock assessment and modelling are the key priorities for building institutional capacity at CRODT. In Cape Verde, INDP has one stock assessment researcher on staff, but there is a strong determination to invest in building research capacity to conduct stock assessment. In Seychelles, the SFA is undergoing a transition towards financial autonomy, which may to impact the primary mandates of the organisation. A newly established quota on yellowfin tuna in the Indian Ocean demands more predictive stock modelling methodologies of SFA scientists.

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3 The EU perspectives on SFPA and high seas

The deputy head of the unit within DG Mare responsible for "Trade Negotiations and Sustainable Fisheries Partnership Agreements" attended the meeting. The representative presented the perspectives of DG Mare, its role and objectives in facilitating sustainable and profitable fishery by the EU fleet.

First, the EUs set of rules for managing European fishing fleets was highlighted. The Common Fisheries Policy (CFP)[4], was presented, as well as its key objectives and tools. The main objectives of the CFP are to (1) promote sustainable fishing, (2) reinforce science-based management, (3) fight against Illegal, unreported and unregulated (IUU) fishing and (4) facilitate transparency.

The tools available for the CFP can be summarized by the International Ocean governance agenda[5], RFMOs (12 active, but most important are ICCAT, IOTC and NEAFC), SFPAs (ca.12 in countries with abundant resources) and by the new EU regulation on sustainable management of external fishing fleets (EU) 2017/2403) [6], which entered into force on the 17th of January 2018. This regulation sets new rules for issuing and managing fisheries authorisations for EU vessels operating outside EU waters. All vessels should be authorised and monitored by its flag Member State, and all vessels must provide specified information according to the annexes in the regulation. In addition, all fishing vessels and any associated support vessel must have an IMO number, intending to ensure traceability of the vessel throughout its lifespan.

The new regulation sets as requirement for EU fleets to be able to utilise fishing opportunities that they can demonstrate data collection, and that science must be checked before entering a new fishery outside EU waters. This could be where the FarFish project can provide assistance to the EU fleet and the contracting countries, by facilitating positive interaction between FarFish and SFPAs with emphasis on support to the knowledge of targeted species, improved stock assessment, value chain considerations, MRs, new knowledge on by-catch and FAD related issues and advanced knowledge on the CS, including the high-seas.

DG Mare considers FarFish as a very ambitious project and has high expectations to its contribution. DG Mare will assist the project as far as possible when it comes to providing data and giving feedback. He did though emphasise that some data can only be provided on aggregated level. As an example of the linkage that has already been established between FarFish and DG Mare, it has been decided that the coordinator of FarFish will have regular meetings (1-2 times a year) to update on progress and allow for exchange of information. Two such meetings took place within the first year of FarFish.

[4] https://ec.europa.eu/fisheries/cfp_en
[5] https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/join-2016-49_en.pdf
[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R2403

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DG Mare emphasized the following suggestions to the FarFish consortium;

- Be sure to cover all relevant species. This was especially referring to Mauritania, where the initial target species were set to shrimp in MP0; whilst small pelagics are clearly the most important species within the SFPA.
- Reinforce interaction with RFMOs (also on species like sharks).
- Enlarge the network of partners. IEO was in particular mentioned as potential important contributors to the project.
- DG Mare will cooperate with providing access to reports and data, but there are limitations on what they are allowed to provide because of confidentiality. Some of the data will therefore only be available on aggregated level. there is also limited information available on some issues e.g. by-catches, presentation of products, port of landings, crew composition, etc.
- DG Mare also emphasized the importance of looking at other fleets than the EU fleet. There issue of level playing field does have to be taken into consideration.

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4 The role of the European Fisheries Control Agency (EFCA)

The head of the unit of operational cooperation at the European Fisheries Control Agency (EFCA), attended the meeting and gave a presentation on the roles and responsibilities of EFCA; as well as initiatives that they are involved in relevant for FarFish.

The role of EFCA is to ensure that the EU's common fisheries policy (CFP) is applied properly by coordinating the cooperation between national control and inspection activities. The international activities by EFCA are based on Article 30 in the CFP, which relate to "Compliance with international provisions" and the improvement of fisheries governance. Risk assessment, support to Monitoring, Control and Surveillance (MCS) strategies (including cost effectiveness) and supports the fight against IUU fishing. Also, joint operations and data/intelligence exchange, application of new technologies and capacity building/training[7] are main areas of EFCA cooperation and support.

EFCA offers support to EU delegation in cooperation with RFMOs and third countries (including SFPAs) and on request by the European Commission. An important activity by EFCA is to establish and assists the cooperation of Joint deployment plans (JDPs). The JPDs apply to European waters by a Specific Control and Inspection Programme (SCIP) or to International waters assessed by an RFMO, where EFCA is requested to coordinate the implementation of the European obligations under the International Control and Inspection Scheme. Within the SFPA framework, EFCA also offer assistance in training programs in for example analysis of VMS/AIS data and port inspection.

The fight against IUU fishing is assessed through IUU evaluation missions and projects like PESCAO[8], a newly launched five-year project funded by the European Development Fund (EDF). The project aims to improve governance in Western Africa, including developing a regional fishing policy, assist regional coordination against IUU fishing and improving fish stock assessment at regional lever.

An important specific objective of PESCAO is to "Contribute to strengthening prevention and control measures against IUU fishing by improving MCS at national and regional level". The areas of intervention in PESCAO are (1) legal support, (2) operational support, (3) capacity building and (4) support for national and regional cooperation. Support for national/regional cooperation includes support for the establishment and/or strengthening of national administrative cooperation and operational cooperation between the countries in the region. The operational support includes technical support for implementation of infrastructure and equipment of regional fisheries control centres, as well as support for the organization of joint regional fisheries control missions and chartering of air assets in support of joint operations. The capacity building in the PESCAO project will support the development of harmonized training programs, development and publication of training materials adapted to the needs of the inspector and support for the training of trainers, fisheries

[7] https://europa.eu/european-union/about-eu/agencies/efca_en

[8] https://ec.europa.eu/fisheries/eu-supports-fight-against-illegal-fishing-western-africa_en
The five-year EU funded PESCAO project, which includes a component aiming to improve the fight against Illegal, Unregulated and Unreported (IUU) fishing activities in Western Africa. The European Fisheries Control Agency (EFCA) in cooperation with the Delegations of the European Union in the region, the European Commission (DG MARE and DG DEVCO) and in partnership with the two sub-regional organizations, the Sub-Regional Fisheries Commission (SRFC) and the Fisheries Committee for the West Central Gulf of Guinea (FCWC), formally launched the PESCAO project activities in Dakar, Senegal.

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inspector and juridical staff. It was pointed out that the PESCAO project and FarFish could provide support to each other.

The participation of EFCA at the MR kick-off meeting was highly appreciated, as their activities are relevant in all FarFish CS and an update of their present work and projects is useful as the FarFish project proceeds. This is in particular important to avoid duplication of work already addressed by EFCA and discover potential synergetic effects of for example the PESCAO project.

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5 Strengthening High-Seas Governance

The two high-seas CS in FarFish were discussed at the meeting, but they did however not get the same level of coverage as the SFPA CSs. The reason is that there were not as many stakeholders presented from these CSs at the meeting and because of the nature of the CSs. There were two presentations given in this session of the meeting, followed by lively discussions among participants. The presentations were given by the representatives of the EU fleet and the Chinese fleet.

5.1 EU fisheries stakeholders' perspective represented by LDAC

The executive Secretary of the Long-Distance Advisory Council (LDAC) presented the legislative toolbox and relevant RFMOs which applies to the far distant EU fleet. Among the main goals for LDAC are the fight against IUU and improvement of international Ocean governance in decision making in fisheries management, including FAO Blue Growth Initiative, coherent network of MPAs/VMEs in high-seas in line with EBAFM and transparency and harmonization of Access Agreement Conditions to Coastal States and coherent management of straddling stocks.

LDAC emphasized the following for FarFish when dealing with the high-seas CSs:

- Level playing field should be provided for fishing operators from EU and non-EU. Meaning the all operators fishing in the same area should obey by the same international rules and standards.
- Establishment of RFMOs for uncovered areas is needed, such as for the SW-Atlantic Ocean (FAO 41). This could be done by expanding on existing RFMOs e.g. expanding the SEAFO convention area to the SW-Atlantic. Upgrading for CECAR as a true RFMO for West Africa demersal and small pelagic stocks.
- Enhanced MCS systems (ERS-VMs-AIS) are needed, including integrated aerial surveillance and satellite imaging, etc.
- Flag State responsibility "due diligence"- ITLOs Advisory Opinion 21 of 2 April 2015 by request of African sub - regional Committee SRFC.
- Regional approach and cooperation between Flag States, coastal, port and market states-Control both at sea and at ports (PSMA).
- Prohibition of at sea (unmonitored) transhipments.
- Conservation of sensitive biological features: Implementation of UN Resolution no61/105 on conservation of Vulnerable Marine Ecosystems in the High Seas (already in place in EU-Spain).

