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# SUCCESS

## STRATEGIC USE OF COMPETITIVENESS TOWARDS CONSOLIDATING THE ECONOMIC SUSTAINABILITY OF THE EUROPEAN SEAFOOD SECTOR

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# DELIVERABLE: D3.4

# REVIEWING OF INITIATIVES AND APPROACHES FOR STRENGTHENING THE COMPETITIVENESS OF FISHERIES AND AQUACULTURE

## *WP3 Competitiveness and sustainability of European fisheries and aquaculture sectors*

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# Contents

# Overview/Executive Summary

This work has been undertaken as part of the SUCCESS project (Work Package 3: Competitiveness and sustainability of European fisheries and Aquaculture sectors) funded by the EC (H2020, GA 635188).

## Goals

The D3.4 is an outcome of the Task 3.3 which aims to explore the room for improving improvement at the production stage. It belongs specifically to the Task 3.3.a which is devoted to the review of new types of production (techniques/products), organisational innovations or new valorisation practices likely to develop new markets/ outlets, to match existing and future demand for seafood (see WP2) and production modes (more sustainable production techniques…) and to consolidate the market power of producers.

## Executive summary

Based on challenges and bottlenecks initially identified for each of the case studies covered by the SUCCESS project, the report reviews and analyses initiatives taken by producers to improve their competitiveness and sustainability. Some challenges are common to both fisheries and aquaculture sectors; others are more specific. In total, the description and results from 18 initiatives (10 in fisheries and 8 in aquaculture) are presented and there is at least one initiative per case study. Initiatives have been classified by category: New products (2), New production technique/mode (2), Institutional changes (3), Management/ spatial tools (2), Labelling and certification (5), New commercial Outlets (4), Producer organisations (3) and Other (2). Some initiatives can overlap across several categories. Moreover, initiatives can be of different nature, ranging from past to current or exploratory initiatives. “Room for improvement” presented here does not claim to cover all the field of initiatives taken in fisheries and aquaculture in order to improve competitiveness and sustainability of the producers.

One major result of this work is the role played by marketing-oriented initiatives including labelling but also producer organisations and other needs for integration of market issues in fisheries and aquaculture management. Outcomes from investigated rooms for improvement can be more or less successful but lessons learned provide insights for policy recommendations common to both sectors or specific to case studies.

## Key Highlights / outcomes

- Most initiatives investigated in both fisheries and aquaculture aim to increase the value of the product. They emphasize the market issues at stake for seafood sectors facing extra EU imports, intra EU competition and competition between different production modes (wild and farmed) or production systems (large scale vs Small-scale vessels in fisheries for instance). Other initiatives in aquaculture focus on ways to achieve growth in EU productions while in fisheries the emphasis is on ways to reduce costs and improve fisheries management.

- **Marketing initiatives** are diverse and range from setting up labelling and certification to finding new commercial outlets through to enhancing producer organisations.
    - Labelling and certification initiatives meet several kinds of expectations including not only environmental sustainability but also freshness, local origin and other social dimensions;
    - Labelling and new outlet initiatives in fisheries investigated within this report often come from small scale / coastal groups of producers. Labelling aims to differentiate their "greater freshness, lower environmental impact and localness" of products from large scale fleets on the fresh market segment. New outlets are one answer to consumer demand of alternative outlets and short channels;
    - Labelling initiatives in aquaculture (shellfish farming) aims to differentiate products based on quality linked to origin and production mode;
    - Marketing initiatives from EU seafood producers are in line with consumer expectations for more environmental-friendly products and increased traceability and information.
    - The expected outcomes from such initiatives for producers are not only to help differentiate their products but also to increase demand, or at least maintain consistent demand for their specific products and therefore increase prices in the light of constrained supply.
    - A difficulty identified for some fisheries in certification/labelling initiatives is the necessity to establish the health of targeted stocks, as it is difficult to establish responsible fishing otherwise. For the case of stocks that aren't assessed for the EU TAC process (e.g. scallops) this is a particular issue that needs to be overcome. Further, joint management of stocks cannot be implemented effectively if stocks and stock status are not known.

- Based on lessons learned from these marketing initiatives, some policy recommendations are proposed:
    - Support marketing initiatives taken by small scale / traditional producers in order to increase their recognition in the EU market. As a first step, marketing measures within EMFF should be used and promoted more efficiently towards Member States. Furthermore, an EU wide label more adapted to small scale / traditional products (including sustainability aspects but not only) should be investigated in addition to existing labelling approaches;
    - One condition for the efficiency of such labelling is its affordability considering the high costs of existing private eco-labels (MSC…) for small scale producers and the low potential for sharing these costs;
    - Improve the consistency between EU quality schemes and organic labelling regulations (especially for farmed shellfish). Further communication on the sustainability of some quality labels based on origin could also be considered;
    - Favour initiatives leading to better transparency and information for the consumer bearing in mind that existing regulations are not really enforced.

- Integration of market issues in fisheries and aquaculture management often relies on the strengthening of producer organisations (vertical integration, horizontal integration…) in order to reduce the fragmentation of some primary sectors. Policy recommendations for fisheries are to support this integration of market issues in management plans and consequently to better

organize expertise (bio economic groups) and data availability in that perspective. For aquaculture, vertical integration upstream or downstream also aims at strengthening the role played by producers in the coordination of the value-chain.

- Other initiatives in fisheries rely on new production technique and innovation in fisheries management. The landing obligation constitutes a big challenge for fleets dependent on quotas, e.g. large scale demersal fleets. It appears that international tradable quotas may mitigate the effect of the landing obligation on the economic performances of these fleets and on EU seafood markets globally with greater uptake of TACs set at the EU level. Without international tradeable quotas, Member States have a share of TACs based on relative stability keys (set over 30 years ago) that does not match catch composition of fleets. Furthermore, catch quotas are set using uplifts evaluated from discard rates of specific Member State fleets, however these quotas are distributed to Member States based on relative stability. Overall, this means quota may not be in the right place at the right time. Another challenge is to improve economic performances by reducing energy costs through implementation of new technologies on specific fleet segments. Although pulse fishing does not appear to be welcomed at EU level, results show that investment in SumWing by itself could be significantly profitable for large beam trawl targeting flatfish in NL and UK as fuel usage and therefore associated costs is reduced.

- Other initiatives in aquaculture rely on technical or management processes to enhance the competitiveness and sustainability of existing or new aquaculture activities. A prerequisite is to create the conditions conducive to the development of more efficient production modes regarding the use of resources (feed, energy, water). In addition, collective actions leading to the adoption of codes of best farming practices or, more specifically, to the setting up of schemes/tools for the management of primary resources in shellfish farming should be further encouraged.

- An additional recommendation is to assess the effectiveness of aquaculture spatial plans to achieve the objectives of sustainable growth of the EU mariculture.

- Lessons learned from successful initiatives in different countries and/or different sectors should be shared broadly at EU level in order to better assess the potential for replicability or further development.

# 1 Introduction

This report only refers to the Fisheries and Aquaculture Producers, meaning that it excludes the down steps of the supply Seafood chain. Based on challenges and bottlenecks preliminary identified per each of the case studies covered by the SUCCESS project, the report reviews and analyses initiatives taken by producers to improve their competitiveness and sustainability.

The first section presents the main challenges faced by fisheries and aquaculture sectors, commonly or more specifically. Due to the importance of marketing issues, a focus is made on quality approaches including quality schemes, organic certification and eco-labelling programs.

The second section starts with a typology of initiatives covered by the report. Outcomes from RFIs analyses are then presented first for fisheries and then for aquaculture. For each "Room for Improvement" investigated, only a summary is provided in the following sections, based on an analytical extended document available on "Emdesk". This document is sometimes in a confidential format prior to a planned publication. The RFIs summaries in the D3.4 include the description of the initiatives and related challenge(s), the method used to investigate the RFI followed by main results and lessons learned, including key highlights.

The third section, as a conclusion, provides some policy recommendations resulting from the outcomes of the studied RFIs.

Further information regarding the Rooms for Improvement documented in this report could be found in the associated analytical reports (please contact directly the authors of the RFI).

# 2 Global challenges in the fisheries and aquaculture sectors

Fisheries and Aquaculture sectors in the EU aim at providing a source of healthy food for EU citizens and to be environmentally, economically and socially sustainable.

## 2.1 Common challenges

In 2014 and 2015, the EU was by far the largest single market for fish imports, followed by the USA and Japan (FAO, 2016). Reducing the dependency towards external supplying is therefore a key challenge in order to improve seafood security and seafood sustainability. For both capture fisheries and aquaculture, this should be achieved by ensuring responsible practices with the aim of optimizing the use of natural resources. In this respect, a common challenge will be to integrate all the aspects of EU policy related to fisheries and aquaculture into a cross-policy sustainable "food system" framework, as recommended by the Scientific Advice for Policy by European Academies (SAPEA) in the "Food from the Ocean" report (EC, 2017[1]).

Worldwide, aquaculture production has been providing the main source of growth for seafood production since the beginning of the 1990s and this trend, mainly driven by Asia, is expected to continue according to the projections published by the OECD-FAO. In 2015, world aquaculture accounted for 45% of the global production of aquatic animals, including for non-food uses (50% excl. non-food uses). However, the role played by aquaculture in the whole seafood supply varies greatly from at least 55% for Asia to less than 20% in other continents (SOFIA, 2016). As concerns the EU28, the share of aquaculture reached 20% in 2015 (EUMOFA, 2017) and the model of development is more dependent on fed & high-value species compared to Asia. One challenge could then be further development of sustainable aquaculture in Europe for the decrease of the EU imports of farmed fish.

In parallel, trends in consumption provide new opportunities to Seafood producers with eco-labelled (or at least eco-friendly) products. It appears that consumers have some willingness to pay more for sustainable seafood but also for diverse attributes like high-freshness or local dimension at least at EU level (Zander, 2017).

The global context of fisheries and aquaculture sectors is now provided by the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) adopted by the United Nations in 2015. Member states set out specific objectives for countries among which the SDG 14 "Conserve and sustainably use the oceans, seas and marine resources for sustainable development" is directly relevant to fisheries and aquaculture and to the sustainable development of the sector. At EU level, the most recent CFP (Common Fisheries Policy), in force since 1 January 2014, recalls the objectives of environmental, economic and social sustainability and implement them through its financial tool.

For the period 2014-2020, the EMFF (European Maritime and Fisheries Fund) dedicated 26.9% to sustainable fisheries, 21% to sustainable aquaculture and 17.6% to marketing and processing,

[1] European Commission, 2017. Food from the Oceans. Scientific advice Mechanisms (SAM). High level group of scientific advisors. Scientific opinion n° 3/2017

corresponding to a global budget around 5.6 billion euros (EU + national contributions). The EMFF regulation detailed the specific objectives according to priorities 1 and 2 providing the global challenges of both fisheries and aquaculture sectors (Box 1).

*Box 1: Objectives according to EMMF Priorities 1 and 2*

Priority 1: Promoting environmentally sustainable, resource–efficient, innovative, competitive and knowledge–based fisheries by pursuing the following specific objectives:
(a) the reduction of the impact of fisheries on the marine environment, including the avoidance and reduction, as far as possible, of unwanted catches;
(b) **the protection and restoration of aquatic biodiversity and ecosystems**;
(c) the ensuring of a balance between fishing capacity and available fishing opportunities;
(d) **the enhancement of the competitiveness and viability** of fisheries enterprises, including of small–scale coastal fleet, and **the improvement of safety and working conditions**;
(e) **the provision of support to strengthen technological development and innovation**, including increasing energy efficiency, **and knowledge transfer**;
(f) **the development of professional training, new professional skills and lifelong learning**.

Priority 2: Fostering environmentally sustainable, resource-efficient, innovative, competitive and knowledge-based aquaculture by pursuing the following specific objectives:
(a) **the provision of support to strengthen technological development, innovation and knowledge transfer**;
(b) **the enhancement of the competitiveness and viability** of aquaculture enterprises, **including the improvement of safety and working conditions**, in particular of SMEs;
(c) **the protection and restoration of aquatic biodiversity** and the enhancement of ecosystems related to aquaculture and the promotion of resource-efficient aquaculture;
(d) the promotion of aquaculture having a high level of environmental protection, and the promotion of animal health and welfare and of public health and safety;
(e) **the development of professional training, new professional skills and lifelong learning**.

*REGULATION (EU) No 508/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on the European Maritime and Fisheries Fund*

Some challenges are common to both sectors and covers the 3 dimensions of sustainability, like:

- environmental: the protection and restoration of aquatic biodiversity and ecosystems;
- economic: the enhancement of the competitiveness and viability and the support to strengthen technological development innovation and knowledge transfer;
- social: the improvement of safety and working conditions, the development of professional training, new professional skills and lifelong learning

In addition, the regulation includes the funding of marketing measures to meet the trends in Seafood consumption and markets and which apply to different actors of the value chain (see appendices). Most of them are of interest for producers like:
- The creation of producer organisations,

- the promotion of the quality and the value added by facilitating the compliance with certification requirements (Quality scheme Regulation (EU) No 1151/2012), the certification and the promotion of sustainable fishery and aquaculture products or the direct marketing of fishery products by small–scale coastal fishermen,
- The traceability of fishery or aquaculture products and, where relevant, the development of a Union–wide ecolabel for fishery and aquaculture products.

All these marketing measures aim at strengthening the competitiveness and sustainability of European seafood production sectors while reducing the dependency toward imports. However, we should bear in mind that the competitiveness within the EU markets remains very high, either from imported products (e.g. farmed fish) or between EU productions. The seabass market provides a good example of different sources of competition: i) between EU and third country producers of aquaculture, ii) between EU producers and iii) between different production modes (wild and farmed) or even production systems (large scale Vs Small-scale vessels in fisheries for instance).

## 2.2 Challenges in fisheries

Globally, the economic performance of EU fishing fleet shows an upward trend since 2008, according with all indicators like revenue, GVA, Gross profit and Net profit, and the projections for the next two years are still favorable (STECF-17-12, Annual Economic Report 2017). However, situation varies between fleets and seems to be currently more advantageous for large scale fleets than small scale ones even if economic performances may differ significantly between countries and/or within categories of fleet. This positive trend in global economic performance may be explained partly by the strong diminishing of the EU fleet (STECF-17-12) and the recovery of several fishing stocks in the North-East Atlantic and adjacent waters (EC, 2016). This leads to a rebalancing of fishing capacities with fishing opportunities, which have massively benefits to the remaining fleet. These fishing opportunities have continuously declined since decades due to fishing stock overexploitation and lack of effective management system.

However, after decades of overcapacity and overexploitation of several fishing stocks, **the sustainable exploitation of EU fishing stocks** is still a challenge which is recalled by the recent CFP and its main objective of **all stocks to be fished at MSY levels by 2020**. Reduce fisheries impact on marine environment, protect and restore aquatic biodiversity and ecosystems and ensure balance between fishing capacities and fishing opportunities are the first three objectives of the EMFF Priority 1 and may affect negatively and positively the competitiveness and sustainability of EU fishing fleets.

Indeed, **the principle of landing obligation** introduced by the last CFP (art.15) could strongly affected the Whitefish and Flatfish fleets, which are mostly mixed fisheries where bycatch/discards rates can be quite high. The rationale behind this measure is to stimulate the fisheries sector to work towards innovations resulting in more selective fishing methods and financial support for measures aiming to achieve environmental objective of the CFP is foreseen under the EMFF. However, it is also expected that the produced unwanted catch (i.e. catch below minimum reference size) will increase production and labor costs and that choke species (species with restrictive quotas) could limit catches and supply of key species for EU Seafood markets. That is why in the North Sea, a transition

period between 2016 and 2018 has been proposed for stocks subject to the landing obligation and included cod, haddock, whiting, saithe, plaice, sole, nephrops and hake. For flatfish fisheries, the landing obligation was implemented in 2016 for sole and plaice and for other EU quota flatfish fisheries in 2019.

In parallel, **sustainable fishing can also be seen as a strategy to compete on EU Seafood markets**, where OECD-FAO outlooks predicted a continuous increase in per capita fish consumption over the next ten years and as far as EU consumers agree to pay a price premium for sustainable attributes. The **positive attitude of EU consumers toward sustainability in aquaculture and fisheries** and their willingness to pay for such attributes are confirmed by recent works (Zander & Feucht, 2017). One key element to guarantee this sustainability is the **implementation of an effective ecosystem approach to fisheries management** in order to take account of all environmental impacts of fisheries (overfishing, by-catch-discards, destruction of fish habitat, ecological disruption…) which is not currently the case in many fisheries (Sumaila et al., 2016).

Meanwhile, the **increase in private eco-labelling/sustainability certification** in fisheries is now a reality and is often driven by the demand from large retailers to access some supply chains (FAO, 2011). In that context, there is no evidence of economic direct benefits for fishers (Bellman et al., 2016) considering the high costs and difficult procedures linked to these certifications (Christian et al., 2013) specifically for small-scale fisheries (Wakamatsu & Wakamatsu, 2017).

Environmental sustainability and EU fishing stocks recovery will not solve by itself the competitiveness and global sustainability of EU fisheries. In 2015 according to EUMOFA (2017), the EU fisheries production (5.1 mln tonnes) is still higher that EU Aquaculture production (1.3 mln tonnes) but World Aquaculture production is now equivalent to World Fisheries production (around 100 mln tonnes both) and the EU Seafood consumption (12.77 mln tonnes) is mainly achieved from imports (8.7 mln tonnes). The EU self-sufficiency rates is still under 50% (25% for Groundfish and 76% for Flatfish). Aquaculture products (Salmonids, Shrimps) contribute to the main imports in value and confirm the importance of **competition between wild and farmed products in the EU Seafood markets**. This competition is particularly affecting EU Whitefish fleets, catching a wide range of species which have been gradually substituted by farmed products especially during the period of low quotas (e.g. in Germany plaice and sole was substituted with pangasius when plaice and sole catches decreased due to lower quotas, cod was initially used as the main species for fish sticks but could be substituted by pangasius or Alaska Pollack). **Marketing strategies to valorize wild fish specific attributes**, including sustainability, could be necessary to tackle competition with aquaculture which is still high and is expected to increase (FAO-SOFIA, 2016) in addition to effective fisheries management as mentioned above.

EU fishing fleets include a large diversity of countries, fishing vessels and catches and competition is also strong within the EU region. As reported by EUMOFA 2017, half of the fish products trade within and outside the EU consists of exchanges between Member states. **Improve in fisheries management and integration of management and marketing strategies** may help to reduce price variability within species according to seasonal concentration of landings for instance or stop the decreasing trend in ex-vessel prices observed for some major commercial species for the EU market (EUMOFA, 2017, table 19). Effective access regulation (to quotas and/or fishing areas) becomes a key

issue to avoid competition between fishing fleet categories (large scale fleet versus small scale fleet) and/or among them. **The growing demand of society for high quality, safe and more sustainably fish,** represents an opportunity for both EU fleet segments, noticeably for small-scale SSF fishers (Josupeit, 2016). The funding of marketing measures foreseen by the EMFF (art. 68) covers a wide range of initiatives and all categories of fleet.

Finally, if the EU fisheries benefits for a favorable economic context regarding the trend in fuel prices since the end of the 2000s, it has to be pointed that **the fluctuation of fuel prices** has a significant impact on fleet economic performance and particularly fleets using active gears (bottom trawl, beam trawl…) which composed the major part of Whitefish and Flatfish fisheries.

## 2.3 Challenges in Aquaculture

The strategic guidelines for the sustainable development of aquaculture [COM (2013 229 final) defined an overall objective for the EU aquaculture sector, which is "to contribute to the overall objective of filling the gap between EU consumption and production of seafood in a way that is environmentally, socially and economically sustainable". This ambitious objective was further detailed according to main priority areas for removing obstacles to aquaculture development:

- reducing administrative burdens for licensing procedures,
- improving access to space and water through coordinated spatial planning,
- increasing competitiveness,
- Exploiting competitive advantages due to high quality, health and environmental standards.

