

Press Inquiry: Fishing for mesopelagic resources

1. In which year did the FAO start to focus on fishery in this part of the oceans?

FAO started to focus on possible mesopelagic fisheries in the 1970's, at a time when major stocks of the north Atlantic had experienced major collapse. The first publication by FAO presenting a global overview of the issue was in 1980, authored by J. Gjosaeter, which provided an overview of the state of knowledge of biology, diversity, abundance and distribution of mesopelagic fishes. Updates were provided in the Report on the Review of the state of world fishery resources (FAO, 1997).

2. What was the reason?

A number of stocks, particularly in the North Atlantic, had been overexploited and there was pressure to find new resources. Krill, cephalopods and mesopelagic fish appeared to be promising targets. Originally, the motivation for research on mesopelagic fish was to assist countries to explore possibilities for new exploitable resources, and the motivation was to expand fisheries beyond the traditional resources. By 1997, however, the potential fragility of these resources had become apparent, and the focus had shifted from directly promoting the exploitation to the management of these fisheries and expanding the knowledge on the resources and their ecological importance.

3. Why is it necessary for the future of the fishing industry to exploit this midwater zone?

A major factor reviving the interest in mesopelagics is the ever-increasing need for fishmeal and marine oils for a growing aquaculture industry, in a situation where the limit of the resources traditionally used for the production of fishmeal and oil has been reached and there is even a growing interest in using these resources directly for human consumption.

Overall, exploitation of mesopelagic fish may be justified in the context of searching for new resources for a growing human population that is expected to reach up to 11 billion people by 2100, most of it in developing countries. However, despite some recent publications showing rather high estimates of biomass of these resources, relatively little is known about these resources, namely about their productivity and resilience to exploitation.

Another driver of this development is the overcapacity of the current fishing fleets in relation to "traditional" resources. The fishing industry sees this as an opportunity to increase its profitability by using part of this excess capacity to harvest new resources. Again technological developments will be required, as fishing the mesopelagic requires large industrial vessels, with very high fuel consumption and operating costs. Profitably operating these vessels requires high catch rates, in the order of 50 tons/vessel day or

higher, and these are not easily attainable with current technology, as evidenced by the closing of most of the fisheries for mesopelagic fish started in the 1980's and 90's. On the quality of the product, many of the main species require specialised processing before they can be easily used for fish feed, and this too may lead to high costs.

4. What is the main goal?

This was partially answered in the point above. The main goals are two, increase the supply of fishmeal for a growing aquaculture industry, and more generally, increase the overall fish production for a growing human population and using the excess capacity of the current fishing fleet.

5. How will the FAO support this new sector?

FAO does not support directly the harvesting sector. FAO's work on fisheries is more directed towards assisting its member countries further develop their capacity to manage their fisheries for the benefit of current and future generations. FAO, or as requested by its members, will continue to assist countries by compiling and disseminating information and analyses about the opportunities and limitations for exploiting these resources, and contributing to develop the capacity of its members to manage their fisheries, both nationally and as part of Regional Fisheries Bodies (RFBs).

6. What kind of projects or task forces or programmes are already established by the FAO to improve this sector?

The FAO does not have specific task forces or programmes targeting mesopelagic resources and related fisheries. Instead, FAO looks at this within the framework of the management of the exploitation of marine resources as a whole. FAO's work is centred on assisting member countries, individually and as part of other organizations (Regional Fisheries Bodies) to better develop and manage the fishing and aquaculture sector, taking account of its connections with other sectors (e.g. oil and gas, environment) in order to obtain the best use of the fishery resources for present and future generations.

So, the work of FAO on all aspects of fisheries management, climate change and energy efficiency, and post-harvest processing will contribute to the management of this new sector.