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5.2 China distant water fishing

A representative of the Chinese came from the Chinese Academy of Fisheries Sciences (CAFS). The CAFS representative presented the status of the Chinese distant water fleet, their management challenges and objectives. By the end of year 2016, a total of 1,329 Chinese distant water vessels were fishing in the high-seas of the Pacific Ocean (squid, tuna), Indian Ocean (squid, tuna), Atlantic Ocean (tuna, saury) and the Antarctic Ocean (krill). The total catch of this fleet was 1.32 million tons, accounting for approximately 12% of the world´s high-seas catches. The high-seas fleet applies tuna purse seiners, saury side pull net, squid jigging, trawlers and ultralow cold storage vessels. The Chinese fleet consists mostly of new vessels, where 52 % are less than five years old and 72% less than ten years old. There are two national bases for distant water fleet and 29 overseas based enterprises. The Chinese catches of tuna is increasing yearly, while the catches of squid are fluctuating.

Over 500 Chinese vessels were fishing in 16 African countries and their adjacent high-seas in 2016, where they have a large number of local African employees and the total reported catch was 229,000 tons in 2016. Most African crew members come from Senegal and Guinea Bissau, and in Mauritania, the Chinese crew for every boat cannot exceed 4. The Chinse distant water fleet also operates in 3 South American countries (43 vessels, 48,000 tons in 2016). The Chinese distant water fleet is present in all of the FarFish CS areas and are managed by approval, license, annual review, regulations, observers, certificate of catch origin and standardized electronic fishing logs. Vessels are required to apply vessel position and monitoring system. China participates in seven RFMOs, and have signed eight agreements or memorandum of understanding between countries. China seeks to carry out its international obligations with regard to control of IUU fishing.

Some of the identified challenges for the Chinese distant water fleet are: application of responsible and selective fishing, combat of IUU activities and reduction of fishing subsidies.

From the 13th Five-year plan, the general goals of China are to have a stable fleet size, improve the selectivity of fishing gear for protecting rare and endangered species and promote sustainable utilization of fishery resources. Further, strengthening of supervision and law enforcement, including the fight against IUU activities. Another main goal is to develop diversified jobs, including fishing, processing, supply and transportation based on the overseas bases. Finally, China aims to establish bilateral cooperation mechanisms between governments, develop win-win cooperation mode of bilateral fishery cooperation.

Specific objectives to be achieved by 2020 are to control the number of deep-sea fishing vessels within 3,000, maintain annual catches within 2.3 million tons, ensure that products entering the domestic market represent above 65% of the catches, strengthen barriers which lead to “zero growth” for fishing enterprise, improve management, fight against IUUs effectively.

The main tasks listed for the Chinese distant water fleet by 2020 are:

- Restrict the construction of new and oversized vessels.
- Actively participate in the regional fisheries management organizations.
- Improve long-term mutually beneficial cooperation and encourage enterprises to join the local economic and social development.

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- Improve the ability for long-term stock assessment.
- Strengthen the Antarctic krill processing abilities.
- Develop a distant water fishing “blacklist” and combat IUU.
- Improve vessel monitoring system and promote electronic fishing logs.
- Promote construction of integrated overseas bases.
- Improve scientific surveys of high-sea fishery with new research vessels.
- Strengthen the training of fishery observer team.

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6 Identifying stakeholders' interests and needs

The aim for the group work at the MR kick-off meeting was to identify needs and interests of operators in particular, which in the RFMS process address the incentive-based part of the approach being bottom-up, whereby the operators are invited to co-operate on defining alternative ways to achieve the objectives set by authorities. However, the main part of the applied approach is top-down, whereby the authorities set the objectives, and was applied when the authorities (or CS leaders on their behalf) were approached during the development of the MP0 (D4.1). As most of the CS authorities were present at this meeting, they were given the opportunity to add needs and interest to those already expressed in the MP0 and potentially revise those already listed. Revisiting this identification of interests and needs in collaboration with operators enhance the progress of defining relevant OTs.

During the first year of the project, it has become evident that some of the CSs face similar challenges; they target similar or even the same fish stocks and involve the same operators from the EU fleet fishing under SFPAs. As these similarities enhance the potential for synergy, the participants were separated into two groups; (A) Senegal/Mauritania and (B) Cape Verde/Seychelles in session III. The participants for the originally planned working group for high-seas (C) joined group A and B, whichever suited their interest or the project best. The high-seas CS areas were treated separately in session IV where all participants attended. FarFish partners were distributed according to their scientific background and knowledge of the CSs and if represented by more than one participant, they split up to be present in both working groups. Representatives from EFCA were also present in both working groups.

6.1 Working group A: Senegal and Mauritania

At the working group session on Senegal and Mauritania the representatives of the EU fleet present at were from OPROMAR, ANFACO and LDAC. The authorities of both CSs were present; Directory of Fisheries Management in Mauritania (DARE) and from Senegal the Maritime Fisheries Directorate (DPM) and Direction de la protection et de la surveillance des pêches (DSPS). And the EU was represented by DG Mare. The CS leading institutions from Mauritania (IMROP) and Senegal (COREWAM) were present as well as FarFish partners from UIT, NOFIMA, CETMAR, MATIS, CCMAR, CSIC and UCAM. Other participants were from EFCA.

The Senegalese CS-leader representative briefly introduced the fisheries relevant to the Senegal SFPA. Under the current agreement running to November 2019, a specified number of EU vessels are allowed to fish 14,000 tonnes of tuna and 2,000 tonnes of black hake. The latter is a resource shared with Mauritania. The black hake fisheries are not important for artisanal fisheries, as they do not have the technology or resources to utilize this. However, there is a growing interest in this fishery from Senegalese vessels, although black hake is not popular among local consumers. Species discrimination of black hakes in Senegalese waters is an interesting and important issue. Another is the potential of regional value adding from processing locally and distribute to other West-African countries.

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The EU-Mauritanian fishing agreement dates back to 1990, but before this, bilateral agreements allowed access for foreign fleets. In 2012, cephalopods were removed from the agreement and only local fishermen could utilize this resource. The agreement now covers small pelagic fish, shrimps, tuna and hake and gives access to a specified number of vessels. There are annual meetings in a joint scientific committee that carries out stock assessments.

During the preparations for MP0 (D4.1), the CS leader from Senegal expressed interest in black hake fishery while the Mauritania CS leader expressed interest in the shrimp fishery when they were asked to prioritize which fishery to address in MRs. However, after the submission of the MP0, dialogues between operators and authorities has revealed that there is limited interest among the operators in the shrimp fishery, as only a small part of this fishing opportunity is utilized. In cooperation with authorities, FarFish has decided to include small pelagics and black hake in the Mauritanian CS as these are also part of the SFPA agreement and are valuable resources. During the workgroup session, the following needs and interests emphasized by stakeholders were roughly characterized as biological or social/economical, but several of them are belonging to both categories.

6.1.1 Stakeholder's biological interests and needs

The biological interests and needs identified by the stakeholders present at the meeting were as follows:

- ***Monitoring and identification of Black Hake species and stocks***

There are two species of black hake in the waters or Senegal and Mauritania. Because the species are difficult to separate in catch, they are reported and assessed as one pooled group. Consequently, the species also enters the market as a pooled group of black hake. It is currently unknown if there are several stocks of the two species with overlapping distributions.

DG Mare emphasised that all EU vessels are reporting catches, but the catch data is aggregated and not on individual basis for vessels.

OPROMAR pointed out that there are observers on-board the OPROMAR vessels and all their vessels have VMS/AIS and transfer the data to both the flag state and the coastal state. Such monitoring should be obligatory for all fleets fishing in the area to ensure that all play by the same rules. With respect to port sampling of hake for species identification, it would be difficult because of processing of the fish and interfering considerably wit on-board logistics.

COREWAM confirmed that Senegalese authorities are receiving vessel e-logbooks from the tuna fleet, but not from the hake vessels. It is however possible that this is due to their technological limitations.

