EUROPEAN SCIENCE FOUNDATION
SETTING SCIENCE AGENDAS FOR EUROPE

Exploratory Workshop Scheme

Standing Committee for Life, Earth and Environmental Sciences (LESC)

Standing Committee for Social Sciences (SCSS)

ESF Exploratory Workshop on

COASTAL FISHERIES: INTEGRATION OF BIOLOGICAL AND SOCIOECONOMIC ASPECTS OF ARTISANAL AND RECREATIONAL FISHERIES FOR THE PRESERVATION OF COASTAL FISHES

Faro (Portugal), 14-16 September 2011

Convened by:

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② University of Girona, Spain

SCIENTIFIC REPORT

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1. Executive summary

This multidisciplinary ESF exploratory workshop was held at the University of Algarve (Faro, Portugal), over two days (15-16 September 2011). It was attended by 24 participants (plus the ESF representative), both junior and senior scientists, from a range of disciplinary approaches, originating from 8 countries. Apart from the researchers, two stakeholder representatives (one from the recreational fishing sector and the other from the artisanal fishing sector) attended the workshop, which was organised by Dr Karim Erzini from the Centre of Marine Sciences (CCMAR) of the University of Algarve (Portugal) and Dr Josep Lloret from the University of Girona (Spain). The meeting was supported by the University of Algarve professional staff and postdocs.

The workshop opened up new directions in coastal fisheries research with a potential impact on the assessment and management of coastal exploited resources and marine ecosystems. The workshop brought together for the first time scientists with different expertise in the field of coastal fisheries, i.e. marine and fisheries biology, fish conservation, maritime anthropology and environmental economics, to discuss, in a European context, the future research needs, and the necessity to integrate the different approaches (biological, social and economic) to better evaluate and manage coastal fishery resources. It was anticipated the workshop would be the start of a new European, multidisciplinary platform for marine biologists, social scientists and economists working on recreational and artisanal fisheries. To achieve this objective, the participants, who work on different biological and socioeconomic aspects of coastal fisheries, outlined future research perspectives that could allow a joint interdisciplinary effort for the investigation of coastal fisheries through future cooperation actions (e.g. COST application).

After short introductory presentations by all participants, the workshop held 4 plenary sessions (two each day) to address four different topics: biological aspects, social aspects, economic aspects of artisanal and recreational fisheries and future cooperation. The following **main conclusions** were drawn:

- Participants agreed that, despite the socioeconomic importance of marine recreational and artisanal, or small-scale, traditional fisheries (including shellfish fisheries) in EU marine waters, these coastal fisheries are not studied with the same rigor as industrial or large scale fisheries (trawling, purse-seining, etc), and as a consequence are poorly managed or not managed at all. Data are scarce and only from a small fraction of both artisanal and recreational fishing components. Furthermore, available data are fragmented in time and space (no monitoring framework in place). Therefore, the impact of these fisheries on coastal resources and ecosystems and the human dimensions are poorly known.
- Workshop participants urge governments (regional, national and EU, including DG Mare) and other institutions with interests in coastal fisheries science, assessment and management (i.e. expert committees such as STECF, GFCM, FAO; research centers, universities and recreational and artisanal fishing organitzations or associations) to address the lack of information needed for a proper management of coastal resources and make adequate preparation for the challenges arising from environment impacts and socioeconomic changes in coastal fishing. It is necessary to estimate accurately the socioeconomic value of fisheries as well as their biological and ecosystem impacts, and compare them against large scale fisheries. The participants recommended that the member states of the European Union, as well as

other countries sharing the fishery resources in European waters, address the large number of unknowns and problems facing these fisheries[1] through specific management plans, policy documents and research programmes. The monitoring, study and management of coastal fisheries should be a priority if a sustainable, integrated use of coastal resources is to be achieved within the framework of the EU Marine Strategy.

- Participants also pointed out that it is necessary to find ways to better integrate social, economic and biological aspects, from both sectors (artisanal and recreational). They also called for continuous dialogue and sharing of ideas between scientists and stakeholders from both sectors to allow co-management of coastal resources and the participation of stakeholders in the monitoring process. All attendees agreed that the development of a common monitoring scheme, for both the artisanal and recreational fishing, is urgently needed in EU and adjacent waters.
- Finally, the participants suggested focusing on fisheries science policy integration. Any further collaborations and discussions should be multidisciplinary, with active participation from stakeholders (artisanal and recreational fishing), government and relevant research institutes and universities. The desired policy issues need to be identified, based on our current knowledge but allowing for adjustments and changes as our scientific understanding of coastal fisheries and its impacts increases. The identification of key policy and science needs must create an opportunity to advance key issues that are important to both artisanal and recreational fisheries in a collaborative and multidisciplinary manner.

