



European Fisheries and Aquaculture Research Organisations

Ref : EFARO/2014-292.

IJmuiden, June, 2014

To **Jacques FUCHS**
Deputy Head of Unit - Marine Resources Unit
European Commission
DG Research & Innovation
F4
COV2 09/095
1049 Brussels/Belgium
jacques.fuchs@ec.europa.eu

Subject : EFARO H2020 16/17 science priorities.

Dear Mr Fuchs,

Herewith I sent you the EFARO marine fisheries science priorities for Horizon 2020 16/17.

We hope this is a valuable contribution.

Sincerely Yours,

For EFARO President Gerd Kraus & Fritz Köster
Rian Schelvis,
Science Officer of the Executive Secretariat



Marine fisheries science priorities: EFARO's perspective

update 10.06.2014

During the EFARO General Assembly on 29 May 2013, a number of marine fisheries science priorities for Horizon 2020 were identified. The identification was based on an analysis of research required to implement policy principals of major European strategies, policies and directives, such as the CFP, MSFD, EU Maritime Policy, EU Strategy 2020, EU Sea Basin Strategies and European Strategy for Marine and Maritime Research, but also global commitments such CBD. At the EFARO General Assembly on 15 May 2014 the priorities were updated taking into account coverage of topics in the H2020 work program 2014/2015, as well as the 1. Call of the EraNet COFASP issues in 2014.

Highest priority topics for the H2020 WP 2016+ under challenge 2.3. ***Unlocking the potential of aquatic living resources***, section 2.3.1. ***Developing sustainable and environmentally-friendly fisheries*** were found to be:

High quality and integrated monitoring and assessment systems

Suggested for 2016

Correct implementation of new the CFP and MSFD will request cost efficient acquisition, monitoring and use of reliable data. The following aspects shall be covered:

- i) spatial distribution of marine living resources including their predators, prey and fisheries including fully documentation of catches,
- ii) develop methodology for analyzing impacts of aquaculture activities in coastal areas in order to minimize spread of deceases and negative impact on the benthic and marine ecosystem,
- iii) improved and automatized monitoring systems, delivering information required for the implementation of the MSY to ensure relevant, timely assessments and predictability,
- iv) combining DCF & MSFD monitoring and data needs using technological advancements and ships of opportunity. Activities should not only focus on the acquisition of data (including remote sampling systems) beyond present pilot projects, e.g. the North Sea/Celtic Sea DGENV tender on integrated monitoring and related JPI Ocean pilot action, but also systems to ensure data quality, and databases needed to allow rapid and easy accessibility by users.

For further explanation, see Annex 1.

Institutional setting of Regional Fisheries Management Systems (RFMS) at EU, regional and cross sectorial level

Suggested for 2016

To achieve the objectives set-out in the EU Integrated Maritime Policy and various EU Strategies and sectorial policies, an analysis of existing governance structures and their performance is needed to identifying structures able to implement the ecosystem approach to the management of marine resources on regional scales with appropriate delegation of self-governance to the industry.

In order to handle this complex task within a sufficient time horizon, a new governance instrument for the EU fisheries management has to be developed in cooperation with involved international



scientific and advisory bodies (e.g. ICES, CIESM) and regional seas conventions (OSPAR, HELCOM, BARCELONA) as well as regional fisheries management organisations (e.g. NEAFC, GFCM, NASCO) and industry representatives (e.g. RAC). For that, the following has to be addressed:

- i) regional implementation of the revised CFP (and its interconnection with the MSFD),
- ii) change of management systems in the direction of self-governance, e.g. rights based management, results based management and co-management. This should include demographic aspects, gender, unemployment and working conditions as well as self responsibility for sustainability and data collection.

Focus should be on the development of indicator frameworks, criteria, monitoring systems and management evaluation tools being able to handle ecological, economical and social aspects to guide and follow the performance of both existing and future management approaches. The development of Regional Fisheries Management Systems shall be tested out in the field by considering different types of main fisheries from each of the EU eco-regions. On a regional basis an analysis will be made of the specific biological, technical, economic, social and societal factors that hinder achieving the conservation objectives of the Common Fisheries Policy. Based on this analysis a governance framework and institutional arrangements in support of the regionalization of the CFP and promoting result-based management to make implementation plans into realities and users/industry more accountable will be developed.

