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# States of Nature

Nature and fish stock reports for policy

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**r m n o**

ruimtelijk, milieu- en natuuronderzoek

**Willem Halffman**

Science, Technology, Health and Policy Studies,  
Twente University

Report for the Netherlands Consultative Committee  
of Sector Councils for research and development

PRELIMINARY STUDY



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## States of Nature

Nature and fish stock reports for policy

## Colophon

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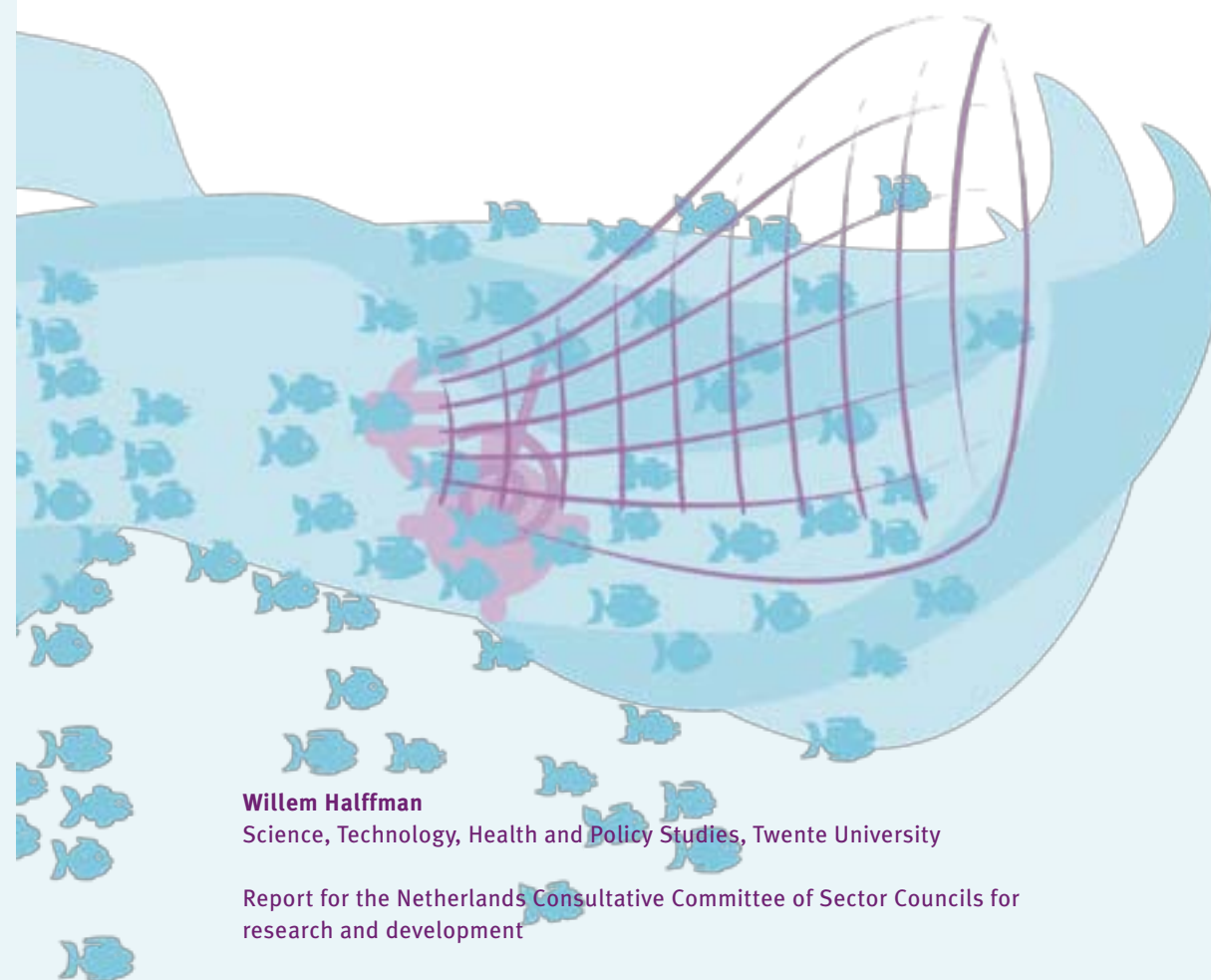
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Report for the Netherlands Consultative Committee of Sector Councils for research and development

January 2008

## About the RMNO publications

The Advisory Council for Research on Spatial Planning, Nature and the Environment (RMNO) offers two series of publications:

- A** Advice
- V** Preliminary studies and background studies.

These series were launched in October 2003.

The Preliminary study “States of Nature – nature and fish stock reports for policy” belongs to the V series.

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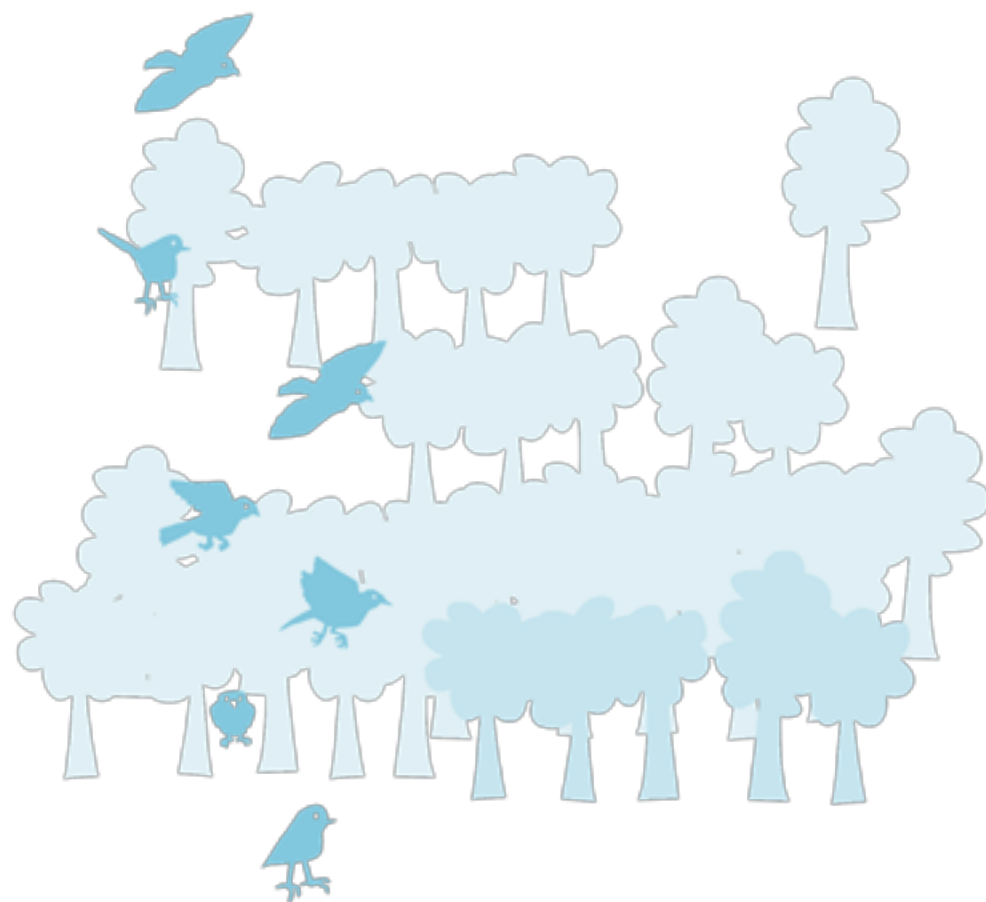
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A.13 (2007)	Kennisagenda Natuur en Gezondheid – in maatschappelijk perspectief

*January 2008*



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## Foreword

The interaction between knowledge and policy is core business of RMNO and COS. As with so many things in life, one can learn most from those things that go wrong. In the past, a number of cases (e.g. the Construction of the Betuwe railway from Rotterdam to Germany, the construction of the 5th landing strip at Schiphol airport) have been analysed by RMNO (see “Willingly and Knowingly”, Lemma, 2000). Based on these analyses, the Council has made recommendations how to deal with knowledge in complex policy problems.

In 2001 RMNO selected “Successes and failures at the interface of policy, science and society” as the subject for its annual conference. Two internationally well-known cases have been discussed during the conference, viz. the functioning of IPCC (Intergovernmental Panel on Climate Change) and the advice practice on BSE in Great Britain and The Netherlands. The idea was to find out which factors are considered by whom to be the cause of success or failure (see RMNO, 2001: “Success or Failure?”). Consequently, Hoppe and Huijs (2003) analysed for RMNO what discourses are relevant at the interface of science and policy and what implications these discourses might have for research (“Werk op de grens tussen wetenschap en beleid: paradoxen en dilemma’s”, RMNO, 2003; *“Boundary Work between science and society: paradoxes and dilemmas”*).

The question remained of the extent the Dutch findings are comparable to other European countries. This prompted RMNO to suggest that COS should finance a comparative study. The selection of cases was entrusted to a broad supervisory committee. The cases were selected in countries known to be not so very different, culturally, from The Netherlands. In “States of Nature, organizing expertise for nature policy and fishery policy” Dr W. Halffman – working for the University of Twente – analyses cases of boundary work in Flanders, Denmark and Norway, more specifically about the relation between nature research and nature policy and between fishery research and fishery policy.

The way knowledge for policy is organized and applied in these countries, appears to be quite different. This conclusion not only applies to so-called formal knowledge, structured according to specific patterns and presented to policy-makers, but also to informal knowledge from the nature and fisheries sectors. The report on the state of nature in Flanders for example is broadly supported by all those who are working on nature policy and nature management because it accepts knowledge from contributors in the field. This of course is an advantage, but at the same time a disadvantage, as others tend to see the report as “biased”. This actually pertains not the data presented, but to the interpretation of the data.

The Danish case on the Nature Council (Naturråd) illustrates that the way reports are designed and structured is crucial in a specific political context. If this design does not match the expectations of the politicians in power,

problems arise. Reflection on long term issues for example does not present an adequate response to the need for more instrumental advice about the feasibility and costs and benefits of specific policy options.

Furthermore, the demand for knowledge in Denmark shifted sharply to decentral authorities, triggering a demand for an adjusted supply of knowledge. But of overriding importance were political considerations from the government at the time, assigning low political priority to nature policy on the whole. This resulted in a conscious alteration of the institutional embedding of the interface between science and nature policy. The protagonist of cost-benefit analysis, Lomborg, consequently was entrusted with the task of producing instrumental advice.

The Norwegian case shows that in Norway people deal in a different way with knowledge from marine fishery biologists, ICES (the international institute) and fishermen than in the EU. In the EU, the Council of Ministers eventually decides about the quota, also on the basis of the same ICES’s advice. This indicates that different “repertoires” exist in various countries to put comparable knowledge to use. If the final result of the Norwegian “repertoire” on the whole seems better, for example because fish stocks in Barents Sea remain at a higher level than in the North Sea, this logically prompts the question of whether the Norwegian example cannot be followed by other countries, even though there are indications that climate change influences fish stocks. This would mean making use of knowledge for policy-making in another way and dealing differently with uncertainties.

The comparative study could in principle have involved cases from the US. In this case, the European continental “repertoire” could be compared to the American modus. Such an excursion outside has not been made as the Supervisory Committee wanted to avoid extreme cultural differences. Such studies are, by the way, already available; see for example “Designs on nature” by Jasanoff (2004). In this book Jasanoff compares the situation in Germany, the US and the UK with regard to repertoires on genetic modification (i.a. of food crops). The lesson from that publication is that certain “repertoires” are pretty stable and also determine the kind of knowledge that is needed for policy-making.

The theoretical framework used by Willem Halffman for his analysis is based in one regard on a characterisation of the type of advisory work (so-called RIMAR classification) and in another regard on the extent to which six aspects have been taken into account. These aspects – that always occur when dealing with advisory work - include dealing with values, informal knowledge, uncertainties and so on.

This theoretical framework can basically be used for further cross-cultural comparisons.

As indicated above, one should take fixed “repertoires” and other institutional aspects into account. Amongst the institutional aspects the extent of external steering of the working programme and the strength of the mission of a research institute seem to be important factors.

It is obvious that this report offers some interesting points for reflection on the function of knowledge brokers, research institutes and research and knowledge directorates. We hope they may use this knowledge to their advantage.

Specific recommendations for improving the input of knowledge for Dutch policy-making cannot be made easily on the basis of this report. To do this, it is necessary to know the results of other studies on Dutch cases which have been carried out in the Rethinking Political Judgment Programme of NWO, the Dutch Organisation for Scientific Research. Furthermore one should take into consideration that there is a political trend to concentrate and reduce advisory functions. If the reason for this is that interactive policy-making can replace this buffer function, the question is to what extent the right knowledge is put to use at the right moment in policy-making. Considering the complexity of many policy problems, the distribution of knowledge in society on one hand and the growing specialisation of academic knowledge on the other, it seems obvious that specific meta-knowledge is needed for gathering and combining this knowledge.

Anticipating this type of reflection, it makes sense to discuss the report with those concerned in The Netherlands, asking them what they consider advantages or disadvantages in the way knowledge for nature and fisheries policy is organized in Flanders, Denmark and Norway. The question “What do you learn from this?” should from time to time come back on the political agenda too.

Furthermore RMNO wants to discuss the findings of this comparative study in the EEAC, the organization of European Advisory Councils on the Environment and Sustainable Development. The aim is to learn more about their own functioning and learn from each other, thus broadening the knowledge produced. There are already some initiatives, such as the study by Professor Susan Owens about the implementation of recommendations by the Royal Commission on Environmental Pollution in the UK.

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# 1 Introduction

## 1.1 Science advises policy

How can scientific advice to policy be organised wisely and democratically? The problem has been discussed in a large body of research, often in the form of a critique of contemporary advisory processes and of what went wrong in them. A major problem with many of the suggestions produced so far is that they are based on attempts to understand what science *is* and what policy making *is*, in order to bridge the essential tension.

A major drawback of such an approach is that it tends to reduce the complexity of science advice, as well as of policy making, to relatively simple schemes. For example, science is seen as a matter of systematic experimentation or measurement, informed by accumulative theories, based on testable hypotheses, and reported in peer-reviewed scientific journals. Policy making is presented as a matter of identifying goals, finding the most effective and efficient instruments to achieve these goals, getting political approval for a plan, leading to implementation and periodic assessment of goal achievement. Whatever the schemata in use, the assumption is that science and policy are fundamentally the same everywhere and at all time. Logically, the problem of how to set up the interaction between the two is basically also universal, as are the solutions – even though there may be substantial disagreement about what is the wisest and most democratic solution.

The question of how to structure advice (scientific or not) to government policy is tricky and old. In fact, it can be traced right back to the roots of political thought. Plato addressed the problem of the position of sages in the polis and was of the opinion that philosophers should dominate government. In the 16<sup>th</sup> Century, Machiavelli also addressed the problem of how governments should interact with advisers. Machiavelli saw advisers as purely instrumental in the purposes of the Prince, but nevertheless advised rulers to let advisers speak freely and not ignore their opinions even if they spelled bad news (Machiavelli 1966 (1532); Kowert 2002).

Some would claim that the problem of how to organise advice is fundamentally different once science is involved, based on the argument that science is based on firm principles that dictate the nature of the advice. However, extensive empirical research, including the research presented in this report, has indicated that the work of scientist-advisers is not ruled by unequivocal principles. In fact, in proximity to the pressures of policy making whatever seemed like firm principles in the research world become fluid, problematic or insufficient. In addition, some of the work of modern scientist-advisers involves tasks that are surprisingly similar to the work of the adviser in Machiavelli: figure out what could be a wise course of action under conditions of incomplete and provisional knowledge.

The long tradition of discussions about advisers suggests that the problem may be constitutive to the position of knowledge in society, rather than a passing problem that can be fixed once and for all. However, that does not mean that we should not try to learn from the wealth of experiences.

This report deals with advice to public policy. I will focus on advice that claims legitimacy with an appeal to science or expert knowledge, rather than, for example, with an appeal to the representation of interests, to creative independence, or political experience. Although the precise demarcation of science is not always clear, but often debated and in flux (Gieryn 1995; Gieryn 1999), the focus of the analysis is nevertheless on advice that at least claims to provide knowledge ultimately based on science and research. Rather than to demarcate science a priori, we cast our net widely and give the border cases the benefit of the doubt, by relying on the appeal to science by the actors themselves.

The report has three analytic moments. First, I aim to develop tools for describing expertise in *diversity*, by providing an analysis of what it is that experts do when they advise policy makers. Rather than to turn directly to the question of how expertise should be organised and how its performance should be assessed, I will indicate how different kinds of activities of experts lead to different tensions in expert work. For this purpose, chapter two provides a typology of expert activities, which divides these in review, instrumental, mediation, advocacy, and reflection activities (R-I-M-A-R).

Subsequently, this typology will be used to analyse the activities performed by experts in four case studies. These case studies have been chosen from the domain of conservation of nature: two on land, in nature conservation policy of Flanders and Denmark, and two at sea, in fisheries management in the EU and Norway. Both of these involve the assessment of the state of the commons. They try to find out how nature is doing as a basis for further policy making; they provide accounts of the commons. This involves the second analytic moment, where the variety of activities that experts perform is analysed in the context of policy making. I will identify different patterns in the organisation of expertise, as it is coordinated with policy, distinguishing corporatist, deliberative, neo-liberal, and statist patterns.

The cases are defined as advisory trajectories. I will describe the production of reports of advisory bodies to policy. Our main interest will lie on the level of organisations and will concern how advisory processes are organised in advisory bodies. (Rather than, for example, the discourse of advice, or the individuals involved in advice, or of how elements of knowledge travel

through the policy world.) The reason for this focus is that we look for insights of interest to people who work in or with advisory bodies.

The third analytic moment is more evaluative. At the end of each case, I will analyse how advisory processes have dealt with six key problems of science advice to public policy, which require some more detailed attention.

## 1.2 Problems of science advice

So what are the problems of scientific advisers to public policy? In a brief but broad-sweep review of empirical research and experience, Ned Woodhouse and Dean Nieuwsma have provided us with useful overview (Woodhouse and Nieuwsma 1997; Hoppe 2005). The authors see a pattern emerging of six issues around public expertise that keep stubbornly keep coming back: how to deal with values, alternative knowledge, uncertainties, institutional design, policy learning, and trust.

Woodhouse and Nieuwsma do not claim that these are six functional requirements are criteria for assessment, nor that experts always have to deal with these six issues, nor even that these issues are a perfect set of analytic dimensions. The claim is much more modest and useful in all its simplicity: when one looks at debates over expertise over the last decades, these six issues keep coming back as topics of debate around expertise. If we were to turn this list into assessment criteria, then this would suggest that experts always have to deal with, for example, institutional design, whereas it might be much more productive to just get on with work, rather than to risk a permanent state of reorganisation. The recommendation is simply that it would be wise to pay attention to these six issues, because at some point they are likely to crop up in most advisory processes and in policy fields that involve a lot of expertise. Although not sharply analytic, nor grounded in an encompassing theory of science or policy, the list is pragmatically based on extensive research on science advice to public policy. Since its publication, it has proven useful for the analysis of advisory institutions in the Netherlands (Hoppe 2005).<sup>1</sup>

**Value issues** can appear even in the most technical of advisory processes, often to the surprise of experts involved. One form in which value issues show up, is in the form of ethical concerns over the practice of knowledge gathering, for example with the use of test animals or in stem cell research. More unexpectedly, experts may find that the knowledge they consider factual and of a neutral, technical nature, is considered highly normative by others. Conflicting ways of framing a problem can cause such issues. One classic example comes from the debates over nuclear energy. Whereas the nuclear experts analysed the risks of nuclear energy in terms of reactor leaks or in-plant events, some of the major objections of the early anti-nuclear

<sup>1</sup> In the Dutch research programme “Rethinking Political Judgment And Science-Based Expertise: Boundary Work At The Science/Politics Nexus Of Dutch Knowledge Institutes.”

activists actually involved worries about centralised energy production or the social and political preconditions necessary for nuclear energy, such as long-term surveillance of waste storage.

Similarly, objections against genetically modified organisms or even risk assessment of chemicals do not necessarily stem from disagreement over measurements or experiments, but from the *frame* within which these are undertaken: what kind of effects are being considered and how are these effects conceived? In the case of GMO objectors, this includes consequences for property relations between seed producers and users. In the case of chemicals, it includes the assumption that the safety of chemicals should be assessed on a chemical-by-chemical basis, rather than by comparing risks or analysing combined toxicity.