Photo: An artisanal fisher fishing with longline in the NW Mediterranean

[1] See paragraph 2.3.

2. Scientific content of the event

2.1 Introduction

Artisanal and recreational fisheries are important socio-economic activities taking place in European coastal waters that need to be properly studied and managed. Recreational fishing is one of the most common leisure activities in coastal zones world-wide, involving several methods that can have a variety of biological consequences on the target populations. For some species, the impact of recreational fishing (rod and line and/or underwater spear fishing) may be greater than that of commercial fishing activity. Artisanal fisheries, which involve large numbers of fishermen and small fishing vessels (around 40% of the EU fishing fleet fits under this cathegory), are declining in many coastal zones, Although they can have significant impacts on coastal fish species, these types of fisheries are considered to have a smaller impact compared with other commercial fishing activities such as trawling and purse-seining and are still generally considered of secondary importance despite their socio-cultural and economic value in Europe.

2.2. Organization

All attendees participated in the conference in an open, informal and helpful manner. During the morning session of the 15th of September, all participants gave a short introductory presentation on their research topics after the ESF representative had introduced the aims of ESF exploratory workshops. During the afternoon session of the 15th, three breakout groups were constituted, one for each of the following topics: 1) biological aspects, 2) social aspects and 3) economic aspects. These three groups discussed and provided feedback on several questions/topics proposed by the convenors, which constituted the basis for the discussions during the workshop and for fulfilling the objectives of the workshop. Attendees were requested –in advance of the workshop, by email- to think about these questions and suggest modifications and new questions. During the morning and afternoon sessions of September 16, all delegates from the previous breakout groups discussed the questions all together and integrated the responses provided by the rapporteurs of the different breakout groups. Under topic 1 (BIOLOGICAL ASPECTS), the biggest unknowns in understanding the biology of coastal exploited species, the impacts of artisanal and recreational fisheries on these species, the planning of closed or restricted areas (marine reserves), the biological factors contributing to the decline of artisanal fisheries and the increase in recreational fisheries were discussed. The topic also considered the different methods of monitoring artisanal and recreational fisheries, the development of long-term databases in order to compare across species, stocks and regions and how the evaluation of coastal fisheries could contribute to improve coastal fisheries management in the context of the European Common Fishery Policy (CFP). Under topic 2 (SOCIAL ASPECTS), the biggest unknowns in understanding the social aspects of artisanal and recreational fisheries and the challenges facing artisanal and recreational fisheries were discussed The topic considered how the qualitative and quantitative results from these social studies could contribute to improve coastal fisheries management. Under topic 3 (ECONOMIC ASPECTS), the biggest unknowns in understanding the economic aspects of artisanal and recreational fisheries, and the economic opportunities arising from leisure fisheries were discussed. The topic also considered the different approaches to evaluate the economic impact of coastal fisheries and how the results from these economic studies and new approaches could contribute to improve coastal fisheries management. Under topic 4 (FUTURE RESEARCH), the main research priorities and future available funding opportunities were discussed. The participants discussed specific ideas for future research collaboration in the European area

and funding opportunities (e.g. COST proposal on coastal fisheries) to establish an expert group in the field of coastal fisheries that could not only contribute to enlarging the group but also to continue to explore new research lines in order to provide advice to European fishery managers within the new Marine Strategy. The opinions of the two stakeholder's representatives were important for all topics, as was the assistance of the ESF representative in topic 4 (future research options). The workshop also benefited from the positive inputs of scientists working on recreational fisheries in freshwater ecosystems, where the available knowledge is much greater than for marine ecosystems.