These guidelines are found in the operational program of the new CFP, the second priority of which has been devoted to "Sustainable aquaculture with the objective to make the sector more successful and competitive by focusing on quality, health and safety, as well as eco-friendly production". Member States were asked to draw up multiannual national plans for the development of aquaculture and related operational programs for the utilisation of EEMF funds (2014-2020). Effort should focus mainly on marine finfish farming according to the Summary of the 27 Multiannual National Aquaculture Plans issued by DG MARE (objective of 60% increase compared to current production levels), but growth targets also rely on shellfish farming and freshwater fish farming.

To achieve the quantitative objectives of the national aquaculture plans, the EU aquaculture sectors will have to face several key challenges:

One of the major challenges will be to achieve the growth of aquaculture production within the environmental regulatory framework**,** in particular the Habitat and Natura 2000 directives, the WFD, the MSFD directives. The different guidance documents published on the implementation of these directives to aquaculture give the extent of the issues at stake in matter of environmental protection (EC, 2012; CEFAS, 2014; SWD (2016)). In return, as aquaculture is dependent on water quality, the compliance of all users with WFD and MSFD to protect, preserve and enhance the quality of marine and fresh waters can have positive effects on the development and sustainability of the activity. The revised EIA directive (transposed by MS in 2017) will also have to play a significant role, and can help ease the regulatory constraint and lower the barriers to entry in some countries if the goals of

simplification and harmonisation of the EIA, in addition to the increase in the efficiency and transparency of the procedures, are achieved.

Further, the development of marine aquaculture has to overcome obstacles related to the growing pressure on coastal areas, including high competition for space and water, lack of dedicated areas for marine aquaculture and lack of social acceptability. Therefore, the implementation of marine spatial planning represents a key challenge to allocate and secure areas for the development of marine aquaculture activities. The setting up of marine aquaculture plans is underway, and the process of identification of suitable sites, including consultation stages with other stakeholders, is expected to minimise conflicts between competing uses, and hence improve public acceptance. To speed up the drawing up of marine spatial plans and ensure its coordinated and effective implementation for the development of aquaculture activities, efficient governance systems/tools are also required, at the most appropriate level, to further integrate aquaculture in local communities and creating social licence (CEFAS, 2014). In addition, "experts acknowledge the value of certification and eco-labelling as useful systems of signalling and social licence" (SAPEA, 2017), as long as all these private or public initiatives, including codes of best aquaculture practices, are associated with relevant and substantive communication to the concerned stakeholders and consumers in general.

Economic and social objectives of aquaculture development appear to be all the more challenging in this complex regulatory context, including national legislations. On the production side, it is essential that the framework of licensing and financing becomes more predictable and reliable for the next generation to be able to contribute significantly to European aquaculture growth and sustainable development and to create jobs and wealth in coastal communities (FEAP, 2016). It is really a big issue in some countries where both the length of the licensing procedures and the very short duration of the aquaculture authorizations provide very dissuasive conditions for investing in the sector (see D3.1). On the market side, to meet the EU consumer demand of healthy and environmentally-friendly seafood while reducing imports, it is not only decisive to exploit the competitive advantage of high quality EU production but also to exploit EU research and innovation skills to increase and diversify the domestic supplies of price-competitive aquaculture products. This could be achieved through different and complementary options, ranging from the adoption of cost-efficient farming technologies to the move towards lower-trophic levels for the production of both aquatic products and feed (SAPEA, 2017). Lastly, in the perspective of EU aquaculture growth, marketing issues should be at the forefront to ensure that effective planning and control of the development of the industry is implemented and that supply is in tune with demand (University of Stirling, 2004).

More specific challenges to either fish farming or shellfish farming are highlighted from reference reports (FAO, EC, FEAP…) and the description of SUCCESS case-studies. For fish farming the efficiency of feed is critical for lowering costs and environmental footprint, but has been tackled for many years with feed formulation improvement including a larger share of terrestrial ingredients (SOFIA 2016). Further steps should be taken to comply with the circular economy initiative of 2014 that aims to optimise the use of natural resources and integrate underutilised sources such as fish-processing waste (SAPEA 2017). To release the pressure on capture fisheries and agriculture, the substitution with new ingredient sources should also be considered (e.g. microalgae) as well as the development of new production systems such as integrated multi-trophic aquaculture (FEAP, EC 2016). Other

specific challenges are to reduce the exposure to climatic hazards and to improve the sanitary status of farming zones (especially for shellfish farming), to control the spread of diseases and again limit the main externalities of aquaculture (fish escapees, pharmaceutical contaminants, eutrophication, spread of NIIS, sedimentation, marine litters), that is all issues addressed by the code of conduct for European Aquaculture.

## 2.4 Focus on quality approaches in the Seafood sector

Different certification and labelling frameworks exist at the EU and international levels that can sustain the enhancement of the competitiveness of the fisheries and aquaculture enterprises (for a broader perspective including retailers and processors branding, see WP4).

NB: Debates around the classification of labelling initiatives as Non-Tariff Measures for the EU Seafood market are not considered here (already covered by the WP1 –WP 9).

### 2.4.1 Quality schemes

Quality schemes based on origin have been provided an EU regulatory framework for the voluntary labelling of seafood products since 1992. The successive regulations implemented organize a system of Community registration which guarantees a legal protection within the European Union for quality labels based on origin (PGI and PDO), and more recently for other quality signs linked with traditional modes of production:

- The council Regulation (EEC) No 2081/92 of 14 July 1992 *on the protection of geographical indications and designations of origin for agricultural products and foodstuffs (r*epealed)
- The Regulation *(EC) N° 510/2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs* (repealed)
- The Regulation (*EU) N° 1151/2012 on quality schemes for agricultural products and foodstuffs*, including in addition other differentiation tools, such as the Traditional Speciality Guaranteed (TSG)[2].

Seafood products represent a little share of all agricultural products and foodstuffs under EU quality schemes. On a total of 1592 European quality labels registered, published or applied (consultation door database 18/02/2018), only 53 concerns seafood (3%). An overview of seafood quality schemes shows that the PGI ranks first (37 PGI; 69%), followed by the PDO (16 in number; 30%). PDO which is the most demanding labelling approach is proportionally less invested by the fisheries and aquaculture industries (28% versus 43% for all food). Conversely the PGI is preferred for seafood (70% versus 52%), possibly because the link between quality and origin is more difficult to certify for aquatic products (raw or processed). By country, the UK is the main country involved in EU quality schemes for seafood (10 IGP, 4 AOP), followed by Germany (7 IGP) and then Italy, Spain and France (total of 5 origin labels each). It is also worth mentioning that the interest for quality schemes regulation have been increasing over time: while only 8 PGI/PDO were registered between 1993 and 2006 (following the first regulation in 1992), 23 registrations occurred between 2007 and 2012 and

[2] Former Regulation (EC) N° 509/2006 on agricultural products and foodstuff as traditional specialities guaranteed

16 registrations plus 6 publications or applications after the latest regulation in force (EU No 1151/2012).

### 2.4.2 Organic certification

While the European regulation on quality schemes encompasses all type of agricultural products, a specific regulation dedicated to organic aquaculture animals and seaweed production was established and entered into force on 1 July 2010[3]. It imposed a common standard based on minimum criteria in order to improve the identification of organic aquaculture, as organic certification in the Member States used to be based on either private standards or national specifications (with a predominance of private operators). The EU production of organic aquaculture reached approximately 50,000 tons in 2015, accounting for almost 4% of the total aquaculture production, according to EUMOFA estimation (9% for salmon, 2% for seabass-seabream). Ireland, which is involved in organic salmon and mussel farming, appears to be the main producer. Although the development of organic certification is undeniable, outcomes of the EUMOFA study question the economic performances of EU organic aquaculture, notably due to the fact that downstream margins are much bigger in the organic supply chains than in conventional ones. It also points out that organic is in competition with sustainable labels (EUMOFA, 2017).

*The big competitor to organic is sustainable. Large-scale retailers sometimes adopt a fish purchasing policy more sustainable-driven than organic-oriented, consumers are skeptical and confused in front of a variety of ecolabels and organic logos. And some stakeholders of the organic fish farming supply chain think that "sustainable" has a brighter future than "organic"* (EUMOFA 2017)

### 2.4.3 Eco-labelling programs

The eco-labelling programs in fisheries and aquaculture followed decades of thoughts on sustainable exploitation of fisheries and aquaculture (Brutland report in 1987; the FAO code of conduct 1995, FAO- Guidelines for Ecosystem Approach to Fisheries 2005, FAO Ecosystem Approach to Aquaculture 2008).

Eco-labelling programs are voluntary approaches which are complement to compulsory commitments under current regulations (e.g. landing obligation in fisheries within the CFP, Environmental Impact Assessment for aquaculture…) and must be differentiated.

These voluntary approaches can be consistent with 3 frameworks:

- **Institutional framework:** although this option seems not easy to implement, it should be pointed that it is included in the marketing measures potentially fundable through the EMMF. It is also consistent with the recent FAO initiative GSSI (Global Seafood Sustainability Initiative) "*a multi-stakeholder consortium of industry, civil society, and intergovernmental agencies, is developing a global benchmarking tool to provide information about certification schemes which come forward for voluntary benchmarking against the GSSI criteria. These criteria are based on FAO instruments,*

[3] Commission Regulation (EC) No 710/2009 of 5 August 2009 amending Regulation (EC) No 889/2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007, as regards laying down detailed rules on organic aquaculture animal and seaweed production

*namely the Code of Conduct for Responsible Fisheries (CCRF), FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine (Inland) Capture Fisheries, and the FAO Technical Guidelines for Aquaculture Certification."*

- **Private eco-certification including a control procedure by independent third party body** which is an accredited control agency (MSC Marine Steward Council, Friends of the Sea…). The limits of approval process for being labelled MSC as well as its renewal (costs, credibility….) have been broadly documented (Food and Water Watch 2010, Christian et al. 2013) including and particularly for Small scale fisheries (Wakamatsu, 2017);

- **Private (individual or collective) trademarks with "quality" and "environmental" attributes** (e.g. ARTYSANAL "International responsible fishing label for artisanal fisheries"; Collective Trademark "Bar de ligne de la Pointe de Bretagne" for Small-scale Seabass fisheries; French Charter "Aquaculture de nos regions" set up by the CIPA (Inter-professional committee for Aquaculture Producers…). In that case, the control procedure is limited but relies on membership and trust between actors (buyers and sellers).

In total, due to all shortcomings related to each framework, the EMMF encompasses most of them in its fundable measures (art 68) including the development of a Union–wide ecolabel for fishery and aquaculture products (see EU regulation 1379/2013 on the common organisation of the markets in fishery and aquaculture products). The "establishment of an Union-wide eco-label scheme" is the more ambitious of the 3 options (in addition to "No change" and "Minimum requirements set") considered in the 2016 Commission report (COM (2016) 263 final).

# 3 Outcomes from RFI analyses

## 3.1 Typology of initiatives

Our report considers rooms for improvement (RFI) according to challenges mentioned above. RFI can take different forms:

- Initiatives already set up by producers or representatives of the production sector, recently or over a long period. In that case, these initiatives may provide feed-backs and lessons at different scales;
- Initiatives to be explored based on expertise knowledge, workshops and/or stakeholder interviews;
- Technical experiments for solving some specific problems.

The tools for analysing the RFIs may be qualitative (interviews, literature review) and/or quantitative (modelling, simulations scenarios, statistical analysis…).

Different categories of initiatives are proposed which range from product and technique innovations to marketing strategies through management and institutional changes:

- New products
- New production technique/mode
- Institutional changes
- Management/ spatial tools
- Labelling and certification
- New commercial Outlets
- Producer organisations
- Other

| **Initiatives** | **Fisheries** | **Aquaculture** |
|---|---|---|
| New products | 3.2.2.9 (SSC fish, IT) | 3.3.2.1 (Mussel, GR) |
| New production technique/mode | 3.2.2.1 (Flatfish, NL&FR&UK) | 3.3.2.2 (Salmonids, FI) |
| Institutional changes | 3.2.2.2 (Whitefish EU, UK)<br>3.2.2.3 (Coastal Scallop fish, FR&UK)<br>3.2.2.4 (Coastal Clam fish, IT) | |
| Management/ spatial tools | | 3.3.2.3 (SBSB, FR)<br>3.3.2.2 (Salmonids, FI) |
| Labelling and certification | 3.2.2.5 (SSC Fish, FR)<br>3.2.2.3 (Coastal Scallop fish, FR&UK)<br>3.2.2.9 (SSC fish, IT) | 3.3.2.4 (Mussel, FR)<br>3.3.2.5 (GER,PL) |
| New commercial Outlets | 3.2.2.6 (SSC Fish, FR)<br>3.2.2.7 (SSC Fish, FR)<br>3.2.2.8 (SSC Fish, IT)<br>3.2.2.9 (SSC fish, IT) | |
| Producer organisations | 3.2.2.4 (Coastal Clam fish, IT) | 3.3.3.6 (Salmonids, FR)<br>3.3.3.7 (Mussel, IT) |
| Other | 3.2.2.10 (Whitefish, GER) | 3.3.3.8 (Mussel, GR) |

Some RFI can overlap several initiatives as for instance the Finnish RFI (3.3.2.2) which can be related to the category of "new production mode" and also to the category "Management/spatial tools" or the French & British RFI (3.2.2.3) which can be related to the category of "Institutional changes" and also to the category "Labelling and certification".

## 3.2 RFI in the Fisheries sector

### 3.2.1 Review of RFI and Synthesis

The 10 Rooms for Improvement presented below do not cover all the initiatives occurring in the fisheries primary sector among Europe but intend to draw an accurate picture of some interesting answers to the challenges summarized in the sections 2.1 and 2.2 of this report. The following RFI cover both initiatives already set up (for a half) or in exploration (the other half). Some initiatives are sometimes a combination of (or regrouping) several ones together aiming at tackling different challenges. They extend over all the SUCCESS fisheries case studies from whitefish fisheries to flatfish and small-scale coastal fisheries.

Initiatives related to the small-scale coastal fisheries sector have been also described and presented during the "Slowfish" event in Genova (May 2017). Posters are downloadable via the SUCCESS website http://www.success-h2020.eu/events-conferences/slowfish-2017/

The RFI described and analyzed in the D3.4 embody challenges faced by fisheries sector in general as well as specific challenges met by particular fisheries or fleet segments. 8 RFI are part of marketing strategies and give evidence of the importance of market competition in the Seafood sector coming from extra EU imports, intra EU imports or existing within different production systems of the same fleet segments and/or country. Marketing strategies cover new commercial outlets (5 initiatives), labelling/certification for (3 initiatives) and new products (1) and concern small scale coastal fleets for most of them. In addition to marketing initiatives, 4 other RFI are presented: 3 are classified as institutional changes (combined with marketing strategies for 2 of them) and one as new production technique.

As regard to marketing strategies, "new commercial outlet" initiatives analyzed here refer exclusively to small-scale coastal fisheries in France and Italy. In France, one case study is about the implementation of fish boxes in the small-scale netter fishery of Ile Yeu dedicated to fish consumers of the nearest big city Nantes. Another initiative in exploration in France and potentially applicable to a broad range of fleet segments (not only small scale vessels) is the fish code. This fish code is a tool providing several types of information (technical, recipes…) to buyers at different stage of the supply chain including the consumer at the end. This tool may create a sort of direct linkage between producer and consumer through information provided. In Italy, 3 initiatives are presented, two of them concern small scale coastal fleets in the Gulf of Salerno and Sicily and one traditional coastal fleet in the Northern Adriatic. In the Gulf of Salerno, the work explores the economic effect of alternative commercial outlets (direct sales to consumer Vs sales to intermediates) for cuttlefish landed by traditional netters. In Trapani, the RFI investigated combines several types of initiatives from new commercial outlets to improvement of the commercial value of landings through labelling

and technical innovation (lengthening the life duration of the product). The initiatives are taken by the PO Trapani, representative of traditional small scale vessels of the region. In the Northern Adriatic, the RFI focuses on the integrated management of a sedentary species combining stock and market issues and finally resulting in increasing vessels performances and new commercial outlets. Again, the involvement of PO and local cooperatives were essential for the initiative.

Labelling initiatives presented in the report mainly concern small-scale coastal fleets. In addition to the PO Trapani RFI already described above and which also includes a quality label, the experience from the Brittany traditional Seabass liners provides the opportunity to assess the effect of a labeling strategy on a long period and to quantify the price premium from this specific label based on price time-series. A work on the labelling/certification strategies in France and UK as regard to the King scallop caught in the Eastern Channel is also presented. Conversely to the Seabass fisheries where the fleet competition involves several fleet segments and is on a non-sedentary stock, the Eastern Channel King Scallop RFI combines international joint-management and marketing strategies for this sedentary stock. As for the Northern Adriatic clams' fishery, this RFI illustrates the integration of market issues in fisheries management and testifies of several experiences among Europe, at least for sedentary stocks.

Institutional changes can be combined with marketing strategies which is the case of coastal sedentary fisheries in this report. Another RFI classified as institutional change is investigated and refers to one major challenge of the recent years for EU fisheries, the implementation of the landing obligation. Based on AER data on large demersal fleets from several EU countries, the work explores the effect of the landing obligation by focusing first on the UK demersal fleets, and then on all EU demersal fleets considering alternative policy levers.

Finally, and considering the high energy costs which are still affecting some EU fleets, the economic impact of the SumWing new production technique in the flatfish fisheries among Europe (UK, NL and FR) is investigated considering the diversity of fleet segments involved in this fishery, their related cost structures and the estimated price for the adoption of the technology.