There is no absolute obligation to pay attention to values, as in some cases problem frames are clear and beyond significant contestation. Nevertheless, it is wise for advisers to reflect on frames and values, especially in times of controversy, even if this controversy only seems to address facts (Schön 1995). A working division of labour between experts and policy makers includes an arrangement of how value issues are to be decided and who should decide them, meaning it may or may not be up to the experts to sort out the value issues.

The consideration of alternative **kinds of knowledge** follows immediately from the previous examples: if problems are framed differently, then different kinds of knowledge may become relevant. Many areas of advice to public policy are dominated by a field of research or a specific profession. For example, it may seem natural to medical doctors that they and they alone should advise on all things medical, but that may exclude valuable insights medical anthropologists on the practicalities of hospital wards. Local knowledge of users, inhabitants, amateurs, patients, or whatever other category of people that are normally treated by professionals as subjects, may prove valuable to enlighten professional knowledge on practical objections to their plans.

Expert knowledge is almost never monolithic, even though the selectivity of professional monopolies may suggest that it is, but consists of competing specialisms and approaches. This can be in the form of disagreeing groups of experts with academic degrees or in the form of non-academic experts, such as experience-based expertise or lay knowledge. The organisation of expertise for public is very likely to run into conflicts with dissenting knowledges and will then have to address ways to accommodate (or exclude) such knowledges.

One can dream about including all the knowledge that could possibly be relevant into an advisory committee, but evidently this is not practical, would not lead to a timely advice, but more likely to unending arguments. At the same time, the danger of getting locked into an established set of knowledge

may lead to timely and efficient advice, but be erroneous and lead to disaster. In science advice, the BSE crisis in the UK has become an icon for such problems. The problem can then be reformulated: How to keep sufficient openness for other kinds of knowledge? How to structure interaction with these kinds of knowledge in order to prevent deadlock (Kowert 2002)?

The third issue that Woodhouse and Nieuwsma signal is that of **institutional design**: time and time again, the structure of advisory organisations becomes a topic of debate, even though this may seem a rather small and insignificant matter at first sight. The Netherlands has struggled with its advisory system for decades, before sufficient political support could be found to reorganise the entire system drastically in 1997, and even then there was significant resistance from some quarters, such as on the council that advised government on emancipation (Halfman and Hoppe 2005). Advisory bodies, even under the banner of pure science and expertise, provide access to policy arenas, are a lever with which issues can be put on the agenda, or forums in which deals can be done. As the story of the Danish Nature Council in this report illustrates, changes in the design of expert advice can lead to protracted conflict.

There are a number of aspects of institutional design of advice that can give rise to conflict. One is the appropriate distance to politics: is a council sufficiently close to the policy process to guarantee that it produces useful advice, then there is also the risk of being accused of collusion, of taking sides with the government, of being too uncritical. A second one is the issue of access: who is allowed to ask the expert advisers for advice? Will the experts formulate their own questions, or is it the executive that sets the agenda, or can parliament ask for advice, or even civil society? Third, who will be heard in the advice? Can NGOs put forward their account of the facts, introduce their knowledge into the deliberations? Fourth, what is the composition of an advisory body? Which fields of knowledge are represented? Should the experts involve academic researchers, or represent interests in a policy sector? Last, without claiming that the list is complete, the cost of expert advice periodically pops up as an issue. In some cases, the argument of the cost of advice can be used to remove advisory organisations as a way to reduce the importance of the policy issue it advises on. Here too, the Danish case discussed below will provide interesting examples.

One form that debates over the institutional design of expert advice have taken concerns the governance of expert advice itself. The governance patterns concern how goals should be set for advisory structures, how resources should be allocated, or on what grounds the validity of knowledge should be assessed. They follow principles that are used in other policy sectors and have clear ideological loads. In statist modes of governance, expertise is seen as an asset of the state, under the umbrella of the executive and relying on professional standards. In corporatist modes, expertise is brought to the negotiation table by the actors considered legitimate



representatives of key interests in society, typically with support from state resources. Deliberative modes governing expertise sees shared reasoning as the prime value in policy making and will aim for inclusion of a wider range of voices than only the corporatist elites. Neo-liberal modes see knowledge as a tradable good, that can be exchanged efficiently by means of market mechanisms under the right conditions and that should preferably not be housed in state structures. Mixed forms exist and are created as compromises are formed between proponents of the different camps (Hoppe and Halffman 2004; Halffman and Hoppe 2005). I will pay extra attention to this aspect of institutional design, as the organisation of expertise interacts both with governance patterns, as well as with the debates in the policy sectors that the advice is meant for.

A fourth issue that regularly plagues expert advisers is **uncertainty**. Well-mediated recent examples are the debate over uncertainties in knowledge concerning the military capabilities of the regime of Saddam Hussein, or the question of how long the argument of uncertainty can be used to postpone action against climate change. In the first case, uncertainty was downplayed in order to proceed to decisive action; in the second case the same government uses uncertainty to delay decisive action. Experts are faced with the problem of how to get an adequate assessment of uncertainties, including on relatively technical matters such as the quality and validity of measurement, but also on more encompassing matters, such as lack of knowledge, radical discontinuities, or unknown relevant parameters, Donald Rumsfeld's "unknown unknowns". In recent years, several tools have been developed to support experts in dealing with uncertainty, but there is no perfect solution. Even if experts are convinced they have an adequate grasp of uncertainty, then there is still the complex problem of communicating this understanding to policy makers (Van Asselt 2000; Van Asselt and Petersen 2003; Van der Sluijs, Risbey, Klopogge, et al. 2003).

Expert advisory systems show a wide variety in tackling uncertainty and uncertainty communication. One is to hide uncertainties from policy makers, under the cloak of expert judgement. Experts often claim that policy makers are not interested in uncertainties and hence provide advice without mention of measurement errors, unpredictability, or lack of knowledge. Inversely, experts may specify uncertainties in great detail to cover themselves from later accusation and then leave conclusions up to bewildered decision makers.

Fifth is the issue of **policy learning**. Are advisory structures conducive to enriching the policy making process, but also: is the policy making process conducive to learning from its advisers, from previous mistakes, from

unwelcome news? The problem of whether learning does or does not occur should not be automatically blamed on the expert. The question of whether learning occurs relates to issues of institutional design, but also pertain to the personalities of people involved or the presence of a culture that is responsive to contrary information. Policy learning tends to become an issue especially when it has failed to occur, when mistakes were made and the responsible need to be identified. Once again, BSE and the Iraq war come to mind and hopefully we can leave climate change off this list in the future.

Last, there is the issue of **trust**. If policy makers do not trust advisers, for whatever reason based on whatever previous experience, then no procedural fix will convince them of the reliability of advice. This holds for policy makers in government as well as in civil society. Experts are often baffled by a crisis of trust. Believing in the reliability of their knowledge and research, they find it hard to understand how outsiders can be distrust the advice that results from it. Experts have tried to rely on notions of transparency, attempting to show what it is that they do, how they perform assessments, in order to show that nothing untoward has happened. Another approach often used is to require experts to declare their interests and affiliations, for example track records of previous employers or sources of research funding, especially for removing the suspicion that experts might be too closely affiliated to industrial interests when the assessment of technological hazards are involved.

Woodhouse and Nieuwsma do not provide ready-made solutions for all of these problems, but rather suggest that we should come prepared, expect that sooner or later problems of this nature will reappear, and learn from previous experience.

### 1.3 The Commons: nature conservation and fisheries

Periodic reports on the state of nature have become an increasingly important part of nature conservation policy in several European countries. State-of-nature reports – 'nature reports', in short – provide overall assessments on the condition of nature in a country or region and may allow for evaluations of how policy conservation policies are performing.

The form of nature reports varies, together with governance arrangements in nature conservation policies. In some cases, such as in England, an overall assessment of the state of nature takes the form of an annual report of the agency responsible for managing nature, English Nature. The agency reports on the condition of nature as a performance indicator of its programmes (English Nature 2006).<sup>2</sup> In other cases, nature reports are

<sup>2</sup> Although English Nature has also produced occasional regional nature reports, the 'State of Nature' series (English Nature 2001; English Nature 2002; English Nature 2004), these assess conditions in nature and conservation policy and recommend policy measures.

integrated into policy cycles based on integrated policy plans, providing a periodic assessment of whether the planned targets are being met, such as in the Netherlands, where nature reports have been produced annually since 1997 by the Netherlands Environmental Assessment Agency (Milieu- en Natuurplanbureau 2006). In 2004, a new integrated policy plan for nature conservation in Denmark also gave rise to reporting on nature, but in the form of a monitoring scheme (Danish Government 2004; Svendsen and Norup 2005). On other occasions, nature reports are occasional reports, taking stock of the state of affairs and of conservation problems in order to prepare policy recommendations (Wilhelm Committee 2001; English Nature 2004). The starting point of this section is therefore that the way nature is reported, both the format and the production process, is connected to the way conservation policy is made. The interesting question is how and in which patterns this process occurs.

In spite of their various forms, nature reports are more than just a product of national constellations. Behind the nature reports are international networks of European Directives, data exchanges, standardisation of data for statistical purposes, and learning practices. For example, several initiatives in nature conservation policy have been developed in international forums. Some of these initiatives appear in the national context as commitments of government, policy targets that have to drive conservation policy forward. An example is the commitment to stop the loss of biodiversity by 2010, as a commitment of the 2004 Biodiversity Conference. An important European commitment for nature conservation is Natura 2000, a Europe wide ecological network of protected areas of nature, coming out of the 1992 Habitats Directive. Such international programmes define targets and require member states to report on progress made. Other elements of coordination are more informal, such as the proposal by the European Environment Agency to use a system of Driving Forces, Pressures, State, Impact, and Response (DPSIR) for indicators ([www.eea.eu](http://www.eea.eu)). Countries also learn from each other. The authors of the Flemish nature reports described below have contacts with the Dutch and have copied some elements, yet have also produced nature reports that are entirely specific to the policy context of Flanders.

Whereas nature reports take stock of the state of nature, fish stock assessment assesses the condition of marine life. Stock assessment has become a key tool in fishery policy. The basic principle of stock assessment is to use catch data and data from samples taken by research vessels to determine population size and age structure. These data provide input for stock assessment computer models that will provide estimates for stock size in the near future.

The immediate policy use for stock assessment lays both with the allocation of limited resources between countries fishing from the same fish populations as and, more recently, with the protection of nature. Increasingly, stock assessment is being performed in international cooperation and for regional

fishing organisations. In these organisations, stock assessments form the basis for agreements over mutual fishing rights, for fishing quota, and for other policy measures intended to create healthy fishing industries and sustainable fish populations. Such agreements are typically made on a year-by-year basis and stock assessment follows that annual cycle, although recently there have been attempts to develop multi-year stock management plans.

Fisheries policy and nature conservation are two policy fields that have a lot in common, especially since conservation has become a more prominent concern in fishery. Both policy fields are concerned with the preservation of natural resources and deal with ecological systems that follow their own dynamic, escaping complete human control. Both policy fields face the problem of how to balance human activities and human use of natural resources with the continued conservation of these resources for future generations. Both policy fields have also moved from finding optimal use of natural resources, such as in forestry, to the conservation of nature, either as a value in itself or as an investment in future availability of resources.

The similarities go beyond such general traits. Some of the latest policy measures suggested for both policy fields are very similar. In nature reserves on land, ecologists have suggested that conservation not only requires nature reserves, but preferably nature reserves linked by corridors. Especially in densely populated regions, such networked nature reserves could create larger areas for wildlife to live in, allow for re-colonising migration of threatened species, and create genetic exchange between threatened populations to prevent in-breeding. Such ideas have informed notions of an 'ecological main structure' in both Belgium and the Netherlands, although with variable effect in policy. Similar notions are now arising in fisheries policy, initially with a plea for marine reserves ('no take areas', from a fishery perspective) and now also in notions of networked marine reserves, from where over-exploited fishing stocks could be regenerated (Lubchenco 2006).

The challenges to expertise and knowledge about the commons in both fields are also similar. Some of the common issues involved are: the complexity and unpredictability of ecosystems, the difficulty of defining sustainable levels of use of natural resources, the contentious environment of conservation issues with vociferous and engaged stakeholders, the difficulty of accommodating different conceptions of nature and natural stabilities, problems of using models and model-based advice, or the difficulties of incorporating lay knowledge (Kwa 1991; Waterton and Wynne 1991; Van der Windt 1995; Collins and Evans 2002; Turnhout 2003; Zeiss and Van Egmond 2006). A comparison of institutes providing expert advice to policy processes shows how different approaches to such issues have been found in different contexts.

At the same time, there are also important differences between these policy fields. One is the very pronounced economic and regulatory context of



fishery policy. Assessments of the state of fish stocks are used to defend decisions on access to fisheries. In Europe alone, the livelihood of hundreds of thousands of people is affected by how marine biologists account the commons. In some cases of nature conservation on land, ecological assessments may have costly consequences for land use, but the regulatory context is not as pronounced. This means that it is more difficult for fisheries biologists to claim that they are ‘merely’ taking stock, as stock assessment is expected to lead to recommendations for policy measures.

Second, fish stock assessment is, much more than the assessment of terrestrial nature, a predictive affair. Because of the use in the negotiation of fishing rights for the consecutive year and because of the high rate with which some fish populations can fluctuate, fisheries biologists attempt not only to estimate stock sizes, but especially also the size of stocks in the near future. This, combined with the fact that fish populations are notoriously difficult to count, creates considerable uncertainties in the expertise provided.

A third major difference is that fishery policy, much more than nature conservation, has been institutionalised at an international level. The European Union may define important parameters for nature conservation, such as the Habitats Directive (Council of European Communities 1992) or the Birds Directive (Council of European Communities 1979), but assessment of the state of nature as well as the implementation of nature conservation remains to a large extent a national matter. In fisheries, both fishery assessment and fishery policy are to a large degree organised at a European level.

#### 1.4 Design of the study

The prime goal of this project was to see if we can learn from experiences elsewhere, ‘we’ being especially people working in the Dutch advisory sector (although hopefully the circle can be drawn wider to professionals in advisory sectors elsewhere and to social scientists interested in the interaction between science and policy/politics). For this reason, a choice was made to look at countries with cultures of policy making and of doing politics that are relatively close to the Netherlands. This implied, in very general terms, cultures of negotiated policy making, coalition governments, some experience with corporatism and with multiple fault lines running through the political landscape, while being roughly of the same order of magnitude in terms of population size. This produced Belgium (and more specifically Flanders), Denmark and Norway as points of comparison.

As it turned out, the selection of fishery research as a case required us to look much more at the international level of EU fishery policy. This does imply policy making on a much bigger scale, with bigger stakes (in absolute terms), and in the form of intergovernmental bargaining. Nevertheless, EU fishery policy does have some of the relevant characteristics: policy making

is very much negotiated and the fishing sector has a significant degree of corporatism, even though these processes occur via national governments. As the stories of fishery policy and expertise show, this choice did lead to very illuminating points of comparison. Norway provides a particular contrast, as this country forms and different fisheries policy, largely based on the same stock assessments.

In order to be able to look at how shifts in policy making interacted with shifts in the organisation of expertise, we chose to select two areas of expertise involving similar bodies of knowledge, both relying heavily on biology, while acknowledging the differences listed in the previous paragraph.

All cases were researched by means of extensive document analysis, including secondary literature and primary sources, completed with a selection of qualitative interviews and interaction with primary witnesses in the form of responses to draft chapters. Interviews were conducted *in situ* and via telephone, which frequently resulted in further exchanges via e-mail. No primary interviews were conducted in the case of EU fishery policy, because in this case detailed results of interviews were available from another research project (Wilson, Bailly, Christensen, et al. 2006). However, here too, I found actors involved in fishing quota and fishery policy prepared to respond to my draft analysis, in order to correct factual errors or qualify possible misrepresentations. Evidently, possible remaining flukes are entirely my own responsibility.

The structure of the report is as follows. Chapter 2 analyses the activities that experts perform for public policy and analyses why it is so difficult to come up with unambiguous and straightforward success criteria, such as could be used in policy evaluation of expert organisations. The chapter particularly questions impact as a measure of success and shows how impact fatally flaws the diversity of activities that experts perform, in favour of instrumental activities and of unwanted side effects of compliance strategies.

Chapters 3 and 4 deal with nature reporting in Flanders and Denmark, while 5 and 6 concern advice on fisheries in the EU and Norway. Each of the empirical chapters follows the same structure. First, the general conditions of the policy field are described, in the context of developments in politics and in the natural environment, in order to, second, describe key developments in the policy field. This includes a description of policies, key actors, and major conflicts. Third, the advisory trajectories are described, how accounts of the commons are produced, who produces them, what the tensions are, and what the reception by various audiences is like. Fourth, these cases are then analysed. Special attention is paid to listing the predominant activities experts perform, in terms of the RIMAR scheme described in chapter 2. The cases are also analysed to determine shifts in patterns of governance of expertise and to determine how each of the trajectories has dealt with Woodhouse and Nieusma’s key issues for expertise. In chapter 7,

these results are combined with the specific intent of looking for patterns in the interaction between patterns in the expert advisory trajectories and the conditions in the policy sector involved, in order to come to recommendations.

## 2 After Impact: success of scientific advice to public policy

*in cooperation with Roland Bal*

### 2.1 Success and Evaluation of Science Advice

Governments spend considerable resources<sup>3</sup> on science-based advice, via commissioned research, statutory advisory boards, ad hoc committees, expert regulatory agencies, or policy-oriented government research facilities. Scientific advice to public policy no longer escapes the present allure of systematic policy evaluation. Senior civil servants and politicians rightly want to know whether public funds spent on all that scientific advice are allocated justly, effectively, and efficiently. Standing advisory bodies draw particular attention for such concerns.

Unfortunately, such concerns are easily translated into the belief that all policy outcomes can be measured unambiguously and without substantial complication. As Pawson and Tilley note: “(...) ‘evaluation’ has become a mantra of modernity” (Pawson and Tilley 1997, p. 2). Especially in the case of such complex processes as the production of expert knowledge, requiring expert judgement and reflection, quantified evaluation based on a few indicators easily misses the mark. Exaggerated trust in simple yardsticks for the performance of expert work may lead to considerable negative side-effects, as is by now painfully clear in the case of publication and citation counting in science (Edge 1979; Weingart 2005). Whereas criticism of straightforward policy effect measurement and evaluation is now commonplace in the policy evaluation literature (Guba and Lincoln 1990; Abma 1996), governments still ask science advisers to demonstrate (quantifiable) success, often in the form of measurement of ‘impact on policy’.

Attempts to evaluate science advice, and especially to evaluate it quantitatively, lead to the question of precisely when advice can be deemed successful. The question sounds deceptively simple, but leads to impressive complications. We will illustrate these complications by discussing some seemingly clear-cut solutions that have been suggested in the past, revolving around notions of knowledge utilisation, ‘uptake’ of advice, or ‘impact’ of advice on the policy process. Consequently, we will show that, at the very least, success criteria for science advice have to consider the wide variety of expert activities covered by the blanket term of ‘expert advice to public policy’. These activities will be systematised in five broad categories: Review, Instrumental, Mediation, Advocacy, and Reflection activities (R-I-M-A-R).

<sup>3</sup> Expenditure on science advice is hard to pin down in public budgets, but we do have some general indications. The budget of the fifteen main Dutch advisory councils alone was about 40 million Euro in 2003 (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties 2005, p. 5). The total expenditure of the US National Academy of Sciences is about \$ 240 million (FY2005), producing about 250 reports to government each year (Blair 2006).

We will conclude with a closer look at the context of evaluation of expert advice and point to some alternative routes to tackle the need for justification of public expenditure in the expert advisory sector.

## 2.2 Knowledge uptake as success

A major concern for the evaluation of scientific policy advice has been whether advice is taken up by policy makers, for example in recent expressions by the UK Parliament Select Committee on Science and Technology, the Dutch Ministry of the Interior, or high ranking civil servants at the European Commission. Depending on the metaphor that is used, the policy maker is considered an active or a passive user. For example, one way to probe the success of advice is to ask for its ‘impact’ (Glynn, Flanagan, Keenan, et al. 2001). This suggests that the producer has somehow launched the advice into the world where, if hurled with sufficient skill, it is likely to somehow change the policy process. A similar term often used is ‘dissemination’ of research. For example, the Framework research programmes of the European Commission stress the importance of ‘dissemination activities’ that are meant to bring the results of research to users. Bekkers et al. call this a ‘push model’ of advice (Bekkers, Fenger, Homburg, et al. 2004, p. 15). Another typical expression is that of ‘knowledge utilisation’, which suggests an active user: it is up to the policy maker to decide whether a particular piece of advice is useable. This does not mean that the provider cannot try to make advice as useful as possible, but the user has some choice in whether to accept or reject the end product. At the other end are ‘pull models’, where a dominant, active user orders a report or requests advice from a committee, focused on utility to the user (for a review, see National Center for the Dissemination of Disability Research 1996).