2.3 Outcomes of the discussions

- From the biological standpoint, the main unknowns and problems detected are: total catch by métier due to missreporting, discards and bad classification of catches by métier, studies about artisanal and recreational are sporadic (lack of continuity), fishing effort distribution and total effort (licenses) unknown, increase in subsistence fishing (were pleasure is not the main motivation) due to the economic crisis unknown, scientific results do not flow from research centres or universities to managers; little enforcement of the rules, control of fishing activities; inexistence of specific working groups on artisanal fisheries; lack of data on biology and population dynamics (maturity, fecundity, etc) considering that parameters may vary depending on the area; lack of information on essential habitats for coastal species (spawning grounds, recruitment grounds); lack of information regarding stock identification, connectivity, home range; lack of information regarding vulnerable species (increasing evidence indicates that coastal marine species may be placed under threat of local, regional and ultimately global, extinction by the direct or indirect effects of fishing), particularly the link of intrinsic vulnerability to métier or gear and consideration of complex reproductive traits; lack of information regarding global warming (new opportunities - warm water species), invasive species; lack of information regarding the use of exotic baits (introduction of alien species, impacts of bait harvesting); lack of information regarding post release mortality (released fish); lack of information regarding ecosystem impacts: impacts on benthic species of the coralligenous habitats, by-catch of birds/turtles; lack of information regarding ghost fishing; inappropiateness of actual minimum landing sizes (e.g. *Diplodus* spp); lack of organisation of small-scale sector (political power compared to e.g. trawlers); complexity of multi-species, multi-gear scenarios.

- From the economic standpoint, the main unknowns and problems detected are: lack of management support to prioritise the separation of catches between different fish species and user groups, and between fisheries and other activities (transport, energy); lack or scarcity of information regarding the value added (product value minus input costs), the economic ripple effects (multiplier effects) and the leisure activities (value added / valuation of leisure activities); non consideration of jobs, export value, revenues as «economic importance»; lack or scarcity of information regarding small scale fishing landing value vs net value added from exported fish-products; lack or scarcity of information regarding recreational fishing sales of related products like accommodation and transport, the rececreational domestic fishery, the economic valuation of leisure time plus net value added from tackle sales, the importance of subsistence fisheries and the alternative cost of getting the same nutritional benefits, lack or scarcity of information regarding local vs national economic effects (including multiplier effects); poor consideration of economic effects to distinguish the types of fisheries: market for catch (local, national, export, black

market; local or national importance; tax-able activity) and market or non-market benefits; lack of information regarding labour (intensive or not; full-time or part-time, and subsidised in household); destination of the value (local, national, international; capital costs); and cost of management (monitoring, controlling, surveillance). Regarding the main knowledge gaps to estimate the economic effects, the attendees reported the following gaps: fishing costs, value of catch, valuation of recreational activities; catches (amount and composition); effort; black market for catches, discards and catch and release: fish mortality, long term fish stock effects, catch in recreational and subsistence fishing; costs of mandatory reporting of activities, costs, expenditures etc; unknown fishing effort (fleet size and recreational fishermen effort); costs and benefits of monitoring/reporting for artisanal and recreational fishing sector; economic cost of invasive species; recreational fishing motivations.

- From the social standpoint, the biggest unknowns and problems are: difficulties of getting information (small scale fishers and some recreational fishers do not share information); small scale fisheries are not well represented in governance and decision-making processes; small scale fisheries are managed by default (they need a differentiated approach); issues of social equity; problems with extreme bureaucracy in small scale fisheries; illegal systems; problems with compliance with rules and regulations; fishing access issues; resilience (flexibility); issue of property rights and access rights; increase in tension and conflicts between artisanal and recreational fisheries in coastal areas; quotas issues; disguised commercial fisheries as recreational; impact of the actual economic crisis on fisheries; profitability of the small scale fishing sector; subsistence and tradition in recreational fisheries; labour mobility; social alienation (due to time spent away from family) and social isolation (fishing community itself) in small scale fisheries including lack of welfare systems; geographical disparities; future of small scale fisheries not only dependent on management of these fisheries, but more on management of large scale fisheries. Regarding research issues, the main problems were described: research funding (social sciences research takes time, not well funded/ difficult to fund); lack of social scientists specialised in fishing interests; lack of continuity in data collection in the social sciences; lack of comparable data series at EU, national and local levels; lack of a definition of recreational fisheries from a social science perspective; poor undersdanding of fisheries management in general; problems to reach agreement in defintions; need for indicators to be identified/ applied to small scale fisheries for social sciences research; social sustainability; rights-based approach to fisheries management and other management issues (e.g. reaction of small scale and recreational fisheries to management measures, cultural politics in each country, reaction to subsidies, impact of subsidies, best management scheme for small scale fisheries, integrated management system small-large scale).