Other initiatives have been reported by SUCCESS partners but not developed in this report for lack of further analyses. In Germany, they rely on MSC certification received by the German North Sea saithe trawl fishery operated by the PO Kutterfisch in 2008 or the Modified Atmosphere Packaging (MAP) fish, innovation from the PO and cooperative Kutterfisch, first introduced through the discount chain LIDL. In Spain, the "PescadeRías" quality label, promoted by the government of Galicia (Xunta de Galicia) aims to differentiate seafood products from artisanal fleet. Starting with a total of 500t of certified product in first sale in 2008, PescadeRías certified in 2015 a total of 8.400t of seafood landings. Higher average price for certified species are clearly demonstrated. More specific to Scallop fisheries and in line with marketing initiatives carried out in UK and France, "PORTO DE CAMBADOS" is a company born in the heart of the Fishermen's Association of San Antonio de Cambados in 2012 in order to offer to final consumer Galician scallops meeting all health and traceability requirements.

| Category of initiatives | RFIs (Fisheries) | Nature of the RFI | Challenge |
|---|---|---|---|
| New production technique/mode | SumWing and/or without pulse technique in replacement of conventional beam trawling for the Sole fleets (NL, UK, FR) | Initiatives to be explored (Flatfish) | High production (fuel) costs |
| Institutional change | International Trade of Quota for the EU Demersal fleets | Initiatives to be explored (Whitefish) | Landing Obligation implementation |
| Institutional change/Labelling certification | Joint management and market differentiation for King scallop caught by UK and France in the Channel Sea | Initiatives to be explored (Joint Management) and already set up (Differentiation) for a sedentary species (King Scallop) | International competition for King Scallop Stock and markets |
| Institutional change & New commercial outlets | Integration between fisheries management and marketing issues in a smooth clams fishery in Italy | Initiatives already set up (Sedentary Coastal Fisheries) | Valorization of a sedentary species with a greater potential |
| Labelling-Certification | Private collective label for the Seabass caught by Small Scale vessels: lessons-learned 20 years after (France) | Initiatives already set up (Small-scale Coastal Fish) | Competition on fresh Seafood market with wild Seabass from LSF and farmed Seabass |
| New commercial outlets | Fish boxes scheme in the Yeu Island (France) | Initiatives already set up (Small-scale Coastal Fish) | Economic sustainability of fishing activity |
| New commercial outlets | Fish code in fisheries (France) | Initiatives to be explored (Small-scale Coastal Fish) | Competition on fresh Seafood market |
| New Commercial outlets | “Short channels” for the Common Cuttlefish in the Gulf of Salerno (Italy) | Initiatives to be explored (Small-scale Coastal Fish) | Competition on local fresh Seafood market |
| New commercial outlets & New products & Labelling/certification | Strategy of promotion of local fresh products focuses on traceability, direct sales and lengthening of the cold-chain from PO Trapani in Sicily (Italy). | Initiatives already set up (Small-scale Coastal Fish) | Competition on Local Seafood market with Imported products |
| Marketing strategies (Diverse) | Lessons from the German North Sea Plaice and proposals to boost consumption | Initiatives to be explored (Whitefish) | Price variability and Non-exhaustion of Quota of North Sea Plaice |

### 3.2.2 Fisheries: RFI investigated

#### *3.2.2.1 SumWing and/or without pulse technique in replacement of conventional beam trawling for the Sole fleets in Netherlands, United Kingdom and France*

Since 2007, two separate elements in gear technology have been developed by the Netherlands beam trawl fleet >24m. The first is the use of a "SumWing" on the gear which acts an aerofoil to lift the gear off the seabed to reduce drag and therefore fuel consumption. The second is a change in the nets to accommodate electrofishing technology known as "pulse trawl". These approaches were developed to help beam trawl vessels deal with increasing fuel price and therefore fuel costs in what is a high fuel use sector of the fleet. It has been seen that vessels in these fleets have use the technology to become more profitable and more competitive. The "Room for Improvement" considered in this report evaluates the impact of enabling a reduction of fuel costs for selected European sole fleets in Netherlands, France and UK to investigate potential economic impacts of investing in such a technology and the financial performance of those fleets.

**Description**

Sole is mostly targeted by drift/fixed nets and beam trawl as a smaller mesh size than typically used by demersal trawl/seine vessels is used. The largest area of sole production is the Eastern Channel, Southern and Central North Sea (ICES areas VIId, IVb, IVc) and mostly landed by Netherlands (53%)

Since 2009, there has been a significant change in the Dutch cutter fleet in terms of the fishing methods used in flatfish fishing (plaice and sole) and, to a lesser extent, in shrimp fishing. The adoption of the gear since 2011 has been progressive with an increasing part of the Dutch fleet switching from traditional beam trawling to fishing with pulse trawl and SumWing. In other flatfish fisheries (for sole in particular), this technology may or may not be transferrable.

Even with the success of the SumWing and pulse trawl and the proliferation of the gear through the Dutch cutter fleet, it must be noted that pulse trawl is still only on trial. So far 84 pulse fishing permits have been granted to the Dutch cutter fleet, allowing the cutters to participate in a research pilot project to assess the effects of pulse fisheries. In addition, beam trawl vessels in Belgium, Germany and UK, primarily owned by Dutch companies, have also invested in this technology.

**Method**

The competitive advantage that is apparent through the introduction of SumWing and pulse trawl technologies is mainly through reduced fuel consumption (and fuel costs) by up to 50% for the >24m beam trawl fleets in which it has been implemented. The SumWing on its own is estimated to result in fuel savings of approximately 20%. There have also been reported effects of improved quality of fish landed (i.e. sole and plaice), a reduction in general gear maintenance costs, increased catchability of sole and reports of reduction of discarded benthic fauna and undersized fish.

The approach taken to evaluate the impact of the new technologies is a fleet economic impact assessment using published financial performances from the Annual Economic Report with supporting evidence from the Netherlands national fishing statistics. With these financial performances, simulations are run to investigate both the positive and negative impacts on fishing fleets that may be able to employ the technologies.

The three overriding fleets that are considered are Dutch and UK beam trawl and French drift/fixed netters that target sole. The fleet of these countries operate in different main areas for sole: the

Netherlands beam trawl in the southern North Sea; the UK beam trawl in the Western Channel and Southern North Sea; and France drift/fixed nets in the Bay of Biscay.

**Lessons**

There is clearly an investment required to fit a vessel with the technology, particularly with a change in nets and gear components. It is reported that the cost of implementation of SumWing and pulse trawl is approximately 300,000 euros per vessel and for SumWing alone is approximately 90,000 euros. Therefore, simplistically looking at the time required for paying off the implementation of the new technology, if a period of 10 years is taken with a nominal interest rate of 5% then approximately 40k euros per year would result in interest and repayment (or <10k euros for SumWing). The litres per day used for these fleets between 2009-14 has halved but significantly more days per vessel are fished in 2014 than in 2009 (approx. 70% more). Income has also increased per vessel (approx. 20%). As a result, even with a fuel price increase of 50% from 2009 to 2014 the fleets are more profitable in 2014 than in 2009. So it may be regarded that the necessity to reduce fishing costs has resulted in the implementation of the technology and driven the change to increase competitiveness.

High fuel usage is (almost) synonymous with mobile gear fishing fleets, and the most relevant for transferability of this technology. The results of the simulations indicate that for the UK and Netherlands 18-24m beam trawl fleets, the increase in net profit is significant with the reduction of fuel costs by 75% as could be expected. However, if a vessel investment cost of 300,000 euros is required to implement SumWing and pulse trawl then the estimated gains are not shown to break-even after 5 years with the UK fleet potentially gaining 248k euros even if fuel costs can be reduced by 50%. With uncertainty in fuel prices, and most forecasts indicating increases in coming years, it would not be certain to be a useful approach for all vessels in the UK 18-24m beam trawl fleet. The results of the simulations on the selected French and UK drift/fixed net fleets also show that savings in fuel costs are not likely to cover the significant expense in investing in SumWing and pulse trawl technologies.

*Table. Simulations of reduced fuel costs for other sole fleets in 2014 (in Euros per vessel)*

| Per vessel | Proportion | Operating profit 2014 | | | Net profit 2014 | | | Available |
|---|---|---|---|---|---|---|---|---|
| Fleet | fuel costs V landings income | 2014 | Simulated 75% fuel costs | Simulated 50% fuel costs | 2014 | Simulated 75% fuel costs | Simulated 50% fuel costs | investment over 5 years |
| NLD_TBB_VL1824 | 17% | 61,578 | 70,945 | 80,311 | 40,851 | 50,218 | 59,584 | 93,666 |
| GBR_TBB_VL1824 | 25% | 21,856 | 46,717 | 71,578 | 5,226 | 30,087 | 54,948 | 248,610 |
| FRA_DFN_VL1824 | 11% | 16,259 | 31,914 | 47,568 | -24,301 | -8,647 | 7,008 | 156,546 |
| FRA_DFN_VL1218 | 7% | 32,296 | 36,135 | 39,975 | 9,694 | 13,534 | 17,374 | 38,397 |
| FRA_DFN_VL1012 | 8% | 13,564 | 15,581 | 17,598 | 5,286 | 7,303 | 9,320 | 20,171 |
| GBR_DFN_VL0010 | 10% | 3,834 | 4,159 | 4,484 | 2,676 | 3,001 | 3,326 | 3,251 |

**Highlights**

The competitiveness of the selected fleets using a net profit to revenue ratio follows an interesting trend. It is indicated that **at the beginning of the period that the fixed gear drift/fixed net (DFN) fleets were competitive at around the 10% level but the mobile beam trawl fleets (TBB) were highly uncompetitive**. In the interim years, it appears the DFN fleets have remained relatively stable

but the TBB fleets are much more variable. It is noticeable that the **Netherlands beam trawl (TBB) fleets >24m have taken some years since 2009 to become fully competitive as the new technology has been adopted**.

**References**


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#### *3.2.2.2 International Trade of Quota for the EU Demersal fleets*

Since 2016, the landing obligation has been applicable to EU fleets. A transition period exists between 2016-2018 where key stocks are introduced to the landing obligation before all TAC based stocks are introduced in 2019. This is a specific challenge for mixed demersal fleets and therefore whitefish focused fleets to address as fishing may have to stop if vessels do not have quota to continue fishing for the most restrictive quota species (i.e. identified as a choke species). Supply of key whitefish species could be significantly affected to markets as a result. The challenge to be tackled by the analysis in this report concentrates on this and considers the landing obligation for demersal mixed fisheries targeting cod, haddock, saithe and whiting, in particular:

1.UK fleets and in the supply of cod and haddock to the UK market, and

2.EU fleets fishing for whitefish in North Western Waters and the North Sea.

**Description**

Whitefish is a general term for several fish species with dry and white flesh which are offered as fillets on the market and often used for processed seafood products like fish fingers or fish sticks and fish and chips. From a production point of view, fleets that target 'Groundfish' (e.g. cod, haddock etc) are quite different to those that target 'flatfish' (e.g. sole, plaice etc.). The analysis undertaken here considers demersal trawl/seine (DTS) fleets more relevant to the former category of species caught.

Recent studies in the UK have indicated that choke species, as a result of the landing obligation, could reduce catching opportunities significantly for fleets if species for which there is low quota held cannot be avoided (Russel et al, 2016). Extra-EU imports, which are considerable, will likely remain unaffected by the changes to the CFP. However, there is competition amongst several EU countries for a limited supply of extra-EU sourced whitefish: cod in particular but also haddock. Therefore, the supply of whitefish at "current" levels is a goal that is assumed.

A modelling approach is taken to estimate how the landing obligation might impact fleets. The UK analysis aims to investigate how supplies and markets for cod and haddock are likely to be affected in the UK in the short to medium term. The EU analysis aims to show the impact of the landing

obligation on the identified EU fleets catching whitefish but also specifically to show the implications of policy enabling the international trade of quota.

**Method**

The modelling and analysis approaches comprise bio economic models for scenario analysis. The UK model is a detailed simulation model of the entire UK fleet that models the fleet and stock interactions of the UK fisheries (i.e. production). In this analysis, two simulations are tested for the landing obligation for UK fleets: the first (AS-IS) is a baseline which simulates the implementation of the landing obligation and is designed to allow for quota top-up to account for total catch and also allows for small limits of zero-TAC stocks; and the second (TO-BE) builds on this by also considering key mitigation tools (or policy levers) including de Minimis, interspecies flexibility and survivability.

The EU model is an optimisation model that includes key whitefish fleets in North Western European waters. The objectives of the model are set to investigate the maximisation of effort and the maximisation of operating profit of the fleets under scenarios of no international quota trade and international quota trade. Note that the two endogenous variables of days at sea and number of vessels at the fleet level are used to flex the structure of the fleets to enable the optimisations to be completed.

**Lessons**

Results from scenarios presented for the UK whitefish fleets indicate that fleet segments may reduce to 35-50% of base year levels of effort, which brings those fleet segments down to breakeven levels. This suggests that UK fleets could continue to operate with profits in the short term with national quota trade even though some individual vessels may struggle with a much reduced financial position. However, it is supply from UK production that could be affected as fleets adjust under the landing obligation.

The results of the EU analysis that includes an international trade dimension shows that international quota trade can help fleets adapt to the landing obligation and overcome some of the supply issues highlighted in the UK analysis. This would also ensure that catch composition is better aligned and ensure that vessels are not stopped from fishing due to quota not being available at the right place at the right time. The obvious downside of such a market for quota trade is that quota would to a degree gravitate to the most competitive vessels and fleets, that is those willing to pay the most and moreover those able to pay for that quota and still make strong financial performance. This shows to some degree that there could be a level of over-capitalisation that still exists in the EU whitefish fleets. As shown in several cases around the world (e.g. Iceland, Australia, USA etc.), individual transferable quotas (ITQs) can result in a rationalisation of the fishing industry that does not necessarily result in the determination of EU and national objectives regarding diversity in the industry.

**Highlights**

Fleet adjustment, and the need to balance resource availability with the size and composition of the fleet, continues to happen in UK and other EU fleets. This reduces pressure on stocks (i.e. conservation objective) thus enabling the drive towards MSY and subsequently improves the economic performance of fleets (i.e. economic objective) but at the direct expense of reductions in numbers of vessels (i.e. social objective) and the social cost that brings. This is important with the

introduction of the landing obligation as the total demand for fish continues to grow to maintain a healthy market for seafood.

**References**

Mardle, S. and S. Metz (2017). "Impacts of current EU regulation on the UK whitefish value chain." Marine Policy 84: pp52-59.

### *3.2.2.3 Joint management and market differentiation for King scallop caught by UK and France in the Channel Sea*

**Introduction**

As indicated in H2020 SUCCESS Deliverables D3.2 and D4.1, pectinidae or scallops-like species is one of the major seafood products traded across the world. King scallops (Pecten maximus) are only caught in Europe and mostly caught by French and UK dredge fleets, accounting for 91% of EU landings in 2014 (STECF AER, 2016; FAO, 2017). The English Channel (i.e. ICES sub-areas VIId and VIIe) is the most productive area with 58% of reported landings in 2014. While the European King Scallop (EKS) has been considered as a high quality and symbolic product for many centuries, difficulties exist on the market to differentiate this product from imported 'substitutes'.

**Description**

After a brief overview of the King Scallop fishery, this report presents the two important, and partially interrelated, rooms for improvements (RFI) for the king scallop fisheries in the UK and France:

1. Differentiation tool / labelling

- use of a label of origin to promote locally based products and to differentiate the (higher-quality) product from import substitutes, and to maintain quality and price of scallops in the value chain ('Charte de la coquille Saint-Jacques de la Baie de Saint-Brieuc; PescadeRias), as well as
- use of quality labels (e.g. label rouge, and MSC) to promote other attributes to differentiate the ESK products, e.g. Label Rouge (quality) and MSC (sustainability) schemes.

2. Joint management

- management of territorial waters / higher exclusivity (capacity to exclude) of the fishing rights,
- co-management with similar rules (e.g. seasonal management of English Channel scallops), and
- role of cooperative / PO to facilitate the organisation of the value-chain (adapting the production to the market) are considered.

Given the English Channel is the most productive area for king scallops in the EU and jointly prosecuted by the UK and France, it is this area that is considered for analysis in this report

**Method**

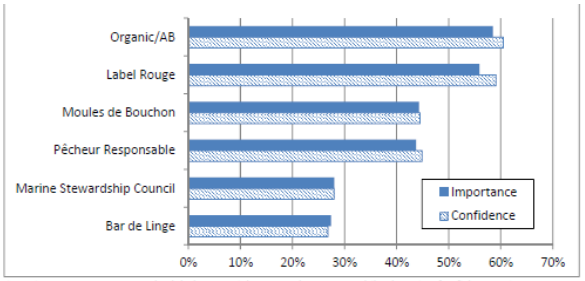
The report first proposes an overview of the prevailing situation, in both the UK and in France. It relies on EU wide database (STECF AER), existing available information (reports, press) and on interviews as well.

The report describes what has been done on both sides of the Channel in terms of management and labelling, and analyses the progresses and shortcomings observed. Some suggestions are then made to improve the situation.

**Lessons**

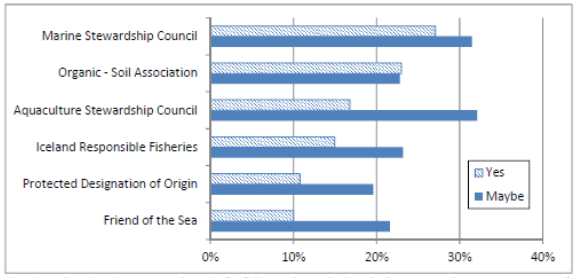
This report shows then some rationale and tools can exist to differentiate ESK from imported substitutes. This can also be reflected in the Deliverable D2.4, where e.g. French and British respondents clearly declared an interest in some key labelling schemes (Fig. 33 and 38 of D2.4)

*Importance of and confidence in sustainability labels for seafood (% of French participants)*




Question - Importance: For the labels you might or you have seen while shopping for fish: How important are these for your seafood choice... - Measured on a 5-point Likert scale ranging from 'Not at all important' to 'Very important'. Scores of 4 or 5 were merged and classified as important.
Question - Confidence: To what extent do you have confidence in the following label(s) when you are purchasing seafood? - Measured on a 5-point Likert scale ranging from 'I have no confidence at all' to 'I have total confidence'. Scores of 4 or 5 were merged and classified as having confidence.

*UK consumers' awareness of different sustainability labels on seafood (% of participants)*




Question: Please imagine you are shopping for fish. Now have a look at the list presented. Have you seen any of these labels while you were shopping for fish?

In the same direction participants in the UK attached the highest importance to the MSC label followed by the ASC label and the label of the Soil Association (Figure 39). Similarly to the other countries, confidence and importance are very closely related to each other. Importance of and confidence in the Protected Designation of Origin (PDO) and the Friend of the Sea label were equally low.

While information, traceability and consumers' knowledge is an overarching part of the problem, the paper suggests that the development of joint and more efficient management would help the use of existing schemes (Label Rouge in France) or the development of new schemes (MSC in UK).

As reflected in other areas of the SUCCESS project, this analysis shows that resource management and marketing considerations should go hand in hand, in order to deliver a win-win situation for both the primary producers and the consumers. This can also help primary producers to develop a collective market answer, in order to balance the market power within the value chain.

**Highlights**

- Scallops are a fully integrated market for some products;
- There is an opportunity to differentiate King scallops for some commodities;
- One approach is a label for EKS (European King Scallops); Sustainable King Scallops (SKS) with Origin/MSC/Label rouge;

•There is a condition that this would require a more comprehensive and efficient management system.
For sedentary shared stocks, joint management, especially with a market oriented perspective, can generate higher wealth for the primary producers and greater amenities for European consumers.

**References**

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Pinfold G. 2001. "Development Potential of the Maine Scallop Industry". Report submitted to the Department of Marine Resources by Gardner Pinfold Consulting Economists Limited
Poseidon 2016. Fisheries Improvement Action Plan: English and Western Channel Scallop (Pecten maximus) Fishery. (http://www.seafish.org/media/1732868/scallop_actionplan_v4_nov17.pdf )

### *3.2.2.4 Integration between fisheries management and marketing issues in a smooth clams fishery in Italy*

Sedentary species (e.g. clams and similar species) are regulated by an integrated co-management system where the management and marketing sides are coordinated and work for the same objectives: resource and fishermen sustainability. The analysis has been carried out specifically on the potential "room for improvement" deriving from those management/institutional innovations put in place for the "fasolari" (*Callista Chione*, smooth clams in English) fishery in Northern Adriatic.

**Description**

The Italian current management system ruling the fishery of clams and similar species is the result of a long regulatory process based on a progressive decentralisation of the decision level, involving the central administration and the local operators (organized in Consortia and POs), ending up with a co-management regime. The analysis carried out for the case study focused on the fishery of a bivalve species called in Italy "fasolari" (*Callista Chione*, smooth clams in English) in Northern Adriatic is aimed to highlight which are the potential "room for improvement" deriving from those management/institutional innovations put in place under this integrated system, where a very strong interaction between the management (Consortia) and the marketing (POs) sides is detected. While Consortia are responsible of the management measures (mainly, limitation of fishing days and the establishment of maximum daily fishing quantities), POs help producers to match supply with market demands and support them in creating added value, sometime setting, for producers adhering, further effort or catch limitations besides those set by Consortia.

The main objectives of the analysis have been to show how the governance and the marketing structure affect the mechanism of price formation and, as a consequence, the economic performance of the fishery under analysis. This has been done by providing evidence of trend in the economic performance of the interested fleet. The main challenges and aspects that have been tackled are the following:
•Low price of a sedentary species with a greater potential: the management/institutional innovations put in place have allowed an increase in the average price of the target species by creating a collective power.