Additionally, the EAF-Nansen programme, the largest global fisheries management support and research programme implemented by FAO, includes in its science plan a specific theme on the mesopelagic ecosystem, that will contribute directly to improve the current knowledge on the mesopelagic resources and ecosystems around Africa, including activities to:

- improve understanding of the ecological role and diversity of mesopelagic organisms in subtropical oceanic and coastal systems and upwelling areas in general;
- develop a more reliable methodology for abundance estimation and sampling both in terms of field studies (acoustics) and modelling;

- assess to what extent the mesopelagic organisms may be a future fisheries resource for partner countries

7. What are the main challenges for the fishery fleets to catch fish in this zone?

As mentioned above, the main challenges are related to profitability. The resource has a low value, and are usually scattered with relatively limited high concentration areas and periods. Fishing in the high seas requires relatively large industrial vessels, costly to buy and operate, that require high catch rates to be profitable, and achieving these will be a challenge. Also related to this, in most places the mesopelagic resource is a mix of species, requiring different processing and handling, and this would increase processing costs beyond the profitability limits. In fact, even though a good number of fisheries have started on these resources since the 1970's, most of them have stopped operating due to lack of profitability and technical difficulties processing the catch.

Energy/fuel efficiency will also be a big challenge, as the relatively deep fishing zones and the large gear require powerful engines, with high fuel consumption and gas emissions.

8. Which countries are already issuing fishery licences for the mesopelagic zone?

We do not have a full overview of all the countries issuing licenses, but India, Iceland, South Africa, Norway, Pakistan and others are included in this list. Several countries abandoned the fishery for lack of profitability some years ago, but there seems to be renewed interest in it, due to the drivers mentioned before

9. How important will it be to regulate fishery in the mesopelagic zone to avoid the destruction of a diverse ecosystem?

The mesopelagic ecosystem is, as far as we know today, extremely diverse, and scattered over good part of the world's oceans. We also know that the organisms of this ecosystem play an absolutely essential role in maintaining the linkages between the upper layers of the ocean, where light allows for the production of new biomass, but that are always drained of the nutrients necessary for this production by gravity, and the deeper layers, where these nutrients accumulate, but are too dark for effective photosynthesis. They are also important in the conversion of the very small plankton organisms into food for larger predators, like most commercial fish and cephalopods, or cetaceans (mostly dolphins). What we do not know is what is the role of the different populations inside the community, nor the likely effect of a fishery extracting significant parts of this biomass on the capacity to maintain these essential functions.

When a new resource is being exploited, its capacity for production and the impacts of the exploitation on other resources and ecosystem function are mostly unknown. On the other hand, a new fishery, in its early days, is exploiting a large biomass that has accumulated in

the absence of exploitation, and there is therefore a clear tendency to overestimate the production of the resources and the economic benefits to be gained from their exploitation.

The accumulated experience of the development of fisheries has shown that unregulated fisheries on a new resource will almost always grow too fast and build capacity exceeding, often by far, the sustainable production that can be achieved from the resource. This has been the case with practically all fisheries, and is one of the main reasons behind the huge overcapacity of today's global fishing fleet.

So, it is always recommended that exploitation of a new resource starts slowly, with very close scientific monitoring, to allow for detailed assessments of the impact of the exploitation on the resources (both direct – on the resource being exploited- and indirect – on other resources and functions of the ecosystem that depend on them).

It is thus absolutely essential that any fishery on the mesopelagic system is closely regulated from the start. This must include a small number of vessels licensed to exploit this fishery, and a very detailed scientific monitoring of the fishery. As knowledge is gained, and if the research allows to estimate that the ecosystem is resilient to a higher level of exploitation, more licenses might be allowed. However, the most important thing now is to keep the number of entrants low. It is always easy, politically and economically, to increase the number of licenses, but very difficult, and sometimes almost impossible, to reduce them once companies have made investments in the fishery.

Main References

FAO. 1997. Review of the state of world marine fishery resources: marine fisheries. FAO Fisheries Circular No. 920: 173 pp.

Gjosater, J. and Kawaguchi, K. 1980. A Review Of The World Resources Of Mesopelagic Fish. FAO Fisheries Technical Paper No 193