In varying degrees, such closely related conceptions of scientific advice to policy are based on problematic assumptions and lead to biased notions of success. First, and most importantly, these notions rely on one-directional movement of advice. A report or piece of research is produced, after which the completed product has ‘effect’ on the policy maker. This is the case most strongly in the impact metaphor, where research is launched and then ‘crashes into’ policy, but it is also present in the consumerist connotations of the utilisation metaphor.

One-directionality conceptions of scientific advice underestimate the negotiation and interaction between the producer and user of knowledge, which are actually essential for the coordination of policy and expertise. Such interaction is vital to programming and timing of research (correspondence with the policy agenda), identification of relevant topics, congruent problem definitions, or identification of meaningful policy recommendations. In some cases, interaction is even crucial for the availability of data, since data are often in the possession of the policy maker or dependent on the

client’s commitment to data gathering (Van der Meer 1999; Bekkers, Fenger, Homburg, et al. 2004).

The underlying bias is that the adviser may well be blamed for the inability of the client to interact with the experts, for example in the formulation of a clear and meaningful question for advice. If a report has insufficient ‘impact’, it may not be because it was not launched with sufficient skill, but because the client chose to evade its unwelcome message, or failed to make clear what policy problem the advice was meant for.

Second, and as a consequence, uptake models tend to have a stereotypical conception of the division of labour between policy actors and experts. Precisely because they do not address the interaction process, they build on implicit notions such as ‘research is about facts and policy is about values and power’. Such conceptions fail to tackle the difficult negotiations between experts and policy makers over responsibilities, integrity, professional standards, or political expedience. The assumption in stereotypical conceptions of the division of labour is that the client has a problem, for which the expert has to provide an instrumental solution. Such conceptions are particularly damaging for the democratic accountability of expertise, especially where knowledge and problem frames are contested (Jasanoff 2003).

Third, not all impact is necessarily desirable, even if impact is defined in a very broad sense. What if the policy uptake is highly selective or even an outright misrepresentation of the advice? What if impact is created by spectacular media campaigns, but based on highly questionable research or even misrepresentation? Even reserving impact measurement for solid knowledge only is no solution. In controversial policy issues and particularly in unstructured problems, such as climate change or the debate over genetically modified organisms, the very definition of what is credible research is at stake and very hard to assess.

Even more open-ended notions of success are defined as any effect on the ‘issue domain’, i.e. the discursive elements that together make up a policy issue. Success is then any contribution to this discourse: changing or contributing to conceptualisations, insights, arguments, or data. This raises the problem that somehow the quality of the contribution needs to be assessed, for example in terms of relevance, credibility and legitimacy (Farrell and Jäger 2001). In addition, it is very hard to attribute a discursive effect to *specific* policy advice products, as these are part of an ongoing stream of advice and policy documents (Van der Meer 1999).

Fourth, such complications lead to a quagmire of operationalisation problems. When should effects be measured? Is ‘impact’ immediate or delayed? How should we assess an advisory report that falls onto deaf ears, but becomes a source of conceptual policy innovation five years later? Where

should ‘impact’ be measured, given that policy advice may travel and be reinterpreted, translated, or selected via the press, NGOs, Parliaments, or via international policy networks before reaching a government department? How should we evaluate such different sites of impact? How can one isolate the effect of advice from other sources of policy change?

A serious attempt to identify knowledge uptake leads to complex sets of indicators that are very hard to measure. Evaluation criteria then risk becoming a garbage can of heterogeneous indicators (e.g. Bekkers, Fenger, Homburg, et al. 2004). Even though all the traces of a report can be measured in principle, in practice this is so hard to achieve and so expensive, that the temptation is very high to choose a few simple proxies. As a consequence, the complex measuring tool becomes a very poor approximation of the complexities of knowledge production.

Fifth, one of the major risks of constructing narrow indicators, especially when coupled to financial consequences, is ritual compliance: the quality of the professional work is defined in terms of how it is measured. Once again, publication counting in science offers a nice parallel, with such behaviour as multiple publication of the same piece of research to boost scores, groups of colleagues agreeing to cite each other to boost citation rating, or the request of journals to cite work in the same journal to boost journal impact ratings (Weingart 2005). Some authors are arguing that excessive use of indicators and quantified measures are now undermining the ability of knowledge intensive professions to make sound judgements (Strathern 2000).

Sixth, the quality of expert advice, both in terms of meaningful policy development and meaningful evaluation of available knowledge, is often contested. What is an excellent report to a government department may not be perceived as such by an entire policy field, including the dissenting experts affiliated with contesting actors. Scientific advisory bodies may actually redefine their tasks in terms of how they are evaluated, aiming to produce advice that is above all expedient to the executive client.

As a public resource in a healthy democracy, scientific expertise is by no means the monopoly of the executive, just as policy formation is not the exclusive domain of government departments. Impact measurement tends to an executive bias, since that is where impact is most easily measured and that is where resources are controlled. In other words, government departments tend to impose their own narrow standards of utility onto expert advice that may have to be assessed in broader terms, and in terms of a much wider range of clients and publics (e.g. citizens, Parliaments, policy

networks). With it comes a focus on instrumental advice, which is only one specific kind of advice that experts provide to policy makers.

In light of these problems of success measurement in terms of impact, utility, or similar criteria of knowledge uptake, it is meaningful to reconsider the variety of activities performed by experts, since this variety shows how specific measures of knowledge uptake become inconsistent and contradictory. In other words: we need to analyse the practice of producing science-based advice.

## 2.3 Diverse expert activities

Experts perform a wide variety of activities with respect to policy. There are various ways of enumerating this variety,<sup>4</sup> but here is one that we found useful to order empirical findings. Building up from previous experience, we can group the activities of experts advising policy in five broad categories: Review, Instrumental, Mediation, Advocacy, and Reflective activities (RIMAR). We will discuss each of these in more detail below, indicating how the evaluation of specific kinds of expert advice is set in competing demands that make evaluation complex and often contentious.

### 2.3.1 Review activities

In review activities, experts bring together and assess knowledge, as relevant to a policy field or question. This can involve relatively straightforward integration of data, but also complicated evaluations of contentious research results. The work typically consists of collecting and comparing research results, previous reports or advice, and discussing these in a committee. The Health Council of the Netherlands performs key review activities for health policy, for example in bringing together and weighing what is known about harmful effects of a chemical or the effective ways to treat a disease (Bal, Bijker and Hendriks 2002; Bal, Bijker and Hendriks 2004; Hendriks, Bal and Bijker 2004). The review activities of the International Panel on Climate Change are another, more widely known example (Miller 2001).

In the actual practice of typical review organisations such as the Dutch Health Council, review activities may be combined with other activities, including suggesting policy instruments or strategic options. Nevertheless, reviewing is a particular kind of expert activity, typically oriented at establishing a widely accepted understanding of what is the state of affairs in the context of contradicting evidence or opposing expert views.

<sup>4</sup> E.g. also: *instrumental, conceptual, agenda setting, political-strategic* (National Center for the Dissemination of Disability Research 1996; Bekkers, Fenger, Homburg, et al. 2004; Ministerie van Binnenlandse Zaken en Koninkrijksrelaties 2004); *the provision of data, ideas, and arguments* (Weiss 1991); *or in terms of advisory styles* (Renn 1995); *or tasks of policy analysis* (Mayer and Van Dalen 2002).



In order to establish such an accepted assessment of the state of affairs, reviewing processes have several options: generate expert consensus, mobilise institutional authority, or establish exclusive control of knowledge. Generating expert consensus occurs by bringing together disagreeing experts (or at least representatives of the various views) and devising a common denominator or a creative interpretation that will satisfy all these views. Mobilising institutional authority implies that accepted practices of establishing truth are used in order to justify the verdict of a review. Typical examples include peer review, but also a reliance on the weight of established institutes, such as the National Academy of Sciences in the US, the Royal Society in the UK, or the Health Council in the Netherlands. Exclusive control of knowledge occurs when a unique collection of information can be gathered, in order to argue that no other source of expertise could have an equally comprehensive overview of the available evidence. This is typically the source of authority for national statistics agencies.

In practice, such means of mobilising authority are combined. For example, it may be impossible to bring together *all* expert views in a review process, perhaps because their number is too large or because the very definition of who is and is not accepted as a relevant expert is contested. Expert consensus is then often replaced with agreement among all ‘relevant’ experts, or all ‘certified’ experts, brought together in an authoritative organisation such as occupied by most academies of science in the West.

Review activities are generally considered successful when they establish what is accepted knowledge beyond significant contestation. In this sense – and with some exaggeration – silence is the success indicator of review tasks. However, convincing or silencing all contestation is exceptional, especially since review processes are typically organised when disagreement has become polarised. Resourceful losers of the review process may continue to mobilise additional research or counter-expertise to question the results of a widely accepted review, as has been the case with the questioning of the health hazards of smoking by the tobacco industry. Deeply committed dissenting experts may continue to gather arguments for their view. Therefore, it is not unusual for review activities to be repeated, for example in light of new evidence or continued dissent. Also, reviews may have to be updated because they are part of ongoing developments, such as environmental degradation, the state of the economy, or demographic developments.

The success of a review activity is a matter of finding a balance in several important tensions. A first is the establishment of an authoritative judgement versus the need to be inclusive, i.e. include all relevant knowledge and/or positions, for example in a controversy. This is a tension because it may seem easier to construct coherence and consensus by excluding more marginal positions in the short run, but this exclusion can undermine authority as the excluded voices continue to raise opposition.

A second tension that typically rules review activities is the one between policy relevant certainties and the uncertainties or esoteric results of research. Here too, climate change provides clear examples, where experts have to find ways of integrating a wide range of uncertainties and scenarios into concrete assessments that can form the basis for policy (Shackley and Wynne 1996).

### 2.3.2 Instrumental activities

Under instrumental activities, we group all those expert activities where experts apply relatively straightforward tools of the trade to answer specific policy requests for information. Instrumental tasks include measurements (e.g. sampling for soil pollution), the application of standard assessment methodology (e.g. environmental impact statements), and can even range to the implementation of policies with a highly technical content (e.g. routine toxicity evaluations or licensing).

Instrumental activities imply that expertise is relatively interchangeable: any qualified expert could perform these tasks. Engineering firms and consultants provide instrumental expertise. Evidently, the problem of who is a qualified expert is always present in the background and can be mobilised to question even routinised expertise (experimenters’ regress, see Collins 1985). Hence instrumental expertise frequently relies on certification of experts (through training, professional certification, or quality labels), or the protocolisation or standardisation of expertise (certified methodology, manuals, standardised measurement techniques, etc) (Halffman 2003).

Not all actors may agree that particular forms of instrumental expertise are the correct way to organise the production of expert advice. For example, environmental groups may claim that the assessment of environmental hazards of chemicals should rely more on precaution than on risk assessment methodology. A classic case where the instrumentalisation of risk assessment failed was nuclear energy, where some opponents argued that a range of side effects were systematically ignored in risk calculations, such as the effects of low-level radiation exposure, the centralisation of energy production, or unrealistic waste disposal scenarios. This type of dissent typically questions the problem frame within which instrumental expertise operates. Nevertheless, with or without general consent, instrumental activities make up the bulk of expert advice to policy makers.

Success criteria for instrumental expertise seem relatively simple: an answer to a technical problem as formulated by the client. Nevertheless, there are difficult tensions here too. The first concerns precisely the tension between keeping a problem tamed and sensitivity for alternative problem definitions. This implies that expert advice procedures have to include sensitivity for alternative problem definitions and unexpected side-effects, while still providing knowledge directly geared towards the production of a decision. If this fails, for example because of a controversy, then instrumental

expertise will cease to function, which implies that different formats for the organisation of expertise will have to be found (e.g. returning to review activities).

A second tension, closely related to the first, is that instrumental expertise has to find a balance between standardisation of procedures and professional judgement. In the controlled environment of a laboratory or a chemical plant, conditions may be sufficiently stable to rely on highly routinised assessments, but outside of such controlled environments, human judgement based on experience, training, and moral responsibility will remain important. In extreme cases, this could imply that the immediate usefulness of the advice is sacrificed in favour of precaution. No quality criteria for expert advice should eradicate space for pragmatic judgement concerning unexpected outcomes or surprise (Perrow 1999).

### 2.3.3 Mediation activities

Under mediation, we understand the specific set of activities experts perform when they clarify positions in societal conflict and/or attempt to find creative ways forward. Rather than to provide or assess knowledge, experts then elicit position, clarify points of view, look for common ground or possible alliances. This may be based on their knowledge of a certain policy domain, but some experts also specialise in mediation as such, as is the case with professional facilitators. A key difference with review tasks is that in mediation a sharp and a priori distinction between lay and expert or science and politics is downplayed, in order to focus on differing problem definitions or issues of trust. Mediation can imply assisting formal negotiations, but also much more informal activities, such as bringing actors together or fostering contacts. Mediation may not be the most common activities one thinks of in association with experts, but it is nevertheless an important category, albeit in specific circumstances. The clearest examples of expert mediation activities can be found in constructive technology assessment exercises in wicked policy problems such as pesticide policy (Groenewegen, Reijnen and van Rijn 1996) or genetically modified organisms (Van den Daele 1995; Bal 1998).

Experts are typically able to perform mediations when actors involved accept them as competent and neutral. Competence does not have to imply omniscience, as experts can suggest consultation of other more specialised sources of expertise as part of their mediating role. Neutrality can be established in various ways, but a classic one is to claim an academic status with no direct interests in either position, or at least a history of well-reasoned positions that have not systematically sided with one of the actors.

Success of mediation can also be positioned in the difficult tension between opposing demands. The most obvious tension is that between neutrality and involvement. To claim competence, an expert must have relevant experience, but frequently this implies a history of contacts with the actors in the disagreement. Actors not involved in the mediation effort may even come to

see the expert as tainted by the very involvement in the mediation and the commitment to the framing of the particular mediation effort this implies.

Second, and similar to review tasks, the problem of exclusion versus inclusion occurs here too. Mediation activities may lead to agreement, but at the expense of the exclusion of stubborn dissenters. This can imply that resolution of the conflict at hand is actually spurious and may turn out to have failed as soon as opposition resurfaces from outside the circle of mediation parties.

### 2.3.4 Advocacy activities

When experts undertake advocacy activities, they provide arguments, data, or strategic options for a particular cause, either in the media or a public forum, or behind the scenes in close cooperation with a policy actor. Advocacy implies that experts take sides with a cause or an actor in a policy field. We can think of experts who have strong affiliations with NGOs, such as environmental movements or unions, but affiliations with far more resourceful actors from industry are probably more common (Krimsky 2003). Sometimes experts precede the formation of NGOs or social movements, such as when they alert governments of new problems and try to push these up on the political agenda, possibly even setting up NGOs themselves. Many prominent environmentalists of the 1950s and 1960s were experts performing advocacy, such as the American pesticide pioneer Rachel Carson (Carson 1962; McCay 1993). The end of the nineteenth century saw hygienists on the barricades for public health (Hamlin 1990). Albert Einstein became an advocate of disarmament (Einstein 1954), and we can still find activist scientists in the news every day. They argue for better warning systems for natural disasters, the preservation of botanic collections, or the increase of bird flu vaccine stocks.

It would be wrong to assume that government agencies are always the *target* of advocacy. Experts can also perform advocacy *for* government, for example by publicly defending policy plans or even by representing governments in international negotiations. Especially in policy fields of a highly technical or specialised nature, it is not uncommon for experts to sit at the negotiation table defending a national interest. The European Union is rife with committees of experts that are expected to present national interests in light of what is considered the state of expert knowledge, for example in veterinary medicine.

The problematic and perspectival nature of expert advice's success is most clear here, as the successful promotion of a cause to the top of the policy agenda generally implies that other causes receive less attention and most likely also less resources. Success in expert advocacy therefore often means success for some of the actors and failure for others, or one cause pushed up the agenda at the expense of another.



A second complication is that scientists tend to be advocates for their own research as well as for the cause they have affiliated with. Knowingly or unknowingly, experts then serve more than one master, not only in competition with other causes on the political agenda, but also in competition for research funding with other experts. The effect can be observed most clearly in the medical sector, where researchers sometimes manage to increase their research budgets by allying with patient groups or industry (Moynihan 2005).

To the extent that one could indicate success here, it would have to be located in a change of political agendas or policies, but obviously competing causes will not agree that the success of their opponent is desirable. Other success criteria involve the tension between supporting a cause and faithfulness to professional standards. Advocacy experts tend to generate a lot of enemies among their peers, who typically question their credentials, integrity, or their tendency to over-stretch their expertise beyond their professional jurisdiction.

### 2.3.5 Reflective activities

Reflection involves interpretation, typically somewhat distant from the day-to-day practice of policy. This kind of expert activities addresses questions such as: what is going on in this policy field? Where are we going? Reflective activities typically involve the writing of essays and books, public lectures, or comments in the media. One case of reflection is the analysis of changes of the research system from 'mode 1' to 'mode 2' (Gibbons 1994; Nowotny, Scott and Gibbons 2001; Shinn 2002; Nowotny, Scott and Gibbons 2003; Pestre 2003). Another one is Beck's 'Risk Society' (Beck 1992 (1986)). As part of the specific interpretations proposed in such analyses, reflective experts can suggest strategies or identify goals for future policies, or even redefine what policy should be. Empirical information and systematic analysis may be part of the final product, but the focus will be on interpretation, even creativity or imagination.

Reflective experts are often academics, but think tanks also typically perform reflexive tasks (Stone 1996), such as the UK think tank Demos, as it tries to identify trends in society, as well as suggest how these should be addressed (e.g. Leadbeater and Miller 2004). A specific form of reflexive expertise is presented by so-called strategic learning, mobilising knowledge about the future, and of future options for action in the form of mainly qualitative scenarios (Schwartz 1996 (1991)).

Reflective expertise is, by its nature, variable and unregimented. It can be offered spontaneously, be commissioned, or be a side product of another type of expert task, such as advocacy or instrumental expertise. Its effects are typically unpredictable and erratic, may be delayed or work in unexpected places. For example, when the Canadian government commissioned a report reflecting on the strategic options for communication policy in 1979, it had no

idea that Lyotard would produce a book that would become a key text in post-modern thinking, with policy consequences that only became tangible after the commercialisation of the Internet towards the end of the nineties (Lyotard 1992 (1979)).

The variety of forms of reflective expertise, as well as its unpredictability, makes it hard to identify success. Once again, there are opposing criteria for quality of reflexive expertise. On the one hand, it needs to resonate with ongoing debates, contribute to actual problems to be more than merely an academic reflection. At the same time, it needs to be careful and systematic, maintaining some degree of distance from the vagaries and illusions of politics. Reflective experts are criticised for being to generalising, for lacking systematic empiric foundations for their conjectures, for being overly ideological, or too involved with their media attention. At the same time, it is their ability to look beyond detail and chewed-out fact, to have vision, and to communicate that allows them to present versatile new interpretations of the world.

### 2.3.6 Overview

Notions of success have to start from the variety of activities contained under the label of expert policy advice (see table 2-1 for an overview). Measurement of success in terms of short-term policy uptake threatens to squeeze expertise into one specific set of instrumental activities, which undermines the vitality of expert contribution to policy formation. Furthermore, such measurements will have to take account of the tensions that are confronted in expert tasks described above.

Additional complication arises from the combination of activities in specific products of expert advice. For example, a group of experts may manage to channel advocacy for their research field into a review report, typically in the 'needs for further research' at the end of a report but maybe also in the fundamental redefinition of a problem area, advocating specific fields of expertise. A review process may serve an instrumental purpose in policy, for example the delay of policy or the closure of debate. Advocacy can take the form of reflection, for example when environmental scientists form comprehensive intellectual frameworks to both grasp environmental degradation and push it higher on the political agenda.

Mismatches between task conceptions occur frequently. Experts may reject instrumental tasks, on the grounds that they feel abused or that the problem is wrongly defined. In such cases, the policy maker may expect a specific product with direct utility, but actually receive a critical reflection on the premises of policy.