•Need of a more localised management: the management/institutional innovations put in place have been the reply to the need of a more local and bottom-up management. Sedentary species are, by definition, "local" and need a more "territorial" management. These features facilitate the implementation of a real co-management and bottom-up approach.
•Market-driven co-management: the management/institutional innovations put in place have resulted in a management completely driven by market trends but without forgetting high level objectives of resources' protection.

**Methods**
The method used for highlighting the main effects of governance based on a co-management and market-driven approach is the analysis of a 25-years trend of the main economic indicators of the dredges fishery in Northern Adriatic. Taking into account that data on the specific fasolari fishery are available only since 2006 and this would not allow to show the main changes happened as a consequence of the born of the PO in charge of managing the marketing aspects of this fishery, the analysis is based on the trend of the overall dredges' fisheries, with a focus, starting from 2006, on the fasolari fishery. The main source of data for the elaboration of the indicators is the Italian DCF National Programme for 2002-2016 data. For 1992-2001 Mipaaf-Irepa data have been used.

**Results**
A set of main effects have been identified and analysed by identifying the most appropriate indicators to describe them. In particular, the following effects have been identified:
1.Reduction of fishing effort which is intended to promote the recovery of the stocks.
2.Stabilisation of the economic performance
3.Market price stability
4.Elimination of the "race to fish" tendency and competition between fishermen in the same district

**Highlights**
The analysis contributes to infer on the feasibility and replicability of those policy options based on co-management. In particular, this case study helps in reply to the following questions:
•Is the co-management system applied for sedentary species in Italy really effective?
•Is the co-management system applied for sedentary species in Italy replicable EU-wide for similar fisheries (mainly sedentary species)? Which are the main conditions to allow a successful implementation?

The analysis carried out allows concluding **that the co-management system in force in Italy can be considered effective in terms of resource, economic and social sustainability**. The trend of the main activity and economic indicators shows that the integration between the management by Consortia and POs has leaded to **positive results in terms of market stabilization and economic performance**. The system is replicable and can be considered as a best practice, especially in terms of interaction between the production and marketing sides of the management. **It is likely to have similar results especially in the management of sedentary species, where a more localized management is easier to apply. The coordination of different Consortia under the same PO is the key factor of these positive results.**

**References**

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SOCIOEC 2014: Deliverable 3.3 - Analysis of current management measures and their incentives in the various case studies. Downloadable at http://www.socioec.eu/outputs/socioec-deliverables

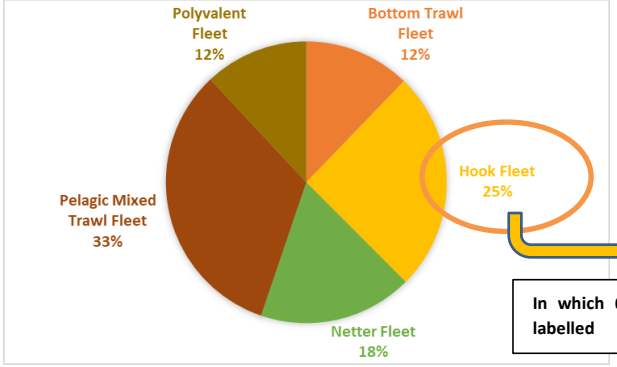
### *3.2.2.5 Private collective label for Seabass caught by Brittany Small Scale liners: lessons-learned 20 years after (France)*

Seafood consumers increasingly ask for high quality, freshness, sustainable and safe products. This could be a good opportunity for small-scale vessels particularly when they compete with large scale fleet to differentiate their landings using a label. Nevertheless, labelling initiatives still have unanswered questions about consumers' effective behaviour and specifically the gap between willingness to pay for high quality – labelled – products and actual purchases.

The Seabass fishery in France provides an interesting framework to assess the influence of product differentiation in the fishing sector since the implementation of the "Bar de ligne de la Pointe de Bretagne" label in the beginning of the 90s. Indeed, this fishery is a perfect illustration of high competition in markets (between wild and farmed Seabass) and fish stocks faced by a small scale fleet segment for several decades and resulting in economic performances uncertainty and instability. The existence of price premium for this labelled fish will be assessed on behalf of ex-vessel (auction) prices per vessel database allowing to consider several fleet segments. This database is available from 2000 to 2015 which enables us to test the temporal trend in this price premium.

**Description**

Seabass is a major species of the French seafood market with 2 main sources of provisioning: 1/ Imports (6,000t) composed with farmed Seabass; 2/ Domestic fish (5,000t/year) coming from a large range of commercial fleets. Given this strong competition, a sub-group of Brittany Coastal liners created in 1993 the brand "Bar de Ligne de la Pointe de Bretagne" which still exists today.




*France – Fleet contributions in Sea Bass landings in volume (tonnes) in average 2011-2015 (SIH, Ifremer, DPMA)*

Association des ligneurs de la Pointe de Bretagne

- Vessel less than 12 meters,
- Line or longline (Hook) to catch Seabass (other gear can be used the rest of the year),
- Respect 48 hours' maximum between the catch and the first sale,
- Being registered in a Brittany harbour
- Obeying a biological stop a part of the year (February and/or March) in order to respect Seabass spawning period

**In which 60% are labelled**

*Criteria to adhere to the association and purchase of tags & "gun"*

The cost for this implementation is rather low but the fisherman commits to respect some criteria for the Seabass catch activity, presented below.

**Method**

A "Seabass database" was settled thanks to time-series from the French ministry of Fisheries and made available through the SIH database (www.sih.ifremer.fr.). This database, covering the period 2000-2015 and gathering all the vessels which have caught at least 500kg per year, includes the following data per year and per vessel:

- annual landings (volume and price) in total and for Seabass;
- technical features (length, kW, number of crew) and location (registered fishing harbour);
- final fleet segment considering the following 7 groups: Hook labelled vessels (G1), Hook non-labelled vessels (G2), Other (non-hook) labelled vessels (G3), Netters (G4), Bottom Trawlers (G5), Pelagic Trawlers (G6), Polyvalent vessels (G7), obviously without label for vessels from G3 to G7.

The ANOVA method is used to test significant differences in ex-vessel annual Seabass prices between these groups of vessels for 4 key years for the fishery (2001, 2006, 2011 and 2014). Post-Hoc tests are developed to assess the price differences between pairs.

**Results**

Our results show a premium price to vessels adherent to the label (G1 and/or G3) on the 4 years compared to all other segment fleets: Hook non-labelled vessels (G2) and other fleets from G4 to G7. This premium increases over time in all cases and compared to G2, it goes from less than 1 euro in the beginning of the period to 2 euros. Moreover, our results conclude at no differences in ex-vessel price between Netters, also belonging to the small scale fleet, and large scale trawlers (bottom and/or pelagic). At the end, the competition on wild Seabass market occurs not between 7 groups but 3: a group of Seabass labelled vessels mostly using Hook as specialized gear (average prices around 17€), a group of non-labelled vessels using Hook as specialized gear (average prices around 15€), a group of non-Hook and non-labelled vessels (average prices around 10€).

Over the period, the Seabass fishery crossed several shocks (anchovy ban and entrance of large pelagic trawlers, decline of the stock after a long period of free access leading to the implementation of strict management measure….) which have led to high instability for fleet economic performances. These events seem to have boosted the adherence to the label.

**Highlights**

- Product differentiation and marketing strategies are paid off for small scale fleets involved in competitive environment on markets and stocks, which is becoming a frequent situation within EU fisheries;
- Based on ex-vessel prices time-series (15 years), price premiums for labelled vessels are present over the period and even increasing which refutes some arguments on instantaneous and fashion effect of labels;
- 20 years have passed since the implementation of the label and the first management measures in the Seabass fishery. That means that small scale vessels have evolved in an unstable and uncertain environment for a long time. In that context, expensive labelling strategies (like MSC or eco-label) are too challenging for small scale fleet, and even if a cheap strategy is chosen, hidden cost related to the association should be considered.

- Nevertheless, when management measures have been taken by the administration, the existence of the label played a major role in the final decisions about licensing and quota limitation favouring the group of Hook vessels.
- Our results also pointed strong differences in Seabass prices within the small scale fleet, namely between netters and hookers. Is it linked to real differences in quality well-known by the buyers at the auctions? Is such a difference will occur if the fish is sell directly to the consumer? All the questions need to be investigated more in detail in the context where initiatives like an "artisanal small scale" label at national or EU levels are carried on.

**References**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#### *3.2.2.6 Fish boxes scheme in the Yeu Island (France)*

The Amap of the Island of Yeu is a fish-box scheme in France distributing fish landed in the Island to households of the big city of Nantes, 80 km far away. This scheme has been implemented as a response to the decline of fishing activities in the Island and to difficulties experienced by local fishers to get a good price for their catches. The number of fishing vessels in the isle of Yeu has decreased fourfold in 20 years and the remaining vessels are small netters. They suffer from a low bargaining power at the auction market and their crew are attracted by the higher remuneration provided by the other ports trawlers.

The Amap of Yeu is a form of "direct" sales of fresh fish and offers its members an opportunity to develop a new commercial outlet. It covers issues regarding its sustainability, in particular the dependence on volunteers, and its replicability in other ports or fisheries. It also questions the ability of stakeholders to build a profitable value chain based on alternative principles. As such, the Amap is an interesting case-study which allows testing the effectiveness of a collective organisation in increasing the competitiveness in coastal fisheries.

**Description**

The Amap scheme relies on five small scale netters from the isle of Yeu (in the bay of Biscaye) which deliver fish boxes to members of 18 associations for the preservation of small holdings in the large city of Nantes area. The relationships between the upstream and downstream stages of the value chain are based on a charter commonly designed by fishers and consumers to promote responsible fishing. As such, the entrance in the scheme is limited to small netters and liners.

The first "test" delivery of 240 boxes took place in Spring 2010. In 2017, it is not less than 1800 boxes that are distributed to households in the city of Nantes and surrounding region. These contracts provide for nine monthly deliveries, from October to June, of 2.5 to 3.5 kg packages of fish (33 euros

per box, i.e. about 11 €/kg). These deliveries represent a total of 4.5 t per month and more than 40 t per year, i.e. 5 % of the total auction sales in Yeu (820 t in 2015). The scheme requires an active involvement of volunteers: one coordinator and 3-4 relay persons per consumers association, leading to a staff of 80 to 100 volunteers. An egalitarian distribution rule of the Amap premium, deviating from the usual 'shared-wage' system, has been implemented: in agreement with the consumers, the skippers have agreed to share out the final margin equally among the crew members, giving one share to each crewman.

**Results**

The outcomes of the Amap can be summarised in three categories corresponding to the three pillars of sustainable development:

- An additional profit representing about 10 % of the total annual wages per vessel and the equivalent of a monthly salary for each sailor due to an egalitarian way of distribution.
- It promotes responsible fishing methods since no trawler can enter the scheme.
- The Amap does not get any public subsidies and is nevertheless profitable.

Thus the Amap satisfies the three social, environmental and economic criteria of sustainable development.

In addition, the Amap provides high quality fresh fish to consumers at a lower price than the average on the French final market (11 €/kg vs 13.2 €/kg in 2015).

A weakness lies in the necessary involvement of volunteers whose renewal is an issue. But this involvement is the core of the project in link with the Teikei principles in Japan.

It is to be noted that such a scheme operates generally with agricultural products at a much lower scale, i.e. 40-50 boxes. The Amap of Yeu provides with a remarkable example of a large scale (1 800 boxes) alternative (Le Velly et al., 2016).

It is not really a short supply chain since it integrates the local auction market and seafood wholesale cooperative. But in doing so, it contributes to maintain local infrastructures of high importance for an island and is clearly an alternative food network (vs conventional).

**Highlights**

- Labelling fishing methods ("Responsible fisheries", "Coastal fisheries" or "Small scale fisheries" for instance) often appears to be insufficient to achieve differentiation between producers belonging to the same segment fleet. It could be supplemented by the mention of territorial origin which includes the local attribute (for clients involved in local consumption) but also the image of geographical origin (for distant customers).
- Fishers have to communicate on their production methods, showing that they are environmentally friendly to meet new consumer expectations.

**References**

http://www.amap44.org/

- Le Velly R., Dufeu I. et L. Le Grel, 2016. Les systèmes alimentaires alternatifs peuvent-ils se développer commercialement sans perdre leur âme ? Analyse de trois agencements marchands, Économie rurale, 356, p. 31-45.

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(Proximities activation in relocalized food supply chain. The case of two territorialized collective organizations in Pays de la Loire region), Revue de l'organisation responsable.

- Noel J., Le Grel L. & I. Dufeu, 2016. L'Amap poisson Yeu-Nantes, un circuit de proximité halio-alimentaire territorialisé, in Mundler P. et Rouchier J. (dir), Alimentation et proximités : jeux d'acteurs et territoires, Educagri, p. 365-383.

### *3.2.2.7 Fish code in fisheries (France)*

The relation of consumers to the food is strongly evolving: what is in my plate? How was it caught? Where does it come from? Who caught it? To comply with these expectations, Wemake has developed a website coupled with a flash code allowing fishermen to tell consumers the story of the product they sell. The goal was to evaluate the interest of fishermen and consumers.

**Description**

The fishers attach a flash code to their product. It can pin on the animal, glued on the box, put in the basket... in any way ensuring the flash code and the product stay tied. When the product arrives at the market, shop, restaurant, and so on... the seller can present the flash code to the consumers. Then the consumer accesses the website of the product which is presented in three sections:

* the producer: presentation of the fisherman and its boat
* the origin of the product: where it was caught
* how to use the product: recipes (carefully selected)

The consumer can also rate the fisherman and let a comment on the product.

The expectation for the fishers is a better valorisation of their product through the differentiation: a consumer will probably buy a product with information rather than an "unidentified" product.







**Results and Highlights**

Despite the interest of fishermen and consumers for this new technology, the dynamic to implement successfully the idea is not easy considering the high dispersion of vessels and the lack of availability of skippers. However, this initiative is clearly a strong opportunity for fishers as regard to its success in Canada for instance, where more than 750 fishing vessels are registered in their traceability system. On key element was in Canada the strong support given by the local fishing industry to the initiative. Next steps in France should rely on identifying the French fishermen leaders who might support the project and help to spread it.

### *3.2.2.8 "Short channels" for the Common Cuttlefish in the Gulf of Salerno (Italy)*

In the Gulf of Salerno, but in general in most of the Italian harbours, direct sales are frequently used by coastal fishermen and represent a traditional marketing activity. The objective of this sub-case study is to investigate if fishermen and other local stakeholders can improve the marketing of the local catch and if direct sales represent a competitive advantage in terms of higher profits for the local small-scale fishery. Fishermen involved in the fishery of common cuttlefish with trammel net in Gulf of Salerno sell the great part of their landings directly (80-90% of total production). Only in the case a part of the product is not sell directly, they use other commercial channels (for example restaurants or retailers).

The main features of this sub-case are:

- high price respect to the same species sold in local market (14-15 €/kg)
- market competition of coastal seafood with products from Large Scale Fleets
- local demand very high and consumers' preference for local seafood product

**Description**

The area of the Gulf of Salerno is located in Campania administrative Region, Salerno Province. The main activities of the coastal fishery were those with trammel nets, combined gillnets-trammel nets, longlines and gillnets. The two first are mainly targeted on common cuttlefish (Sepia officinalis), and, to a lesser extent, red mullets (Mullus barbatus and M. surmuletus) and lobster (Palinurus elephas).

The fishing fleet operating in the Gulf of Salerno consists of 300 vessels of which 259 are classified in the segment of the small-scale fishery. In the last ten years, the sustained increase of intermediate costs, together with a decrease in the production level, eroded added value and profits, further weakening the sector already in economic recession. Several factors affected the decrease in total captures and unitary productivity, such as the increase in fuel price that led to a reduction of the effort in terms of day at sea. In addition, fishermen interviewed have highlighted a reduction of landings of common cuttlefish in the last 10 years. Decreasing trend in production is due to the poor state of fisheries resources; in addition, local fishermen express their concern that the marine environment is under increasing threat from human activities (creation or artificial reef in the Gulf or increasing in pollution). In August 2015, a Local Management Plan (LMP) was introduced by Directorial Decree No.15801/2015 of Ministry of Agriculture, food and forestry policies. The LMP is a voluntary act of the fishermen of maritime district of Salerno and contains restrictive management

measures in order not only to reduce fishing effort but also to limit the conflict between other users (sport and recreational fisheries, tourism).

**Analysis (Issues and Methods)**

The analysis is intended to highlight the effects of the direct sales on the profitability of the fishing vessels by comparing the gross profit margin indicator in two scenarios:

- Scenario 0: status quo (80-90% of total landing sold directly by fishermen)
- Scenario 1: sales to intermediaries (retailers and local wholesale fish market) with no direct sales

Data used for the present analysis are data collected by the Italian DCF National Programme, according to DCF provisions. Other data have been directly collected on the field by mean of direct interviews to local fishermen thanks to the support given by the local fishermen association "Campania Pesca". In addition, quantitative information reported in this section are based on the data collected in the project "Integrated coastal zone management: an example of multidisciplinary approach in Campania region" funded by Italian Ministry of Agriculture and Forestry -DG for Maritime Fisheries and Aquaculture under the European Fishery Fund (EFF) (Gambino, at al. 2016).
Indicators were calculated on the basis of the glossary and methodology reported in the Annual Economic Report on the EU Fishing Fleet of the Scientific, Technical and Economic Committee for Fisheries (STECF, 2016).

**Results**

The total annual value of landings of the vessels involved in small scale fishery in the Gulf of Salerno was approximately estimated, for the year 2014, in € 6.6 million; small scale vessels generated total gross value added of around € 5 million. The average income per vessel amounts to 25,000 €; in consideration of the low level of the operational costs (in particular of the fuel costs), the incidence of gross value added on the value of landings is very high (about 75%).

Income and economic data for small scale vessels in the Gulf of Salerno in Scenario 1 have been calculated; in this scenario, it is assumed that the costs remain the same of the scenario 0; landings income varies depending on the average price that is assumed less than 25% than that observed in scenario 0. On the basis of these assumptions, gross profit amounts to € 971 thousand euro and the gross value-added amounts to € 3.3 million (respectively 63% and 33% less than the data estimated in scenario 0).

In scenario 0 the gross profit margin is higher than that observed in scenario 1 (about 40%); it indicates that the sector has a good commercial profitability. On the contrary, in scenario 1, the lowest percentage (20%) indicates a low margin of safety i.e. a higher risk that declines in production or increases in costs may result in a net loss, or negative profit margin.

**Highlights**

The most important benefit associated with the direct sale is the improvement of economic performance thanks to the higher level of the value of landings. This is a fundamental point for the small scale fisheries that is affected, in general, by poor economic performance and decrease in total captures and unitary productivity.

Other benefits of the direct sales are the following:

• Promote lesser known species, local products and the territory through traditional activities and seafood products

• Increase the employment (family members) through the sale of seafood and the diversification of income's sources

• Promote the figure of the "fishermen", of his profession, skills and know-how and encourage new generation of fishermen

Recently, new initiatives have been launched by local fishermen organization in order to improve the marketing of the local catch; most of these initiatives have been promoted by Fisheries Local Action Group (FLAG) and supported by European structural funds (Farnet, 2014).