Effects of climate change on biodiversity and productivity of marine fishery resources in the Mediterranean Sea

Suggested for 2016

Climate change is altering marine ecosystems by modifying spatial distribution of species and communities, and, ultimately, their productivity. This is particularly evident for the Mediterranean Sea which is characterized by high biological diversity. Furthermore, because of its interface position between temperate and tropical biomass, the Med Sea can host both cold- and hot-affinity species. Increasing sea water temperature as well as the connection with the Suez Canal result in a deep modification of fishing assemblages, especially in the Eastern Mediterranean, with alien species becoming the main target of fisheries. More than 20% of fish species living in the Levant Sea are migrants from the Red Sea, including venomous fish. As general pattern two main processes are occurring: (i) gradual migration of Mediterranean warm/hot affinity species from the southern coast to the north, and (ii) invasion of alien species from the Red Sea and the Atlantic Ocean.

Although the General Fishery Commission for the Mediterranean have recommended studies on substitution of new species as fisheries target in some areas of the Eastern Basin, no projected impacts of climate change on marine resources and fisheries is available. The knowledge of the structure and functions of fishing assemblages in the new “warm” phase is a prerequisite for addressing impacts of climate change on sustainable exploitation of biodiversity in the Mediterranean fisheries.



Implementation of MSY and fisheries management plans

Suggested for 2017, awaiting output from FP7 projects MYFISH, SOCIOEC, ECOFISHMAN and MAREFRAME.

The objective is to improve and implement integrated multispecies stock (incl. process such as competition and recruitment) and fisheries analyses and models (incl. regulatory, economic and social drivers), being spatially stock and fleet specific and covering biological, ecological, economical and social aspects, with the aim to evaluate the present performance and design of future fisheries management plans and targets, including the implementation of MSY within the boundaries of the MSFD. The integration of MSFD requirements into fisheries management requires definition of environmental constraints for fisheries to be factored into fisheries management plans on a regional level, considering direct and indirect effects of fisheries on Good Environmental Status as defined by the MSFD.

The following ***cross cutting challenges linking across several Societal Challenges*** (Bioeconomy (challenge 2), Climate and Environment (5), Transport (section 4), Energy (3) are suggested to be addressed in cross cutting Blue growth calls:

Marine pollution: exploration, mitigation and remediation

Suggested for 2016

The objective is to describe and quantify cycling, impact and elimination in food webs and accumulation in seafood, including establishment of monitoring tools, assessment models and technologies for efficient and innovative mitigation and remediation. This should be achieved by bringing together marine scientists, technology providers and end-users (including policy makers), with a view to the exploration of new approaches for efficient and innovative mitigation and remediation of pollutions, also within the scopes of the MSFD implementation, characterization of good environmental status, and the enhancement of a sustainable European maritime economy. Analysis of marine coastal areas and open sea environments affected by point-source and/or dispersed contamination of traditional and emerging contaminants, radionuclides and littering combined to specific understanding of i) specific biogeochemical cycles, ii) dispersion models, iii) transfer in the marine trophic web and eventually iv) potential effects on human health should be taken into account as sound based knowledge to explore new approaches for efficient and innovative mitigation and remediation by new and integrated methodologies.

Climate change impact on marine resource exploitation in the Arctic

Suggested topic for 2017

Future climate and ecosystem scenarios should form the basis for assessing potential economic opportunities under climate change. Reduced ice cover will result in greater oil and gas as well as mining possibilities. It will also change production in the Arctic ecosystem, produce shifts in fish distributions and increase access to fishermen. As main consequence it will lead to drastic changes in fishing potentials. The project should address ecosystem production forecasts (mainly for fishes), policy options, including marine spatial planning, for sustainable development, whilst protecting and preserving the Arctic environment. The governance, including Regional Fisheries Management



European Fisheries and Aquaculture Research Organisations

Systems, and geopolitical aspects in relation to these multilayered cross-sectorial activities and climate change need also to be addressed, including foresight and assessment of the economic impacts.