DG Mare and OPROMAR responded on this comment by COREWAM by emphasising that all EU vessels are reporting their catches, so it might be necessary to check if data is lost somewhere. Regarding collection of hake for species identification, Senegal has a research vessel and surveys that could potentially be used for sampling, adding scientific data on the distribution of the species in Senegalese waters.

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IMROP (Mauritania CS leader): On-board sampling is preferable due to getting spatial and temporal information about the stocks. Suggested to create a working group to discuss and coordinate with existing programmes.

CCMAR pointed out that if the discrimination between the two black hake species were to be done with self-sampling, it would mean involving fishermen to do the sampling, which require a training programme to identify fish.

UiT commented that they felt it was probably not feasible to identify separate stocks of black hake within the FarFish project, as was suggested during previous discussions. Stock identification require comprehensive collection and analysis of data than species identification. Addressing the proportion of the two species of black hake in catch is probably achievable as an on-board collection of data and or subsamples of catch (for example 100 fish per subsample, check variation between subsamples and adjust the number needed). Thereafter analysis can be made by qualified staff on land.

It was then discussed in some length whether the collection of fish should be on-board or at port, but it was not agreed upon a consensus on which method was better.

- ***Sustainability of tuna stocks***

Sustainability of tuna stocks in Mauritanian and Senegalese waters was discussed and ANFACO expressed in particular their interest in any efforts to improve the sustainability of the tuna fishery.

- ***Need for better data collection for improving the stock assessment for all the players, potential for self-sampling***

OPROMAR pointed out that their vessels provide data to Spanish researchers and they would like to share the data with the Senegalese authorities. OPROMAR would like more commitment from the joint scientific committee in using the data. They would like to have joint scientific committee meeting more often and reviewing the total catches in the fishery, not only by the EU fleet.

Discussions on the possible contributions of self-sampling took place as a way to improve data collection, particularly addressing gaps in the existing data sets. However, the operators appeared to be sceptical of this approach and referred to ongoing observer programs, particularly under the responsibility of the IEO, and making full use of the data being collected there. The issue seems to be more of limited capacity to make full advantage of the data being collected as well as making it generally available, including to FarFish. Access and analysis of these data should be explored first, before proposing alternative approaches such as self-sampling, which could add to the burden on the operators.

- ***Improve the stock assessment of black hakes***

COREWAM expressed its interest in stock assessment in Senegalese waters. Since the SFPA are to catch surplus stocks, it is clear that there is a need to know what the state of the black hake stocks is, which the current stock assessment for black hakes is hardly capable of. COREWAM also pointed out that more than 50% of the black hake catches are supplied to Africa.

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- ***Improve the knowledge of the effects of the climate change on shrimp and small pelagics***

There is a recognized need by DG Mare for a better understanding of how large natural dynamics influence stock sizes and its links to value chain. It would be extremely valuable if FarFish can contribute to the assessment of the environmental factors driving small pelagics population dynamics in Mauritania.

6.1.2 Stakeholder's socio-economic interests and needs

The socio-economic interests and needs identified by the stakeholders present at the meeting were as follows:

- ***Improve understanding of the economic conditions of Black hake***

OPROMAR expressed their view that the quantity of black hake in the SFPAs of Senegal and Mauritania is too low. They also pointed out that the EU fleet should only have to pay the same price for access rights as anyone else, which is not currently the case. Black hakes are potential species for the market, but the market is currently not interested, but OPROMAR has desires to try to market it. OPROMAR wants to continue to fish for black hake in Senegalese waters and contribute to the national economy. OPROMAR feels as well that there is an opportunity in adding to the black hake quota in Mauritania. Maximising value and producing human food is most important.

LDAC highlighted that economic trade-offs can be explored within FarFish. The value chain analysis will therefore be important, as it can for example consider opportunities for the EU fleet to build processing facilities in Senegal.

DG MARE pointed out that the EU fleet is not using its full quota of black hake. This is probably because the prices are too low. The economic considerations that need to be looked into in that regard are for example the fact that black hake is transported by truck from Mauritania to Europe, but by boat from Senegal. Other socio-economic issues that need to be considered are: analysing the marked/demand for black hake in EU, value chain analysis, investigate if there is a market for black hake in Africa etc.

IMROP commented that the lack of demand for black hake from EU is a problem, and COREWAM pointed out that more than 50% of the black hake catches are supplied to Africa.

- ***Potential for enhanced food security regarding the small pelagics caught in Mauritanian waters***

LDAC pointed out that if EU operators build processing facilities in the CS countries, the small pelagic fish caught in for example Mauritanian waters under SFPA can then be used for human consumption in Africa, in light of food security; it is not satisfactorily that the small pelagics are being used for fishmeal production. OPRPMAR agreed with this comment by LDAC and expressed their view that maximising value and producing human food is more important than producing fishmeal.

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6.2 Working group B: Seychelles and Cape Verde

At the working group session on Seychelles and Cape Verde the operators were represented by ANFACO, OPAGAC, CAFS. The CS leader from Cape Verde (INDP), who also expressed the needs for the authorities, was also present, but the fisheries authorities in the Seychelles and the EU were not present. Other participants at the session were from the FarFish partner institutions CCMAR, CSIC, CETMAR, IMR, NOFIMA, UNU-FTP, UiT and USP.

The CS leader introduced the fisheries relevant to the Cape Verde SFPA, current Tuna and tuna-like agreement is running to December 2018 with a reference tonnage of 5,000 t/year. The Cape Verde tuna fishery is relatively well regulated by ICCAT. Important fishery nations are Japan, France, Portugal and Spain. Shark landings (both fins and meat) have increased over the years and is sometimes higher than the tuna catches. Sometimes they are landing their catches straight into containers, as the tuna is being frozen on-board. This is increasing every year. Some of the landings enter the local market, but the mainstay goes to the EU market. The main problems identified for the national fisheries are in the pole and line fishery; where overexploitation, insufficient control, high dependency on live bait, limited financial capacity create problems. This was all reported on in the case study characterisation (D2.1) and in MP0 (D4.1), where the insufficient control, monitoring and non-compliance of the Cape Verde Fisheries Management plan (PGRP) by foreign vessels were highlighted as key challenges. Also, there is a need for capacity building for the establishment of a stock assessment team at INDP.

The stakeholders were invited to express the needs and interest that may be addressed through the FarFish project. Several issues relating to use of FADs in the tuna fishery in Seychelles was discussed. FADs may cause environmental problems, such as ghost fishing and marine pollution, as about 30% of FADs are lost at sea and end up at the seafloor. The FAD owners can locate the FADs as they are equipped with devices that transmit their position. However, as a vessel may have many FADs drifting in the sea for a long time its FADs may disperse over a large area and then escape the radius of control by the vessel. In addition to environmental and sustainability aspects, FADs could be explored from the point of view of business economics, but this is very complicated as many factors are involved in decisions relating to the number and use age of FADs. In some cases, FADs may be used by other vessels. Operators and suppliers of FAD equipment may have detailed information on FADs, but this may be difficult to access as it will likely be regarded confidential business information. There is an ongoing project called FADs Watch, which expects to deliver results for the beginning of next year (2019). The participants in Vigo felt that it might be better to wait for these results to come out before committing to address OTs relating to the use of FADs.

6.2.1 Stakeholder's biological interests and needs

The biological interests and needs identified by the stakeholders present at the meeting were as follows:

- ***Standardize data collection. High levels of uncertainty in the data provided***

It was discussed that there is a need to standardize the data collection as there is currently high levels of uncertainty in the data provided and the catch data from EU and ICCAT can diverge. Homogenous

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catch data declaration and potentially creation of new data protocols on fishing activity was suggested.
IDNP highlighted that coastal states have a responsibility for reporting data from vessels submitted by the flag state, but may be in need of capacity, tools and resources for data processing and for improving monitoring. This data is collected but needs to be processed and shared by a regionally harmonized approach.

This issue was then discussed and contemplated on. It was suggested that this issue could be addressed by reviewing the current situation with regard to data reporting, comparing with ICCAT protocols, and cooperating with nations like Seychelles to define needs and solutions. However, tasks such as software development may be best addressed by very specific expertise (consultancy), which may not be available in FarFish. One possibility could be to invite coastal state members (also INDP) to ICCAT scientific meetings. A measure could be to train expertise on stock assessment as to respond to the requirement of RFMO. It would be good to divide training between managers and scientists. OTs could be to train a specific number of staff members in stock assessment and management.