**Reference**

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Scientific, Technical and Economic Committee for Fisheries (STECF) – The 2016 Annual Economic Report on the EU Fishing Fleet (STECF 16-11); Publications Office of the European Union, Luxembourg; ISBN 978-92-79-64633-1; doi:10.2788/842673

### *3.2.2.9 Strategy of promotion of local fresh products centres on traceability, direct sales and lengthening of the cold-chain from PO Trapani in Sicily (Italy).*

**Introduction**

In the context of the regional Sicilian economy, fishery represents 0.58% of the total economy, still the Sicilian fleet represents by far the largest regional fleet in Italy, in terms of number of vessels (26% of the national fleet), tonnage (32.4%), and power (23.7%). Most of the Sicilian production is destined to the local consumer market that prefers locally grown products over imports; the production, destined to the local market, uses traditional selling channels (specialist retailers, fishmongers and wholesalers), direct to fresh markets and processing industry (small pelagic fish). In the sub-case of coastal fisheries in the province of Trapani we analyse the promotion strategy of fishing producer association (PO Trapani) to increase sale value of fresh products.

**Description**

In 2008, three fisherman's cooperatives of Trapani started an integration process creating a producer organization in order to generate external economies of scale and increase the local market value of their fishery products. The sub-case explores the most recent PO initiatives promoting a diversification of activities (new species, new products, new production techniques, new commercial outlets, labelling, new management) with a more integrated supply chain, governed by fishermen. Since 2010, the PO manages the Trapani Fish Market and sells mainly to small fishmongers and local restaurants. These relationships, based on trust, have been strengthened by two new initiatives: QR-code traceability and a quality label "Mare Nostro". This label has been established to qualify the fish

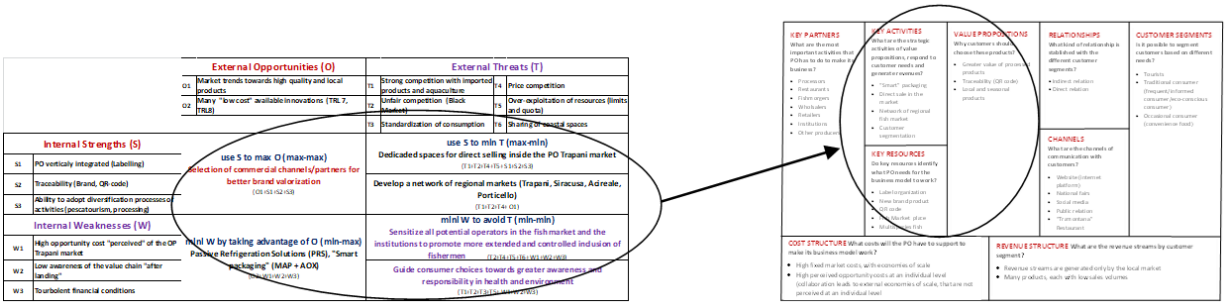
products caught by fleets operating in the Trapani area. Operators, through voluntary adherence to the brand, are undergoing a periodic audit to maintain and improve the quality of their products. In order to reach new market opportunities, the PO has started a new processing activity of a fish species of low commercial value (picarel, spicara flexuosa). The new process unit produces a Sicilian traditional products using traditional process mixed with innovative ones (Salted picarel). Furthermore, The PO Trapani has undertaken innovative initiatives to reduce costs and improve the efficiency of the cold chain downstream (i.e. Fish Market). Finally, the new income opportunities generated by the local growth of the tourism sector have encouraged the PO to develop pesca-tourism and ittio-tourism activities, including a restaurant ("La Tramontana") that prepares dishes using fish caught only by the PO.

**Methods**

Initially, a strength, weaknesses, opportunities and threats (SWOT) analysis was performed for the PO Trapani. Furthermore, by a TOWS analysis, following the approach used in similar cases, we identify the areas for improvement of the initiatives analyzed in the Sicilian sub-case.

The TOWS analysis is a simplified tool to generate strategic options starting from a stronger emphasis on those external factors which can have greater influence, and on the correlation of them with the internal ones (strength and weakness of PO Trapani). Taking into account the internal condition it is possible to identify which actions are able to maximize the opportunities generated by the market and minimize the risks related to the external environment. The CANVAS model, built following the TOWS matrix, is functional for developing a visual approach to generate a process of value creation.

In our sub-case, this method for focusing on RFIs taking into account the correlation between the actions to be started (see Key activities), the key resources, the customer targets, the actors of the supply chain (potential partners and competitors) for the valorization process enhancement. We have represented the elements of RFIs through a canvas model that focuses on the construction elements of the value for the end customer and to explain the basic conditions for the value to be actually used.




**Lessons**

- Strengths:

• Ability to adopt diversification (pesca-tourism and ittio-tourism)
• Capability to vertical integrate processes (processing, restaurant, commercialisation)
• Traceability: QR-code, quality label

- Weaknesses:

• High perceived opportunity costs at an individual level. The PO leads to external economies of scale that are not perceived at individual level. In fact, part of fishermen prefers selling directly small quantities of fish without using the Fish Market. That's because selling small amounts of fish can give economically advantageous conditions (scarcity) than the market.

• Low awareness of the value chain "after landing". In fact, traceability ends with the landing of fish on the dock and the consumer knows where the fish comes from, but not as the fish arrived in the point of sale.

**Highlights**

Suggested strategic options for greater competitiveness and consolidation of economic sustainability are:

• Select commercial channels/partner for better brand valorization

• Dedicate a spaces for direct selling inside the Fish Market

• Develop a network of regional markets (Trapani, Siracusa, Acireale, Porticello)

• Sensitize all potential operators in the fish market and the institutions to promote more extended and controlled inclusion of fisherman

• Guide consumer choices towards greater awareness and responsibility in health and environment

• Adopt low cost available innovations (PRStm, MAP+AOX)

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### *3.2.2.10 Lessons from the German North Sea Plaice and proposals to boost consumption*

The German fishery for North Sea plaice presents a paradox when trying to meet the challenges of competitiveness and sustainability. Compared to other fisheries, which do not have enough quota due to e.g. choke species, the plaice fishery has enough quota but is not being able to exhaust it. The price variability within the species goes in the case of the North Sea plaice against economic logic. Prices have stayed low despite the lower and sustainable landings, and only lately, with higher landings, have the prices started to rise. The initial hypothesis, that the challenge would be to avoid substitution of plaice by pangasius leads to other hypothesis that have to do with both supply but also demand factors. In addition to this, the main challenge remains to overcome price variability and cover the demand of society for sustainably caught fish.

**Description**

The German flatfish fishery in the North Sea is a mixed fishery targeting basically plaice, with catches of sole and Norwegian lobster in some periods of time. The fleet segment employs bottom beam trawls as main fishing gear. The landings of plaice have been under the quota for most of the time series (see fig.1), what makes the fishery a sustainable one from the management point of view and hints at the possibility of increasing profitability.

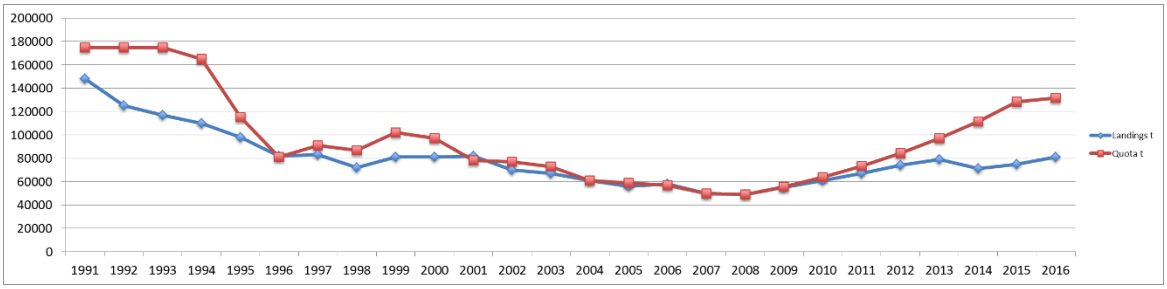


*Fig. 1: Official Landings and TAC Plaice North Sea in tons (1991-2015). Source: ICES*

However, the behaviour of the prices does not correspond to what could be expected, as there have been low prices with low landings and higher prices with higher landings (see fig.2)

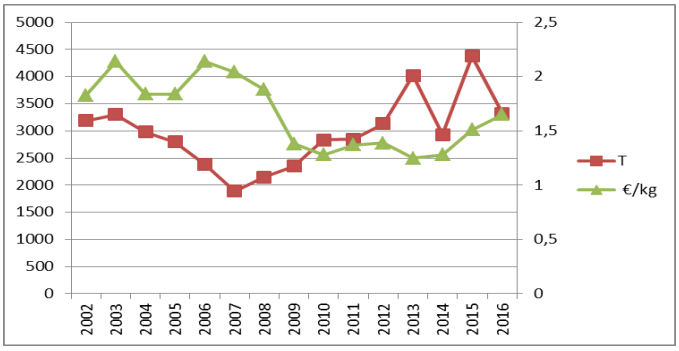


*Fig. 2: Average price of plaice between 2002 and 2016 (German landings) Source: BLE, Germany.*

**Methods**

As the first analysis showed the existence of unfished quota, stakeholders were consulted to explore possible explanations through expert interviews. Six stakeholders were interviewed in their quality of experts: two producer organizations (PO) directors, the representative of the German fish processing industry, the spokesman of a large fish processing firm, the quality and sustainability director of a fish restaurant firm and the marketing director of a fish promotion agency.

**Lessons**

The main reason for the existence of unfished quota presented by the stakeholders from the catching industry would be the reduction of the fleet size. This reduction of the fleet would have been due to lack of succession of fishers to the fishery, due to low profitability caused by low fish prices and sometimes high fuel costs. Other causes would be the change in the target species (to sole and Norwegian lobster) and more recently bad weather conditions.

According to the same sources the reasons why the prices stayed low when the catches were low would be related to the economic crisis, with stored fish reaching the market at low prices; with the

competition with imports from pangasius and finally with the reduction of processing facilities, which would have occurred as an adaptation to the period of low catches. Prices would have been higher when catches were high because of a mix of advertising, less pressure from environmental NGOs, less speculation with stored fish and opening of specialised processing lines for plaice.

Both industry representatives coincided on the positive role that advertising campaigns would have on the demand and prices of plaice. Some current and potential marketing initiatives can be suggested for improving the competitiveness of the sector. An advertising campaign for plaice in videos and at selling points would have been a clear step to increase demand. Other campaigns that would have improved the knowledge of consumers and their demand for fish were an advertising campaign using postcards by the promotion agency Seefischkochstudio, educational videos on how to filet plaice by the fish processor Deutsche See and the campaign of cookbook leaflets matching plaice with other popular food products by the German fish processors association. Initiatives to increase consumption locally include restaurant and fish counters at the PO facilities, and the linkage of a fish restaurant to cycling routes. Finally, potential campaigns could include linking the fishery to ecosystem benefits or a wider dissemination of the compliance of the fishery.

**Highlights**

- A biologically sustainable fishery as the German North Sea plaice fishery can be unsustainable economically, through lack of profitability, and socially, through lack of fishers´ succession.
- The reduction of the fleet in times of low profitability would have compromised the exhaustion of the quota for plaice in early periods, the weather conditions in more recent times.
- The reduction of the processing capacity would have provoked an adjustment in the demand for plaice, and therefore lower prices when the landings were also low.
- Some dissemination campaigns would have a broad reach, as the 10000 persons a year of the campaigns by a promotion agency or the 300000 new visitors a month of a fish processor´s website.

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- Interviews with Dieter Hullmann (Elsfleth PO, 1/6/2017), Ulrich Elsner (Küstenfischer Nord PO, 25/9/2017), Matthias Keller (Fisch Verband processors´association, 28/2/2017), Andreas Kremer (Deutsche See fish processors, 21/9/2017), Dietmar Hoffmann (Nordsee fish restaurants, 26/9/2017) and Christina Klug (Seefischkochstudio fish promotion association, 22/9/2017).

## 3.3 RFI in the Aquaculture sector

### 3.3.1 Review of RFI and Synthesis

In the field of aquaculture, 8 RFIs have been investigated. Two of them concerns technical experiments in order to address specific issues. The others analyse the outcomes of initiatives already in place or explore new initiatives (or set of initiatives) which are expected to both contribute to the development and to improve the sustainability of the aquaculture sectors.

As regards the fish farming sector, the RFIs presented in the D3.4, although non-exhaustive, are representative of the main issue facing the EU aquaculture sectors involved in national strategic plans for the development of sustainable aquaculture (NSPDSA). Taken into account the growth objectives of their NSPDSA, MS are urged to remove the obstacles for fish farming development in a context of high competition for the access to sites and markets, and strict environmental regulations.

In this respect, two RFIs tackle different dimensions of marine fish farming development in the EU (technical/economic, institutional). The Finnish RFI analyses the economic feasibility of alternative/sustainable modes of production, including RAS (recirculating aquaculture systems), large scale offshore farming and use of local fish feed. It concludes that a mix of these production methods, or even the current methods applied at a larger scale, are likely to reach strategic growth objective in a competitive manner, provided that they could comply with water quality and other environmental requirements. A French RFI is dedicated to a preliminary assessment of the capacity of SRDAMs (regional schemes for the development of marine aquaculture), as guiding and planning documents of the aquaculture sector, to enhance the access to new aquaculture sites. In spite of the achievement of the French Mediterranean SRDAMs at the end of a long process (including the mapping and multi-criteria selection of suitable sites for aquaculture development, followed by phases of consultation/concertation with other stakeholders), preliminary conclusions are mitigated and concrete results are still awaited by project holders.

On the other side, two other RFIs about inland fish farming address more marketing-oriented issues in order to consolidate the competiveness of longer-established EU fish farming sectors. In the French RFI about trout farming, the attention is paid to the different benefits resulting from the setting up of the PO "*Bretagne Truite*" which allowed improving the economic performances of the producers by mutualising marketing and investments costs, developing new products (salmon trout, organic trout and eggs), implementing a collective brand, etc.… These results are all the more noteworthy that when the PO was created at the beginning of the 2000s the French trout market was not buoyant, suffering from high competition with Norwegian salmon imports, resulting in a low bargaining power of small scale farmers with large retailers. The RFI dedicated to both German and Polish carp farming studied jointly the "Region marketing" as a strategy to support a traditional fish farming sector, providing ecosystem services like preserving landscapes, biotopes and cultural identity of some European regions. As the economic study concludes that small scale carp farms hardly benefit from the "region marketing" effects, unlike larger farms, the remuneration of the multi-functionality of small farms through either public funding or a touristic tax system is a policy

option which is recommended to maintain the peasant carp farming and the unique carp pond landscapes.

| Category of initiatives | RFIs | Nature of the RFI | Challenge |
|---|---|---|---|
| New products | Development of fresh unvalved mussels with extended lifespan in Greece | Technical experiment | Increase of domestic mussel sales, in both traditional consuming areas and other areas with high potential due to tourism |
| New production technique/mode | Exploring the growth of sustainable trout farming in Finland | Initiatives to be explored | Growth of fish farming production in a context of stringent environmental regulation |
| Management / spatial tools | Study of the SRDAM as a possible tool to improve access to new sites for marine fish farming in the French Mediterranean coast | Initiatives already set up | Growth of marine fish farming aquaculture in France |
| Labelling-Certification | Assessment of the labelling strategies developed by the French mussel farmers in terms of market opportunities and management of common resources | Initiatives already set up /to be explored | Consolidate the market power of producers within the value chain and promote best cultural practices |
| Labelling-Certification | "Region marketing" as a room for improvement of carp farming in the German Aischgrund and the Polish Barycz Valley | Initiatives already set up | Support a traditional mode of aquaculture providing ecosystem services and strengthening local identity |
| Producer organisations | Vertical integration strategy in Italian mussel farming. Future prospects for strengthening the consortium “Cozza di Scardovari DOP” | Initiatives already set up /to be explored | Increase the income /competitiveness of producers through producer organisation and marketing strategies |
| Producer organisations | Improving the organisation of trout farmers with the PO "Bretagne truite" | Initiatives already set up | increase the income /competitiveness of producers through sales organisation and marketing strategies |
| Other | Laboratory experiment and outcomes of alternative management options for Greek mussel farming | Technical experiment | Upgrading of the quality of Greek farmed mussels |

As for mussel farming, the RFIs cover different categories of initiatives. The two already mentioned technical studies were carried out to solve some problems experienced by the Greek mussel farming. The first experiment led to the development of an alternative process technique to enhance the quality (microbiological, organoleptic) of unvalved mussel products with extended lifespan, mainly

dedicated to the domestic market (especially to comply with increasing demand in summer and to reduce imported frozen mussels at that period). The second experiment using hydrodynamic models of productivity aimed at evaluating spatial planning scenarios, in order to upgrade the quality of Greek farmed mussels. These scenarios will be delivered to local and national authorities and producer's organizations.

Moreover, RFIs about mussel farming are related to labelling and certification issues along with producer organisation. One RFI provides an assessment of the different labelling strategies of the French mussel farmers, focussing on EU quality schemes and organic certification regulations (with a particular attention paid to the PDO). As the current multiplication of public producer labels might be conflicting with large retailers marketing strategies and confusing from consumers, further coordination and organisation of French mussel farmers would need to be considered. Further, a greater consistency between quality schemes and aquaculture organic regulations is expected for promoting and communicating on sustainable shellfish productions. A second RFI analyses the benefits related to the Italian Consortium "Cozza di Scardovari DOC", which was able i) to aggregate producers, establishing a recognized Producer Organization (POs), ii) to achieve vertical upstream integration with the setting up of a shared "quota" management system and iii) to obtain the registration of the Protected Designation of Origin (PDO). This consortium located in Veneto region is likely to be replicable to other organisations existing in Italy.

Other initiatives have been reported by SUCCESS partners but are not developed in this report for lack of further analyses. The main initiatives in terms of new products concern the development of the productions of large size fish for seabass, seabream and the diversification in salmon trout and other salmonid species (arctic char, crossbreed char in Germany). A few institutional changes identified refer to a small extension of the terms of the licenses in Italian mariculture and simplification for their renewal; the creation of a National Aquaculture Council in Greece for the implementation of the strategic programme of development and the nomination of DGAs as "one stop shops" for licensing procedures. In terms of management/spatial tools, it would have been interesting to analyse further the initiatives taken in other countries (for instance AIAD in Greece, AZA in Italy and in Spain), to compare their scope and legal status, but the setting up of these plans are in progress and outcomes are probably not definite at this stage. As regards certification and labelling initiatives, the list of initiative is quite long (albeit probably non-exhaustive) and range from organic labels (Greek and Italian seabass, seabream; French seabass, Scottish salmon, German carp and trout- with both EU labels and private standards) to EU quality schemes (PDO "Mejillon de Galicia" and "Cozza di Scardovari" for mussels, PGIs for carp and trout in Germany…), through Label Rouge for Scottish salmon and French seabass, seabream. Codes of best practices have also to be mentioned, like the charter "Aquaculture de nos regions" developed by the inter-professional committee of French fish farmers and the "code of good fishery practices in fish farming" set up in Poland. At least, initiatives based on the organisation of producers for the commercialisation of farmed fish and further integration in the value chain should be cited, as for instance the organisation of aquaculture producers of Andalucia.

### 3.3.2 Aquaculture: RFI investigated

#### *3.3.2.1 Development of fresh unvalved mussels with extended lifespan in Greece*

**Introduction**

The aim of this study is the development of new products for targeting both traditional markets in consuming areas (i.e. Thessaloniki) and other areas with high potential due to tourism (i.e. Crete). Although consumers manifest a great demand for mussel consumption, the production cannot cover the needs of remote market areas due to the shortage of mussels' shelf life. To make things worse, imported frozen mussels have substituted for fresh mussels in the local markets and a need for inventing a technique to prolong their shelf life calls for high priority. Currently, there is a processed product from mussel bodies labeled as "Unvalved" mussels: Mussel bodies are separated from the shells, then placed in plastic bags filled with potable water (1:1 ratio) and sealed.