The expected developments have the potential to impact the environment through increased pollution, increased species invasions, and removal of key ecosystem components through fishing thereby having important consequences and resulting in feedbacks to the Arctic ecosystems. These should be explored and measures to mitigate negative impacts (e.g. protection of sensitive habitats, necessary infrastructure, application of new resource extraction and fishing technologies, etc.) should be identified. The interdisciplinary approach within the project is expected to provide the tools needed for ecosystem-based management and sustainable development in the marine Arctic.

Proposals should contribute to implementing the Transatlantic Research Alliance launched by the Galway Statement on Atlantic Ocean Cooperation in May 2013, and should benefit from the inclusion of partners from the United States of America and Canada. Cooperation is also encouraged with other international partners.



Annex 1: High quality and integrated monitoring and assessment systems

The suggested topic covers:

- i) spatial distribution of marine living resources including their predator and prey and fisheries including fully documentation of catch and their origin etc.,
- ii) develop methodology for analyzing impacts of aquaculture activities in coastal areas in order to minimize spread of diseases and negative impact on the benthic and marine ecosystem,
- iii) improved monitoring systems, especially automatized systems, delivering information required for the implementation of the MSY to ensure relevant, timely assessments and predictability,
- iv) combining DCF & MSFD needs using technological advancements and ships of opportunity. Activities should not only focus on the acquisition of data (including remote sampling systems) beyond present pilot projects, e, but also systems to ensure data quality, and databases needed to allow rapid and easy accessibility by users.

Ref. i) The spatial aspect is based on the recognition that there is an increasing demand for spatially explicit information in both fisheries and environmental management, e.g. to design, implement and evaluate MPA's, but also to document the local impact of fisheries (and other human activities) on stock, habitats and ecosystems. Here the need is to **design and implement observation systems at spatial scales presently not addressed collecting the information on distribution of the exploited resources, their prey, competitors and predators, incl. fisheries (on fleet and métier scales)**. This includes aspects like changes in spatial dynamics over time as well as coastal, shelf-sea and open water interactions, e.g. fish stocks spawning in coastal areas, having shelf nursery areas and off-shore feeding grounds.

Design of such monitoring systems require understanding of the acting processes and their variability in time, meaning that addressing the issue alone under the DCF has not delivered, and **spatially explicit assessment and prediction tools have in consequence not been developed, but are urgently needed**. The need is/has been addressed as side aspect in FP7 KBBE projects dealing with trophic interactions; regionally it is partly addressed in a new BONUS project and in the Channel as a follow-up of a MariFish activity. MPA design and function have been addressed in former FP's, within FP7 through Ocean in the Med., but monitoring needs were only considered as side aspects.

Ref. ii) The revised CFP explicitly includes aquaculture, but both **methodology for routinely recording and analyzing impacts of aquaculture in coastal areas on the ecosystem** are largely lacking. This includes aspect such eutrophication and contamination of the benthic and marine ecosystem as well as impact and spread of diseases and escapees.

Ref. iii) With respect to MSY, we are in **need for a concept development defining what should be observed and when to allow determination of MSY in a dynamic world**. This includes monitoring and assessment systems **allowing timely assessments and improved predictability of changes affecting MSY reference points and related management measures**.

In principal this should be handled by the DCF, but the scientific requirements are way beyond related capabilities to **design sound monitoring and assessment systems incl. estimates of uncertainties** and none of the MSY related projects is addressing this, as they focus more on objectives, what and how to optimize and related uncertainties.

Ref. iv) Technologically advanced integrated monitoring systems are the only realistic chance for the member countries to establish a cost efficient and **effective monitoring system servicing both the CFP and the MSFD** with the resources available. How to do this best and most efficient (both in



European Fisheries and Aquaculture Research Organisations

terms of information gained and costs spent), **incl. databases and access to the information, and using ships (and other platform) of opportunity** has not been addressed in comprehensive way.

Only technological aspects are dealt with in FP7 and BONUS. JPI has launched a first technical pilot study (in the North Sea) financed through the North Sea/Celtic Sea DG ENV tender on integrated monitoring. Discussions on the needs for transatlantic observations are started in relation to the development of the Atlantic Strategy.