Tasks	Activities	Typical questions	Typical formats
Review	Integrate findings, overview, assess overall state of knowledge, identify common denominator and unknowns	What is the state of knowledge? What do we know about X?	Councils of prominent scientists. (Health Council, National Academy of Science)
Instrumental	Measure, apply methods, tools, implement, provide data	How much is X?	Engineering firms, consultants, contract research
Mediation	Facilitate, support negotiations, interpret positions, bring actors and/or views together	How can we resolve this controversy?	Workshops, meetings, e.g. in constructive technology assessment
Advocacy	Defend, argue, provide arguments, promote issues, take sides	Why is this policy not sound?	Concerned or activist scientists, possibly affiliated with an actor.
Reflect	Interpret, identification of overarching goals and strategies	What is going on? Where do we go from here?	Public statements, books, public intellectual.

Table 2-1 Overview of expert tasks

Measurement of the uptake of expertise, such as in terms of ‘impact’, fails to address the diversity of tasks, the tensions in each of these tasks, as well as complications due to the identification of what kind of expert tasks are at hand. However, we do not want to suggest that any kind of evaluation of expertise is impossible. In order to proceed we need to have a closer look at the reasons for evaluation. Why is success such an issue? What do we want to define and measure success *for*?

## 2.4 Why measure success of science advice?

Policy evaluation of science advice can serve various questions. First, it can serve management purposes for the providers of advice: is the advice giving process well organised or can improvements be made? This is relevant for an advisory council, or a consultancy firm. Second, the question is relevant for the management of the department under which advisory bodies resort. For example, in the Netherlands the responsibility for the strategic advisory councils is shared between the sector department for budget and programming (e.g. the General Energy Council resorted under the Ministry of Economic Affairs) and the Ministry of the Interior for overall periodic evaluation, as part of the evaluation of the overall advisory system. The UK has a similarly shared responsibility. Third, there is the more political purpose of justification and legitimation of public expenditure. Depending on the purpose of the process, evaluation needs to take a different form and measure different things.

### 2.4.1 For the production management of advice

For the management of an organisation that produces expert advice, performance measurement is relevant only in as far as the organisation can actually manage the process, i.e. the aspects that are within its sphere of control. Evaluation is then a way to monitor past performance or to identify goals for the future. Parameters can pertain to the process or the product of advice. Examples of process parameters are: is our support staff working efficiently? Are our reports finished in a reasonable time frame? How much does it cost us to write an average report? With respect to the product: is our client satisfied? Does an external review by our peers confirm the quality of our advice? Evidently, the concrete form of these questions will differ radically depending on whether we are talking about a statutory advisory council or a consulting firm, where there is always the profit rate as an important parameter.

On this level, the negative effects of a fixation on impact as success measurement are most obvious. If wide visibility and citing of a report were to be the prominent target, then it would make most sense to invest heavily in a strong media strategy based on snappy sound bites, at the expense of the quality of the advice. A clever media strategy may be important for some advisory councils that have review tasks in public controversies or for experts in an advocacy role, but it should not become more important than the advice and the quality of the arguments itself.

Improvement on this level has most to gain from learning processes, at best based on management information that can be collected without excessive expenditure. Such learning processes can stem from comparison over time (e.g.: are we getting the cost of our reports under control?) or from learning from similar organisations, either in the same country or in a similar policy sector abroad. In our opinion, especially learning from other organisations is an important and presently much under-utilised resource.

Detailed and meticulous measurement of performance, such as in impact measurement, would be in itself a very expensive way to improve very little. In most cases, the staff supporting the production of a report will have a fairly good idea of where a report is being read, provided the management of feedback and questions is organised properly. More improvement can be achieved by stimulated learning: from success, from failure, from reflection, review and discussion groups, or from periodic external review. Detailed success criteria run the risk of distracting from obvious improvement, distorting the complexity and idiosyncrasy of advice, while costing a considerable amount of money to be even remotely reliable. Only in specific cases of highly instrumentalised expertise can relatively simple and quantifiable success criteria be identified, and even then at risk of distorting the professional quality of the work involved.

### 2.4.2 For the external management of the advisory process

From the point of view of the top of a government department, it is tempting to think of the management of science advice as an optimisation problem. Would it make more sense to invest more in science advice to improve policy, or can we do with a few reports a year less? Unfortunately, the effect of more or less research on the quality of policy is very hard to establish, precisely because the tasks performed by experts are so varied and because the interaction with policy makers can follow different patterns.

Once again, the human actors involved in this process prove to be the most reliable assessors of quality, although their biases and positions will skew the information. Are the civil servants satisfied with the quality of advice? Is their dissatisfaction caused by the critical nature of the advice? Perhaps it is the civil servants themselves that are systematically under-achieving, while the advisory council is performing its role of an annoying but useful watchdog. What do the peers of the advisory committee think? And what of other actors involved in a policy sector? Impact scores lead to complacent advisory structures that tell policy makers what they want to hear, preferably in a usefully condensed and snappy executive summary.

From the point of view of an effective policy making system (which is not necessarily synonymous with the point of view of the executive), it is important to maintain a varied and healthy advisory system. This implies advice that is directly useful and instrumental, as well as advice that is stubborn and contrary. Decisions over where budgets for advisory structures should be extended and where cut go far beyond impact measurement and optimisation problems, into vision and wisdom of the policy maker.

Rather than to aim for optimisation, evaluation of advisory structures should therefore focus on learning from mistakes and the identification of shortcomings. The UK science advisory system was revised and much improved not by measuring what kind of advice was utilised, but by learning from the blunders of the BSE crisis (Freedom of Information Act 2000; House of Commons 2000; UK Government 2001; UK Government 2005).

### 2.4.3 For political justification and legitimization.

From the point of view of political legitimization and justification of advisory expenses, there is an obvious need to have a sense of which expenses on expert advice are sound. At the same time, it is much easier to question expenditure by comparing expenditure in different policy fields irrespective of misleading impact measures. In addition, the view of expert advice as a mere element of cost in public spending misses the essential political quality of expertise. Experts can be on top of an underachieving department, can be critical, can keep issues on the political agenda, or issues can be moved down the political agenda by reducing resources for an advisory council. These are political choices for which political representatives are accountable. Hiding them behind the rhetoric of optimisation does not support an accountable

government, but hides it behind a smokescreen of seemingly neutral and self-evident public 'management'.

## 2.5 Main arguments

This chapter has argued the following points:

1. An attempt to define success criteria for expertise has to depart from the diversity of activities entailed under the heading of 'expert advice'. Attempts to measure short-term uptake of advice as a performance indicator (provided the quagmire of operationalising knowledge uptake) will lead to a bias in favour of instrumental advisory activities and in general push expertise towards a more obedient position towards its principal. This comes at the expense of other vital activities, such as reflection on policy assumptions or bringing bad news.
2. It is important to define the purpose of evaluations of advisory bodies, as evaluation can take very different forms depending on the purpose. Such purposes include: improving the management of the production of advice, political justification and legitimization of expenses for advisory bodies, improving the advisory system as a whole.
3. Evaluation of specific bodies in an advisory system should keep an eye on a sound diversity of expert activities in a sector. Even though specific expert institutes may be pushed towards one specific type of activities, it is wise to make sure the full range of RIMAR expert activities are available, if not all at the same level.
4. For the evaluation of expert advice, it makes more sense to learn from mistakes rather than to aim for optimisation. This is an argument in favour of interaction and exchange of experiences between experts and advisory institutes.
5. Evaluation itself is a form of expertise: Applying our range of expert tasks, there is no reason to assume that evaluation research always has to be of an instrumental nature. In fact, we have suggested that improvement in the advisory sector can come from learning from mistakes and similar organizations elsewhere (typically through reflection or through a review of best practices), or through constructive dialogue in times of crisis (where evaluation could acquire aspects of mediation), and even through the criticism of advocacy experts.

I will return to some of these arguments in the conclusions, when they can be confronted with the empirical materials presented in the following chapters. The aim for these empirical chapters is to show the variety of expert activities in action, in the context of particular patterns of organising expertise. This descriptive research question is followed by a more evaluative one that focuses on how these patterns work out in terms of values, plural kinds of knowledge, uncertainties, institutional design issues, policy learning, and trust.

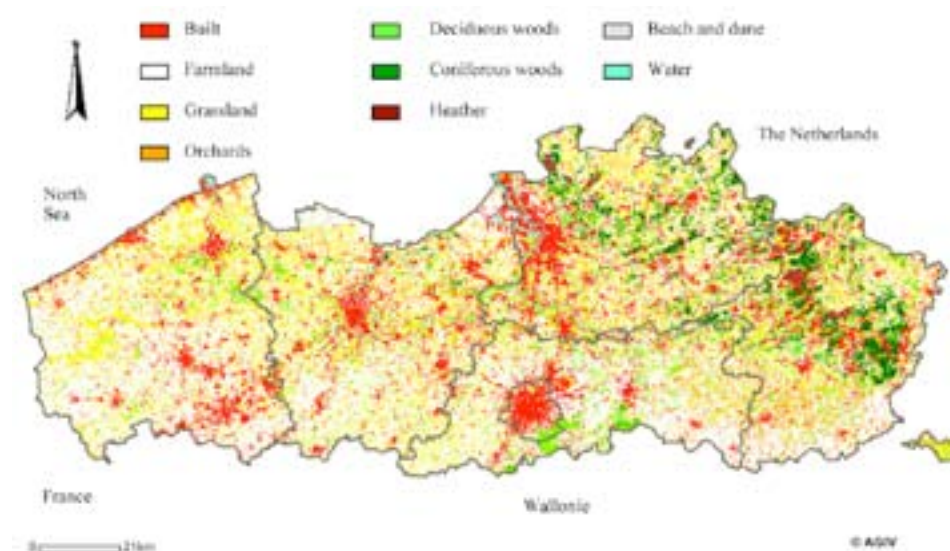
### 3 Nature reports in Flanders

#### 3.1 Nature conservation in Flanders

##### 3.1.1 Policies

Flanders, the Dutch-speaking northern region of Belgium, is one of the most densely populated areas in Europe: 450 inhabitants per square kilometre.<sup>5</sup> The pressure on land use is high, through both industrial and population expansion, putting both nature and agriculture under stress. Between 1980 and 2003, the built up area expanded from 18% to 25%, at the expense of agricultural land (69% to 62%). The remaining area, forest, 'nature' and water, fluctuates around 13%. Not all of this open space has high values from a conservation point of view, as much of the countryside is used for intensive agriculture (www.natuurpunt.be, De Blust 2004).

Nature and forest reserves make up 2.4% of the region's surface of 317 km<sup>2</sup>. However, land use in Flanders is very dispersed and nature reserves too are scattered and small (see Figure 3-1): the region has 928 reserves, with an average size of about 34 hectares. A third are smaller than 5 hectares, the size of about seven soccer fields (www.inbo.be, 2006). Even though the space reserved for nature is growing steadily every year and even though there is a lot of valuable nature outside of these reserves, the constraints are considerable (Loots and Leroy 2001).



<sup>5</sup> Data 2006 (www.statbel.fgov.be); after the Netherlands (483 inhabitants/km<sup>2</sup>, 2006) and Malta; the density for EU (2003) is 116 inhabitants/km<sup>2</sup> (www.cbs.nl).



Figure 3-1 Land cover in Flanders (adapted from *geo-vlaanderen.agiv.be*)

Protecting special areas and nature reserves was one of original pillars of nature conservation policy in Flanders, together with the protection of species, such as through 'red lists' or hunt restrictions. Given the sharp competition over fragmented land, much of the activism of conservationists of the 1970s and 80s was cast in terms of land use policy, trying to ward off encroaching real estate development or municipal industrial zones by either pressurising government to create nature reserves or by acquiring land for conservation themselves. On paper, every bit of land in Flanders is categorised for a particular use in detailed regional plans (*Gewestplan, Ruimtelijke Uitvoeringsplannen*), framed in a comprehensive plan for Flanders (*Ruimtelijk Structuurplan Vlaanderen*), including some 20% with some form of nature value. However, in practice, the regional plans have been embattled and have in the past often lost nature to holiday homes, building allotment and industrial expansion. Since re-zoning can radically alter the value of land, the precise label of a zone can become a major issue, for example when retiring farmers hope to turn their land into building plots. With the high pressure on land use, it is not surprising that most of the areas left for nature are the ones that were either too wet or too dry for agriculture. Other important sources of conservation areas are former military exercise grounds, publicly owned forests or castle grounds, and crown lands (Loots and Leroy 2001; De Blust 2004).

Since the 1990s, nature conservation policy has tried to move beyond the policies protecting specific valuable plots of land and threatened species. After institutionalising initially as a separate policy field, nature conservation policy gradually became more integrated with land use policy and environmental protection, in more encompassing policy approaches. There was increasing attention for the important and unique ecosystems on cultured land, intricately connected to a long history of human intervention. Given the limitations and the presence of valuable nature in cultured land, area-based conservation policies hesitantly tried to identify multiple uses of land, for example as agricultural land with nature value or nature with recreational use. Management agreements have to guarantee nature values for such areas. However, especially the combination with agriculture has had limited success, in a policy field where tensions between nature conservationists and farmers organisations are often polarised (De Blust 2004; Bogaert 2004; Bogaert and Leroy 2004).

Another attempt to move conservation policy beyond the protection of small ecological treasure isles was the idea of a green network, connecting isolated patches of nature to an interconnected structure. The policy, first announced in 1995, was met with a lot of controversy and resistance from agriculture. After an initial failure, by 2003, the general layout of 86.000 ha of Flemish Ecological Network was established, to be implemented in regional nature plans. The network also implements the EU Bird and Habitat Directives,

which require member states to identify protection areas ('Nature 2000'). The ambitions of the Network go beyond the protection of disappearing valuable nature, but put conservation policy on the offensive as it tries to develop (new) nature, echoing similar approaches all over Europe (Van der Windt 1995; AMINAL 2004; Bogaert and Leroy 2004).

Lastly, conservation policy became increasingly linked to environmental policy, paying special attention to the physical disturbances and conditions of nature. Eutrophication had been an issue in the management of nature reserves, but some of the 'disturbances' as thematised in Flemish environmental policy, also entered conservation policy: pollution, low water levels, acidification, and manure depositions. Especially manure policy, cast in the regulatory framework of the European Union, brought conservation policy to head-on conflict with agriculture, as government tried to not only set general nitrate norms, but also more strict local norms in nature conservation areas (Kuijken, Boeye, De Bruyn, et al. 2001).

A turning point for nature policy was 1990, when the responsible Minister at the time initiated a series of comprehensive environmental plans, including the development of nature, inspired by the Dutch Nature Policy Plan. These plans were ambitious and innovative, but often lacked timely legal instruments, creating a wave of new but informal and hence sometimes confusing initiatives. These initiatives brought new actors to the realm of environmental policy, actors who previously did not have a conscious role in nature conservation policy, such as municipalities, farmers, recreation companies, or heritage organisations. The new integrated nature policies affected these new actors and in some cases expected new initiatives from them, but did not manage to accommodate conflicts. Protest of actors who found that their views were not accommodated in these new plans, including the fierce and in a few cases even violent actions of farmers during 1993, lead to the failure of the first plans for a green network, a failure that became a strong symbol of how not to make nature conservation policy in Flanders (Bogaert 2004; Bogaert and Leroy 2004).

Integrated nature conservation policy made a new start after 1995 with legally defined mandates, in which environmental policy as a whole was cast in a cycle of policy planning and reporting. Part of the new start was a painstakingly created compromise specifically with agriculture, such as over the Flemish Ecological Network. The network became more flexible, as new categories between complete conservation and other uses were defined, allowing for complex accommodations. The price paid for the conflicts of the early nineties was a more modest plan with a smaller area designated for nature conservation. After the conflict with agriculture was pacified, new conflicts with some of the other new actors followed, such as over illegal holiday homes in nature areas, but nature conservation policy reached a stage of stronger institutionalisation with expanding areas of protected nature (Bogaert and Leroy 2004; Leroy and Bogaert 2004).

Some progress has been made in the integration of nature conservation. Nevertheless, some of the tradition of protecting mono-functional valuable nature by shielding it off remains, is still present in the discourse, the policies and the kind of experts that support them, with a strong presence of biologists and natural scientists (Wiering, Crabbé, Leroy, et al. 2001, p. 111).

It is these developments that form the policy context of the nature reports that I will describe in more detail below. A central element of the policy context is the gradual development of an integrated conservation policy, against the background of high pressure on land use and heated conflict with especially agriculture, but also recreational users of nature. Nature conservation policy moved into a planning cycle, creating the basis and requirement for periodic reporting on the state of nature in the nature reports I will describe later. First, I will give an overview of some of the crucial actors in Flemish nature conservation policy and describe the advisory structures that were instrumental in the pacification of the conflict with agriculture. This will add another important element to the policy context of the nature reports: the predominantly corporatist structure of participation, that had difficulty accommodating resistance and participation of the wider range of new actors in nature conservation policy.

### 3.1.2 Key actors

Nature conservation policy in Flanders mainly resorts under the Administration of Environment, Nature, Land, and Water Management (Administratie Milieu-, Natuur-, Land- en Waterbeheer, AMINAL), part of the Department of Environment and Infrastructure. Along with many other policy areas, nature conservation policy was federalised in Belgium in the state reform of 1980, becoming the full responsibility of the Flemish government. In the past, nature conservation had been tightly linked to agricultural policy, but the fact that agriculture remained primarily a national responsibility until 2001 meant that a new integration of nature conservation, regional planning, and environmental policy became possible (Bogaert and Leroy 2004). Currently, the Flemish administration is going through an extensive reorganisation process, aiming for more efficient and rational government structures (*Beter Bestuurlijk Beleid*). One of the consequences of this reorganisation was the formation of an Agency for Forests and Nature, but during the period researched here, nature conservation was the responsibility of two subunits of AMINAL<sup>6</sup> for nature and forest. AMINAL is the main administration for nature conservation policy, although a series of other government agencies are involved in nature conservation, e.g. for environment, water or land management.

<sup>6</sup> AMINAL since 2006 is now part of the Environment, Nature and Energy Department. The Nature and Forestry Sections merged into the Agency for Nature and Forests. In the rest of this report, we will still use the word AMINAL, as the research has been carried out before the departmental reshuffle.

Ministers in the Flemish government have a portfolio of responsibilities. At the moment, the Environment, Nature and Energy Department is in the portfolio of the Minister for the Environment and Energy (2007). Because the various administrations are not tightly linked to each other, it is relatively easy for portfolios to be re-arranged during the formation of coalition governments and for politicians to keep a tight reign on a divided civil service. Unlike Northern European countries, the administration and its civil servants are relatively weak: the general direction of policies – and often even the details – are determined by the ‘cabinet’, a personal staff of the Minister, appointed by the Minister for the duration of his or her term only, consisting of about two dozen advisers. These are typically loyal supporters of the minister with specialised knowledge, often with a background in sector organisations or the administration, to advise the Minister on specific policy issues. When a new Minister comes into office, the top levels of the executive are therefore replaced completely. Since 2004, the Minister is Christian Democrat Kris Peeters, part of a broad coalition with liberal and social democratic parties in the Flemish government ([www.mina.be](http://www.mina.be)). His cabinet member responsible for environment comes out of the conservation sector and was formerly involved in the production of the Nature Reports (as head of the steering group).<sup>7</sup>

Nature and environment organisations in Flanders show the usual diversity, but what is particular about them is the fact that they have organised themselves as a sector, ready to provide representation in negotiations, be it for environmental policy or for collective salary negotiations in NGOs. Over 140 organisations, ranging from Flemish chapters of Greenpeace and WWF to local groups, have affiliated in an umbrella organisation, the Flemish Union for a Better Environment (BBL, *Bond Beter Leefmilieu Vlaanderen*). In spite of its heterogeneity and tensions, between progressive and conservative, between nature conservation and environment, this NGO represents nature and environmental concerns in dozens of governmental and non-governmental committees and supports its member organisations administratively ([www.bblv.be](http://www.bblv.be), Bond Beter Leefmilieu Vlaanderen 2005).