Discussions on the possible contributions of self-sampling took place as a way to improve data collection, particularly addressing gaps in the existing data sets. However, the operators appeared to be sceptical of this approach and referred to ongoing observer programs, particularly under the responsibility of IEO, and making full use of the data being collected. The issue seems to be more of limited capacity to make full advantage of the data being collected as well as making it generally available, including to FarFish. Access and analysis of these data should be explored first, before proposing alternative approaches such as self-sampling, which could add to the burden on operators.

- ***Support to provide data, such as self-sampling for improving the stock assessment for managers and scientists***

INDP and OPAGAC asked why it is not possible to rely more on self-sampling, like the Dutch are doing. This did however come back to the discussions on increasing the burden on operators (see discussion under bullet point above).

- ***High catches of shark (not a real by-catch)***

INDP complained that blue shark has been dealt with as a by-catch despite being targeted by EU fleets in catches that surpass that of the tuna species. The SFPA is now being renegotiated and it is expected that blue shark will now be regarded a target species. However, the catch information on blue shark is limited to the total weight of landings. Hence the information basis for blue shark is rather poor.
This contributed to lively discussions where it was for example suggested that this issue could be addressed by developing protocols for a more detailed reporting of blue shark catches, and this could be defined as an OT in the FarFish project. ANFACO even commented that they were prepared to look into issues related to sharks and they could collect information thereof.

- ***High evidences of juvenile catches on the tuna fishery (around 80%)***

It was discussed that although FAD Watch is addressing many issues, it might be necessary to shed some light on juvenile catches in the tuna fishery.

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- ***Sustainability and assessment of tuna stocks (some indicators are testing full exploitation in yellow fin and bigeye tuna)***

General discussion took place on the lack of well-defined Harvest Control Rule (HCR) for tuna, which can act to adjust fishing mortality in response to changes in stock status.
INDP and OPAGAC pointed out that there is not enough research on stock assessment, which is needed to define HCRs. One possibility is to invite coastal state members (also INDP) to ICCAT scientific meetings. One measure could be to train expertise on stock assessment as to respond to the requirement of RFMO. It would then be good to divide training between 1) managers and 2) scientist.

- ***Improve self-sampling programme on by-catch***

Discussions on the possible contributions of self-sampling took place as a way to improve data collection. However, the operators appeared to be sceptical of this approach and referred to ongoing observer programs, particularly under the responsibility of the IEO, and making full use of the data being collected. The issue seems to be more of limited capacity to make full advantage of the data being collected as well as making it generally available, including to FarFish. Access and analysis of these data should be explored first, before proposing alternative approaches such as self-sampling, which could add to the burden on operators.

- ***Improve coordination, distribution, support & logistics within on-board observers***

The issue of on-board observers was discussed in some detail. OPAGAC pointed out that there are difficulties caused by the fact that observers are usually required to be national. This means that vessels have to go ashore and replace the observers every time they cross an EEZ. This could be addressed by having an international pool of observers. Another challenge is the associated costs for the vessels. OPAGAC is doing a regional strategy for improving training, aiming for regional training of observers, and it was suggested that FarFish may take input from this program. It was also mentioned that AZTI and ICCAT are also doing something with training.

General discussion followed, where it was suggested that observers could receive common training and that a standardized approach to observation could be deployed. Accordingly, the situation could be reviewed in FarFish, and the development of a protocol for a shared pool of observers could be defined as an OT.

OPAGAC commented that for them it is a particular challenge that ICCAT requests 55% coverage, whilst EU requests at least 10%. OPAGAC tries as they can to adopt to good practice, so they voluntarily increased coverage to 100%. First solely with human observers, but now some have electronic observation, and some have both. The electronic system is being audited and the independent auditors concluded that it provides the same quality more or less, as having human observers.

OPAGAC commented that they need regional and coastal state support on observers. They are working with organisations to promote regional observers in the Atlantic. Same approach as for port state in FAOs as food reference for regional cooperation on observers. The ICCAT area closures, are to be monitored by national observers.

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It was then pointed out that there is a 100% observer coverage in Seychelles.

6.2.2 Stakeholder's socio-economic interests and needs

The socio-economic interests and needs identified by the stakeholders present at the meeting were as follows:

- ***Food safety and security***

ANFACO highlighted that the main interests in their fisheries include food safety and food security. They would therefore really appreciate a defined OT on processing and improving quality.

- ***Strengthening labour rights on coastal states***

ANFACO confirmed that one of their main interests is on labour rights.

- ***Improve compliance, control and surveillance within the fishing areas***

ANFACO expressed the importance of combatting IUU, as such practices create uneven playing field which responsible operators cannot compete with.

OPAGAC pointed out that monitoring and control is difficult when transhipment exists. They are therefore promoting Electronic monitoring and are openly opposed to transhipment; which many other fleets practise e.g. the Japanese fleet. How can a level playing field be promoted?

This was then discussed in some length and it was suggested that a review the regional requirements for transhipment could be done in WP3 of FarFish, led by NOFIMA.

CAFS highlighted that all Chinese long-distant waters vessels must have VMS and that insufficient monitoring and the need to increase compliance area among the main issue for CAFS. China aims to control the construction of new vessels for distant water fishing and to focus on control and efficiency. CAFS is happy to collaborate with EU and FarFish on these issues and to exchange ideas.

- ***Advancing on sustainable fisheries***

OPAGAC commented that their main goal is to achieve MSC accreditation. They have been developing a Fisheries Improvement Project (FIP) for its global tuna fleet together with World Wildlife fund (WWF). They have 96 goals to achieve for the MCS plan.

CAFS mentioned that there is an overcapacity in Chinese long distance fleet, which is being addressed; and the promotion of sustainable fisheries are among the main issues currently addressed in China.

- **Other issues**

In addition to the bullet points above, the issues of Value chain development, relevance of local socio-economic issues (e.g. consumption) and improvement of knowledge on the effects of climate change were also discussed during this working group session.

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7 OTs and draft of management scenarios

Although OTs were proposed and discussed, based on MP0 (D4.1), by FarFish partners involved in Task 3.2 prior to this meeting (Table 7.1 - Table 7.6), it was important to identify the needs of a larger set of stakeholders, including the operators before defining the OTs and being able to draft alternative management recommendations. In addition, as the key target species in MRs for Mauritania had changed since the MP0 was submitted, new management objectives demanded new OTs for this CS. Therefore, after another round to identify the needs of all stakeholders, a number of new OTs and potential management recommendations were drafted (Table 7.7 and Table 7.8). Several of the OTs suggested in this meeting and in the preparatory work for the MR Invitation (D3.2) did not qualify as OTs according to the MR Guidelines (D3.1), as the operators cannot be solely responsible for them. They are however, considered to be of such an importance that FarFish wishes to explore them, making the authorities partly responsible to ensure a successful implementation. These FarFish initiatives are classified as Actions instead of OTs in D3.2 MR Invitation and will feed into the Management Recommendations 1.

7.1 The progress of defining the OTs

Based on management objectives listed in MP0 (D4.1) and the preparatory work for the MR Invitations, where the OTs were to be suggested (D3.2), members of the FarFish consortium contributing to Task 3.3 Authority role in RFMS, drafted some OTs in advance of the MR kick-off meeting. The objectives and drafted OTs are listed by the specific CS in Tables 7.1 to Table 7.6. At this point, the drafted OTs were not categorized as biological/ecological or socio-economic OTs.

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Table 7.1 Senegal Case study objectives and appurtenant Outcome Targets from Management Plan 0 and preparatory work for MR Invitation

CS objectives (MP0)	Outcome Target (OT)	Comments
Develop sustainable MRs for the two black hake species (Tropical African hake (*Merluccius polli*) and Senegalese hake (*Merluccius senegalensis*).	1. Develop self-sampling protocols for black hake species identification which can be implemented on a voluntary basis on fleets targeting hake. 2. Investigate potential of different management strategies if hake stocks can be separated.	Note: this does not necessarily involve any practical participation from the operators, it could only be a document, or tested by observers). Investigate optimal F, SSB and HCR for the two stock separate rather than together
Contribute to better monitoring in the area by supporting the enforcement by utilizing latest available satellite systems and tools.	3. Develop user friendly, digital maps (VMS/AIS based) of: a) EU fleet and fishing activities of other fleets' compliance in reporting in accordance with requirements of the protocol. b) the frequency of VMS/AIS gaps.	
Improve by-catch registration, improve monitoring of by-catch, effort and sizes for hake as target and by-catch species.	4. Develop and test a protocol for self-sampling that can be implemented on a voluntary basis in fishery of black hake.	Note: this does not necessarily involve any practical participation from the operators, it could only be a document, or tested by observers.
Observers on EU vessels - improve by-catch registration, self-sampling protocols, improve monitoring of catch, effort and sizes for hake as target and by-catch species.	5. Participation in training programmes for self-sampling and hake species identification (targeted at Senegalese observers). 6. 100% fisheries observers programme, with Senegalese observers.	This can be a FarFish activity, but cannot be a part of the RFMS approach (i.e. not be audited and revised as an OT). EU vessels should have a Senegalese fisheries observer on-board (Included as emphasis to continue and encourage other nations to do the same).