- Particular actions to be undertaken to solve these biological and socioeconomic unknowns and problems were discsussed. First, it is necessary to implement a cost-effective data collection, starting regular monitoring using different methods with different costs (onboard/port, historical reconstruction, blue box, fisher's ecological knowledge; interviews, etc.). In particular, data on new species targeted by recreational fisheries must be collected at sea (Mediterranean) through the data collection framework (DCF) and new socioeconomic data should be gathered in order to obtain a richer profile of the socio-economic characteristics of fishing related activities. It is necessary to start evaluations with Ecopath models and indicators (trophic level, vulnerability index, etc), to use tracking devices, data loggers, mobile

phone system, to conduct spatial analysis/management (MARXAN, linked to Ecopath/Ecosim), and to consider management/control actions such as marine protected areas, closed seasons, protection of vulnerable species, recreational fishing licenses, fisheries certification, establishment of minimum and maximum landing sizes (protection of big spawners). For the artisanal fishing sector, it is necessary to demonstrate economic importance, to gain legitimacy for getting fisheries resources and to acquire data /knowledge to facilitate the right measures to increase demand (marketing, infrastructure-investments). For the recreational leisure activity, it is necessary to document/demonstrate the users' valuation of the activity. Furthermore, conflicts between commercial and recreational fisheries should be addressed as well as the evaluation of real gains from management measures, the consideration of new research trends (artificial reefs; is recreational fishing going up and artisanal down? Is there a connection?). In order to address the knowledge gaps for estimating the economic effects, the following actions or data are needed: effort / catch limitations; cost of monitoring, control and surveillance; discarding; catch and release; data on tradeoffs between economy, ecology and social objectives, following a multidisciplinary integrated view where scientists of different disciplines cooperate altogether. Other future important issues are: the identification of charter boats (service vessel/platform for anglers, commercial vessels with tourists/anglers, pure recreational vessel); the assessment of benefits of MPAs and efficient management of MPAs

Photo: A recreational fisher fishing with an angling rod from the shore in the NW Mediterranean.

3. Assessment of the results, contribution to the future direction of the field, outcome

The workshop discussions were very fruitful in showing the diversity of approaches to coastal fisheries science and management, but also in showing the current lack of knowledge about these fisheries. The discussions showed that marine recreational and artisanal fisheries are not studied with the same rigor as industrial fisheries (trawling, purse-seining, etc) and little is known about their socioeconomic importance. Therefore, attendees agreed that new studies should be conducted regarding the impact of these fisheries on the coastal environment taking into account the human dimensions, if coastal resources are to be properly managed in EU waters. The attendees pointed out the necessity to follow up the activities of the workshop group because the EU lacks a network of scientists working on artisanal and recreational fisheries from a multidisciplinary point of view (biological, social and economic sciences). Therefore, a concrete action was planned as a follow up of the workshop: participants agreed to submit in the future a COST proposal to to establish and enlarge the group regarding the biological, social and economic aspects of coastal fisheries. This is the first step towards the integration of the future research on coastal fisheries (recreational and artisanal) in Europe from a multdisciplinarly perspective.

Furthermore, it is also planned to draft two scientific papers: a paper to summarize the main scientific outcomes and discussions of the workshop paper, and another one to evaluate the vulnerability of fish targeted by the different artisnal fishing gears. In particular, the review publication will improve the synthesis of the workshop findings, making possible to go into details.

Photo: Small-scale catches in the Mediterranean

4. Final programme

Wednesday 14 September 2011

Afternoon	*Arrival*
20.00	*Dinner*

Thursday 15 September 2011

09.00-09.20	**Welcome by Convenors** **Karim Erzini** (University of Algarve, Portugal) **and Josep Lloret** (University of Girona, Spain)
09.20-09.40	**Presentation of the European Science Foundation (ESF)** **Dr. Sonja Lojen** (Jozef Stefan Institute, Ljubljana, SI. Representative on behalf of ESF Standing Committee for Life, Earth and Environmental Sciences (LESC)
09.40-12:30	**Morning Session: Presentations**
09.40-10:40	**Short introductory presentations by all participants**
10.40-11.00	*Coffee / Tea Break*
11.00-12.30	**Short introductory presentations by all participants**
12.30-14.00	*Lunch*
14.00-18:30	**Afternoon Session: Discussions (three separate groups corresponding to three topics: biological aspects, social aspects, economic aspects)**
14.00-15:30.	**Discussion groups (each group will discuss one topic)**
15.30-16.00	*Coffee / tea break*
16.00-18.30	**Discussion groups (each group will discuss one topic)**
20.00	*Workshop Dinner*