Among nature conservation organisations in Flanders, a key BBL member is *Natuurpunt* (“Nature Point”), a conglomeration of the major birding and conservation NGOs that manage nature reserves, created in 2002, currently claiming a membership of 57.000. The organisation manages 11.000 ha of nature reserves, which its parent organisations started to acquire in the early fifties. A large section of the activities of the organisation concern the management of these reserves, involving considerable amounts of volunteer work of its members, ranging from cleaning refuse to cutting reeds, polling willows or planting trees. *Natuurpunt* has a large and active network of very motivated volunteers and with its network actually makes its own policy for

<sup>7</sup> Since July 2004, Hilde Crevits is the Minister for the Environment and Energy in the Flemish Government.



its reserves and generates knowledge to manage these reserves. Its 150 local chapters and working groups are active in nature study, such as bird watching or the organisation of guided tours. Some of these working groups play a key role in the study of nature, acting as knowledge centres for taxonomical identification and the registration of species distribution. Local groups are also active in local policy issues and are represented on local advisory boards. The national policy division acts as a lobby group, represents nature conservation interests in Flemish policy circles and advisory boards, and supports policy work of local groups. (www.natuurpunt.be, Wiering, Crabbé, Leroy, et al. 2001, pp. 35-36)

BBL and *Natuurpunt* together represent virtually the entire environmental movement in Flanders, with BBL covering the environment and *Natuurpunt* specifically nature conservation interests, including some of the more traditional and even conservative elements of the movement. Both organisations have become an important source of input and political support for government in making environmental policy and especially so for nature conservation. When conservation policy initiated its ambitious phase of integrated policy plans in 1990, the minister of environment relied heavily on both organisations<sup>8</sup> for support and for knowledge to draw up ‘nature development plans’. The active policy engagement (rather than activism from outside) was rewarded with financial support from government to develop nature conservation policies and the recognition that these were to become the representatives of the environmental movement, represented on the new advisory council for the environment. With the new resources, these organisations grew and professionalised throughout the 1990s. By 2002, *Natuurpunt* employed just under 200 people, mostly through alternative employment schemes (Bogaert 2004, pp. 102 et seq., 138).

A formidable adversary of the nature organisations is the Flemish Farmers’ Union (*Boerenbond*), an organisation encompassing virtually every aspect of farming and even of rural life in general. Important sections of the Union have roots in Catholic organisations that reach back over a century. To this day the links with the Flemish Christian Democrats are strong. At its core, the Union supports farmers with anything they could possibly need: from financial and legal advice, including in environmental affairs, to training and education, knowledge of new agricultural techniques, savings and loans through affiliated financial institutes, farm products through its own holding company, interest representation and lobbying as its key political activities, and even recreation. It has an extensive network of local and sector groups, including organisations for farmers’ women and young farmers and is affiliated with countryside organisations such as the Federation of Equestrian Sports.

A new alliance of the Farmers’ Union is that with the organisation that raised the 2003 protest against the Ecological Network, the Countryside Platform (*Platform Buitengebied*). The organisation has a similar constituency as the UK Countryside Alliance, perhaps internationally better known because of its vociferous defence of fox hunting: it brings together fishers, hunters, horse riders, heritage organisations, dog lovers, and other people whose recreation or lifestyle involves the countryside (www.platformbuitengebied.be).

The Environment and Nature Council (*Milieu- en Natuurraad van Vlaanderen, Minaraad* in short) advises government and the Flemish Parliament since 1991. These advises can be requested, but in many cases there is also an obligation to consult the Council. This is the case in major legal changes, but several laws require consultation of the Council as part of a planning cycle or even of licensing schemes. In addition, the Council has some capacity to undertake two or three minor research projects per year through its secretariat, consisting of a dozen supporting staff. The Council itself consists of representatives of various interests in environmental policy in general, complemented with a smaller group of experts without voting rights. A closer look at how the membership is distributed reveals the voices that count in this policy field. Of the 24 voting members, half come from nature and environment organizations (6 for *Natuurpunt* and 6 for BBL, see below). Another 6 members are reserved for the socio-economic partners, being the one for each of the major unions, one for employers, one for self-employed people, and one for the Farmers’ Union. Four members represent other specific councils, one each for forests, river fishing, hunting and nature.<sup>9</sup> The remaining two voting members, the chair and vice-chair, are appointed by government. Even though the seven experts are seen as neutral members, two of them are nominated by local government (municipalities and provinces). The Council can bring in additional experts, which it can do in preparatory working groups and hearings (Wiering, Crabbé, Leroy, et al. 2001; Bogaert 2004, pp. 108-110; Milieu- en Natuurraad van Vlaanderen 2006).

The Council therefore has clear corporatist characteristics: relevant interests are pre-defined, anchored in law, and covered by established and recognized spokespersons – even though some of these have entered the establishment only relatively recently. The arrival of the Countryside Platform on the scene is illustrating. The groups involved did not feel represented in the closed quarters of the corporatist negotiation platforms, not by the nature conservationists not by the agricultural lobby (Leroy and Bogaert 2004). However, the arrival of a new actor does not necessarily mean the end of corporatist structures, merely a possible need for a similar adaptation as to

<sup>8</sup> In 1990, the partner for conservation policy was Nature Reserves (Natuurrestaten), one of the two organisations that merged into *Natuurpunt*.

<sup>9</sup> Each of these areas have sector specific councils. The most relevant here is the High Council of Nature Conservation, installed in 1985, consisting of experts, but experts defined widely as both (academic) researchers (10 members) and nature conservationists (10 members from conservation NGOs), complemented with representatives from forestry, agriculture, hunting, river fishing and wildlife management. The council reflected the contemporary alliance between conservationists and researchers (Bogaert 2004, pp. 96-97).

the arrival of the environmental movement. The Countryside Platform is trying to find its way into advisory councils and into recognition through its alliance with the Farmers' Union.

The Environment and Nature Council offers a platform for generating agreement among the major established interests and an arena where the position of becoming established interest can be fought. Membership not only implies a formal position in policy and the right to be heard, but also a form of recognition that affects informal consultations. The platform is geared towards compromise and consensus, but not necessarily without conflict or hard bargaining. Minority positions in advice are not uncommon. As Pieter Leroy has argued, the possibilities for participation outside of these highly selective platforms are limited in Flemish nature conservation policy. He analysed the consultation process around the second attempt to introduce the Ecological Network, which was open to all citizens, managed by the Environment and Nature Council. The consultation showed all the voices that found no expression elsewhere, including from other government administrations, provinces, municipalities, land owners. It also showed all the unresolved issues, conflicts small and big, that could not be resolved in the limited capacity of the dominant policy making arenas (Leroy and Bogaert 2004). Even though institutions such as the Environment and Nature Council can potentially generate trust among representatives who meet on a regular basis and generate agreements that guarantee some sector commitment, they are not particularly flexible at accommodating new actors and new conflicts.

## 3.2 State of nature reports in Flanders

### 3.2.1 Nature Reports with authority

Every two years, the Research Institute of Nature and Forest (INBO, *Instituut voor Natuur – en Bosonderzoek*) produces a report on the state of nature in Flanders.<sup>10</sup> The bi-annual Nature Reports (NARA, *Natuurrapport*) present an overview of the condition of biodiversity and biotopes in Flanders, the effects of human disturbances, and the effects of nature conservation policies. NARA has become one of the main products of the Institute's policy advisory tasks and certainly the most visible one, receiving wide attention in the media as well as among actors in the nature conservation policy field. It complements the Environment Report (*Milieurapport, MIRA*) that started in 1994 and for which it now provides input. NARA follows the same model and the NARA team has learned a lot from the experiences of its environmental counterpart.

<sup>10</sup> To be precise, INBO has not actually produced a Nature Report yet, as the institute was only formed in the first half of 2006, in the same administrative reorganisation that also restructured AMINAL (the operation Beter Bestuurlijk Beleid) by bringing forest and nature together. The Nature Reports were produced by the nature-side of the institute, the Institute of Nature Conservation (Instituut voor Natuurbehoud, IN). The research was conducted before this reorganisation.

Since its first appearance in 1999 (Kuijken 1999), NARA has also become a central document in Flemish nature conservation policy. Its specific strength is that it provides authoritative data on which political negotiations and new conservation policies can be based. Some actors claim that the overall portrayal of the general state of nature in the NARA reports has a 'green bias'. Especially farming organisations and their traditional political ally, the Flemish Christian Democrats (CD&V), tend to be very sceptical of ecological data. Nevertheless, such criticism focuses on the evaluation of the state of nature, while the factual data of the report are apparently questioned very rarely, as was confirmed in various interviews, even at the cabinet of the Christian Democrat Minister of the Environment.

We know from extensive research on controversies over the use of scientific advice in policy making that polarised conflict tends to engender scepticism and that it leads opposing actors to mobilise resources to question the opponent's facts. Conflict over policy goals or priorities then frequently extends towards more technical issues such as the quality of data, the reliability of methodology, or the trustworthiness of researchers and their institutes. In light of such experience, the authoritative position of NARA is remarkable and calls for a closer look, starting with the institute that produces it.

### 3.2.2 Research Institute for Nature and Forest (INBO).

The Research Institute for Nature and Forest is a research institute of the Flemish government. It has a staff of about 270 people spread out over five places in Flanders and has its own laboratories, greenhouses, nurseries and fishponds. However, the headquarters of the organisation is an inconspicuous office in the rough south side of Brussels, where the major research assets are a library, a collection of databases, and a staff of about 130 people, mostly ecologists, but including librarians, lab technicians, and administrative personnel. The same building also houses the Environment and Nature Council. It is the seat of the former Institute of Nature Conservation, which was merged early 2006 with the Research Institute for Forestry and Wildlife.

An Institute of Nature Conservation was announced in the Law on Nature Conservation of 1973 as part of a more active Belgian nature conservation policy, but this part of the Law was not implemented until after the federalisation. The Institute was set up in 1985 and since 1986 it has advised the Flemish government on nature conservation policy. Among its first areas of operation was the controversial Ecological Network, cooperating on the developments of a map of the network. Its director, Eckhart Kuijken, was an ecologist with a passion for conservation who was the chairman of the Nature Reserves NGO. He is a highly respected and visible figure in the nature conservation world and has lead the Institute ever since (De Rijck 2006). The Institute embodied the strong connections between ecologists and conservationists and had an activist profile. Although the Institute now tries to maintain a more neutral position, especially with a eye on its policy work,

the connections with conservationists are still strong and in fact, as we shall see, essential for its operation (Wiering, Crabbé, Leroy, et al. 2001; Bogaert 2004, p. 105).

Research and expertise at the Institute focus on ecology, both aquatic and terrestrial. Due to the recent merger, the structure has not entirely settled, but a brief look at the structure of the Institute for Nature Conservation, one of the parent organisations, clarifies how research is organised. The groups were:

1. Ecotypology and biological mapping. The group gathers field data in order to develop typologies of ecological units, connecting ecological communities (specifically flora) to abiotic and landscape ecological data. The work is coordinated with similar efforts in the Netherlands.<sup>11</sup> This results in ecological indicators and monitoring schemes, as well as maps indicating the 'value' of local nature, products that become input for the annual Nature Report.
2. Ecohydrology and water systems. This group analyses how characteristics of water systems influence the biotic system, in order to provide information for integrated water management, including ecological restoration projects.
3. Landscape ecology and nature management. This group, the smallest of the six, works on topics such as habitat classification, grazing effects and human impact on landscapes.
4. Nature development and policy. The group supports regional nature policy (*natuurgericht beleid*), e.g. in formulating area-specific goals for nature conservation and suggesting means to achieve these goals, as well as indicators to monitor goal achievement. Together with the Nature report group, this is one of the two 'horizontal' groups, i.e. one of the two groups that integrate research from the first three in order to package knowledge in a format that fits policy programmes. In order to guarantee good cooperation with the 'client', the unit maintains close contact with various government departments, including local authorities such as provinces. This cooperation is talked about as a 'partnership'.
5. Nature report. This group prepares the annual nature report and is also a 'horizontal group'.
6. Population and distribution ecology. This group studies the ecology of specific species or taxonomic groups. It includes highly specialised researchers and maintains close contacts with amateur biology groups for monitoring species distribution. The research is relevant for monitoring biodiversity, species-specific protection plans, but also for the development of bio-indicators. The institute provides detailed distribution information via its web page, for example on butterflies, ladybirds, or reptiles and amphibians, as well as counting and reporting methodologies.

The structure is likely to change as a consequence of the recent reorganisation, accommodating forestry, wildlife management, and freshwater fishery researchers. Nevertheless, as becomes clear from this overview, the research is largely organised along lines that are relevant and meaningful from the perspective of ecology as a discipline, but has built at least two units 'across' these divisions based on the definition of two policy fields most important for its work (Instituut voor Natuurbehoud 2004a; Instituut voor Natuurbehoud 2005a).

INBO has a central position in nature conservation research in Flanders. It not only coordinates data collection, but also performs research and cooperates with researchers throughout the sector. It also has the position of a knowledge broker between NGOs, policy, and universities. Apart from the NARA reports, the policy group at the institute also responds to ad hoc questions from the administration, although the policy work does concentrate around NARA (Wiering, Crabbé, Leroy, et al. 2001; Milieu- en Natuurraad van Vlaanderen 2003)

### 3.2.3 The Nature Reports

The team that produces NARA is a group of nine people, adding up to seven full-time equivalents, of which 5 fte in biology and one in social and economic sciences (NARA-team 2006b). This may seem small, but the report is produced with the help of hundreds of volunteers. These are people from other groups at the Institute, from related institutes, from universities, NGOs, and various branches of government. These people cooperate on chapters, review texts, or even write entire chapters of the report, largely on a voluntary basis. The NARA team is in control and writes or at least edits the texts for the report. Every chapter of the report falls under the responsibility of a team member, but the number of people involved in the report adds up to

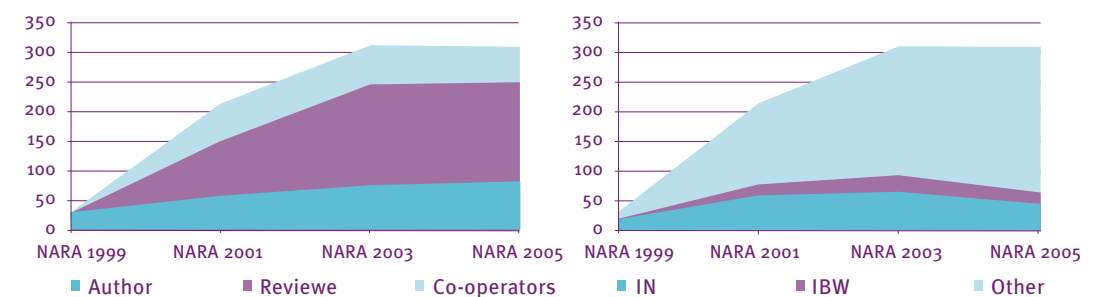


Figure 3-2 Number of people involved in NARA, as authors, reviewers and co-operators (left) and according to affiliation (right, where IN and IBW are the institute's own researchers). (Adapted INBO graphs, which may include some double counts (Instituut voor Natuurbehoud 2005a, p. 122))

<sup>11</sup> <http://www.synbiosys.alterra.nl/ecotopen/>

more than three hundred (see figure).<sup>12</sup> The large majority of the external involvement is as reviewer and in smaller numbers co-operator (i.e. providing information, data, or other input into a chapter). The most recent two NARA reports consist of about forty chapters with one to ten authors and about five, sometimes up to ten reviewers. More than eight out of ten of the authors have a background in biology, nine out of ten in natural sciences (NARA-team 2006b).

Although the network of participants in the production of NARA is extensive, with very few exceptions they come out of the Flemish nature sector, be it NGOs, administration or universities. One of the exceptions includes a representative of a hunters' organisation and two members of the administration of agriculture. In 2005, three more people from public research institutes linked to agriculture reviewed some chapters. Although nature conservation and environmental NGOs are asked to comment, there are no comments of, for example, the Farmers Union or federations of industry. Apparently, the construction of broad support for the NARA report is first and foremost a matter of consensus in the nature conservation sector, with a few extensions to researchers and civil servants in agriculture and to hunters. Nevertheless, the process is clearly described in public documents and there is a permanent invitation to cooperate on the text in the NARA scenario, available on the INBO website (Dumortier, De Bruyn, Peymen, et al. 2003; Dumortier, De Bruyn, Hens, et al. 2005; Nara-team 2006a).

Overseeing the activities of NARA is a steering group that makes strategic choices for the report with an eye on policy uses and facilitates the use and support of the report. The group has 25 members, several of which re-appear in the report as reviewers. The group is composed of members of various parts of the administration (mostly AMINAL, but also one person from agriculture), several members of the Institute, including the director, representatives of advisory committees and coordinating bodies (such as the Minaraad), and a representative of the Nature Point NGO. Since 2004, there is also a wider feedback group (*klankbordgroep*) of interested people, who can simply subscribe to an e-mail list, follow the planning stages of NARA, receive all the information that the steering group receives, and mail comments to the NARA team. The team encourages people to become a member of the feedback group and tries to spread membership over administration, scientists and societal organisations. From this address file too chapter reviewers can be drawn (www.inbo.be, Instituut voor Natuurbehoud 2004c; Instituut voor Natuurbehoud 2005b).

The wide range of participants is a conscious attempt to establish a 'strong' assessment of the state of nature, later embedded in the legal mandate.

<sup>12</sup> An analysis of the authors listed at every chapter of the NARA 2003 shows that about a third of the authors come from the NARA team. With a few exceptions, there is an author of the team on every chapter. Two thirds of the authors come from the INBO institutes and about one fifth of authors work at universities, the rest come mostly from government agencies and the administration (Dumortier, De Bruyn, Peymen, et al. 2003).

The review of data is extended beyond scientists to specialists in the administration and societal groups to foster commitment to the assessments and prevent later questioning. The team leader of the parallel state of environment report in an published magazine interview:

*"Reviewers from societal groups make the reports so much stronger. So many people who cooperate on them, that means the reports are supported even more, enforces their credibility and reliability."*  
(Anon. 2005)

The NARA reports present concise overviews of key issues for conservation policy. For example, it has an analysis of how various species are doing, of various biotopes (e.g. swamps or forests), of specific areas (coastal, rivers), of environmental pressure (manure, pollution), sustainable use of natural resources, protection measures, and society (education and social support for nature protection). The sections largely correspond to the structure of the Nature Policy Plan, the document that integrates Flemish conservation policies, although the biannual pace of NARA does not integrate well with the five-year policy cycle of the Nature Policy Plan. Each of the chapters has graphs and maps that the authors consider revealing or that contain established indicators, typically with evolutions over time, which are then discussed. This can be development of rare species over time, the deposition of nitrates, or the surface of land to become part of the Ecological Network.

Since 2005, based on an evaluation of the 2003 report, the report becomes more systematically evaluative of policy: each subject in the report gets a series of indicators which allows the reader to establish at a glance whether policy targets are met or not, symbolised by smileys (see Figure 2-3). Every chapter starts with an overview of the key indicators, to get an impression of how developments are going in this particular field in one glance. In this sense, NARA does not provide a full-fledged policy evaluation, but an assessment of target achievement. With the inclusion of these indicators, the policy assessment aspect of the NARA reports becomes stronger, in addition to the 'state of nature' character. This policy assessment includes an aspect of prediction, as some indicators assess whether policy targets will be met in the near future.

The Institute uses the DPSIR scheme developed by the European Environment Agency and Eurostat (and based on older versions of the OECD) to structure these indicators, and to structure the report. DPSIR stands for the Driving forces behind stress on nature, such as climate change or human development; Pressure on nature caused by these driving forces, such as acidification; State of the environment, such as the condition of the habitat of organisms; Impact of these changes on organisms; and Response of government and society to these changes. The same scheme is also used for policy evaluation and to systematise the various components where policy intervention is possible (Dumortier, De Bruyn, Hens, et al. 2005, pp.



22-35). Since 2005, the indicators can also be consulted independently of the report through a website, where they become available as they are updated. Users can even be alerted by e-mail when relevant data is updated ([www.natuurindicatoren.be](http://www.natuurindicatoren.be)).<sup>13</sup>

The indicators have been developed in the institute and submitted through the NARA review scheme. The introduction to NARA 2005 clearly links the development of the indicators to notions of new public management and performance indicators and includes a discussion of the problem of validity of indicators and the risk of perverse effects. Some of the indicators are clearly connected to policies, using explicit policy targets to assess whether policy is on track or not. For example, annual nature policy plans (*Milieujaarprogramma's*) of 2003-2005 set the target for recognition of nature reserves managed by NGOs at 1000 hectares per year, a policy target that could be used as an indicator. When in 2005 the indicator pointed at 800 hectares of newly recognised NGO nature reserves, the policy target for the consecutive years was set at 750 hectares. For other indicators, some extra translations need to be made. For example, NARA 2005 includes an indicator for the situation of ants in Flanders (they are not in good shape), an indicator based on the general target to stop loss of biodiversity by 2010. A problem with deducing indicators from policy statements and planning documents is that these are not necessarily widely supported. Where some form of policy target cannot be deduced, data are still presented, but given a white smiley or no indicator at all. The policy basis for the indicators is explained with legal references on the indicator website ([www.natuurindicatoren.be](http://www.natuurindicatoren.be), Dumortier, De Bruyn, Hens, et al. 2005).






