



## **Call for research project proposals on fisheries management indicators**

### **Identification of strategic requirements for fisheries research and jointly funded research programmes**

Fisheries management is closely associated with the concept of long term sustainable use of fisheries resources and it is generally agreed that fisheries management should ensure that exploitation of the resources provides economic, environmental and social conditions that are sustainable.

The World Summit on Sustainable Development (Johannesburg 2002) resolution “to maintain or restore stocks to levels that can produce the Maximum Sustainable Yield (MSY)” has been adopted by most states and forms together with FAO’s Code of Conduct for Responsible Fisheries the international framework for fisheries management.

The main objectives in fisheries management for the last 25 years have been the rebuilding of depleted stocks and reduction of the exploitation rates to sustainable levels. A key issue for the advisory system has been to develop reference points to support fisheries managers in achieving these objectives. Examples of such reference points are the precautionary biomass and fishing mortality reference points developed by, for example, ICES. These precautionary reference points have been central elements in fisheries management in Europe for the last 10 to 15 years and the scientific advice has been formulated on the basis of the status of the stock and the fisheries in relation to them.

We have seen signs of a positive development for some of the overfished stocks in recent years and many stocks are now fished within precautionary limits. This means that the key question in fisheries management is changing from how to avoid stock collapse to how to develop management plans that provides for long term sustainability, MSY and ecosystem health.

The precautionary reference points are still important but are not sufficient in guiding managers when setting long term management targets for stocks that are within the precautionary limits. It is generally accepted that the target should be to maintain the stocks at MSY levels. The problem is that the MSY concept is in itself not operational. It does not take account of the dynamics of the stock and the ecosystem, the developments in the fisheries and it does not address socio-economic issues.

For example MSY reference points for prey species cannot be defined without considering changes in the biomass of their predators and the impact they have on the



prey species. Likewise reference points for the predator species may not be reliable without considering changes in the biomass of its prey.

There is in European fisheries an increasing focus on reducing discards and improving the exploitation pattern, for example by introducing more selective gears. This will affect the dynamics of the stocks and how to manage the fisheries to achieve MSY.

Climatic changes are affecting the whole marine ecosystem including the fisheries resources. We have already observed a northern shift in distribution of important fish stocks which again have had an impact on how the resources are utilised. Climatic driven changes may also affect recruitment which again has a direct impact on the spawning stock biomass consistent with the MSY. How do we take account of such changes in the management of the fisheries?

The MSY concept has traditionally been based on biological considerations and simple calculations of the first hand value of landings. Can we develop resource indicators that combine biology and economy and are compatible with the MSY concept?

It is clearly not straight forward how to apply the MSY concept in the fisheries management and there is a need to develop the MSY concept into an operational tool that can assist fisheries managers in developing long term management plans.

Researchers are invited to submit proposals that will (a) help develop the concept of operational fisheries management indicators and (b) explore ways in which these indicators could be applied to selected fisheries through their inclusion in future management plans.

Proposals should focus on one or more of the following five topics:

- *Stock – recruitment relationships with process understanding*  
Critical factors when determining stock/fisheries reference points are the assumptions on the relationship between stock size and recruitment. Most stock- recruitment relationships used in estimating reference points are based on regression analyses of historical data of stock size and recruitment without understanding the underlying causality.

Possible topics of relevance include:

- Link between environment, ecosystem dynamics and recruitment.
- Stock composition and recruitment.

- *By-catches and discards*

Most stocks are exploited sub optimally, with high mortality rates on small individuals and in some fisheries discard rates of target and/or by-catch species.

Possible topics of relevance include:

- Incorporation of exploitation pattern, discard and by-catch issues in management targets.



- *Biological interaction between species*  
Setting management targets on the basis of single stock criteria may result in sub-optimal utilisation of the resources and unintended impacts on associated stocks. The present form of advice on fisheries management does in general not take account of biological interactions and may fail to meet management objectives.

Possible topics relevance include:

- Multi-species indicators and targets.
- Fishing mortality and prey – predator relationships.

- *Environmental impact of fisheries*  
There is for most fisheries no agreed level for acceptable impact of fisheries on the environment. Is fishing at levels consistent with long term sustainable utilisation of the resources a sufficient guarantee for an environmentally friendly fishing or is it necessary to take other actions to ensure acceptable impacts levels?

Possible topics of relevance include:

- Definition of acceptable impact of fisheries on the environment.
- Need for specific measures to limit impact on the environment.

- *Economic indicators*  
Traditional bio-economical evaluations of fisheries yields are based on profits of direct harvest investments in a changing market. Other stakeholders' interests in the resources require definition of societal goals and acceptable methods for valuation of the resources.

Possible topics relevance include:

- Formulation of objectives for the resources addressing major societal needs.
- Indicators of resource value compatible with an operational MSY concept.