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Table 7.2 Mauritania Case study objectives and appurtenant Outcome Targets from Management Plan 0 and preparatory work for MR Invitation

CS objectives (MP0)	Outcome Target (OT)	Comments
Advance knowledge on small pelagic species fluctuations in the context of environmental forcing.	1. Establish protocols for gathering of biological and oceanographic data for understanding the dynamics of small pelagic species. 2. Assess vulnerabilities originated from the combined action of human exploitation and adverse oceanographic conditions. Analyse alternatives to minimize risks.	
Increase number of Mauritanian staff (in line with the SFPA agreement) to increase national employment.	3. Number of staff in line with agreement.	Cooperation with operators; how to meet the target.
Develop a study on value chain for small pelagics which go for both human and fish meal consumption.	4. Define a study on value chain for small pelagics, which enter into Mauritania for food security and transparency in terms of sustainability of these important stocks.	CECAF performs stock assessment for these stocks. Agreed at FarFish annual meeting in May, 2018, to ask the operators at the MR Kick-off meeting where they see opportunities regarding where we can add value.
Reduce by-catch in the shrimp fishery.		Due to limited interest among the operators in this shrimp fishery, these issues were not prioritized in progress towards the MR kick-off meeting and in the MR Invitation.
Advance knowledge on shrimp landing fluctuations in the context of environmental forcing.		

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Table 7.3 Cape Verde Case study objectives and appurtenant Outcome Targets from Management Plan 0 and preparatory work for MR Invitation

CS objectives (MP0)	Outcome Target (OT)	Comments
Increase knowledge about shark and swordfish catches in conformity with ICCAT. If data is available, analyse data on by-catch and potentially model scenarios which may add value to harvest control rules.	1. Develop and test a protocol for catch registration, to include size and number of sharks (not only volume).	Cooperate with authorities of Cape Verde and EU (DG Mare) on how do this. Shark was specifically mentioned in the ex-post evaluation[9] of the SFPA evaluation and is considered in the negotiation of a new agreement[10]. If sufficient data is accessible, model scenarios, which may add value to development of HCR for these by-catch species. Could this be a basis for developing a model scenario?
Contribute to better monitoring in the area by supporting enforcement by utilizing latest available satellite systems and tools.	2. Develop user friendly, digital maps (VMS/AIS based) of a) EU fleet and fishing activities of other fleets' compliance in reporting in accordance with requirements of ICCAT. b) the frequency of VMS/AIS gaps.	Check if the technical problem with receiving and processing VMS data from EU fleet by Cape Verde is solved. There is also a need for training in assessment to handle the data.

[9] Ex-post and Ex-ante evaluation of the Sustainable Fisheries Partnership Agreement between the European Union and the Republic of Cabo Verde, MARE/2015/23 Specific Contract n° 4

[10] Evaluation Accompanying the document Recommendation for a COUNCIL DECISION authorising the opening of negotiations with Cabo Verde for the conclusion of a Protocol implementing the Fisheries Partnership Agreement between the European Communities and Cabo Verde. COMMISSION STAFF WORKING DOCUMENT. Swd/2018/194 final

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Table 7.4 Seychelles Case study objectives and appurtenant Outcome Targets from Management Plan 0 and preparatory work for MR Invitation

CS objectives (MP0)	Outcome Target (OT)	Comments
Investigate the economic consequences of different FAD number scenarios as emerging from the ad hoc IOTC working group of FADs.		The issue is already addressed by the different RFMO WGs and at the inter-RFMOP lead by ICCAT. There is a FAD watch Programme's inspection to be released soon.
Contribute to better monitoring in the area by supporting the enforcement by utilizing latest available satellite systems and tools.	1. Develop user friendly, digital maps (VMS/AIS based) of a) EU fleet and fishing activities of other fleets' compliance in reporting in accordance with requirements of the protocol; b) the frequency of VMS/AIS gaps.	
Contribute to the assessment of the sustainability of non-target species included in the recent IOTC discard ban (17/04) that are not currently assessed (e.g. dolphinfish, wahoo, barracuda, rainbow runners).	2. Develop a protocol for registration of catches on non-target species in e-logbooks.	There is a need for data sampling on by-catch. Currently there is limited data on by-catch and no recent sampling programmes to identify by-catch species and amount.
Landing of all non-targets species of commercial value.	3. Analysis of the economic impacts of the discard ban (17/04) (i.e. landing of non-target species). 4. Analysis of incentives for landings and regulative obstacles to landings.	This will be conducted but not be a part of the RFMS approach (i.e. not be audited and revised) For Seychelles, there are some potentials for socio-economic OTs regarding landing and processing of by-catches (often valuable species) and getting them to the market.

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Table 7.5 Southwest Atlantic Case study objectives and appurtenant Outcome Targets from Management Plan 0 and preparatory work for MR Invitation

CS objectives (MP0)	Outcome Target (OT)	Comments
To initiate dialogue between stakeholders involved in fishery in FAO area 41.	1. FarFish offers a common platform (meeting) with representatives of all key fleets operating in the area as well as other key parties.	In the lack of an RFMO, we aim to address the challenges by initiating a constructive dialogue between representatives of all key operators in the SW Atl. High Seas. Aiming for a level playing field.
Improve the quality and quantity of data collection.	2. Develop and test a self-sampling protocol that can be implemented on a voluntary basis on fleets targeting hake.	Is the separation of the two hake species *M. hubbsi* and *M.australis* in catch satisfactorily? By-catch registrations? Note: this does not necessarily involve any practical participation from the operators, it could only be a document, or tested by observers).
Increase knowledge on the targeted fish stocks.	3. Compile existing knowledge on stocks from different scientific institutions.	Stock distribution and climate change, distribution by VMEs.
Contribute to better monitoring in the area by supporting the enforcement by utilizing latest available satellite systems and tools.	4. Develop user friendly, digital maps (VMS/AIS based) of a) EU fleet compliance in reporting of activities and avoidance of identified VMEs; c) fishing activities of other fleets on identified VMEs; d) the frequency of VMS/AIS gaps.	

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Table 7.6 Southeast Atlantic Case study objectives and appurtenant Outcome Targets from Management Plan 0 and preparatory work for MR Invitation

CS objectives (MP0)	Outcome Target (OT)	Comments
Improve data quantity and quality.	1. Create a liaison with Japanese trial fishery.	Very limited fishing activity occurring in the area. Japanese trial fishery will soon be starting. What can we learn from the trial fishery.
Advance biological knowledge and improve monitoring in the SEAFO area.		
Contribute to better monitoring in the area by supporting the enforcement by utilizing latest available satellite systems and tools.	2. Develop user friendly, digital maps (VMS/AIS based) of demersal fleets compliance with SEAFO requirements and the frequency of VMS/AIS gaps.	

During the working group in session III at the Vigo meeting, the stakeholders expressed their interests and needs. Based on the consecutive discussions and potential OTs, some management recommendations were drafted (Table 7.7 Senegal/Mauritania, Table 7.8 Cape Verde). Although Seychelles authorities were not present at the meeting, they face several of the similar challenges as Cape Verde and thereby several of the suggested OTs and management recommendations drafted in Vigo for Cape Verde (Table 7.8). A suggestion for a common observer pool was one specific need mentioned by operators in both Atlantic and Indian Ocean. The neighbouring countries to Seychelles are Mauritius, Madagascar, Union of Comoros, Mayotte, Somalia, Tromelin Island and Tanzania. However, FarFish will need to look into other proposals already working on this issue were also OPAGAC is involved, to ensure we are not duplicating work. In Cape Verde, an observer programme is still to be set up and there are some conditions that need to be in place in terms of legal and institutional framework.