Positive development, target within reach	
Positive development as yet unclear or limited, but insufficient to meet the target	
Negative development, away from target	
No target defined	
No evaluation due to lack of data	

Figure 3-3 Symbols for evaluative indicators in NARA 2005

<sup>13</sup> Cf. the Dutch "Milieu & Natuurcompendium" set of indicators available online: [http://www.mnp.nl/mnc/d-nl-Achtergronden\\_Natuurbalans\\_2006.html](http://www.mnp.nl/mnc/d-nl-Achtergronden_Natuurbalans_2006.html)

The development of this indicator system and the evaluation of NARA 2003 made clear that a lot of the data that was collected and reported in NARA was included simply because it was available. Knowledge on the state of nature that was seen as policy relevant was collected throughout the institute and in the network of its staff, organised and processed, reviewed, and presented to policy makers. The 2005 introduction argues that data should be collected more with an eye on what are useful indicators and useful indicators should be defined also by policy use. If NARA did not always feed directly into policy, the problem as the NARA team analysed it was also that the demand for data from policy should be more articulated. One of the consequences would be that NARA needed to pay more attention to the human driving forces and hence to social science, largely absent from an institute with predominantly biologists and especially ecologists.<sup>14</sup> The policy intentions of the NARA team for the 2007 report aim to develop a closer connection to policy, by coordinating more with the policy cycle and policy needs (Dumortier, De Bruyn, Hens, et al. 2005; Instituut voor Natuurbehoud 2005c). This modifies the original course of the report that was set up by the steering group and the top of the institute, which was to steer away from direct policy involvement by leaving policy evaluation and the DPSIR scheme to the Environment Report MIRA (Leroy 2006).

The information on which NARA is based comes from a wide variety of sources. A large amount of data finds its origin in administrative registration, for example with respect to licensing schemes or financial policy instruments such as subsidies. For such data, contacts with a range of government agencies are important. Other data come from routine monitoring schemes, such as for water quality. A third set of information comes from research projects, either performed by the Institute, available in the literature, or through colleagues at other research institutes. Some of these data are from periodic biological monitoring projects. Fourth there is a category of data peculiar to nature conservation: the data provided by the volunteers of nature conservation organisations. This last category is of particular importance to the first part of the report, devoted entirely to the frequency and distribution of (rare) species.

Ecologists at the Institute manage several databases with data from naturalist groups. The bigger ones contain data on birds, including volunteer surveys of water birds, and plants, but there are also databases on dragonflies, ladybirds, grasshoppers, butterflies, reptiles, or amphibians. Some of these data have been used to make beautifully illustrated atlases, describing species and their distribution patterns, such as for butterflies (Maes and Van Dyck 1999).

<sup>14</sup> Flemish nature research in general has strong traditions in the natural sciences, focused on ecosystems and instrumental policy issues, not in social sciences and research with a more strategic analysis of policy (Wiering, Crabbé, Leroy, et al. 2001, pp. 86-87).

These databases have a somewhat ambivalent status at the institute, as they are kept at the institute, managed by biologists at the institute, but not formally owned by the institute. The data actually belong to the naturalist groups that collect them and the biologists themselves are also members of these naturalist groups. There is an unspoken arrangement by which the Institute hosts the databases in return for the use of the data in reports such as NARA. The databases contain information that would cost a fortune to collect in formal research projects with professional biologists – and in fact it would probably be difficult to hire research biologists for this kind of work, since it rarely leads to high returns in terms of professional recognition or publishable research.

To describe these naturalists groups as amateur groups would be a misrepresentation. First, the suggestion of the term ‘amateur’ as ‘amateurish’, sloppy, misses the exceptional levels of experience and knowledge of some of their members, even if they were not formally trained as biologists. Among Flemish botanists, one of the highly respected people in taxonomical identification of Flemish plants earns his living as an accountant. Second, professionally trained biologists are often also members and especially among the smaller and more specialised naturalist organisations, such as for specific groups of insects, distinctions between professionals and amateurs are not always clear or explicit (cf. Star and Griesemer 1989). Nevertheless, the quality of field observation data from naturalist organisations is problematic, but the database managers have found ways to validate sightings, for example by an assessment of the data reporter, by confirmations of sightings, or by judging the likelihood of sightings according to location or season. The database manager will typically build a protective layer between the input provided by the naturalists and the actual database, so that the manager can screen the data first, in some cases using software tools that will flag unlikely sightings for further investigation (for example, a claim for a sighting of a species out of its season). Data managers at the institute are confident that they can produce reliable assessments with these data and even have triangulation research to shore up their claims. However, when policy issues are heavily contested, the ‘amateur’ source of data has been used to question the validity of assessments, such as in the case of birding data used to assess the impact of the left bank expansion of the Antwerp harbour (Interview Meire).

It is not always easy to keep the data flowing and to make sure that sightings are reported in a format that is useful to the biologists and the Institute. The naturalists have to stay motivated and this requires some careful operating from the side of the biologists. One of the biologists has noticed that naturalists remain more motivated if he can show them that their sightings have been incorporated and that the data are actually used in reporting or in conservation projects. To this end, databases are accessible on-line, with various use restrictions, such as required membership of naturalist organisations. Sometimes, it is difficult to keep naturalists motivated because

of the nature of the observation process. For example, one biologist explained how difficult it is to encourage amphibian lovers to go to dead ponds to once again report the complete lack of amphibians. On the other hand, birders can be motivated to move out in force to sit by their allotted pond one Sunday a month throughout the winter months, year after year. It seems to depend on the nature of the beast.

I have expanded on the naturalists in some detail, to illustrate how the Institute and NARA are connected throughout the nature conservation sector, not just through its authors and reviewers, but even through the naturalists who spend their weekends looking for wildlife. This remarkable mobilisation of people involved in the nature conservation sector is only possible because people are motivated to do so and what seems to be an important motivation that they have in common, at least in the perception of the people I interviewed, is that in one way or another they are contributing to nature conservation. The nature conservation world is also a user of the NARA reports. A 2005 survey among the target groups for NARA shows that members of nature conservation organisations are actually the most positive and frequent users (NARA-team 2006b).

NARA is intended above all as a policy document. The task of producing nature reports was formally commissioned to the institute by ministerial decree in 1997,<sup>15</sup> which specifies that the institute is required to: describe and evaluate existing nature in the Flemish region; describe the expected development of this nature under conditions of unchanged policy and under conditions of presently intended policy; evaluate past policy, reporting specifically on the Ecological Network. The report itself is presented as a ‘scientific basis’ to support and evaluate Flemish nature conservation policy.

However, the Institute has a wider audience in mind for these reports. In its 2003 evaluation questionnaire, the IN defines these audiences as: professionals involved in the making or implementing environmental or nature conservation policy in Flanders, environmental or conservation scientists in Flanders, students in a programme related to conservation or environment, and nature conservation organisations. Apart from being Flemish and involved in nature or environment, these audiences share a strong professional definition: all these audiences are *knowledgeable*, involved in the sector.

The 2003 evaluation indicated that NARA is considered useful among these audiences, but that usefulness was graded highest by scientists, then nature organisations, and lastly policy makers (Dumortier, De Bruyn, Hens, et al. 2005, p. 21). All these groups, especially nature conservationists, are positive about the scientific quality of NARA, but the report seems to be valued mostly

<sup>15</sup> “Decreet betreffende het natuurbewoud en het natuurlijke milieu” van 21 oktober 1997, B.S. 10 januari 1998.



as a reference work, typically consulted a few times per year. Interestingly, eight of ten of the respondents of the questionnaire found the report also very useful to illustrate the degradation of nature in Flanders and the failure of government policy, an opinion most pronounced among policy makers in the sector – rather than conservation organisations. The evaluation also indicated two possible uses of NARA that were not as highly valued. The one is provision of concrete policy recommendations, the second the fact that specialists (including policy makers) signalled that they usually already had the data that were relevant for them – and in fact had sometimes provided these data themselves. Informally, there were also signs that civil servants found the reports sometimes too critical and there were attempts to get more control over its production. The major conclusion drawn from these evaluations was that direct policy use should be increased by the further development of the indicator set (Instituut voor Natuurbehoud 2004b; NARA-team 2006b).

Much of the approach of the NARA report is based on its counterpart in environmental reporting, MIRA (*Milieu- en Natuurrapport Vlaanderen*). From 1994, reporting on the state of nature was integrated in the report on the state of the environment, until the first separate NARA report came out in 1999. Summarised information of NARA and some key indicators are still included in the state of the environment reports. MIRA pioneered the extended peer review method for Flanders. In fact, goes even further in the use of guest writers and the selection of reviewers, regularly including people from industry (such as petrochemical multinationals or the electricity sector) as well as the administration, environmental consultants and professionals, or environmental NGOs. (The MIRA team is smaller, so has less capacity to write, but can rely on a small budget to give writers some compensation, up to 1000 Euro). In government, the wider constituency of MIRA is cited as an advantage, compared to NARA that does not carry, for example, the support of agriculture and has a constituency more restricted to the conservation sector (Van Steertegem 2005).

Since 1996 MIRA used the DPSIR method and the system of smiley indicators (and in fact applied them to nature data of NARA before they were included in NARA itself). The MIRA reports have addressed the different uses of state of nature reports by splitting up the report in three parts: theme reports, focussing on indicators and state of the environment; scenarios, analysing the effects of policy alternatives; and policy evaluation reports. Nevertheless, the MIRA team too has shied away from making direct policy recommendations, although it has a stronger evaluative element. The evaluation of NARA has led to discussions about what the functions of NARA should be and whether NARA should also consider a scenario version, but for now NARA remains a state of nature report with some policy evaluation elements (target achievement), largely refraining from advising concrete policy measures. (Vlaamse MilieuMaatschappij 2003; Projectteam MIRA 2004; Vlaamse MilieuMaatschappij 2004).

### 3.3 Discussion: extended peer review, to a degree

The NARA reports are produced in the context of a high-tension policy field, where complex politics is played on various levels. Against the background of repeated clashes between conservationists, agriculture, and recreational users of nature, the NARA reports present an assessment of nature that is considered a ‘green’ view of things by some, partly through the conservationist image of the Institute, but nevertheless a thorough and trustworthy account. The NARA team achieves this by building a coalition based on wide participation in the nature conservation sector – and hesitatingly also beyond. This coalition is heterogeneous in that it brings together actors who are involved in complex games on various levels: NGOs trying to provoke policies, administrations competing with cabinets for control over issues, or researchers trying to pursue their academic project. Partly this network is a continuation of old connections between biologists and NGOs in the conservation sector, but the NARA team has tried to extend network, especially through its sounding board. NARA brings the wide range of actors together through participation in its steering group, its feedback group, its survey, its reviewers, co-operators, writers, or NGO data providers. By separating the question of the current state of nature from the desirability of policies, a space for cooperation becomes possible, even between parts of the administration that normally compete.

The analysis of the NARA shows the complex structure of success of science advice to public policy. The dominant interpretation of NARA as a highly valued product of the Institute has to be defined in light of the specific task of establishing a reliable assessment of the state of nature in Flanders for use in the sector of nature conservation. NARA establishes a space of facts and figures within which meaningful and constructive negotiation and even disagreement can occur. The network of participants of the production of the report is extensive, but largely restricted to the nature conservation world, although there are attempts to reach out further, as is shown by the inclusion of a hunting organisation and agricultural researchers and administrators.

The Institute is part of an informal network of contacts with the AMINAL administration, conservation NGOs and university researchers, dominated by biologists. Wiering et al. have indicated, this network shares a preference for traditional mono-functional protection of nature, in competition with older discourse of multi-functional nature, carried by a tighter network around forestry researchers and forestry policy makers at AMINAL (Wiering, Crabbé, Leroy, et al. 2001, p. 114) I would suggest that now, three NARA reports later, there are openings to include other actors and elements of a discourse of multi-functional nature. The merger of the Institute for Nature Conservation and the Institute for Forestry and Wildlife Research, and their larger involvement in NARA, would underline that.

However, this is only one conception of the task of NARA and even only one aspect of its success. At the same time, NARA also has a certain degree of

success as a tool of *advocacy*. Every two years, it pushes nature conservation policy a notch higher on the Flemish political agenda, through media as well as its position in the policy cycle. In the same advocacy vein, it provides arguments for the further development of nature conservation policy, as the report indicates which targets are not met. In fact, if NARA did not perform a certain degree of advocacy, its very production would collapse, as it relies on the voluntary cooperation of its authors, generally motivated by a concern for Flemish nature. In one interpretation, NARA can even be seen as the scientific upgrading of conservationist knowledge, providing this knowledge with certification. This contrasts with the environment report MIRA, that lacks such an activist motivation (Leroy 2006).

At the same time, NARA is moving towards a much more instrumental role in policy making, developing indicators of policy performance more prominent in the report and even presenting these as an independent product. The indicators accept official policy targets, although sometimes some extra interpretation is needed, and are hence dependent on how far policy is willing to go. The administration and the cabinet prefer the development of the instrumental activities of NARA. From the side of the top of the institute, however, there are hesitations about moving too close to policy evaluation. There, the strategy is to keep NARA away from a risky engagement that could lead to politicisation, which could undermine the position of NARA and the institute. The aversion of policy engagement had another element too, especially among the ‘hard green’ camp in the Institute that wants to stick to the ‘hard facts’ of biology to signal problems for conservation and not run the risk of getting drawn into the compromises of policy (Leroy 2006).

There is some tension between the different functions for the current audience and participants in NARA. For advocacy purposes, indicators dependent on policy targets allow only for political strategies that point at discrepancies between promises and results. If policy targets are shifted to current performance levels, such as in the case of annual targets for nature reserves, then indicators shift from red to green not because nature is better off, but because policy became more modest. This is a tension between a report that is geared to evaluate established policy and a report that is geared to provoke new policy. Inversely, from the point of view of the department, NARA is sometimes seen as leaning too much towards advocacy, leading to some attempts to get more of a grip on the process from civil servants.

A similar tension exists between the advocacy element of showing the threatened state of nature and the element of building a widely accepted assessment of the state of affairs in nature in order to move on to bargaining politics based on a shared understanding. The MIRA state of environment reports target the latter more. To find out to what extent NARA succeeds in providing a widely accepted assessment of the state of nature, beyond its own advocacy coalition, the evaluation surveys should target some of the

less likely audiences, such as the Farmers’ Union. In any case, so far, NARA has managed to balance advocacy, extended review, and instrumental policy advice admirably, leading to the highly appreciative evaluations.

The structure of the NARA process is mainly corporatist: the sector is mobilised to produce knowledge that makes nature conservation issues visible for policy making. However, membership of the sector is informal and the coalition around NARA is a network rather than a tightly defined group. Especially the attempts to extend the network (inclusion of hunters or the agriculture administration as reviewers) suggest elements of a deliberative pattern. Some in the governing structure of the organisation have argued that this further extension should continue, to resemble the network around the MIRA report, but so far, the participation remains largely confined to the conservation sector.

The expertise is organised in a state research institute, not an NGO, but this is seen as an institute ‘of the sector’, financed by the state. For some research projects, the Institute even has its own budget, outside of state control. The neo-liberal/market form of governing expertise is almost entirely absent (although some have argued during the interviews that perhaps consultants could be involved more in some tasks).

This corporatist pattern in the advisory system around the nature reports is a direct extension of the formation of an environmental corporatism in the policy sector in general. The installation of the INBO institute was even seen as a way to accommodate conservation NGOs into the corporatist policy regime: the research of institute would allow conservation NGOs to make their case in the corporatist negotiation process.

## 3.4 Analysis

### 3.4.1 Expert activities involved in NARA

NARA is based on (limited) extended peer **review**, aiming for specialist knowledge rather than academically certified knowledge, but restricting review largely to the nature conservation sector, where it is highly valued. However, review activities are definitely central to the construction of the report and are highly valued in the evaluations.

Recently, there has been a shift to more **instrumental** policy advice, paying more attention to timing in policy cycles and limited evaluation of existing policy targets through indicators of policy target achievement. This development is somewhat distrusted by the ‘hard green’ camp in the institute, that prefers to stick to the production of facts rather than evaluation.

**Mediation** activities are not visible as such, but are performed to a limited extent in the participation process. NARA has brought actors together to cooperate, especially with respect to different parts of the administration,

creating links that extend to the administration of agriculture. (Whether these links will remain more than personal contacts remains to be seen.)

For large parts of its audiences, NARA has **advocacy** uses. NGOs can signal environmental degradation or failure to meet policy commitments, while increasing the status of its own knowledge and input through the review process. However, NARA is also a resource for the administration to argue its case and it is not under exclusive control of conservation NGOs. The higher legitimacy therefore comes at the cost of less say over the report.

**Reflection** activities are not strongly developed around NARA: there are no long-term analysis or more distanced analyses trying to understand underlying assumptions of conservation policy, models of nature, or the future of Flemish nature. To the extent that there is explicit reflection, it is mostly about the role of NARA itself, on the basis of extensive self-evaluations.

### 3.4.2 Key issues of expertise

#### Value issues

The existence of value judgements is acknowledged and the writing procedure is designed to make these debatable and the result balanced. However, disagreement over values involved is not presented in the report. The production of NARA is geared towards neutralising value judgements and creating consensus. Value judgements become visible again when critics claim the consensus does not stretch beyond the nature conservation sector (NARA is 'green', or has not enough attention for agriculture).

#### Accommodation of knowledges

Knowledge that is part of the broad conservationist world, is readily accommodated, even with different approaches, but there is strong focus on biology and natural sciences. Such gaps have been identified in evaluations, e.g. shortage of attention for social sciences and the 'driving forces' of the DPSIR scheme, which could lead to an extension of the horizon of knowledge. On the positive side, the Institute does manage to accommodate a very wide variety of sources of knowledge in NARA, from administrative data, to academic research and amateur biologists' data.

#### Uncertainty issues

NARA itself is seen as a way to address the uncertainty over the state of nature for conservation policy. Beyond this, uncertainty in advice receives very limited attention. In some of the graphs, measuring uncertainty is indicated and the indicator smileys do allow for a symbol for lack of data, but beyond the occasional mention in the text of lack of research, uncertainty receives very little attention.

#### Institutional design

The NARA team and the network around it, is very occupied by the institutional design of the advisory process. Through regular evaluations and discussion, the process is debated and attempts are made to constantly improve it. From the point of view of the department, there is an issue of how much control policy makers should have over the NARA process, but formally the administration has no direct say over the Institute (the Institute and the administration are parallel in the organisation of the department, both responsible to the Minister). Meanwhile, the institute is seen as producing a valuable but 'green' account of nature and relies heavily on its conservationist network, putting it predominantly in a corporatist tradition (in spite of the attempts to break out of conservation world and make NARA more open and deliberative).

#### Policy learning

The NARA report constitutes a 'reference work'. As a product, I saw no clear signs of major policy innovations triggered by NARA, although there may be more incremental learning going on. The process of producing NARA looks more promising and could lead to new policy coalitions if the expansion of participants continues.

#### Trust

Trust in NARA is high in the nature conservation sector and low outside of it.