In Northern Greece only, there are 32 mussel processing plants producing this type of product due to specific environmental conditions that prevail in Thermaikos Gulf and facilitate a massive mussel culture (main production area in Greece). However, the unvalved mussel product exhibits a shelf-life of 5-6 at 4°C, lacks the unique mussel taste and shows a brownish color, thus rendering the product unappealing and thereby of low acceptability.

Thus the aim of the study was to establish some key-factor criteria in order to develop a better unvalved mussel product in terms of public health and taste acceptability, such as:

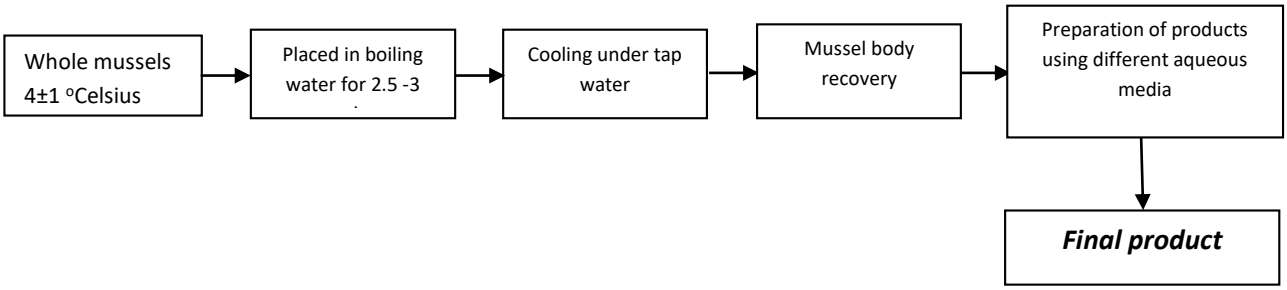
- Microbiological quality : *E. coli* β-glucuronidase positive (<230 MPN/100 g sample); *Salmonella* spp. (Absence in 25 g sample); Colony count (<5×$10^5$ cfu/g)
- Taste (quality criteria): evidently, there exists a loss in the medium of nutrients that mostly contribute to taste.
- Color (quality criteria): frequently, several mussels are damaged due to an operational failure during the mussel body recovery process, diffusing a brownish color in the medium.

**Description and Methods**

A series of experimental designs was conducted using thoroughly selected media for the preparation of unvalved mussel products (mussels 500g in aqueous medium 500g): brine concentrations (1, 2, 3, 3.5, 10, 15, 20 and 25%) and aqueous white vinegar solutions (10, 15, 20 and 25%).
All products were stored at 4±1 °C and assessed in terms of their microbiological quality, taste and appearance in relation to storage time.

The unvalved samples were assessed in terms of their sensorial acceptability using an unstructured measuring scale (0-15 cm, not at all to very acceptable). Members of the academic staff of the Department of Food Technology and mussel farmers participated in the sensory evaluation of products. Statistical analysis was performed in the data collected from all the experimental trials.

The currently applied mussel body recovery process damages mussels and as a result juice is released to the medium, which turns brownish. Therefore, an alternative mussel recovery process was employed as shown in the flow chart that follows:




This alternative process proved to be superior in terms of microbiological and taste quality and shelf-life longevity as compared to those of the traditional product.

**Lessons learned and Highlights**

The demand for mussels in the Greek market typically increases during summer due to tourism flood, but that demand is mostly covered by imported frozen mussels, due to the limited shelf life of fresh and unvalved mussels produced mainly in Northern Greece. Now, by presenting and taking promotion actions to disseminate the image of the innovative product, it is strongly expected that a new chance opens for the Greek mussel produces to broaden the Greek market, particularly at production peak due to the seasonality of production.

The microbiological quality fulfilled all the food safety criteria concerning the species *E. Coli*, *Salmonella* spp and colony counts. It was significantly improved by using different mediums and the alternative mussel recovery process.

Products placed in 4% brine and 10 and 15% white vinegar solution were the most preferable by the panelists, while mussels placed in 10% brine were found to be very salty.

A washing step is deemed necessary to improve the taste of the unvalved mussels placed in 10% brine (Placing drained mussel bodies in water for 180 min prior cooking is proposed).

The innovative products are highlighted by the following points:

- The appearance of all products was significantly improved throughout storage, irrespective of shelf-life.
- Unvalved mussels placed in 4% brine exhibited a shelf-life of 17 days, while those placed in 10% brine, 27 days.
- Unvalved mussels placed in aqueous white vinegar solution exhibited a shelf-life of at least 32 days.
- An easily adaptable process for any mussel processing plant.
- Overall, the shelf-life of all products further improved by employing the proposed mussel recovery process.

### *3.3.2.2 Exploring the growth of sustainable trout farming in Finland*

**Introduction**

The Finnish aquaculture sector has been controlled with stringent environmental regulation. Fish farming is regulated with environmental permits, which determine the location and the size of operation. The permits include various conditions for the farmer: for instance a maximum allowable amount of feed is used to control the nutrient loading. From the economic point of view the fish

farming licensing system is a pure production volume regulation system. And during the past decades the policy has led to continuous reduction of aquaculture farming unit sizes and production volume. This has happened in spite of the fact that the fish farming industry has decreased its nutrition loading by 70 percent from the beginning of early 90's; And today the share of nutrition load of aquaculture is about 1 percent of the total load of nutrients. The stringent environmental policy with production unit size limitations has prevented fish farmers' ability to gain from economies of scale and has hampered the competitiveness of the sector.

Finnish multiannual strategic plan for Aquaculture targets for some 10 million kilos production increase during EMFF financing period. The growth of aquaculture must be compatible with water quality requirements and other environmental objectives. There are several opportunities for sustainable production growth in the Finnish aquaculture. We examined the potential competitiveness of three different approaches:

- Recirculation Aquaculture System
- Offshore aquaculture production
- Baltic Sea Fish Feed

**Description**

Recirculating aquaculture systems (RAS) enable controlled nutrient loadings to the environment. Limited environmental impact allows a growth in production. During the past years RAS production has increased in Finland; however it has faced technological challenges and profitability problems. We examined the competitiveness of developed new technology with different level of production. The national spatial plan for aquaculture identified offshore areas suitable facilitating increased production with bigger production units with low environmental impact. This would enable establishing large-scale production units with up to 1 000 tonnes of production that are three times larger than a general fish farm as at present. The competitiveness of these production systems was analysed using fish farming profitability analysis tool (Kankainen 2014) and compared with the current production technologies.

In addition there is an opportunity for sustainable increased production by recirculation of nutrients using Baltic Sea caught fish for fish feed in aquaculture. The Baltic Sea fish feed (BSFF) is designed to close the nutrient loop in the Finnish aquaculture industry. Using under-utilised fish stocks in the Baltic Sea to produce fish feed for fish farming enables nutrient-neutral production growth in aquaculture if the amount of nutrients in the harvested fish for feed corresponds to the nutrient loading from the fish farming using Baltic Sea fish feed. We examined the potential for increased production of 10 million kilos using BSFF and the value added created along the whole value chain. The net nutrient load was calculated with simple mass balance calculation based on the nutrient content of Baltic herring and fish feed (Mäkinen et al. 2013). The value added of nutrient neutral production growth is estimated along the value chain based on current productivity from DCF data.

**Lessons and highlights**

State of the art technology and spatial planning together with environmental monitoring allow room for production growth. In highly competitive market, such as salmon and rainbow trout farming, lowest production costs are achievable in off shore production where there is no need for high investment in water treatment technology and energy cost low. The larger the production is, it will

compensate the higher investment cost, compared to present production models, both in offshore farm and RAS farms.

Currently RAS production is not competitive in salmonids markets and specializing is likely needed for profitable production when compared to alternative production methods. However some niche products such as high-value species or fingerling production may provide option for competitive production. However when the rainbow trout market prices are favourable as in 2016 and 2017 RAS production would be profitable together with technological development that lower the operating cost in RAS.

Large scale offshore farming is competitive due to economies of scale. Operation costs as well as capacity-depended investment cost decline with increased production. This would indicate a potential for increasing production off-shore, however, taken that this requires introduction of new technology there is uncertainty whether the whole production system will turn out to be feasible in practice.

BSFF enables sustainable aquaculture growth and the concept creates wide economic benefits along the whole value chain. It creates new profitable market for fishermen and better utilisation of Baltic herring quota. It also creates a totally new industry concept in Finland, local fish feed industry closely integrated to fishing, aquaculture and fish processing sector. In addition to better integrated production chain it enables new marketing possibilities, which utilize consumers' demand for locally produced environmental-friendly products. 10 million kilo production growth with BSFF is estimated to generate 47 million euro cumulated annual value added in the entire value chain from fishing to retail sector. This net benefit to Finnish economy can be reached with BSFF circular economy concept in a nutrient neutral manner. One third of the value added is realized in the primary and fish feed sectors and two thirds in processing and trade sectors.

Additionally it should be noticed that also current production systems are competitive even limited by production licences. There is also potential for increasing production if production licenses could be increased without compromising the water quality requirements and other environmental objectives.

Therefore in summary there are several potential alternative options for increasing the Finnish fish farming. And in the end a mix of above mentioned production methods together is likely needed to reach strategic growth objective in a competitive manner.

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### *3.3.2.3 Study of the SRDAM as a possible tool to improve access to new sites for marine fish farming in the French Mediterranean coast*

**Introduction**

Despite a long coastal zone, France has a limited development of marine fish farming, (4920 T in 2016, source CIPA), attributed to the difficult access to new farming sites, shortcomings of governance, regulatory constraints and a lack of social acceptability.

In France, the Regional schemes for the development of marine aquaculture (SRDAM) have been introduced by the French Law on modernisation of agriculture and fisheries (LMAP, 27th July 2010). The aims of SRDAM are to make a double inventory: existing aquaculture sites, potential suitable sites, and to conciliate the development of marine aquaculture with other coastal activities or uses.

The SRDAM for the three Mediterranean administrative regions: Provence - Alpes Cote d'Azur (PACA), Languedoc Roussillon (LR), and Corsica, have been approved in 2015. As the SRDAMs should create opportunities for accessing new fish farming sites, the objectives of our study are (i) to understand the building and the contents of the SRDAMS and the opportunities offered by these new planning schemes on Mediterranean coasts; (ii) to look at the changes occurred after the publication of SRDAMs in 2015; (iii) to analyse the possible constraints to an extension of marine fish farming allowed by these new tools.

**Methods**

The present study is based on desk work and on interviews. We have done 13 face-to-face interviews (1 to 2 hours) following a semi-directive guide, with several types of actors: 5 in the national administration (national, inter-regional, regional scales), 1 in regional administration in Corsica, 4 in the fish farming sector (2 fish farmers associations –national, Corsican- , 2 CEO of main French companies), 3 in the research sector (Ifremer, Univ. Corte).

**Description of the SRDAM**

The implementation and development methods for SRDAM is described in the administrative circular DPMA/SDAEP/C2011-9626, dated August 2nd 2011. Under the authority of the regional prefects, the DIRM (inter-regional directorate for the sea) is in charge of the elaboration of SRDAMs. For the three Mediterranean zones, the DIRM Méditerranée has followed a similar method for the inventory of suitable sites. The first draft has been issued from a first concertation and working phase with professional fish farmers, public services –DDTM- and Ifremer (who provided a methodological basis set for Corsica in 2007 for criteria, data base and GIS, method that was adapted): an initial list proposed by professionals has been crossed with different criteria (choice discussed on pertinence and data availability) relevant for fish farming, environment protection, and other activities, to obtain a list and mapping. Then consultation and concertation phases followed, within wider circles of stakeholders, until a final version adopted by regional prefect.

The SRDAMs must be taken into account during the administrative examination of demands for authorization to use the public maritime domain for aquaculture. But the set of procedures for

authorization of fish farming remains necessary. The SRDAMs will also be taken into account in the preparation of DSF[4] including MSP[5].

As pointed by the professional sector, a SRDAM has a weak judicial value, as it cannot prevail against other land planning documents. In Corsica, the SRDAM's preparation has been simultaneous, and congruous in results, with the PADDUC[6], providing a stronger legal framework than a SRDAM.
As underlined in the Mediterranean SRDAM reports, the SRDAM are flexible documents, supposed to be revised every five years, with possible new options in methodology and choices.

**Lessons learned**

*About the process to elaborate Mediterranean SRDAMs:*

- It was a very important work (for DIRM and fish farmer representatives) and a long process (4 years) including consultation & concertation;
- it concerned only the sites for coastal cage farming or on-shore farming, there is a lack of space planning for land-based facilities indispensable for farming companies;
- the criteria about environment and its protection were part of the selection process for suitable sites, but tools for impact assessment of farms or carrying capacity of sites were not, despite a need for holistic approach;

*About the results for marine fish farming sector*

- No project of new farm was launched since Mediterranean SRDAMs were completed in 2015; access to sites is not today the main constraint for marine fish farming development;
- long and complex administrative procedures are the major constraint pointed by professionals, asking for a simplification; the other one is weak social acceptability visible in local opposition but also in difficulties for authorization procedures,
- according to professionals, the market is not a limiting factor for a limited production growth, nor the investments capacity today but investors may go in other countries with easier conditions,
- For professionals, high expectations (on access to sites and social acceptability) put in SRDAMs are followed by a great disappointment.

*About marine spatial planning*

- As a first experience of marine spatial planning, SRDAMs bring methodological lessons, especially the need for a high precision in mapping scale, required by users for preventing or solving use conflicts;
- About the participation of stakeholders: following the definition of SRDAMs, the concertation/consultation in SRDAMs process was limited to fish farmers and fishermen for economic activities, while other stakeholders or coastal zone users where associated through a representation by various bodies. In the future concertation for MSP, an in-depth participative work with all stakeholders and users could open an opportunity for mutual understanding of activities and issues, and bring a better social acceptability of aquaculture.

[4] Document Stratégique de Façade;
[5] marine spatial planning
[6] Plan d'Aménagement Durable de la Corse = Plan for land management and sustainable development in Corsica

*For main policy options*

- Improving access to sites through SRDAMs for Mediterranean marine fish farming has not improved development and competitiveness, as other constraints prevail, especially the administrative procedures which simplification is asked as a priority by the professionals; as the simplification of administrative procedures is already a goal included in public policies, notably NSPDA, it is mentioned here for recalling that it has to become effective, showing a real political will in favor of aquaculture development;
- The SRDAMs are flexible documents which revision after 5 years should include the land-based sites necessary for companies facilities, and possibly models for environmental impacts of farms;
- For the French marine fish farming aquaculture, a recent and small activity in the high–pressure context of the coastal zone, a tool for development and improvement of competitiveness could be dedicated zones, like Aquaculture Allocated Zones (AZA, defined by CGPM-FAO); this option should be considered and studied;
- The weak social acceptability of marine fish farming appears again as a major constraint requiring work: actions to improve it, and research work to understand the public representations at stake and the controversy about aquaculture.

#### *3.3.2.4 Assessment of the labelling strategies developed by the French mussel producers in terms of market opportunities and management of common resources*

**Introduction**

France is one of the major producers and markets of mussels in the EU. The bulk of the French market corresponds to fresh mussels, which are supplied in majority by domestic production (65-70%) and supplemented by EU imports. This market was globally stagnant between 2000 and 2015 due to the downward trend in EU production and levelling off of the French production. The consumption of fresh mussels (1.8-2 kg/capita /year) is shared between home consumption (50-60%) and out of home consumption. The main changes occurred within the value-chain over the last 20 years were i) the increasing role played by the supermarkets for the retail sector and ii) the distribution of packed live mussels, which began with the catering sector and then spread to the large retailers. With this innovation, the mussel purchases for home consumption still rely on live mussels, remain seasonal (in line with French productions), and show a clear preference for the traditional farming mode, called “bouchot”. Added to the geographical diversity of production basins, these characteristics are suitable for labelling initiatives based on quality and origin. Current consumer expectations as regards “environmental” labelling also offer new market opportunities.

**Description and Method**

The title of the RFI emphasizes the different dimensions of “quality” labelling for the shellfish farming sector. The geographical perimeter of this CS is limited to the main production areas for bouchot mussels. The labelling initiatives investigated here only refer to the quality schemes related to the regulation (EU) N° 1151/2012 (PDO, TSG), to the French Label Rouge and to the European regulation on organic aquaculture entered into force on 1 July 2010**.** The specific issues addressed are: How much do these labelling approaches improve the collective management of common natural resources? To what extent can they influence the coordination of the value-chain and meet current consumer expectations?

Due to the different issues at stake, the methods used come within the sector analysis, the institutional analysis and the value-chain analysis. Background from WP3 and WP4 was completed by a review of literature and legislative texts and targeted interviews with actors of the value-chain from production to final distribution stages. In total, more than 20 people were interviewed in face to face or by phone using semi-structured questionnaires. All this material has been used for the assessment of the labelling and certification initiatives of the French producers of blue mussels, with a proposed grid of analysis relying on both quantitative and qualitative indicators.

**Lessons learned**

The rationale of labelling for the French mussel farmers are i) consolidating the pre-existing market segmentation according to species, production techniques and geographical origins (from French regions to EU countries) and ii) improving the market power of producers within the value chain. Nevertheless, issues at stake of mussel labelling go beyond product differentiation on the domestic market and keeping competitive advantage towards imports. The labelling process, especially for obtaining the AOC and then the PDO "*moules de bouchot de la baie du Mont Saint Michel",* contributed to improve the involvement of producers in co-management and to support the adoption of more sustainable cultural practices. This was achieved with the setting up of a specification and related independent third party control body which superimposed onto existing regulations (structural schemes for shellfish farming) and administrative control framework. The success of the PDO mussel is indeed due to the intrinsic link existing between product and geographical origin, i.e. the bay of Mont Saint Michel (BMSM), benefiting from exceptional tides range and richness in phytoplankton… But it further relied on its capabilities to draw up norms for upgrading the "quality" and "environmental" attributes of the cultivated mussels and to federate all the mussel farmers of the BMSM. Due to the volume share of blue mussel production under PDO (15-20% of the whole bouchot mussels), positive effects on prices were also reported to redound the French bouchot mussel production as a whole. Some mussel producers excluded from the PDO were however incited to seek other market opportunities and pushed into other labelling approaches for value adding, with the French Label Rouge and Organic certification. Feedback is missing on these newly approved labels, but a preliminary comparison of labelling initiatives was attempted as regards their feasibility, credibility and scope (potential market share, recognition in the French market...).

Lessons learned from this RFI show that the EU quality schemes regulation has been providing an appropriate frame for labelling mussel farming in France, either in order to identify and protect a traditional mode of production (TSG) or to get a market recognition for the extra-quality of production in certain areas (PDO). The value-adding is however more obvious in the case of the PDO which was also driven by a collective project for the management of common primary resources and the adoption of better cultural practices, in the context of reorganization of the bouchot farming in the bay. Even though specific requirements aiming at the protection of natural resources are integral part of the PDO specification (EU regulation N° 1151/2012), this point is less known by the consumers and suffers from lack of promotion from INAO according to the PDO committee.

On the other hand, the Label Rouge which targets upper quality based on mussel size and meat rate criteria is likely to benefit to mussels cultivated in the most productive areas only, or with more productive techniques, but does not aim at improving the sustainability of farming practices at the scale of production basins. This lack of collective dimension can also be emphasised in the case of organic labelling, which in addition suffers from a lack of legitimacy by the actors of the upstream

value-chain, considering that mussel farming does not need input (feed) and is more dependent on the quality of the environment than impacting it. Indeed organic certification may provide market opportunities to producers located in good quality waters, but due to basic specification (reduction, reuse and recycling of farming wastes) it seems to offer little room for value-adding.

As the multiplication of public producer labels might be competing with the marketing strategies of large retailers (own-brand), and confusing for the consumers, the capacity of producer labelling initiatives for increasing the bargaining power of producers needs to be questioned.

