Theme session R

Towards a better understanding of human behaviour for improved fisheries science and management

Conveners: Melania Borit (Norway), Bruce Edmonds (UK),
Marloes Kraan (The Netherlands)
Rapporteur: Viktoriia Kuz (Norway)

The aim of this session was to draw attention to the importance of achieving a better understanding of human behaviour (including fisher's behaviour) in science and management, in the context of fisheries being understood as socio-ecological complex adaptive systems (SECAS). This aim is important given human behaviour has been called the key source of uncertainty in management. When human behaviour is included, this has often been done in a very limited manner. Most existing models of fisher behaviour continue to work with basic assumptions such as that of the rational agents acting to maximize their individual profit. This session was therefore dedicated to contributions that enable a better understanding of human behaviour and encouraged inter - and transdisciplinary efforts for furthering our understanding of fisheries as SECAS. Such an understanding, and a thorough understanding of the interdependencies between various system components (such as fish stocks, gear, and fisher and consumer behaviour), could give stakeholders the tools to take action in solving problems that support sustainable fisheries. Besides requiring the consideration of all aspects of fisheries processes, understanding fisheries in this way necessitates more cooperation between different disciplines, and between scientists and stakeholders. Improved management of fisheries will, in part, mean a better understanding of human behaviour in this context and of ways of linking understanding of the natural system with the social system.

The session gathered a diverse audience, which successfully reflected the session's focus on integrative science. The presenters and audience represented social scientists, biologists, ecologists, economists, model developers, and managers. They also covered different generations, so that overall the session was a team effort for integrative science.

This was a theme proposed jointly by the SAF21 project – Social science aspects of fisheries for the 21st Century (www.saf21.eu; project financed under the EU Horizon 2020 Marie Skłodowska-Curie (MSC) ITN - ETN Programme; project number: 642080), ICES Strategic Initiative on the Human Dimension, and the ICES - FAO Working Group on Fishing Technology and Fish Behaviour.

Contributions to the session

This session welcomed submissions from all disciplines or multi-, inter-, transdisciplinary combinations (e.g. fisheries, biology, ecology, and other life sciences, anthropology, sociology, ethnography, cognitive sciences, social psychology, history, geography, political sciences, education and learning, humanities, law, management,

economics, including behavioural economics and marketing, food sciences, medical sciences, computer sciences, data visualization, mathematics, engineering and technology). The contributions were asked to address (if applicable): a) how they understand "human behaviour" or "fisher behaviour", b) how they study it (including application of change management models), c) the questions they have, and (d) limitations or solutions. All the 59 contributions accepted in the session (42 oral presentations and 17 posters) met these expectations. The session included also two discussions around the topics of understanding relevant human behaviour and interdisciplinary fisheries science.

The contributions accepted to the session were within the following topics:

• wide range of models and tools for studying human behaviour (e.g. agent-based models, conceptual models, bio-economic models), including a variety of both qualitative and quantitative methods and data;

• fishers' responses to various management approaches and environmental challenges;

• classification of fishers' behavior;

• stakeholders interaction;

• how fisheries science interacts with the policy making process;

• ways of doing inter- and transdisciplinary fisheries science;

• processes of fisheries science (e.g. co-authorships).

The full list of contributions and the presentations are available at the theme session web-page

Concluding remarks

We all know that in fisheries management we do not manage fish, but we manage people. However, mainstream fisheries science approaches still tend to focus on getting a better understanding of (the processes in) natural ecosystems, and human impact on them. The session highlighted a need to give more attention to furthering our understanding of the behaviour of people (as it causes human impact and is the recipient of management intervention) and of the feedback of the natural ecosystem to human society. One of the fundamental questions is: why do people do what they do, and how do we incorporate that information in fisheries / ecosystem science? What is needed is an increase in integrated approaches, so that the qualitative information we gather (mainly) in social science (often by looking back) can be used in future management advice.

The papers and the resulting discussions highlighted several areas for further consideration:

• Even though inter- and transdisciplinary research has been called in for solving the wicked problem of fisheries sustainability for some time now, the main contributions to fisheries science still are mono- or multi-disciplinary, some with participatory approaches (something that could also be observed when having an overall look at the submissions to this session).

• Fisheries researchers need to learn new skills and methods/tools (e.g. agent-based modelling, machine learning, games) to be able to collect and integrate different information (ecological, economic, socio-cultural factors).

• In inter- and transdisciplinary settings it is important to establish a common ground by being precise in which concepts are used and what they mean.

• Fisheries researchers have to be open to cross the boundaries of their own disciplines and to seek actively collaboration with specialists from new fields (e.g. computer sciences, political sciences, social psychologists).

• A full appreciation of the complexity of human behaviour should result in reflecting on the use of too simple assumptions in modelling.

• Modelling social science aspects of fisheries is still an area in the initial stages of development.

• What is the purpose of modelling in fisheries science? Is prediction possible?

• It is difficult to change people's minds about what they eat for breakfast, let alone problems they have worked on all their lives, be they fishers, researchers, or policy-makers.

• The ability to communicate scientific results clearly to the stakeholders cannot be over-emphasized (as this is needed for full participation in research and / or management).

• The ability for scientists engaging with stakeholders to listen (rather than to send information) cannot be overemphasized.

• Researchers need to be aware of their role within the wider process of making fisheries policy and ensure they do not inadvertently contribute to future negative impact.

• We also have to reflect over researchers' behavior (e.g. responsible research and innovation; co-authorships).

• Working in inter- or transdisciplinary teams, where we are all grounded in our own disciplines, yet can understand each other's strength and approaches, is a good way forward.

We highlight the need to make it further explicit to policy-makers and researchers that we have to deepen our understanding of fisheries as socio-ecological complex adaptive systems, with an emphasis on exploring closer the fisheries' behavior and on facilitating a variety of types of research, from mono- to transdisciplinary approaches.