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Table 7.7. Main outcomes from MR kick-off, session III, Senegal and Mauritania CS where interests and needs, with suggested potential outcome target and FarFish recommendations

Interests and needs	Outcome Targets (OT)	FarFish recommendations
Biological/Ecological		
Monitoring and identification of black hake species and stocks. Sustainability of tuna stocks. Improved understanding of the technical and economic conditions for black hake. Support to provide data for improving stock assessment for all the players. Improve the knowledge of the effects of climate change on small pelagics and shrimp.	• Species identification of black hake in Senegal. • Increase the knowledge on how the environment influence the small pelagics. • Improve data collection of all operators (i.e. catches, landings, by-catches and discards). • Improve the quality of the currents stock assessment for the species included in the SFPA agreement.	• Set indicators on the proportion of catch needed to fulfil conditions for statistical tests on samples of black hake for stock differentiation. • Literature reviews on environmental influence on the small pelagics. • Identification of data gaps. • Creation of a common database. • Allocation of priority to those fleets who respect the rules (Level-playing field incentive).
Socio-economic		
Low price of black hake (in comparison to European hake). Increase of local markets for black hake (e.g. Cameroon, Cape Verde). Improve the knowledge of what happen when fish is landed (destination/use, quantity, value). Marketing activities affecting prices of black hake. Contribution to local markets and social aspects (e.g. employment, landings). Increase the human consumption of fish. Develop Value Chain in Africa. Relevance of local socio-economic issues (e.g. consumption). Improve the knowledge of the effects of climate change.	• Improve the socio-economic conditions (i.e. employment, human consumption and value) linked to small pelagic. • Increase the knowledge of trade flows (destination/use, quantity, value).	• Link the valuation to processing plants. • Promotion and more access of fish.

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Table 7.8 Main outcomes from MR kick-off, session III, Cape Verde and Seychelles CS where interests and needs, potential outcome target and FarFish recommendations

Interests and needs	Outcome Targets (OT)	FarFish recommendation
Biological/Ecological		
Standardize data collection. High levels of uncertainty in the data provided. Support to provide data for improving the stock assessment for managers and scientists. Homogenous catch data declaration. Catch data diverge (from EU and ICCAT).	• To develop an operational method for strengthening and harmonizing of data protocols on reporting. • To build gathering protocols with specification of by-catch (into logbook data). • Well trained staff for tuna stock assessment and management recommendations. • To schedule the activity of on-on-board observers regarding logistic issues.	• Fluent collaboration between national authorities and ICCAT-IOTC. • Creation of a common database (EU, coastal state, ICCAT). • Electronic reporting through e-logbooks and full access of logbook data on catches within Cape Verde EEZ to INDP. • Identification of data gaps. • Participation for members from coastal states on ICCAT scientific meetings. • Linked to existing programmes like Management Strategy Evaluation (MSE). • Expertise training stock assessment for: managers and scientists.
Create new data protocols on fishing activity.		
High catches of sharks in the Cape Verde (not a real by-catch).		
High evidences of juvenile catches on the tuna fishery (around 80%).		
Sustainability of tuna stocks (some indicators are testing full exploitation in yellow fin and bigeye tuna).		
Improve self-sampling programme on by-catch.		
Improve coordination, distribution, support & logistics within on-board observers in the Seychelles.		
Socio-economic		
Food safety and security.	• Improve tradability through standardization of sanitary certifications. • Increase the knowledge on trade flows (destination/use, quantity, value).	• Linked to appreciations and RFMOs interests. • Socio-economic issues for FADS in Seychelles join to further results on different projects (e.g. FADs Watch).
Strengthening of labour rights in coastal states.		
Improve compliance, control and surveillance within the fishing areas.		
Advancing on sustainable fisheries.		
Socio-economic impacts of FADs (Seychelles EEZ).		
Weak capacity for obtaining funds.		
Value chain development.		
Relevance of local socio-economic issues (e.g. consumption).		
Improve the knowledge of the effects of climate change.		

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Following the MR kick-off meeting, the first MR Invitations (D3.2) were published. The MR Invitations included the agreed OTs, cross-checked with the MP0s and taking into account the discussions in Vigo. The OTs were classified as "***Obligatory***" or "***Recommended***", and in addition a number of "other potential ***Actions*** as supplement or the MR" were identified. These other potential Actions were not included as OTs, as they cannot be solely operationalised by the operators, as they require input/action from other relevant parties (authorities, scientific institutions, other international fleets, etc.). The following tables show the OTs and other potential actions for each of the FarFish case study from the first MR invitation (D3.2). Table 7.9 shows the SW-Atlantic Ocean CS (FAO 41), Table 7.10 the SE-Atlantic Ocean CS (FAO 47), Table 7.11 the Cape Verde CS, Table 7.12 the Senegalese CS, Table 7.13 the Mauritanian CS, and Table 7.14 the Seychelles CS.
It must be taken into account that these OTs have been somewhat adjusted after the Vigo meeting by WP3 acting as the authority and aiming to define most of the OTs in accordance with the FarFish General Guidelines for making MRs (D3.1).

Table 7.9 FarFish outcome targets (OT) for CS Southwest Atlantic finalised after input from Vigo meeting and submitted as D3.2 first MR Invitation. OT code (O=obligatory, R=recommended, S=supplementary), FarFish Action=A (other potential actions as supplement to the MR, operators are not responsible for these actions)

OT/Action	D3.2 MR Invitation
OT_1.1_O	Commitment by the EU fleet to help facilitate increased cooperation with fishing fleets operating in FAO area 41, as well as other stakeholders.
OT_1.2_O	Compilation of existing knowledge and development of protocols to facilitate discrimination of the two hake stocks.
OT_1.3_O	Commitment to transmit VMS/AIS signals.
OT_1.4_O	Commitment to honour the VMEs in accordance with the Council Regulation (EC) No 734/2008.
A_1.1	Compilation of existing knowledge on main stocks being targeted in the fishery.
A_1.2	Development and testing of self-sampling protocol for fleets targeting the two hake stocks (*Merluccius australis* and *Merluccius hubbsi*).
A_1.3	Develop user friendly, digital maps (VMS/AIS based) with the intention of; a) demonstrating the EU fleet's good compliance in reporting of activities and avoidance of identified VMEs (thus creating pressure on other international fleets to do the same), b) mapping fishing activities of other distant water fleets operating on identified VMEs, and c) visualise the frequency of VMS/AIS gaps.

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Table 7.10 FarFish outcome targets (OT) for CS Southeast Atlantic finalised after input from Vigo meeting and submitted as D3.2 first MR Invitation. OT code (O=obligatory, R=recommended, S=supplementary), FarFish Action=A (other potential actions as supplement to the MR, operators are not responsible for these actions)

OT/Action	D3.2 MR Invitation
OT_2.1_O	Reporting of all catches via e-logbooks.
OT_2.2_O	Commitment to transmit VMS/AIS signals.
OT_2.3_R	On-board observers.
A_2.1	Compiling of existing knowledge on main stocks being targeted in the area.
A_2.2	Development of user friendly, digital maps (VMS/AIS based) with the intention of identifying fishing pressure of different fishing fleets.

Table 7.11 FarFish outcome targets (OT) for CS Cape Verde finalised after input from Vigo meeting and submitted as D3.2 first MR Invitation. OT code (O=obligatory, R=recommended, S=supplementary), FarFish Action=A (other potential actions as supplement to the MR, operators are not responsible for these actions)

OT/Action	D3.2 MR Invitation
OT_3.1_O	Development of an operational method for strengthening and harmonizing data protocols and reporting of swordfish and blue sharks.
OT_3.2_R	Setting of conditions for a better coordination of observer programme.
OT_3.3_R	Increase knowledge and data collection of trade flows.
OT_3.4_O	Transmission of VMS/AIS signals of all vessels operating in Cape Verde EEZ without any unjustified gaps.
A_3.1	Improve competence in stock assessment for Cape Verde officials.
A_3.2	The need to improve/harmonise data sharing between ICCAT, EU and Cape Verde authorities.
A_3.3	Electronic reporting through e-logbooks by all fleets operating within the Cape Verde EEZ is needed so that Cape Verde authorities can fully monitor catches within their EEZ and thereby contribute to improved stock assessment of both local stocks (which may serve as prey for other important commercial species) and stocks assessed by ICCAT.
A_3.4	Develop user friendly, digital maps (VMS/AIS based) that shows clearly; a) fishing activities of the EU fleet and other fleets, b) frequency of VMS/AIS gaps.
A_3.5	There is a need to increase research into the socio-economic and ecological impacts of FADs.