**Highlights**

- The TSG "*moules de bouchot*" was carried out in order to extent the protection of the traditional mode of production for blue mussels in France at the EU market level. As the whole bouchot mussel production is certified (about 50,000 tons), the specifications of the TSG provide the minimum standard for "bouchot mussels" to the retailing sector.
- The labelling approach process for obtaining the PDO "*moules de bouchot de la baie du Mont Saint Michel (BMSM)*" was more complex and longer (French label AOC in 2006, PDO in 2011), but the whole process created dynamics along the value chain and contributed to keep a competitive advantage to quality based on origin (and on sustainable production mode).
- The "success" of the PDO can be assessed through several criteria of sustainability: rate of adhesion of producers, capability to draw up norms for upgrading quality, to adopt best cultural practices and to maintain a premium price to producers, etc.…
- …but the difficulty to promote sustainable practices is pointed out as a weakness of the PDO BMSM, and as a shortcoming of the EU quality schemes in general
- Still to be improved: the recycling of farming wastes, including the valorization of small mussel discards (in progress with the involvement of BMSM producers in the "*plan Conchy 35*")
- Organic certification can provide market opportunities (high demand for organic food in general), but in the case of shellfish farming (no feed, dependence on water quality) its justification might be questioned if it does not include higher quality standard nor additional farming restrictions in the specification (mainly focused on the reduction and recycling of farming wastes)
- Conflicting interest between the marketing strategies of the large retail sector and public B to C labels could limit or challenge the potential for further producer initiatives.
- In a context of increasing demand for sustainable food productions, consumer expectations towards labels with higher environmental attributes would imply improving transparency and consistency between the EU regulations on quality schemes and organic aquaculture

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### 3.3.2.5 "Region marketing" as a room for improvement of carp farming in the German Aischgrund and the Polish Barycz Valley

**Introduction**

Carp (*Cyprinus carpio*) is the oldest freshwater species hold in European aquacultures (FAO 2017). With its extensive rearing methods and the earthen dam constructions, carp farming looks close to nature. In fact, it can be seen as a true sustainable aquaculture, which provides ecosystem services (Hutchinson 2006). Carp ponds serve as natural enclaves of nature and support biological diversity (Cereghino *et al.* 2014). In Western Europe small-scaled peasant carp farms are the dominant type of farms, while medium to large-scaled farms are typical for Eastern Europe. Poland and Czech Republic issue half of the EU carp production (FEAP 2016). They are the largest producers of carp in EU, followed by Hungary and Germany. With exception of the exporter Czech Republic, the EU markets for common carp address domestic markets. Although, there are different processed carp products, the tradition to buy fresh slaughtered carp or even alive to prepare it at home is still very present.

**Description**

Our study analyses the economics of carp farmers in Europe. We have selected two European regions as case study, which have a highly concentrated carp production and started a region marketing: The Aischgrund is a German carp region located in Bavaria with a strong and stable demand for carp, where small peasant carp farms characterize the region. On the contrary, Barycz Valley is a Polish carp region in Lower Silesia, where a few large producers dominate supply. Since the millennium, local opinion leaders have initiated or supported diverse, but often coordinated initiatives. The shared function of those initiatives is to increase attractiveness of the regions for visitors, with strong emphasis on environmental issues. The second function is to strengthen identification of the local people with the region and its distinction (especially with carp farming). We title the umbrella term of all these marketing activities for a defined part of a country “region marketing” according to Kotler’s *et al.* “marketing of regions” (1993).

**Methods**

A set of methods was chosen. To explore the essence of region marketing in the Aischgrund and in Barycz Valley and its role for the carp aquaculture, 17 stakeholders, thereof 8 carp farmers were interviewed via semi-structured interviews. The majority of interviewed carp farmers were participants of two focus groups, too. The farmers’ focus groups formed the central tool to define what a typical carp farm might look like according to the typical farm approach used in *agri benchmark* Fish (Lasner *et al.* 2017). Five carp farms were defined as typical for a given business scale (production in tonnes and farm size) in the Aischgrund and Barycz Valley: DE-FCP-5, DE-FCP-20, PL-FCP-10, PL-FCP-90 and PL-FCP-190.[7]

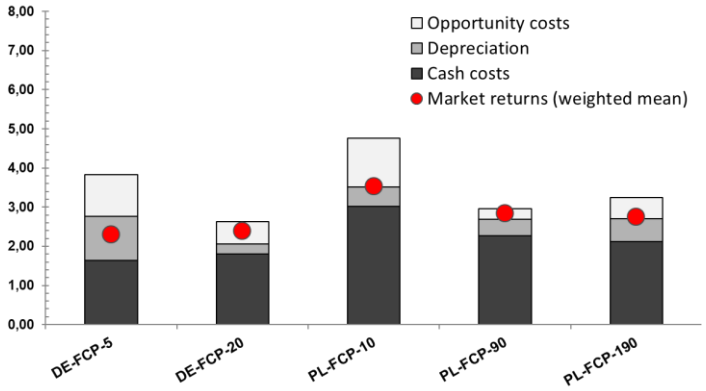
**Lessons**

Since the millennium and often supported by EU programs regional stakeholders have established a wide range of region marketing initiatives to attract tourists or strengthen the local identity with carp farming: guests information offices, carp festivals, fish farming museums, Protected Geographic

[7]Each model farm has a farm code, which refers to the ISO 639 country code, the FAO 3-Alpha Species Code (ASFIS) and the annual production of the main species of the farm in tons live weight. As example, the farm code «DE-FCP-5» refers to a German (DE) carp (FCP) farm model, which produces 5 t of carp in a typical year.

Indication (PGI) and local labels, network of restaurants and fish farmers, pond guides, school teaching materials and new products. Our fieldwork leads to the impression that stakeholder in both regions have understand the today's challenges of carp regions as well as how to start to meet them. The single grow-out and the traditional distribution of almost unprocessed fresh carp is not profitable. The sum of cash, depreciation and opportunity costs are higher than the weighted mean of market returns (cf. figure 1).

Figure 1: Cash costs and non-cash costs, market returns and profitability (€/kg Live Weight) of selected carp grow-out systems in 2015




At the same time carp farmers face many challenges: changed consumers' preferences; price competition; imbalances at the value chain; poor innovativeness; lack of farm successors; high fish losses due cormorant and other animals; diseases; shortage of water; poor infrastructure; de-population of rural areas. There are only limited adaptation strategies to improve their profitability: upscaling, specialization, vertical integration and diversification. Large farms in Poland (PL-FCP-190) have specialized their production. They have to compete on Polish national market and lower their costs via intensification. For medium farms (DE-FCP-20 and PL-FCP-90), the way of closing the carp production cycle as well as diversifying their business is already paved. Thinking in long-terms, mean returns of 2.63 €/kg Live Weight (LW) for DE-FCP-20, 2.95 €/kg LW for DE-FCP-90 and 3.25 €/kg LW PL-FCP-190 are necessary to make them profitable. For smaller farms (DE-FCP-5 and PL-FCP-10) upscaling, specialization or diversification is hardly put into practice. If they are not able to work closer together, far beyond the existing pond cooperatives in the Aischgrund towards real production, storage and marketing cooperatives to shorten the supply chain and strengthen their position within, small scale carp farming will further solidify as a hobby.

By better recognition of their products at national market level large farms could benefit indirectly from region marketing effects. Medium farms will profit directly through higher customer frequency as a result of the region marketing, if their direct marketing is developed. But, how to let the small farms participate from the region's profit of a developing tourism sector? Reformed public programs should include compensation payments for fish loss through protected wildlife like it is common in the German wolves' resettlement programs. In doing so, they public would honor the ecosystem services provided by carp farming. In general, to apply for investments funding should be simplified at least for small scale farmers. Further, a private transfer payment could contain a "visitors carp tax" system, which integrates a low extra payment for each touristic overnight stay or carp meal served in the restaurant. These payments seem to be necessary to enhance the profitability of small-scaled

carp farms and thus the positive externalities resulting from the unique pond landscape for the society. The regional carp label for local restaurants in the Aischgrund is already a starting point. All these private payments could be collected in a fund, which pays small scale farmers a subsidy per pond ha as recognition for their contribution towards the attractiveness of the region. Without their farming, ponds overgrow and turn into fallow land in a few years. The regions would lose the core of the region marketing: the carp pond landscapes.

**Highlights**

- Carp farming form landscapes, biotopes and cultural identity of specific regions in Europe
- The single grow-out and the traditional distribution of almost unprocessed fresh carp is not profitable in long-terms considering current wholesaler prices
- Small scale carp farms hardly profit from region marketing effects. Transfer payments should remunerate the ecosystem and cultural services for the society provided by the carp farms. This could happen either as compensation payments for fish loss and/or "visitors' tax" from the touristic sector.
- Region marketing is a good strategy to enhance direct marketing opportunities for medium sized carp farms
- Large farms could indirectly profit from region marketing, which helps to improve the national recognition/image of their products
- Application process for public funding should be simplified; in particular for small scale farmers

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### *3.3.2.6 Vertical integration strategy in Italian mussel farming. Future prospects for strengthening the Consortium "Cozza di Scardovari DOP"*

**Introduction**

The Italian mussel farming sector was born, with large-scale production connotations, at the end of the 70s. Initially mussel farmers were fishermen who had received the state concession of marine areas or fishing lagoons. In the 80s the sector has experienced enormous growth, both in terms of volumes offered and in number of manufacturing organizations. The main characteristic of companies is that they are micro-sized, often represented by family businesses. Although in the 1990s the sector became more competitive, in terms of volumes offered, mussel farms continued to see a strong fragmentation. At the current time it continues to repeat the inability or low propensity of producers to aggregate has damaged their market power. This weakness is represented by the inability to valorize and make the mussel farm activity profitable, in which the volumes grow, but the average ex-farm price remains rather low (< 0.70 € / kg). This weakness was considered a challenge

to be analyzed in order to give indications to the Italian mussel farming sector to face a future of greater certainty in terms of profitability and better positioning of offer on the market. The changes in the organization of wholesale markets and the growing presence of modern distribution (MD), has strongly influenced the methods of sale of mussel. In the last five years only the mussel farms organized in cooperatives and consortiums, have been active and have had more chance to get into large-scale retail (MD). The weakness that remains in the new challenge for the mussel sector is the difficulty of increasing the ex-farm price. Starting from the analysis of the structural, organizational and market characteristics of the main Italian Consortium of mussel production, it has been possible to acknowledge the challenges as they have been faced, and which will be the strategic levers on which they can push to make the farming activity profitable.

**Description of RFI**

The main objective of this work is to analyze the benefits related to efficient and integrated management system of a Consortium of shellfish, which has been able to aggregate producers, establishing a recognized Producer Organization (POs), and finalizing a long path that has came to the acquisition of the Protected Designation of Origin (PDO) trademark and the associated birth of the Consortium "Cozza di Scardovari DOC". Starting from the analysis of the productive, social and commercial dynamics of the Consortium that guarantees the Scardovari PDO, the survey covers the **national** sector. The type of localized farmers in Veneto Region is a replicable model for both the other organizations and facilities presently in Italy, and to new companies that may be born in the future. The methodological basis on which the RFI was founded has been that of starting from the existing economic and social statistical data of the Consortium for producing a benchmarking analysis between the economic indicators of the Consortium and Italian's mussel sector ones. The remuneration of capital is therefore a fundamental variable of competitiveness. In the analysis, therefore, the economic indicators for the mussel segment were analyzed, both macro (STECF) and micro, referring to the analysis of the Consortium's economic balance sheets (last 10 years). Integration has been the focus of the investigation. Vertical upstream integration was the starting point for investigating good management practices of consortium systems. Further investigation, which is a challenge to be reported, concerned the capacity for resilience, i.e. reacting pro-actively, positively and with great organizational flexibility, to the continuous changes in the market. The methodology has also been based, in parallel, of both *vis a vis* interviews to the main Italian stakeholders involved in the mussel sector, and of a brainstorming moment carried out during a workshop that was held in May 2017. The methodology has been top-down to draw up a series of critical issues in the sector. It has also been up-down, to associate with each criticality a possible criterion to improve and identify possible strengths and development for the future of the sector.

**Lessons learned**

The results of the study, thanks to the joint research with the farmers, allowed identifying the main bottlenecks for the sector but also the growth opportunities for the farmers' income and, last but not least, they could help to improve the production efficiency and consequently reduced production costs. The competitiveness of the mussel farms depends on their ability to continuously improve production efficiency and create value. In case of the Consortium, the assessment of the competitive capacity requires the capability to remunerate the capital factor. The RFI has analyzed and verified that no mussel company can maintain the competitiveness of long medium-term, without adequate investments in capital infrastructure, new and technologically advanced, which allow improving the

efficiency of the production process. The analysis also investigated about adequate investments: the vertical integration and the efficiency of the production process do not occur if the capital is not sufficiently remunerated, compared to what happens in competing sectors (breeding of other shellfish species) and compared to competitors mussel farmers at national level. The analysis has taught that profitability is linked to two main factors: (A) capitalize the organization and (B) involve and general safety in the producers. The goal of creating satisfaction among the members is achieved through vertical upstream integration represented by a shared "quota" management policy. The Consortium guarantees its members the annual conferment of the same mussel quota. The analysis showed that the approach based on the internal system of "quotas" guarantees: (A) economic balance between producers, (B) sustainability and social well-being, (C) efficient monitoring of fish resources/biomass. Furthermore, the objective of the analysis has been to verify that among the strengths of the organization there is the ability to be self-sufficient in raw materials, which in this case are represented by the mussel seed (better control of operative costs of production).

On the hand of market, the mussel industry has a value chain that contrasts with the maturity of the production sector. The sector is pulverized; therefore the reconstruction of the value chain considers the main factors that drive the formation of prices of production resulting from the increased supply from the Adriatic. The analysis of *ex-farm* prices of mussels has shown a price almost unchanged in the last 5 years, though both consumption and consumer prices have gradually increased. Related to value chain for mussels offered by Scardovari, the results of the analysis in RFI has demonstrated that the Consortium's approach has proven to be resilient, meaning that in the last five years it has responded to the challenges of the market by following two approaches: (A) internal one, which involved the strategy of capitalizing and investing in infrastructure, for vertical downstream integration. New properties have been purchased, both with share capital and with subsidies from the FEP and the EMFF funds. (B) External one, which involved the strategy of diversifying their offer of mussels. Investments have been made to obtain ISO 9001 certifications, POD acknowledgments and organic certifications, to respond to the various wholesalers and the new mussel modern commercial distribution chains.

In 2016-2017 market prices of mussel of over EUR2.50/kg were recorded for mussels with organic certification and for mussels carrying PDO labels. From a market point of view, it shows a tendency among consumers to appreciate the consumption of Italian mussels and to recognize their value if they have certificates of quality, organic or PDO. It is a successful example in the regions where vertical integration has been considered as an opportunity by producers.

On the sales side, most co-operatives are not involved in marketing, so there is definitely a generalized **downstream integration** practice of the production process in *strictu sensu*. In the last 10 years, the cooperatives have intensified the need to consortium and to create, in situations of greater cohesion and maturity, the POs. The opportunity for small producers would be to join up with producer organisations and be able to make investments to increase their production, enhance it through certifications and involving in commercialization of mussels, according new patterns drive by modern distribution channels. Moreover, it will be an opportunity to diversify activities. Currently the degree of diversification in the mussels sector is very low. In Northern Italy there are some fishing cooperatives that aggregate internally and breed mussels, clams and other bivalves. In addition, the validation of the bottlenecks of the mussel sector has been made both in the meeting

with the Italian stakeholders (May, 2017) and investigating the main Consortium of Italian offer of mussels. Analyzing bottlenecks directly with the Consortium's managers made it possible to know their capacity for resilience and reactivity, but also the power to interact and dialogue with institutions and other stakeholders.

**Highlights**

- **Efficiency in co-management**: The consortium provides an efficient integration between management of a production area managed with **the quota system** and efficient operation of the Producers' Organization which is responsible for ensuring profitable results to the farmers. In fact annually the Consortium **distributes profits** to its members;

- **Resilience to non-tariff barrier:** possibility of differentiation of the mussel supply from a B2B perspective: creation of the PDO trademark and of the Protection Consortium "Cozza Scardovari DOP " which can enter markets where brands and certifications represent a **non-tariff barrier**. Certification can be considered as a non-tariff barrier, as it represents in a decisive and discriminating way the possibility of entering different international markets.

- **Increasing employment**: capacity for **vertical integration**, through multi-year investment plans that strengthen the value chain, reduced intermediate steps and, very importantly, **created new non-seasonal jobs; high degree of involvement of the employed** people and general interest in being actively involved in the medium and long-term strategic choices.

- **Public dialogue: ability** to attract both **public funding** (FIFG, EFF and EMFF funds) and ease of access to **banking loans**; **positive perceptions** in the regional institutional setting and good dialogue with the public control authorities; good **interactions with the local coastal community**.

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### *3.3.2.7 Improving the organisation of trout farmers with the PO "Bretagne Truite"*

**Introduction**

What is Bretagne Truite?

*Bretagne Truite* properly said is a collective brand used by a Breton trout producer cooperative (*Coopérative des aquaculteurs bretons*) in the French western administrative region of Brittany since 1996. This cooperative has been recognized in 2001 as a producer organisation for trout farmers. It gathers 28 farms and 3 processing plants in order to take over the downstream stages of the value chain. Strictly speaking, the case study is the cooperative and not its collective brand but in the present document, *Breton Truite*, which is much more well-known is used to mean the trout producer cooperative.

Why was it selected as a room for improvement?

Bretagne Truite is an organisation of first hand sales and offers its members an opportunity to develop commercial outlets on a collective basis.

Bretagne Truite is the only PO in the French fish aquaculture sector and addresses two main challenges. On the first hand, it is a quite innovative scheme in the field of first hand sales in the French farming sector. Farmed fish compete with fisheries products which are mainly sold through auction markets while farmers usually market their production on an individual basis. On the second hand, and this is specifically related to the salmonid industry, the French trout producers, who operate small inland size units, have to compete with large imports of salmon from Norway.

Bretagne Truite has set up a collective business strategy to improve the market power of its members, by promoting joint sales under a collective brand and the national charter "*Aquaculture de nos régions*". It is noticeable that "Bretagne Truite" is a collective brand which allows local producers to differentiate from the other regions farmers who also use the national charter by adding the territorial origin to the technical specifications of the charter.

But the analysis of the case study reveals that Bretagne Truite is more than a collective organisation only devoted to develop sales. It has played a role far beyond the business strategy and has covered various fields, following the needs of the members faced with the evolution of the market. It has provided assistance to the individual producers in defining a common production strategy, responding to the competition with imported salmon. They have thus diversified the products in link with the new consumer expectations. Bretagne Truite has set up a new value chain structure, integrating not only the processing stage but also the hatchery one. This strategy has been made possible by an R&D effort which could be achieved through cost mutualisation.

As such, Bretagne Truite is an interesting case-study which allows testing the effectiveness of a collective organisation to improve the competitiveness of individual small size producers.

**Description**

Bretagne Truite has been created in 1996 by three Breton farmers. Prior to this creation each of them was working on an individual basis, with his own processing plant, while a joint marketing structure was in charge of selling the production. When this marketing unit felt into bankruptcy, the farmers decided to try and federate the Breton producers in building a project around a collective tool. These three pioneers created a production cooperative (Coopérative des aquaculteurs bretons) underpinned by a limited company (SA Piscicultures de Bretagne) in which each applicant to the cooperative is to buy shares. Bretagne Truite is the collective brand of the limited company. The cooperative applied for the status of producer organisation and was recognised as such in 2001.

The collective action now gathers most of the Breton farmers (more than 70 % of the trout production in Brittany). The production of each farmer is fully marketed through the cooperative.