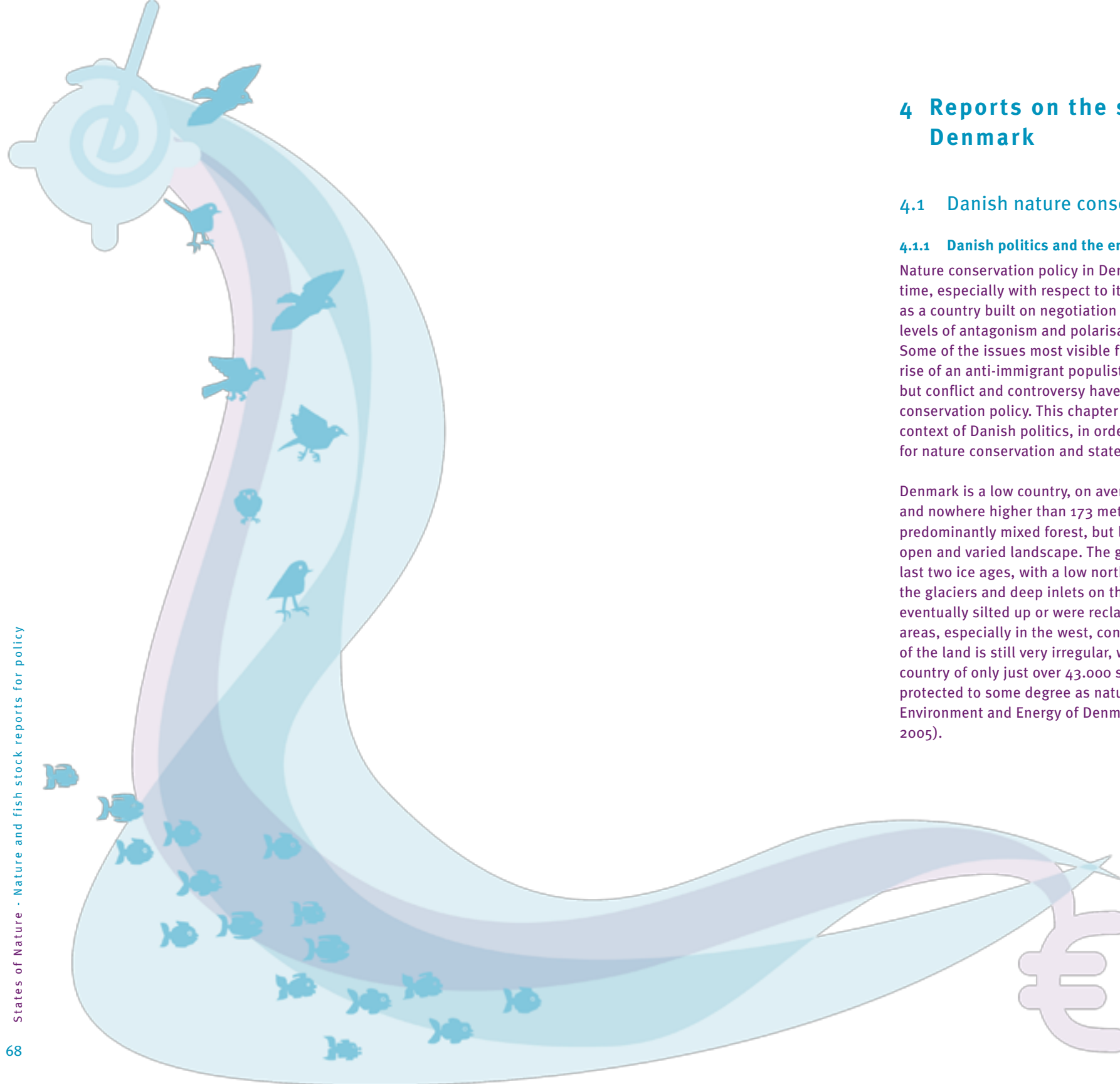
## 4 Reports on the state of nature in Denmark

### 4.1 Danish nature conservation policy

#### 4.1.1 Danish politics and the environment

Nature conservation policy in Denmark has recently gone through a difficult time, especially with respect to its scientific advice. In spite of its reputation as a country built on negotiation and accommodation, the country has faced levels of antagonism and polarisation it was not previously accustomed to. Some of the issues most visible from an international perspective are the rise of an anti-immigrant populist movement and euro-sceptic sentiments, but conflict and controversy have also struck environmental and nature conservation policy. This chapter will briefly describe these conflicts in the context of Danish politics, in order to continue with an analysis of expertise for nature conservation and state-of-nature reports in particular.

Denmark is a low country, on average only 31 meters above sea level and nowhere higher than 173 meters. The original natural vegetation is predominantly mixed forest, but long-term deforestation has created a more open and varied landscape. The geography was principally shaped by the last two ice ages, with a low north/south ridge of flowing hills pushed up by the glaciers and deep inlets on the western and eastern flanks. These inlets eventually silted up or were reclaimed for agriculture. Hence the coastal areas, especially in the west, consist of plains boarded by dunes. The outline of the land is still very irregular, with about 7400 km of coastline, for a country of only just over 43.000 square kilometres. Over 10% of this surface is protected to some degree as nature (Earth trends 2003, p. 18; Ministry of the Environment and Energy of Denmark and National Forest and Nature Agency 2005).



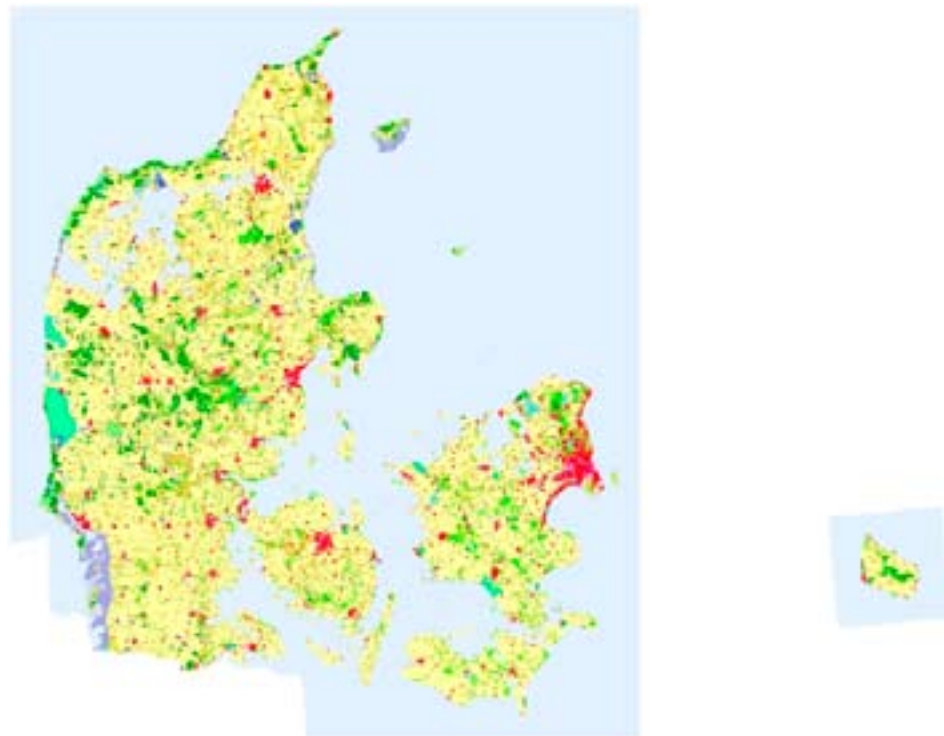


Figure 4-1 Land use in Denmark (reds and pink are built environment, tones of yellow agriculture, greens are nature with forests in dark green, and lilac are maritime wetlands; source: Corine Land Cover 2000, European Environment Agency).

This geography sets the scene for a rich natural environment, including important marine and freshwater wetlands, but also for good cultivation possibilities. Just under 60% of the land is used for agriculture, mainly intensive cereal (about 60% of cultivated land), vegetable, and livestock farming.<sup>16</sup> As in other European countries, the agricultural share of land is in steady decrease, after a long period of post-war expansion and intensification. This weighed heavily on the natural environment, both in terms of land use and of nutrient and pesticide pollution. In addition, there is pressure from expanding cities, with a built up land surface of about 10%. There is a gradual shift of population from the west coast to the east, towards urban centres of economic activity, such as around sprawling Copenhagen. This leaves between 10 and 30% as natural vegetation and wetlands (depending on the precise definition: a lot of this vegetation consists of often imported, monoculture forestry). In spite of a population density of 116 people per square kilometre, just below the European average, competition

over land use is nevertheless intensive (Fox 2004; Strange, Rahbek, Jepsen, et al. 2006).

The Danish political scientist Henning Jørgensen sees the geography of Denmark, with its 400 islands connected by many bridges, as symbolic for its politics: in spite of a shared culture and history, there are many divisions across which the Danes are constantly building bridges. Danish policy making traditionally relied on negotiated solutions and high levels of decentralisation, with important roles for regional authorities and municipalities, including extensive responsibilities in welfare policy (www.statbank.dk, Jørgensen 2002; Heidar 2004a). Interest groups in Denmark follow suit by investing a large share of their resources into negotiation and debate, while few choose outright confrontational strategies (Binderkrantz 2005).

Decentralisation and a strong culture of local ownership of problems also help to understand the Danish EU scepticism. The rejection of the Euro and the initial plebiscite ‘no’ against the Maastricht Treaty are known internationally, but Denmark also has strict procedures to keep EU relations under control. Danish negotiators in the EU have to report directly to the *Folketing*, the unicameral Danish parliament. It is the parliamentary EU commission which maintains close oversight and narrow negotiation mandates, not the executive (Bursens 2002).

Negotiations over government policies tend to include opposition forces. For example, in national politics, it is common for governments in power to consult opposition parties. This practice results from the complex coalition politics of Scandinavian countries. Because of the low parliamentary access threshold (2%), Denmark has a multiparty system with many relatively small parties. However, together with Norway, there is no green party, as traditional progressive parties have incorporated green post-material ideas before an environmental party could take off. Crucially, four out of five Danish governments in the post-war era have been minority governments. This results from a constitutional peculiarity of Nordic countries, which do not require a positive vote of investiture from their parliament, but merely an absence of motions *against* government. As a result, Danish governments frequently rely on ad hoc support from opposition parties, which have an exceptionally large say in how the country is run. Parliament is therefore more active in policy making than in countries with clear executive majorities. As the EU example shows, the *Folketing* is a working parliament, rather than a parliament of ex-post executive oversight (Jørgensen 2002; Heidar 2004a; Heidar 2004b).

As arrangements for negotiation have institutionalised, many policy fields have taken on a corporatist character. Corporatism is deeply rooted in Danish history, especially in welfare policy, where it originated in formal negotiations pacifying labour relations as far back as 1899. Denmark has an active civil

<sup>16</sup> Data from 2005 agricultural statistics of Statistics Denmark; most recent detailed land coverage data at Statistics Denmark are only from 1995 and indicate 66% agriculture (www.dst.dk).



society, one of the highest densities of organised social life in Europe and high levels of unionisation. Civil society is represented in standing advisory structures, advising policy and providing a negotiating platform. In corporatist fashion, interest organisations must earn recognition and inclusion, a feat environmentalists managed already in the 1970s and 80s “as the political-administrative system accorded them official status” (Jørgensen 2002, pp. 245, 37).

However, the dominance of traditional forms of corporatism in Denmark requires three important qualifications. First, there is considerable variation in degrees and nature of corporatism and negotiated rule making between policy sectors. The citizen panels used in technology assessment in Denmark organise direct citizen involvement, rather than through corporatists representation procedures. Regional planning also has procedures of direct involvement of citizens, but these are restricted to consultations over already developed plans (Tress and Tress 2003). Thus negotiations and civil society do not always follow the specific corporatist route. Second, the importance of national advisory structures partly provides a counter force to the high levels of decentralisation, and vice-versa. Corporatist structures therefore contend with other negotiation platforms (Jamison 2004; Nordby 2004). Third, Danish policy making has gone through some important changes. After the wave of new public management and the creation of autonomous agencies in the nineties came a more radical swing to small government ideas after the millennium, especially with a political shift to conservative governments. The dominant new discourse stressed the negative sides of corporatism: its tendencies to create elites and resistance to policy change and its weakness at policy implementation (Blom-Hansen 2000).

Danish politics was shook up by the November 2001 elections, in which the social democrats suffered their worst post-war defeat. Victory went to a conservative coalition of the Liberal Party (*Venstre*) and the Conservative People's Party. The coalition was continued after the 2005 elections. Presently, the parties control 70 of the 179 seats in the *Folketing*. The coalition has been able to count on the ad hoc support of the right-wing populist Danish People's Party of Pia Kjaersgaard, in return for highly restrictive immigration policies. The predecessor of this party had originally appeared on the political scene in 1973, with an unexpected break-through on an anti-tax ticket. After a long period of low-level voter support, Danish populism grew in the nineties with non-economic topics, including a vociferous anti-immigrant position, but also anti-establishment and anti-environmental agendas (Anderson 1996; Jørgensen 2002, p. 40).

The new political force field created a major rupture with the coalitions around the social democrats and the liberal democrats of the nineties. The neo-liberal ‘small state’ agenda of the new Prime Minister, Anders Fogh Rasmussen, aimed to reduce taxes and revert social policies of the previous governments. However, the agenda was neo-liberalism of a Scandinavian

kind, where some aspects of the welfare state continued to be seen as unquestioned public goods. The new government realised that a reduced state was not to be realised fully in the field of social policy. Facing high levels of popular support for collective health care and quality of life of the elderly, it saw all the more opportunities for budget cuts in environmental policy.

The difference in policies was both a matter of substance and style of decision making: in spite of being a minority government, the support of the populist right guaranteed an unusual majority force. This support was mobilised to push through reforms, side-stepping much of the traditional negotiation culture, which was portrayed as stifling and elitist (Jamison 2004).

One of the main rallying points for the new government was to attack what was seen as an overzealous environmental policy of the previous government. In the nineties, Danish environmental policy had been ambitious, cast in terms of strategic environmental planning by the centre-left government that had won the elections in 1993. Intensive support for clean technologies (e.g. wind turbines) and market-oriented implementation strategies were based on a broad consensus. Denmark was among the first wave of countries making wide-spread use of green taxes as an environmental policy instrument. A coalition around the social democrats had initially already forced these taxes into policy under a previous conservative minority government through an ad-hoc ‘green majority’ in the *Folketing*. Even though these environmental policy plans were not as encompassing as the Dutch ones, they signalled a significant expansion of the policy effort. With the exception of sector plans such as for water, these policy plans often lacked time limits or quantified policy targets. Nevertheless, Minister of Environment and Energy, Social Democrat Svend Auken, cast Danish environmental policy in a discourse of a pioneer nation, tackling environmental problems offensively in a collective national effort.

However, crucially, agriculture remained largely outside of this consensus. This set the scene for a series of confrontations towards the end of the nineties. Throughout the seventies and early eighties, farmers' organisations had managed to keep control over environmental policies that affected agriculture. Only in 1984 did environmental groups break into the agricultural field, around issues such as desoxygenation, fish kills, nitrate pollution, and a few years later also pesticide use. In 1987, the conservative-liberal minority government was forced by the ‘green majority’ in the *Folketing* to accept an action plan for the aquatic environment, after a highly mediated event involving lobsters dying from desoxygenation in the Kattegat. The plan contained ambitious targets on reduced nutrient discharges, including an 80% reduction of phosphorus and 50% of nitrate, to be enforced by municipalities. After the social democrats came to power in 1993, they expanded green taxes from CO<sub>2</sub> taxes to pesticide taxes. Agriculture was slow

to catch up, which became politicized in 1997 and led to further restrictive measures in 1998. Nevertheless, “Danish farmers have come through the environmental conflict relatively unscathed (...)” (Jørgensen 2002, p. 222), as they participated in policy formation and implementation, including through the mobilisation of their own experts (Moe 1995; May and Winter 2000; Blom-Hansen 2001; Jørgensen 2002, p. 240; Daugbjerg and Pedersen 2004, p. 225; Klok, Larsen, Dahl, et al. 2006).

The new conservative government argued that environmental problems had been grossly exaggerated and that the over-zealous policies of the previous government had damaged the economy. The green taxes were a particular target and *Venstre* had sensed popular discontent over the sustained international environmental leadership role (Klok, Larsen, Dahl, et al. 2006). After his 2002 victory, Anders Fogh Rasmussen reduced support for several environmental programmes in public organisations, including large wind energy projects and for environmental research. In addition, a large number of advisory boards and negotiation platforms were abolished, especially in the nature and environment sector. One in seven staff positions at the Ministry of the Environment were removed.<sup>17</sup> The government argued that especially the problem of climate change had been overstated. By his side, Anders Fogh Rasmussen found the anti-environmentalist Bjørn Lomborg (Jamison 2004; Toft 2006).

Lomborg, a statistician and political scientist, started his attack on environmental policies in Danish newspapers already in 1998, but gained international notoriety a few years later with his book *The Skeptical Environmentalist* (Lomborg 2001). In the book, he argued that environmental scientists and policy makers systematically exaggerated environmental problems through statistical fallacies. He claimed that environmental policies had to be submitted to meticulous cost/benefit scrutiny, with the slogan ‘more environment for the money’. Since his scepticism led him to systematically question benefits of environmental policies, especially in the short run, the cost of these policies quickly seemed excessive.

The reaction from the scientific community was fierce, with denunciations of Lomborg’s data, his statistics, and his scientific credentials. His critics

<sup>17</sup> *Danish Ministries are seen as secretariats of the Minister, assisting him or her in political functioning. Agencies report on the implementation of policies, while the departments set the policy framework. This general model varies strongly between departments, but has been implemented extensively in the Ministry of the Environment, which is responsible for six organisations with agency status, among which the Danish Environmental Protection Agency, the Forest and Nature Agency (for conservation policy) and the National Environmental Research Institute. In principle, the departments consist of a neutral civil service, in which staff is not replaced after elections on political grounds. However, for decades, there have been discussions about the actual independence of the civil service and the grey zone between the function as a ministerial secretariat and providing support for the Minister’s political party. In spite of the existence of freedom of information legislation, the administrative culture is secretive, while informal, pragmatic, and flexible (Moe 1995; Jørgensen 2002, p. 33; Christensen 2006).*

argued that he systematically used whatever data he could find to support his preconceived ideas. An especially convened committee of prominent Danish scientists questioned his scientific integrity. Nevertheless, Lomborg was able to use even negative media attention to his advantage and mobilised his political alliance to continue a diatribe that seemed unbothered by criticism or counter-argument. This impervious attitude has led Andrew Jamison to compare him with Stalin’s charlatan biologist Trofim Lysenko (Joravsky 1970; Jamison 2004).

In 2002, Lomborg was made director of the Danish Institute of Environmental Assessment. This research institute was to aggressively push cost/benefit analyses in order to question environmental policies, while under constant accusations of environmental scientists. The institute was initially portrayed as a replacement for the previous science advice to environmental policy, after the government had abolished key advisory bodies. However, the institute never actually achieved this exclusive position, in spite of easy access to government. Rather, it became one source of advice in a reconstituted field of expertise, next to public government research institutes that continued their work, albeit with reduced budgets.

One of the controversial projects Lomborg set up was the ‘Copenhagen Consensus’, in which eight prominent economists ranked global problems in terms of maximum returns on money spent. HIV/AIDS and malnutrition ranked top, climate change lowest. Once again, the international reaction was fierce, this time from both environmentalists and economists. One of the main criticisms was that Lomborg replaced political prioritisation with technocratic assessments by economists, which Lomborg called more rational. Another argument was that his approach to prioritisation did not consider long-term damage, but based its cost/benefit calculations on a time horizon of about a decade.

Lomborg waged his campaign from his institute for two years. Claiming his work was done he unexpectedly resigned in 2004 and was given a guest professorship (an unpaid position as ‘external professor’ in Danish academia) at a university. The Institute of Environmental Assessment was eventually abolished at the end of 2006, after a series of conflicts in the management ([www.wikipedia.org](http://www.wikipedia.org), interviews). Lomborg’s role now seems largely played out, although he remains close to the Prime Minister, but his rise and coalition with the new government are indicative of the frontal attacks on the environmental policies of the previous government.

Andrew Jamison has suggested that the anti-environmental turn of the new government was more than just the consequence of a swing to the right among the electorate. After all, budget cuts in the welfare state were not as drastic. Jamison suggests that the Danish environmental policy field had gone through a series of fundamental changes. In his analysis, increased professionalisation of environmentalists, accelerated by Europeanisation,

had disconnected environmental policy from its grass root support, such as in the anti-nuclear or organic agriculture movements. Jamison claims that this created a close-knit community of professional policy actors, isolated from their popular base, but dominant in negotiation forums and increasingly technical policy discourse. In this analysis, these professionals pushed environmental agendas further than the voter was willing to go (Jamison 2004).

#### 4.1.2 Nature conservation policy

Until very recently, Danish nature conservation policy focused first and foremost on the integrated protection of landscapes (Arler 2000), and since the mid-eighties also on the chemical pressure of agriculture. Even though there are also measures to protect individual species or red lists of protected species,<sup>18</sup> the main focus of conservation policy lay traditionally on the protection of the countryside as a whole, as a basis for a thriving natural environment. In regional planning, this was historically motivated by a wish to provide access to nature for a growing urban population, as well as to protect landscape as a common heritage, for example against foreign holiday homes (Agger 2001). Attention for consequences of nutrients and pesticides in agriculture were politicised in nature conservation from the mid-eighties onward, culminating in conflicts at the end of the nineties.