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Table 7.12. FarFish outcome targets (OT) for CS Senegal finalised after input from Vigo meeting and submitted as D3.2 first MR Invitation. OT code (O=obligatory, R=recommended, S=supplementary), FarFish Action=A (other potential actions as supplement to the MR, operators are not responsible for these actions)

OT/Action	D3.2 MR Invitation
OT_4.1_O	Improved data collection and reporting from all operators in Senegalese waters where data on catches and landings of all species is reported via electronic reporting (including target- and by-catches and should ideally account for discards where applicable).
OT_4.2_O	Enhancing data collection to enable for more accurate estimations of the share of each black hake species in total catches.
OT_4.3_O	Commitment to transmit VMS/AIS signals.
OT_4.4_R	Increase knowledge and data collection of all fleets operating in the Senegalese EEZ on trade flows to include for example catches, destination/landings, utilization/processing, exports, value etc. This could include providing copies of sales invoices (sales certificates) in order to verify what markets the catches enter. Major aim of this OT is to support efforts to increase local supply and demand and strengthen local markets for black hake.
A_4.1	Improved quality of current stock assessment for black hake, with a separate stock assessment for the two species.
A_4.2	Knowledge gap analysis is needed, in order to identify key knowledge and data gaps, especially for the black hake stocks. The responsibility for this cannot realistically be placed on the operators. This is at least partly to be addressed within the FarFish project.
A_4.3	Effort should be put into increasing local demands and local markets for black hake, including those in other African countries e.g. Cape Verde, Côte d'Ivoire and Cameroon. Analysis of the Senegalese black hake value chains will be a part the FarFish project, which will potentially contribute to this.
A_4.4	Develop user friendly, digital maps (VMS/AIS based) that supports monitoring of all fleets operating in the area could be valuable for this case study.

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Table 7.13 FarFish outcome targets (OT) for CS Mauritania finalised after input from Vigo meeting and submitted as D3.2 first MR Invitation. OT code (O=obligatory, R=recommended, S=supplementary), FarFish Action=A (other potential actions as supplement to the MR, operators are not responsible for these actions)

OT/Action	D3.2 MR Invitation
OT_5.1_O	Enhancing data collection to enable for more accurate estimations of the share of each black hake species in total catches.
OT_5.2_O	Improved data collection and reporting from all operators fishing for black hake, (E logbook, target, by-catch and discard where applicable).
OT_5.3_R	Increase knowledge and data collection of all fleets fishing for black hake operating in the Mauritanian EEZ on trade flows.
OT_5.4_O	Registration and reporting of all catches in the shrimp fishery, including by-catches.
OT_5.5_O	Improved data collection and reporting from all operators fishing for small pelagics in Mauritanian waters where data on landings and catches of all species are reported via electronic reporting (E logbook, target, by-catch and discard where applicable).
OT_5.6_O	Full on-board observer coverage on all high-capacity pelagic vessels.
OT_5.7_R	Increase knowledge and data collection of all fleets fishing for small pelagics on trade flows.
A_5.1	Improved quality of current stock assessments for black hake, with separate stock assessments for the two species.
A_5.2	Knowledge gap analysis is needed, in order to identify key knowledge and data gaps, small pelagics.
A_5.3	Effort should be put into increasing local demands and local markets for black hake, including those in other African countries e.g. Cape Verde, Côte d'Ivoire and Cameroon. Analysis of the Senegalese black hake value chains will be a part the FarFish project, which will potentially contribute to this.
A_5.4	Socio-economic effects and conditions linked to small pelagics.
A_5.5	Develop user friendly, digital maps (VMS/AIS based) that supports monitoring of all fleets operating in the area could be valuable for this case study.

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Table 7.14 FarFish outcome targets (OT) for CS Seychelles finalised after input from Vigo meeting and submitted as D3.2 first MR Invitation. OT code (O=obligatory, R=recommended, S=supplementary), FarFish Action=A (operators are not responsible for these actions finalised after input from Vigo meeting and submitted as D3.2 MR Invitation

OT/Action	D3.2 MR Invitation
OT_6.1_O	Mandatory e-logbooks and full access of e-logbook data to local research institutions.
OT_6.2_O	Development of a protocol for registration of catches of non-target species in e-logbooks.
OT_6.3_R	Setting of conditions for a better coordination of observer programme.
OT_6.4_R	Provision of data on the use of FADs within Seychelles EEZ, relevant for estimating the economic advantages of using FADs (particularly DFADs).
OT_6.5_O	Transmission of VMS/AIS signals by all EU vessels operating in the area.
OT_6.6_O	Commitment to honour MPAs and no-take zones identified in the SMSP.
OT_6.7_R	Mandatory provision of sales invoices (sales certificates) to verify the markets tuna derived from Seychelles EEZ ends up in (i.e. canning or others).
A_6.1	Analysis of the economic impacts of using FADs in Seychelles waters, and estimate the economic consequences of reducing the number of allowable DFADs.
A_6.2	Analysis of the economic impacts of the discard ban (IOTC resolution 17/04, 2017).

7.2 Management scenarios

Based on the drafted OTs from the Vigo meeting, management objectives from MP0 (D4.1) and the newly submitted first MR invitations (D3.2), management recommendations and accompanying scenarios may be drafted for one or more OTs in the different CSs. It is essential though; that it is conceivable to model potential scenarios with existing models or with models/tools that can be developed within the project. Some OTs cannot be addressed by modeling alternative management strategies. For instance, this concerns initiatives to harmonize the handling of catch data reported by flag states. It may be possible for WP5 to define ways to assess the likely impact of achieving such OTs. Therefore, we consider this sub-chapter as work in progress. However, based on the fruitful discussions at the MR kick-off meeting and the suggested OTs, WP3 and WP4 have in cooperation drafted some suggestions for management scenarios after the meeting. The scenarios should be considered as work in progress, which will be presented to stakeholders for feedback.

Task 4.3 Management Recommendations 1 (MR1), which is to be reported on with MR1 for each CS (D4.3), will benefit from the tools provided by WP6, as well as from the identification alternative scenario strategies – and vice versa. The alternative scenario strategies were however not identified at the MR kick-off meeting, as planned, due to time restraints. However, the needs of especially operators were identified, and a number of additional OTs (adding to those already suggested based on the MP0) were proposed for several CSs. With a basis in the previous, proposals on how management scenarios may be defined for each CS to be of relevance for one or more OTs in the respective CS are suggested. Yet, having mind that it must be possible to model these scenarios with existing models or with models/tools that can realistically be developed within the project.

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We note that some OTs are potentially addressable by modeling alternative management scenarios. For instance, this concerns initiatives to harmonize the handling of catch data reported by flag states. It may be possible for WP5 to define ways to assess the likely impact of achieving such OTs. The draft alternative management scenarios for each CS are presented in the following sub-chapters:

7.2.1 South West Atlantic (FAO major fishing area 41)

Draft scenarios: No scenarios have been proposed for this area, but a similar approach as to the Senegal and Mauritania case with regard to the separation of the hake stocks (see below) could be employed if desired and necessary. We do not see the large benefit from defining such scenarios for this case study at this stage.

7.2.2 South East Atlantic (FAO major fishing area 47)

Draft scenarios: No scenarios have been identified for this CS at this point.

7.2.3 Cape Verde

Exploring the potential of improved management of blue sharks

Linked to OT_3.1_O (see Table 7.11 and D3.2). Identify and model scenarios to explore the potential for better management of blue shark, based on improved knowledge on actual catches through improved catch reporting from EU vessels. EU fleet registers quantity in tons, and number of individuals is estimated through minimum allowed landing size for shark. This overestimates the actual number of landed individuals.

Draft scenarios:

1) Status Quo: Current uncertainty about catches. Harvesting is constrained by the current policy requirements provided by ICCAT and SFPA agreement.
2) Theoretically optimal management based on perfect catch data, both quantity and numbers. This is a scenario to reflect the theoretical potential for optimal management through increased knowledge about the stocks. It may be useful to define sub scenarios that reflect different stock parameters etc.

Exploring employment issues

This scenario is not currently linked to any OT but was commented upon in the last evaluation for the SFPA agreement (EU 2018 Ex-post evaluation, Amador et al. 2018.), and may be considered as a potential scenario at this stage. The benefits from local employment on EU vessels is currently restricted due to lack of expertise and training. Suggested indicators: a) Employment as in previous SFPA (# jobs) as benefit for Cape Verde. b) Costs of training and certifying locals and the distribution of these costs.

Draft scenarios:

1) Status Quo: No training offered, baseline as described in the 2018 ex-post evaluation.