The production of trout has risen from about 1 200 t in 2000 to 4 889 in 2016 (source: Bretagne Truite) representing a 20 % market share in France.

New products (salmon trout, organic trout and eggs) have been developed: salmon trout accounted for 29 % of the production in 2009 (in volume) with 862 t. it has been multiplied by 3.3 in eight years,

reaching 2 853 t in 2016 and 69 % of the total production. There was no organic trout in 2009; production started in 2010 with 60 t; i.e. 2 % of the total volume. In 2016, it is 445 t and 10 % of the sales. Eggs have risen from 18 t in 2009 to 34 t in 2016, mostly exported to Japan.

As far as production planning is concerned, a meeting of farmers is held every two or three months.

Products are not sold on the final market but to distributors. It is compulsory for them to use the label of the charter "Aquaculture de nos régions".

As for the upstream stages of the value chain, on the first hand Bretagne Truite has integrated the hatchery and built a plant which supplies its members and sells trout caviar. On the other ones, they have formed a joint buying organization with the farmers to buy food.

**Lessons and highlights**

Outcomes:

The outcomes of Bretagne Truite are numerous. When it was created, the market was not buoyant and the bargaining power of small scale farmers facing big retail stores was low. Bretagne Truite was a tool for mutualising marketing and investments costs by organising the horizontal coordination of farmers. It has allowed developing new products (salmon trout, organic trout and eggs) by sharing R&D costs among producers.

Bretagne Truite has also regulated competition among its members. It should be kept in mind that no member of the cooperative has suffered bankruptcy while the Breton capacity of production has registered heavy losses.

In addition to the innovation in new products, Bretagne Truite has also implemented a consistent trade policy. The collective brand refers to the territorial origin of production. As such, it enables product differentiation from its major competitor on the market for salmon trout (aqualande). They have adapted their supply to the raising environmental and health concerns of consumers by developing organic production.

Moreover, as administrative constraints related to water usage and restoration of ecological continuity is increasing, Bretagne Truite provides each member with a collective support. Bretagne Truite which experienced difficulties until 2010 is now profitable.

Policy recommendations

Organic labelling is not enough to achieve differentiation because you still compete with the other organic producers. Even if this segment is smaller than the whole market, price competition remains very hard. Dufeu *et al.* (2014) highlight the replacement of the French AB label by the European leave "which has a lower level of awareness and trust ... and is perceived as less complete". They conclude that "it may be wise for producers to associate it with other complementary labels". Differentiation can build on the local origin as it has been by Bretagne Truite with its collective brand.

But more than a local origin, producers should highlight the territorial origin which includes the local attribute (for clients involved in local consumption) but also the image of geographical origin (for distant customers)

1. As for environmental constraints are concerned, farmers have to communicate, on an individual basis but preferably at a collective level, on their production methods, showing that they are environmentally friendly even with recirculation systems.
2. As a consequence at the EU level, SME initiatives in their communication on the sustainability of their production methods should be supported.
3. As well as should be supported initiatives which aim at increasing production in a sustainable manner in the context of water use conflicts (recirculations systems)

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### *3.3.2.8 Laboratory experiment and outcomes of alternative management options for Greek mussel farming*

**Introduction**

The productivity in an organized mussel culture area is closely related to the hydrodynamics, the orientation of the farms the cultivation density and the farmers cultivation handling. The interaction between the hydrodynamics and mussel farming in Chalastra coastal area (NW Thessaloniki gulf) has been investigated during last decades. More specifically, Savvidis et al. (2015) conducted field and numerical experiments showing very good agreement between field measurements and model results revealing quite weak currents in the area of the mussel farms. Also Konstantinou et al. (2015), studied mussel cultures and hydrodynamics with the help of numerical simulations and integrated management tools. Taking into account the aforementioned research works, the need of a more detailed experimental investigation on the hydrodynamics focusing on the area in and around mussel shocks was arisen. More specifically, it was considered that this research could take place in a laboratory channel with natural shocks from the sea field so that the experiments would lead to the best possible integrity of the results. Furthermore in order to evaluate selected spatial planning scenarios against a set of productivity, profitability and sustainability indicators a number of mathematical simulations were initiated.

**Description and Method**

The experiments were designed in physical/natural scale so that the relevant hydrodynamic variables would be determined. More specifically, the positions for the measurements, the depth of the flow and the velocity currents were also determined. The following three mean velocity values of entrance water velocity U were used in the experiment; 5 cm/sec, 7 cm/sec and 9 cm/sec. A basic research parameter used in the experiment was the distance between the mussel shocks. Four cases

were taken into account: 300 mm, 500 mm, 700 mm and 900 mm. The final goal was the determination of the velocity field in the areas around the shocks with mussels of a market size (~5 cm length). The velocity field was studied with the modern Particle Image Velocimetry technique. Concerning the mathematical modeling work, this was applied in two levels: a) at the level of a farm and b) at the level of the whole farming area of Chalastra. The overall water circulation was simulated in 2 dimensions through the equations of mass and momentum conservation while the effect of the porous media in the flow, is described through the modifications of these equations in order to take into account the porosity of the medium.

**Lessons and Highlights**

The following points were enlightened during the realization of the present research.

- According to the laboratory experiments, for distances between the shocks greater than 500 mm the velocity field is almost restored. Furthermore the case of largest distance between the shocks (90 cm) present the largest percentage of the velocity class 5-10 cm/sec (occurring for entrance velocities 7 and 9 cm/s) which constitutes the best range for mussel's growth (Inglis et al. 2000). This finding is in line with findings of previous field research (Savvidis et. al 2015).
- According to the numerical modeling work, the results showed that the values of velocity in and very close to the cultivation socks -for different spatial scenarios of mussel cultivation- are very small. This is in general accordance with the results produced from the laboratory experiments, which demonstrate that the cultivation socks are, at some stages of their development almost impenetrable. However it is important to use penetrable structures for the simulation at the farm level, since we cannot expect fully impenetrable behavior of the mussel shocks in the filed for all the stages of mussels' development. According to the calculations based on the characteristics of the cultivation in Greek mussel-farming, the porosity was approximately p=0.73 which for the case of a farm parallel to the flow, leads to inhibition of the structure to the water circulation up to 25% (at the farm's end), while for farm perpendicular to the flow the inhibition is up to 65%, which are values very close to field measurements.
- Concerning the size or the number of lines of each long-line farm the mathematical simulations showed that groups of small farms present both the largest mussel production and the best quality.

The above results of the present research have to be taken into account by the authorities and farmers as a tool to improve the mussel culture conditions.

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# 4 Lessons /Policy recommendations

The Rooms for Improvement (RFI) presented in this report cover several kinds of initiatives already set up or in exploration which aim to answer to different challenges. The successes of such initiatives cannot always be assessed or quantified, depending on the methodology, material and data available. However, for most of them, lessons learned provided by all RFI summaries give evidence of success or shortcomings and potential replicability of some initiatives. Moreover, they provide insights for some policy recommendations which can rely on regulatory, economic, social and technical inputs.

**Based on lessons learned from initiatives undertaken in the fisheries sector,** some policy recommendations can be summarized below.

- Quotas are distributed on relative stability keys which on a Member State level do not match well with catch compositions of fleets. International tradable quotas should be considered in order to reduce the impact of the landing Obligation (LO) on large-scale mixed demersal vessels competing for EU stocks (3.2.2.2). It is now admitted that the LO will reduce catching opportunity of EU fleets due to choke species while extra EU imports remain unaffected. Based on modelling approaches, it is shown that international quota trading would help to maintain the supply of key whitefish species close to current levels and achieve satisfactory financial performances for EU fleets despite obvious effects on fleet restructuring. Moreover, international quota trade would ensure that catch composition is better aligned and therefore vessels are not stopped from fishing due to a quota not being available at the right place at the right time.

- Sedentary and non-quota stocks have not historically been part of the stock assessment processes. This is improving for some stocks (e.g. scallops). However, as stocks are not well defined and well known regarding status, it has historically fallen to local (i.e. Member States) management of the species.
  - The lack of joint management of sedentary and non-quota stocks affects the ability to provide label certification (e.g. MSC) as a result of lack of perceived effective management of shared stocks. As regard to the English Channel king scallop, both the UK and France have a common interest and duty to effectively manage such an important fishery, although systems of governance and leadership are different between countries. The recent marketing initiatives implemented by the two countries (e.g. MSC for the UK and Label Rouge for France) in order to differentiate 'local' king scallops (*Pecten maximus*) from imported products (3.2.2.3) provide a strong incentive to achieve this joint management and make it urgent. A key issue to overcome in this case is the identification of stocks and the status thereof, fundamental to ensure sustainable fishing is assured.
  - Furthermore, due to this the interactions between large scale and small scale (i.e. coastal) fleets is not well defined. The French Seabass fishery illustrates such a challenge where large scale and small scale vessels are involved as well as several fishing techniques (3.2.2.5). Insufficient management or mismanagement creates uncertainty on resource availability and may put at risk some fleet segments, specifically small scale fleets, those which are usually generating the lowest fish mortalities on the stock. Moreover, these small scale fleets are currently pro-active in the

implementation of marketing initiatives (see next) and a prerequisite for successful marketing initiatives is an efficient fisheries management and a resource access guarantee.

- As a consequence, initiatives aiming at integrating resource management and value-adding should be encouraged especially when it is implemented by local producer organizations. The Clams (fasolari) example in Italy (3.2.2.4) shows that the co-management system implemented has allowed an increase in the average price of the species by creating a collective power. Moreover, because it is a sedentary species, a real co-management and bottom-up approach were facilitated. The regulatory framework at the EU level can be supportive to such arrangements and can specifically promote vertical integrated POs that link producers to markets.

- More generally, the integration of market issues into fisheries management should be encouraged and Bio-economic Expert groups should be fostered. This multi-disciplinary expertise would have been useful to forecast some effects of management measures, like the impacts of quota cuts on German plaice markets. The reduction of fleet following the quota cuts has led to unfished Plaice quotas and an adjustment of the demand for plaice which has generated lower prices while landings were also low (3.2.2.10);

- Flatfish fishing using beam trawl is a high fuel consumption activity and SumWing (without pulse technique) should be considered as a potential to reduce fuel costs for some Flatfish fleets in line with objectives regarding the limitation of energy. Facing a huge degradation of profitability due to increase in fuel prices, the Netherlands beam trawl fleet >24m has developed the "SumWing" technology in addition to electrofishing technology known as "pulse trawl". These are two separate innovations. Simulations on impacts of the adoption of the "SumWing" technology on economic performance of major flatfish fleet segments in NL, UK and France show that this investment would be profitable for large beam trawl fleets in NL and UK but without interest for others considering the adoption cost of the technology (3.2.2.1). However, it does highlight the absolute need for fishing fleets, particularly using mobile gear, to reduce fuel usage in order to achieve continuing economic performance. Further, reducing fuel usage helps to maintain the drive towards reducing carbon emissions and other related environmental goals established at the EU and Member State levels.

- There is a need to support marketing initiatives taken by small (SME) producers, which have proven their efficiency in many situations. Fish boxes implementation in Ile d'Yeu has generated additional profit for fishermen involved and contributed to maintain local infrastructures on the island (3.2.2.6). Direct marketing in the Gulf of Salerno turns out to be the best commercial channel to ensure profitability of vessels involved in the common cuttlefish fishery (3.2.2.8). In Sicily, initiatives implemented by the PO Trapani give insights on potentiality of mixing several marketing tools (labelling, direct sales, new commercial outlet, innovative technology…) in order to increase the sale value of local products (3.2.2.9).

- Eco-labelling and certification are costly to gain and retain (e.g. audit etc.) which is often only possible for large scale producers. Furthermore, eco-labelling is enable to cover all the potential valuable attributes of small-scale fleets (SSF) which are not limited to environmental attributes (low-impact production mode) but also include extra quality, greater freshness and local and social dimensions. One challenge is then to make these SSF products easily identifiable by consumers (see

WP2 results on consumer expectations on Coastal products) and provide more support for SSF product differentiations. Statistical analyses on Seabass dockside (ex-vessel) prices over 15 years in France give evidence of premium prices for existing SSF private brands (3.2.2.5). Better prices are also reported for labelled fisheries products in Sicily (3.2.2.9).

In addition, more information/communication on some EU quality schemes to fisheries, like Traditional Speciality Guaranteed (TSG) particularly towards SSF, should be enhanced. If marketing measures, particularly aiming to support SSF, are already in the EMFF, they need to be strongly promoted towards MS.

• Bearing in mind that mandatory information on Seafood products (CMO Regulation) is not really enforced, initiatives aiming to protect consumers and meet some of their expectations about knowledge and information should be encouraged. Several technical options are now available to help with traceability and information dissemination along the market chain (PescadeRias, QR-codes, smart packaging…). They are sometimes linked with individual marketing strategy (Fishcode, 3.2.2.7) and should be promoted as soon as they contribute to traceability and transparency.

**Based on lessons learned from initiatives undertaken in the aquaculture sector**, some policy recommendations can be reported.

A number of these recommendations directly refer to the main challenges faced by the aquaculture sectors for removing obstacles to their development (see section 2.3) in the context of the current CFP and the EMFF priority 2 dedicated to sustainable aquaculture:

- Reduce conflicting objectives between environmental policies and Blue Growth. This recommendation is transversal to all aquaculture sectors. It is notably expected that the application of the revised EIA directive, aiming at the simplification and harmonisation of EIA implementation (while maintaining a high level of environmental protection), will help to foster new development projects and reduce existing disparities between MS.

- Simplify administrative licensing procedures. This is already listed as a priority in most of the national aquaculture programs (2014-2020), but has yet to become effective (as emphasized again in 3.3.2.3) to reduce transaction costs and investment risks. As for other initiatives (but not analysed as RFI), the setting up of a “one-stop shop” has been mentioned, but only little feedback on these new institutional tools are available as of yet to assess their effectiveness.

- Increase the legal value of aquaculture spatial planning tools. Preliminary conclusions drawn from the analysis of the SRDAMs (regional schemes for the development of marine aquaculture) in France show that they have provided comprehensive tools for identifying new potential areas for aquaculture, but are not effective enough to facilitate the access to new aquaculture sites (see 3.3.2.3). Along with the on-going process of marine spatial planning, the current contribution of aquaculture spatial plans (SRDAMs, AZA in Italy, AIAD in Greece…) to aquaculture growth needs to be assessed.

- Provide governance tools and methods for increasing the social acceptability towards aquaculture development. Lack of social acceptability and of political will appears to be a major constraint in some countries. This key issue could be addressed through different research work to understand the public representations at stake and the controversy about aquaculture (3.3.2.3). Moreover, the setting up of governance instances at the appropriate level could be a strong signal to boost the aquaculture development.

All these recommendations point to the need for creating an integrated framework for the development of sustainable aquaculture, in order to achieve the growth targets included in the multiannual national aquaculture plans (2014-2020).

Other recommendations are based on diverse initiatives carried out to improve the competitiveness and sustainability of the EU aquaculture sectors and to meet continuing needs for producer organisation:

- Promote the development of EU aquaculture productions which can reduce the dependency of the EU markets on extra-EU seafood trade **and** foster the consumption of domestic production versus exports, in particular through the development of new products/new outlets (like unvalved mussels; see 3.3.2.1)

- Support traditional aquaculture sectors providing ecosystem services and strengthening local identity. This can include the remuneration of multi-functionality – e.g. landscape preservation, ecosystem services (carp farming; 3.3.2.5).

- Support the adoption of best farming practices initiatives in order to increase the environmental sustainability of the EU aquaculture sectors. Sustainable aquaculture includes for instance the diversification into more efficient systems of production as regards the use of resources (feed, energy and even water in freshwater fish farming); the setting up of circular economy concept through the supplying of feed by local sources and in a “nutrient neutral manner” (see 3.3.2.2); the development of management tools for complying with carrying capacity principles (see 3.3.2.4 and 3.3.2.8 in relation to shellfish farming). They indeed comprise all the codes of best practices set up by professional organizations (e.g. 3.3.2.7).

- Provide incentives for the producer organisations (cooperatives, professional committees…) which play a significant role in the coordination of the value chain (vertical integration upstream or/and downstream) and in gathering fragmented producers fragmented producers (see 3.3.2.6 and 3.3.2.7).

As long as the number of certification and labelling initiatives including environmental attributes are multiplying, there is a need to enhance consumer awareness and to improve the consistency between existing regulations (and may be forthcoming regulation on EU ecolabel).

- Improve the credibility of the Euroleaf by upgrading its specifications for organic aquaculture. Today, Euroleaf has to be associated with national organic labels which are more demanding (such as AB in France), contributing to the confusing multiplication of labels and logos (trout farming; see 3.3.2.7).

- Improve the consistency between EU quality schemes and EU organic label regulations. In the case of shellfish farming (no feed, dependence on water quality) the justification of the organic label might be questioned if it does not include higher quality standard or additional farming restriction rules in the specification (leading again potentially to multi-labelling). On the other hand, the difficulty to promote sustainable practices, in addition to the quality of origin, is pointed out as a weakness of the PDO (see 3.3.2.4).

**Common to fisheries and aquaculture,** one major result of this RFIs review is the predominance of marketing initiatives in both fisheries and aquaculture sectors. These marketing initiatives rely on new products, new outlets and product differentiation through labelling, certification or individual codes and should be encouraged by EU policies. Moreover, there is a clear need for increasing traceability of seafood products with the emphasis put on local or European origin, freshness according to date of catch for fish products. Lastly, in order to prevent confusion and label fatigue, steps forward should be made with regards to the consistency between different quality approaches including eco-labelling programs.

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Furthermore, posters describing small-scale fisheries RFI are accessible via http://www.success-h2020.eu/events-conferences/slowfish-2017/

# 6 Appendices

**Article 68 (EU Regulation N° 508/2014 on the European Maritime and Fisheries Fund) - Marketing measures**

1. The EMFF may support marketing measures for fishery and aquaculture products which are aimed at:
(a) **creating producer organisations**, associations of producer organisations or inter-branch organisations to be recognised in accordance with Section II of Chapter II of Regulation (EU) No 1379/2013;
(b) **finding new markets and improving the conditions for the placing on the market of fishery and aquaculture products**, including:
(i) species with marketing potential;
(ii) **unwanted catches** landed from commercial stocks in accordance with technical measures, Article 15 of Regulation (EU) No 1380/2013 and Article 8(2)(b) of Regulation (EU) No 1379/2013;
(iii) fishery and aquaculture products obtained using methods with low impact on the environment, or organic aquaculture products within the meaning of Regulation (EC) No 834/2007;EN L 149/40 Official Journal of the European Union
(c) **promoting the quality and the value added by facilitating**:
(i) the application for registration of a given product and the adaptation of concerned operators to the relevant compliance and **certification requirements in accordance with Regulation (EU) No 1151/2012 of the European Parliament** and of the Council ( 1 );
(ii) the certification and the promotion **of sustainable fishery and aquaculture products**, including products from **small–scale coastal fishing**, and of environmentally-friendly processing methods;
(iii) the **direct marketing of fishery products by small–scale coastal fishermen** or by on–foot fishermen;
(iv) the presentation and packaging of products;
(d) contributing to the transparency of production and the markets and conducting market surveys and studies on the Union's dependence on imports;
(e) **contributing to the traceability of fishery or aquaculture products and, where relevant, the development of a Union–wide ecolabel for fishery and aquaculture products** as referred to in Regulation (EU) No 1379/2013;
(f) drawing up standard contracts for SMEs, which are compatible with Union law;
(g) conducting regional, national or transnational communication and promotional campaigns, to raise public awareness of sustainable fishery and aquaculture products.

2. The operations referred to in paragraph 1 **may include the production**, processing and marketing activities along the supply chain.
The operations referred to in point (g) of paragraph 1 shall not be aimed at commercial brands.