Friday 16 September 2011

09.00-12:30	**Morning Session: Discussions (one group) -**
09.00-9.45	**Definition of artisanal fisheries from biological, social and economic standpoints (provide an integrated definition accounting for the biological, economic and social perspectives altogether)**
09.45-10.30	**Biological, economic and social challenges facing recreational and artisanal fisheries**
10.30-11.00	*Coffee / Tea Break*
11.00-12.30	**Main handicaps found by biologists, economists and social scientist when studying small-scale and recreational fisheries**
12.30-14.00	*Lunch*
14.00-18:30	**Afternoon Session: Discussions (one group)**
14.00-14.45	**Main handicaps to assess and manage artisanal and recreational fisheries from a biological, social and economic standpoint**
14:45-15:30	**Discussion on follow-up activities/networking/collaboration/projects/publications (topic 4: future research)**
15.30-16.00	*Coffee / tea break*
16:00-18:30	**Discussion on follow-up activities/networking/collaboration/projects/publications (cont.)**
18:30	*End of Workshop and departure*
20.00	*Dinner*

Saturday 17 September 2011

Morning	*departure*

5. Final list of participants[2]

Nr	PARTICIPANT	INSTITUTION	COUNTRY
1	Karim Erzini	CCMAR-University of Algarve	Portugal
2	Josep Lloret	University of Girona	Spain
3	Marta Muñoz	University of Girona	Spain
4	Beatriz Morales	IMEDEA-CSIC	Spain
5	Ian G. Cowx	Hull International Fisheries Institute, University of Hull	UK
6	Kostas Stergiou,	Aristotle University of Thessaloniki, School of Biology	Greece
7	Dimitris Moutopoulos	Education Institute of Mesolonghi	Greece
8	Ellen Hoefnagel	Wageningen University	Netherlands
9	Cristina Pita	University of Aberdeen	UK
10	Sanja Matic -Skoko	Institute of Oceanography and Fisheries	Croatia
11	Jan Kappel	European Anglers Aliance	Belgium
12	Ana Gordoa	CEAB-CSIC	Spain
13	Eirik Mikkelsen	NORUT, Northern Research Institute	Norway
14	Brian O'Riordan,	ICSF Belgium Office	Belgium
15	Ståle Knudsen	University of Bergen	Norway
16	Vahdet Unal	Ege University	Turkey
17	Pedro Veiga	CCMAR-University of Algarve	Portugal
18	Jorge M.S. Gonçalves	CCMAR-University of Algarve	Portugal
19	Miguel Neves dos Santos	IPIMAR	Portugal
20	Henrique Cabral	University of Lisboa	Portugal
21	Pedro Pintassilgo	University of Algarve	Portugal
22	Margarida Castro	CCMAR-University of Algarve	Portugal
23	Toni Font	University of Girona	Spain
24	Caterina Dimitriadis	University of Girona	Spain
25	*Sonja Lojen*	*ESF representative*	*Slovenia*

[2] Five scientists (2 from France, 2 from UK and 1 from Spain) cancelled their participation after the provisional list of attendees was released on the ESF website (these are not shown in the table above). However, two of them (D. Symes and K. O'Connor from UK) participated actively during the discussions held by email before the workshop and their contribution is reflected in the report.

6. Statistical information on participants.

6.1. Experience
Young scientists (Ph. D. students, post-docs and equivalents): 28%
Senior scientists: 72%

6.2 Gender
Males: 64%
Females: 36%

6.3. Discipline
Biological sciences: 66%*
Social sciences: 13%
Economic sciences: 13%
Stakeholders: 8%

*Around 40% of the biologists also work in socioeconomic sciences

6.5. Country
Portugal: 7
Spain: 6
Belgium: 2
Greece: 2
Norway: 2
United Kingdom: 2
Croatia: 1
Turkey: 1
(Slovenia: 1, ESF representative)