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2) Operators finance courses linked to employment of locals as required in the protocols. Estimate impact for Cabo Verde and costs for provision of courses. Consider how can this be made incentive compatible for operators, e.g. though reduced license fees (either as reduced EU contribution or reduced variable component from vessels to Cabo Verde). Another Alternative is that operators are refunded course costs, e.g. with 50% refunded when the course is finished and 50% when workers are actually employed.

7.2.4 Senegal

Management objective is an improvement of black hake assessment and management by the separate stock assessment of the two species

Identify and model scenarios to explore the potential for increasing harvest yield based on a separation of the two hake species.

Draft scenarios:

1) Status Quo: No differentiation of the two species in stock assessment and management. Proportions of the two species in catches are unknown. Harvesting is constrained by the current policy requirements.
2) Theoretically optimal management based on two species that can be assessed and fished fully separately. This is a scenario to reflect the theoretical potential for optimal management through increased knowledge about the species. It may be useful to define sub scenarios that reflect different stock parameters to take into account the uncertainty around these. Such as ratio of stock sizes, growth patterns in stocks, recruitment. Look into recent work on hake species in Mauritanian waters (Fernández-Peralta et al. 2017). Management based on two species that to some extent can be assessed and fished separately. This represents an intermediate scenario that acknowledges the uncertainty and practical limitations in actual fisheries. Sub scenarios parallel to scenario 2 can be developed.

7.2.5 Mauritania

The potential management gain from hake stock separation

The same approach as described for management of the hake stocks for Senegal can be employed. Identify and model scenarios to explore the potential for increasing harvest yield based on a separation of the two hake species.

Draft scenarios:

1) Status Quo: No differentiation of the two species in stock assessment and management. Distribution between species in catches is unknown. Harvesting is constrained by the current policy requirements (provide some detail about these from MP0).
2) Theoretically optimal management based on two species that can be assessed and fished fully separately. This is a scenario to reflect the theoretical potential for optimal management through increased knowledge about the stocks. It may be useful to define sub-scenarios that reflect different stock parameters to take into account the uncertainty around these. Such as ratio of stock sizes, growth patterns in stocks, recruitment.

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3) Management based on two stocks that to some extent can be assessed and fished separately. This represents an intermediate scenario that acknowledges the uncertainty and practical limitations in actual fisheries. Sub-scenarios parallel to scenario 2 can be developed.

Allocation of priority to those fleets who respect the rules (Level –playing field incentive)

Linked to OT_5.1_O Improved data collection and reporting from all operators fishing for black hake (E logbook, target, by-catch and discards were applicable) (Table 7.13) and the commitment to transmission of AIS/VMS data which applied to EU and Chinese distant water fleet. Potentially a theoretical approach.

7.2.6 The Seychelles

Shared pool of observers

Currently, the requirements for national observers force the operators to substitute observers when crossing EEZs. This is a costly and time-consuming operation. a) There are costs related the logistics with replacing an observer and the reduced hours of fishing activity. b) There are costs for authority of having more or less observers for a given level of observer coverage c) costs and benefits for authority related to having individual or a common pool of observers (transparency, level playing field, trust, compliance, etc. d) as c but for operators.

Note: The dimensions c and d will probably have to be addressed qualitatively, e.g. by a SWOT analysis, with inputs from expert judgement (interviews or whatever).

Draft scenarios:

1) Status Quo: Baseline in the Seychelles case regarding the dimensions indicated above.
2) Common pool of observers. Define relevant sub-scenarios based on more detailed knowledge about the fishery.

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8 Conclusions and discussions

The aim of the MR kick-off meeting was to discuss the stakeholder's interests and needs, in light of potential OTs according to OT characteristics defined in the FarFish General Guidelines for making MRs (D3.1). The process of defining these OTs has been challenging and the OTs may be subject to change as the FarFish project progresses e.g. as a result of auditing, disagreements between RFMS agencies or due to advanced knowledge affecting associated OTs. The Mauritanian CS serves as a good example of how challenging the settling of OTs can be. However, through dialogue where both authorities from Mauritania & DG Mare were present, as well as representatives from EU operators, new management objectives and appurtenant OTs were drafted during the MR kick-off meeting. This must be considered as a major progress in this CS. Progress on defining OTs was made in all CSs, especially in the SFPA CSs. All interests and needs reported by operators were considered in light of the management objectives listed in MP0 or discussed under the meeting.

There is a need for improved data collection in most CS and based on the MP0, self-sampling programmes were proposed as one potential way to address this issue. However, during this meeting it became evident that operators are sceptical to such an approach, which may interfere with fishing operations. Also, there are ongoing programmes which FarFish could benefit from. As a consequence, the application of self-sampling has been removed from most of the suggested OTs defined in the first MR Invitation (D3.2) that will serve as basis for the development of MR1 for each CS. It is however, retained in the high-seas CS of the SW-Atlantic Ocean, where the need for data collection is high and the approach may be just to develop the self-sampling protocol, not to apply it.

The progress of developing the MR1 and MR2 depend on the defined OTs, which are classified as obligatory, recommended or as actions in the MR Invitation. A comprehensive and thorough work with the OTs will enhance the probability of a successful implementation of the MRs as the operators are to develop MRs that demonstrate how obligatory OTs set forward in the MR Invitation will be met. Nevertheless, the operators cannot be made solely responsible for a number of OTs, the authorities will have to take on part of the responsibility to ensure a successful implementation of the MRs.

The alternative management scenario strategies are to be considered work in progress, as we did not get this far during the MR kick-off meeting in Vigo. We aim to address at least one scenario per CS, but it is evident from discussions between authorities, operators and other stakeholders that many OTs cannot be addressed by modeling alternative management strategies. They are however, important issues that FarFish might address as other potential actions as supplement to the MRs. FarFish will proceed working on potential management scenarios and distribute suggestions to stakeholders when we have a broader overview of data availability and a broader consensus on OTs.

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Appendix

MR Kick-off meeting agenda

Responsive Results-Based Management and capacity building for EU Sustainable Fisheries Partnership Agreement and international waters

Strengthening fisheries sustainability outside EU
AGENDA

CETMAR, Vigo, 26-27 June 2018

26th June 2018

09.00 Registration
09.15 Welcome (CETMAR)
09.40 The FarFish project in a Nutshell [Jonas Viðarsson; MATIS, Iceland]

Session I Advancing knowledge and capacities

09.55 How to improve the Biological Knowledge [CCMAR, Portugal]
Questions & answers 5'
10.15 Governance in the SFPAs and the High Seas [Nofima, Norway]
Questions & answers 5'
10.35 International fisheries management under the Results-based approach [UiT, Norway]
Questions & answers 5'

11.00 Coffee-break

11.30 The assessment of the Management Recommendations [SYNTESA]
Questions & answers 5'
11.45 What management tools can be designed? [CSIC, Spain]
Questions & answers 5'

Session II Advances in management, monitoring and cooperation

12.00 The EU perspective on Sustainable Fisheries Partnership Agreements and the High Seas [DG-Mare] / TBC

12.20 The role of European Fisheries Control Agency (EFCA) in fisheries monitoring and cooperation [Pedro Galache, EFCA]

12.40 Discussion on current monitoring initiatives [DG-Mare, Pedro Galache, Jonas Viðarsson & Management Authorities]

13.00 Lunch

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Session III Working Group: Case studies

14.30 General introduction [Plenary] (30' dynamics/incentives)

Mauritania	Senegal	Seychelles	Cape Verde	High Seas
Key management specie: black hake		Key management species: Tuna & swordfish		Key management specie: Squid and hake
Management: DG-Mare, DARE & DPSP Fishing operator: OPROMAR		Management: DG-Mare, SFA & DNEM Fishing operator: ANFACO, OPAGAC, ORPAGU		Management: DG-Mare & FAO Fishing operator: ARVI

17.00 Closure

19.30 Dinner

27th June 2018

Session III Next steps for the Case studies

09.00 Wrap-up and forthcoming activities [Case Study leaders & CETMAR]

Session IV Training actions of FarFish & Governance

09.45 The assessment of training needs in Mauritania, Cape Verde, Seychelles and Senegal [UNUFTP, international]
10.00 Matching interests and identifying further needs [CETMAR]

10.30 Coffee-break

11.00 Round table on Strengthening High Seas governance
[Alexandre Rodríguez, LDAC]
[Jilong Li, CAFS]
[Hassan Moustahfid, FAO representative]

12.00 Closure

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