

### “PKFM”

## Policy and knowledge in fisheries management

*European fisheries management has, as described in the Commission's Green Paper on the future of the Common Fisheries Policy (COM(2001) 135), not delivered sustainable exploitation of fisheries resources and will need to be changed to do so. This has happened despite a long tradition of knowledge-based management and a detailed regulatory system. Against this background, it is pertinent to consider and analyse the factors that have contributed to the failure of the management system.*

*Within this framework, the PKFM project was funded in order to identify and understand the knowledge production and related decision-making processes within the fisheries management system and the role played herein by stakeholders.*

The **interaction between knowledge and policy decisions is a crucial link in the management system**. The pressures on the scientific advisory process include requirements, within a total allowable catch (TAC) system based on annual predictions, to produce very accurate predictions of catch rates in substantial weight in the prediction. The advisory process itself is also under political and economic pressure caused by losses of legitimacy among users, which are related to their lack of involvement, and increasing costs to produce the advice when better precision is required.

PKFM focused on fisheries for North Sea cod as a case study and more in particular on the aspects of the institutional set-up of the management system that have contributed to the shortcomings and negative developments in North Sea cod stocks.

Four parallel research efforts were at the heart of the project. For each of these, the findings are summarised below:

#### **1. Stock assessment models**

For the North Sea cod stock, the principle tools used in scientific advice are Virtual Population Analysis (VPA) models, in which catch-at-age data are used to reconstruct the stock history and

determine the recent state of the stock in comparison with past trends. Whereas the period from around 1987 to 1995 was characterised by a good performance of the VPA, bias started to occur since 1995, whereby mean fishing mortality in the most recent year has been underestimated by around 30% and stock numbers overestimated. There is no single explanation for this bias, but it is assumed that it probably results from events in the cod stock or fishery and biases introduced at the forecast stage which result from the use of estimates of growth and recruitment which do not adequately capture the nature of the variation in these processes.

#### **2. Institutional influences on fisheries science**

Scientists working to produce scientific advice are doing so in an environment that has many bureaucratic and political impacts on their activities. There is a systematic pressure on them to “inflate the science boundary”, meaning that they are pushed to expand their models to deal more explicitly with problems around the allocation of fish in addition to simply assessing their biological condition. In addition, they feel like they are often asked to create certainty that is not really there when they are producing scientific advice for

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“PKFM IDENTIFIED SPECIFIC  
SHORTCOMINGS IN THE  
EUROPEAN COMMON  
FISHERIES POLICY AND ITS  
IMPLEMENTATION, WHICH  
HAVE CONTRIBUTED TO  
THE PROBLEMS EVIDENT IN  
SEVERAL EUROPEAN  
FISHERIES”

policy support. Other issues leading to greater job dissatisfaction relate to travel demands and frustrations about their chances to produce peer-reviewed publications

In response to all these experiences, a growing group of scientists throughout the advice system is calling for increased dialogue between and interaction with science, management and other stakeholders. They recognize that they are not the only experts in the process and that, moreover, the uncertainty of the marine environment means that no single form of expertise has the right, or even adequate, answers.

**3. The policy-science interface**

Within the mixed fisheries context of the North Sea, the reliance on single stock VPA as diagnostic tool and single stock total allowable catches (TAC) as basic intervention instrument has obvious and foreseeable vulnerabilities. Combined with high overcapacity and inadequate monitoring and control infrastructures, the system is prone to failure. These are features that make this “TAC machine” into a mechanism with severely limited capacity to predict and adapt to non-exceptional changes in the ecosystem within which it operates. When put under pressure, for instance by a resource crisis, the capabilities of

the TAC machine deteriorates even further. In the most general and non-technical meaning of the term “precautionarity” we may say that the TAC machine in the North Sea cod cases is fundamentally non-precautionary: while it may work well when the stock is healthy and fishing pressure is light, it will tend to break down when it is most needed, when fishing pressure is high and the stock is threatened.

**4. The public debate**

The public debate is to a large extent a national scene. At the core of this discussion is not the scientific basis for the management advice, but the question whether it is fisheries or other factors (such as climate change, predators like seals and cormorants, pollution caused by oil drilling, ...) which are responsible for the decline in fish stocks. Stakeholders maintain that there is incomplete or unbalanced consideration of the various factors that affect the abundance of fish. There is too much focus on the impact of fishing and too little or no consideration on ecological processes (temperature, water quality, habitat destruction) and the effects these processes have on a stock in North Sea cod.