The main policy programmes that implement the landscape approach are the protection of ecological networks in the context of regional planning; subsidy schemes for the development of nature and for afforestation; and legal instructions for the use and management of nature. I will discuss these in more detail below (Van Ravensteyn, Hornis, Verwest, et al. 2005). Apart from the aspect of landscape and land use, the biggest pressure from agriculture is of a chemical nature: nutrients leading to eutrophication and pesticide use. These are regulated under environmental policies, especially for surface and ground water (Agger 2006).

Ecological networks became a central concept for the conservation of Danish nature in the early 1980s. However, notions of the protection of 'corridors' and 'buffer zones' can already be found in Danish legislation in 1937, when they were used to protect dunes for coastal defence, prevent roving dune sand from damaging agricultural land, as well as guarantee popular access to the coastline and green recreation. Danish nature conservation policy still combines the protection of nature with recreation, as well as with

conservation of cultural heritage, such as Viking burial mounds.<sup>19</sup> Since 1983, national instructions for the regional planning efforts of the counties, the regional authorities, prescribed the identification of core protection areas as well as corridors that would allow species to disperse, effectively making Denmark one of the pioneers of ecological networks as conservation instruments. When Denmark faced the European ecological network directives, it merely reinforced policies that had been in place for over a decade (Jongman and Kristiansen 2001, pp. 20-23; Jongman and Kamphorst 2002).

In Denmark, ecological networks are implemented through the framework of physical planning and hence the regime of regional planning becomes a key arena for nature conservation. The Planning Act of 1992 redistributes the authority for physical planning between the Minister for the Environment, the original 15 county councils, and 275 municipal councils. These levels are nested: each has to work within the conditions set at a higher level. Municipalities need to get approval from counties and counties have to propose their plans to the relevant national authorities. These authorities are the Ministry of the Environment and in particular its National Forest and Nature Agency (Van Ravensteyn, Hornis, Verwest, et al. 2005).

Through the planning system, conservation policy identifies core areas for protection and ecological corridors (*Naturforbindelse*), with special attention for rivers and waterways. The policy includes restrictions on the utilisation of the coastal strip, the borders of waterways and lakes, as well as forest edges. In addition, ecological networks make use of small biotopes and of the borders between estates, for example between parishes, to create a system of relatively fine-meshed networks (Jongman and Kristiansen 2001; Jongman, Kùlvik and Kristiansen 2004).

Public participation in the planning process is organised through local and regional public inspection and objection procedures; through the regional green councils; and through national negotiations with stakeholders. From the conservation side in civil society, the key actor is the Danish Society for the Conservation of Nature (*Danmarks Naturfredningsforening*), both on a national and regional level. This is by far the largest NGO articulating the interests of nature conservation. It has 140.000 members with over 200 local committees on the levels of municipalities and regional councils, as well as a head office with a staff of 45 people. The organisation is also active in a European context (cooperating with the European Environment Bureau). Thus, the Society has set up structures to participate in decision making on all the relevant levels in nature conservation. It covers nature protection as well as related issues, such as chemicals, water pollution, waste, and agriculture. On the national level, the organisation has its own expert advisory committees,

<sup>18</sup> Denmark's 'red list' of species is a very extensive list that functions as a periodic indicator of biodiversity, classifying species on the basis of the World Conservation Union (IUCN). The version of 1990 (published by the Environment Ministry) contained about a third of the 30.000 known native Danish species (Agger and Sandøe 1997), revised for birds in 2006. However, species protection is regulated in the 1997 Hunting and Wildlife Management Act, particularly with respect to hunting, and the Nature Protection Act, by which, in principle, all mammals and birds are legally protected unless if hunting provisions apply (Ministry of the Environment and Energy of Denmark and National Forest and Nature Agency 1998).

<sup>19</sup> An estimated 80% of Viking burial mounds have been destroyed (National Forest and Nature Agency and Jensen 1992).

involving academics and scientists. In addition, it can rely on the knowledge of its members and sympathisers, which includes not only naturalist enthusiasts, but also many professional scientist (www.dn.dk, Stoltze 2007).

Since 1980, the counties develop plans for twelve-year periods, with revisions every four years. The basic concept for these plans is a division of the country in urban, recreational, and rural zones. The latter zone, which covers 90% of the country, is highly restrictive and as a rule allows only changes in land use for agricultural or conservation purposes. Through this system, the national government can designate specific conservation areas as well as a general strategic vision, but the main tasks for nature protection through the planning system lie with the county level (Enemark 2002; Jongman and Kamphorst 2002; Van Ravensteyn, Hornis, Verwest, et al. 2005; Strange, Rahbek, Jepsen, et al. 2006).

Between 1982 and 1987, over half of the counties undertook regional studies to assess the possibilities of developing corridors and identifying core areas. This involved mapping nature values in the landscape, ranging from birds to recreational use, in many cases involving the knowledge of nature organisations. However, because of the highly decentralised procedure, the process varied considerably between counties. Some of the networks were based on map studies, while others made extensive use of biological data (Jongman and Kristiansen 2001, p. 22).

To expand the core nature areas, the 1989 Nature Management Act made available over 140 million kroner (about 19 million Euro) in subsidies for nature management projects, a quarter of which went to regional initiatives. The money was used for nature restoration projects and acquisition of 2500 ha of nature reserves. A similar subsidy scheme also exists for the creation of hedgerows, as lesser connections in the network (National Forest and Nature Agency and Jensen 1992).

Forests are of particular importance in Danish nature conservation. Large parts of the country were once covered with deciduous and mixed woods, now largely claimed for agriculture or replaced by commercial spruce and pine. The Nature Management Act specified that forest should receive special attention and formulated the policy target of doubling the total area of forests in Denmark over a period of 80-100 years, which translates to 5000 ha per year. The specific instrument of subsidies allowed the scheme to be voluntary, making money available to buy land rather than forcefully reallocate it. The scheme was presented as an opportunity to combine nature protection with land consolidation for farmers and even job creation in the recreation sector (National Forest and Nature Agency and Jensen 1992; Jongman and Kamphorst 2002).

In addition, the Nature Management Act created a consultative committee. Its composition shows what were seen as the relevant actors for this policy field,

ranging from the ministries of environment and finance, over counties and local authorities, nature conservation organisations, farmers, hunters, and anglers organisations (National Forest and Nature Agency and Jensen 1992).<sup>20</sup>

After 1992, conservation policy became more restrictive, specifying a series of biotopes that were to be protected. This included lakes over 100m<sup>2</sup>, bogs, heaths, meadows and commons. These 'nature types' were to become key ingredients for the ecological network, potentially designating 9% of agricultural land for conservation. Since 1917, Denmark uses a system of 'conservation orders' (*fredning*), prescribing land use restrictions and management obligations. Usually, these orders involve a form of financial compensation for landowners, although farmers are not always aware of these provisions. These areas are proposed by government, or by the Danish Society for the Conservation of Nature, underlining the special status of this NGO in conservation policy. The Society can also be consulted on the management plans that are developed for the areas under a conservation order (Ministry of the Environment and Energy of Denmark and National Forest and Nature Agency 1998; Van Ravensteyn, Hornis, Verwest, et al. 2005; Stoltze 2007).

By 1994, 4.4% of the country effectively consisted of areas protected under conservation orders. Somewhat larger protected areas can be found in the coastal areas, especially along the West coast and around the islands in the Southeast (Strange, Rahbek, Jepsen, et al. 2006). Towards the end of the nineties, wetlands were particularly high on the conservation agenda, for example with the restoration of lakes and wetlands once drained for agriculture (Jongman and Kamphorst 2002) (Primdahl, Gravsholt Busck and Søderkvist Kristensen 2004, p. 104). The policy of the current government focuses mostly on compliance with the European NATURA 2000 commitments, creating elements of a European ecological network. Part of this policy is an experiment with the creation of national parks. This is a novelty in a conservation policy that was focused on overall protection of landscapes with integrated functions, rather than on areas protected exclusively as nature (Ministry of the Environment and Energy of Denmark and National Forest and Nature Agency 2005).

In practice, ecological networks have been hampered by low implementation levels. The counties had limited resources and detailed ecological knowledge to realise their planned ecological networks beyond already protected elements of nature. Inspection mechanisms for upholding planning decisions are virtually absent. The relative success of the Danish planning system had owed a lot to the equally active mobilisation of conservation organisations and a well-developed system of complaints boards, but these could also be

<sup>20</sup> Note the difference with the way interested parties are defined in Flemish corporatist structures, where unions and employers are always present, irrespective of whether the policy field concerned is of a socio-economic nature or not.



used to obstruct new policies. The ambition of plans for ecological networks was watered down in negotiations over implementation. Proposals in the nineties to create corridors along waterways by creating a buffer of 6 to 25 meters between agricultural land and water, were reduced to strips of 2 meters, close to already existing practices in agriculture, as a result of resistance by farmers. Farmers also blocked implementation on local levels, creating a gap between the visionary plans on the county level and the practice at municipality level. (Jongman and Kristiansen 2001; Ministry of the Environment and Energy of Denmark and National Forest and Nature Agency 2005; Van Ravensteyn, Hornis, Verwest, et al. 2005).

As a way to create more flexibility in planning, the new conservative government started a process of further decentralisation. In 2002, a substantial share of planning responsibilities was shifted to municipalities, which were given the right to allow farmers to build up to two extra houses for family and staff. Conservationists argued that this led to urban sprawl and that it was much harder for municipalities than counties to be strict on land use. In 2004, the government announced it wanted to disband the counties altogether and shift responsibility down to the municipalities completely. These plans have been toned down to a reorganisation of the county system, creating new regional authorities. By January 2007, the role of municipalities in planning will again be greatly increased. This administrative reform is joined with a new national strategic planning vision, in which new possibilities for urban growth, economic development, and the resolution of traffic congestion play a prominent role. Increased responsibility for municipalities is presented as the way to create the flexibility needed for economic development (Danish Ministry of the Environment 2006).

Also in 2004, the government presented its policy plan for biodiversity and nature conservation, which is the latest comprehensive policy document for nature conservation. Central topics are ongoing measures to reduce the impact of agriculture (such as protected zones along waterways to reduce leaching of nutrients as well as a phosphorus tax), conservation-friendly management of state-owned land (important for forests), and continued afforestation and nature restoration. In addition, the plan describes the efforts to comply with international obligations, such as the NATURA 2000 areas and the Convention on Biological Diversity (see Figure 4-2). The report also announced the experiments with national parks, something some conservation NGOs had been arguing for. Here too, the cost/benefit logic was not very far:

*“The basic idea behind the Action Plan is to invest resources in Denmark’s most valuable natural areas and to ensure we get our money’s worth in terms of more nature.” (Danish Government 2004, p. 5)*

The focus of conservation policies hence lay on protection of the most precious areas, in practice NATURA 2000 areas. The integration of nature

protection and other functions is also still official policy, but here resources are much lower. Especially at the ministry of agriculture, there is resistance against integrating agriculture and nature management. Environmental groups are arguing for higher budgets in this area and are trying to convince agricultural organisations that it is a good idea to involve farmers in nature conservation (Danish Government 2004; Stoltze 2007).



Figure 4-2 NATURA 2000 areas designated in Denmark, i.e. Habitat Directive and Bird Directive areas (Danish Government 2004, p. 76).

By toning down environmental policies that targeted agriculture, as well as by decentralising regional planning, the new government strengthened its support in the countryside and in agriculture. The Danish agricultural sector is highly organised. Almost every Danish farmer is a member of one of the encompassing agricultural organisations, federated under the umbrella of Danish Agriculture (*Dansk Landbrug*).<sup>21</sup> The origins of these organisations reach back to the cooperative farmers’ movement that started in the middle

<sup>21</sup> Danish Agriculture consists of the Danish Farmers’ Union, representing mainly larger farmers, and the Danish Family Farmers’ Association, bringing together mostly the smaller farmers. Both organisations have joined their national offices in 2003, but continue as local grass root organisations ([www.ddl.dk](http://www.ddl.dk)).



of the 19<sup>th</sup> century. Land redistribution at the end of the 19<sup>th</sup> century led to a system of cooperatives that basically still dominates Danish agriculture, albeit on a much larger scale. (Average farms in Denmark are now 55 ha, about twice as large as in Belgium or the Netherlands.) These organisations also assist members with implementation and compliance with environmental regulations through the extension services of their local branches. At the same time, they represent the farming sector to government. Contacts are especially close with the Ministry of Food, Agriculture, and Fisheries via an elaborate system of working groups and informal contacts. The current<sup>22</sup> Minister of Agriculture, Hans Christian Schmidt, was Minister of Environment under the first Rasmussen government, during Lomborg's hey days (Winter and May 2002; Daugbjerg and Pedersen 2004, p. 233).

Agriculture is traditionally well represented in Danish political institutions. There is a history of farmers' parties in politics and of (statistical) over-representation of farmers in the *Folketing*. It was disenfranchised farmers who formed the currently ruling Liberal Party (*Venstre*) in 1870, and it remained primarily a farmers' party until it transformed into a more traditional liberal free market party after the 1960s. Underlining the cultural importance of farming, farms are protected by specific legislation against use for non-agricultural purposes and the reallocation of agricultural land for habitation or industry is subject to strict regulations (Jamison 2001, pp. 108-109; Jørgensen 2002, p. 29; Van Ravensteyn, Hornis, Verwest, et al. 2005; Lauridsen, Christensen and Ahrensbach 2006).

Danish agriculture faces a well-organised sector of nature conservation NGOs. Apart from the Danish Society for the Conservation of Nature that was mentioned earlier, Denmark also has an active local chapter of the Worldwide Fund for Nature (WWF), which has been campaigning for the creation of national parks ([www.wwf.dk](http://www.wwf.dk)). In addition, there are important organisations of naturalists, among which the Danish Ornithological Society (ca. 12.000 members, [www.dof.dk](http://www.dof.dk)) and the Danish Botanical Society (ca. 1400 members, [www.botaniskforening.dk](http://www.botaniskforening.dk)) are the most prominent ones. Both organise wildlife enthusiasts with professional as well as volunteer backgrounds and undertake nature studies as well as educational activities. These organisations are not only advocates for nature conservation, but also important sources of knowledge of the natural environment.

Throughout the 80s and 90s, environmental groups were gradually integrated in the policy-making process. They acquired the formal right to appeal decisions and the right to be consulted in policy preparation. However, in practice, this policy integration was often confined to the implementation stage of policy, while the influence of policy formulation was

less institutionalised, with fewer positions in consultation bodies and more reliance on informal processes (Blom-Hansen 2001).

To sum up, Danish nature policy has shifted from a landscape-oriented approach, focusing on mixed functions of nature, to a conservation policy that concentrates efforts on 'valuable' nature, in practice defined by EU obligations of NATURA 2000. Outside of these areas, the present government aims for more flexibility in planning, which is partly realised by some major reorganisations of local and regional authorities. With this context in mind, the shift from environmental pioneer to environmental sceptic, as well as the particular force field of nature conservation, we can turn to how the Danes account their nature.

## 4.2 The state of Danish nature

Over the last twenty years, reports on the state of Danish nature have been irregular and produced by different sources. In this period, more or less comprehensive state of nature reports have come from three main sources. The first one is the Nature Council, originally a public advisory council that became controversial after a major conflict with the new government in 2002. The second source consists of civil society reports, such as monitoring programmes set up by conservation NGOs, particularly for birds, plants and butterflies. The third one consists of monitoring programmes managed by agencies of the Ministry of the Environment and in particular recently the National Environmental Research Institute (NERI). Apart from these three, there are also publications by scientists working at various institutes and universities, but these mostly concern detailed aspects of Denmark's nature, such as a selection of species, rather than comprehensive and systematic overviews. I will discuss the Nature Council, NGO, and Ministerial activities in more detail below.

### 4.2.1 Advising from beyond: the Nature Council

In February 1998, the Minister of the Environment and Energy installed the Nature Council (*Naturrådet*) as an independent body advising on nature protection and sustainable use of wildlife, environment and landscape. The council was composed of four 'sages' (*vismænd*). These were university professors with backgrounds in regional planning, nature conservation, or biology, appointed by the Minister for a period of three years. Assisting the four sages, there was a board of 40 representatives, divided equally between government authorities, scientists, and commercial and NGO stakeholders. The Council had a small secretariat and an annual budget of about 670 thousand Euro (2001). It was to identify priorities for the policy agenda in nature conservation and advise government at its own initiative or in response to requests. It also had a broad mission to study nature conservation or issues related to land use, forestry, wildlife, or use of natural resources, for example through seminars with professionals and NGOs (Agger 2001).

<sup>22</sup> In 2007, after the general election, Mrs. Eva Kjer Hansen is the new Minister of Food, Agriculture and Fisheries.

The Council was the successor of an older nature council that had provided the government with scientific advice on nature conservation since 1917. However, during the 80s and 90s, competing governmental expert resources had expanded considerably, with professionals hired by the administration and the expansion of major public research institutes. The old nature council was seen as a duplication of the public research apparatus and hence all but abolished in the mid-nineties. The argument to reinstall the Nature Council in a new form came from various sides, including the Danish Society for Nature Conservation who wanted an alternative source of expertise to the research institutes run by government.<sup>23</sup> Conservation scientists at universities insisted that such a Council could maintain communication between government and academic researchers and the Ministry wanted an independent body to assist with appeal procedures. At the same time, the Council was to overcome some of the shortcomings of its predecessor: it was to be a smaller Council, with four instead of twelve members, who would have more affinity with the policy process than the former, more academically oriented members, and with a stronger secretariat to assure timely production of reports. The board of representatives, although merely advisory, was to focus the Council on an agenda relevant to its stakeholders (Agger 2002, interview).

The Council was instated as an advisory organisation consisting of scientists, but with a remit that extended to signalling problems and identifying policy priorities. Its chairman articulated the Council's task conception, as follows:

*“The Council’s own interpretation points in the direction of what may be called an enlightened subjectivity, where the scientific background and the value judgements are both made explicit, and where things are seen in a more cautious, broad, and far-sighted context than by the other stakeholders in the environmental debate.” (Agger 2001)*

The Council positioned itself as a body that could provide a wise reflection in a diverse field of actors, containing growing numbers of experts and NGOs advising government, but clearly defending nature conservation. Explicitly referring to the work of social scientist Maarten Hajer, the council meant “to create the sort of problems that institutions can handle and for which solutions can be found” (Agger 2001; Agger 2002). In other words: the Council would provide solvable problems to policy makers.

The council itself clearly had a conservationist position and was expected to do so when the government installed it. It had support from the conservation sector and in fact saw this sector as an important client. Through the activities of the Council, a wider range of voices could be represented in

the conservation debate, including even those of dissenting civil servants (interview Agger).

Head of the *Naturråd* was ‘Chief Wise Man’ Peder Agger, professor at Roskilde University, formerly working for the Environment Ministry, and veteran of the Danish environmental movement. He was one of the founders of Noah, one of the pioneering environmental NGOs in Denmark in the 1970s and later the Danish branch of Friends of the Earth (Jamison 2001, p. 4). Agger took on the task of representing the Council and explaining its task conception in public. When the Council was attacked in a newspaper even before its installation in 1998, for having ties too close to the conservationist world (in particular the Danish Ornithological Society), Agger defended the independent status of the Council in the debate. Independence rooted in science was to be the key strategy. However, another aspect of the criticism was to haunt the Council: not only had the Council itself been accused of collusion with bird watchers, but the Minister had been accused of surrounding himself with an abundance of advisory councils filled with allies and even close friends. Nevertheless, unperturbed by an early skirmish, the Council positioned itself as independent of specific interests. It did not claim an objective voice among subjective positions, but a position as an engaged yet reflective and impartial actor, with an ‘enlightened subjectivity’ (Agger, Baagøe, Hamann, et al. 2000; Agger 2001; Agger 2002).

With this almost post-modern task conception, the Council set out to produce regular reports, occasionally referring to thinkers such as Zygmunt Bauman or Frank Fischer. It offered reflection on specific themes, such as on the concept of sustainable development (Danish Nature Council 2000; Holten-Andersen, Pedersen, Stensen Christensen, et al. 2000a), or ‘bio-invasion’ of exotic species and GMOs (Naturrådet 2001). This took the form of edited reports with chapter contributions by scientists from Danish universities and research institutes.

In 2000, using the same formula of an edited report, the Council produced a state of nature report, under the title *Danish Nature Policy: knowledge and assessments (Dansk naturpolitik: viden og vurderinger)*. The report presented an overview of nature conservation policy, societal pressures on nature, and the condition of Danish nature in a broad, historical perspective (Holten-Andersen, Pedersen, Stensen Christensen, et al. 2000b). It provided some general indicators, but of developments over a period of decades and sometimes even a century (e.g. Figure 4-3). Hence this was not a report that presented a state of nature to analyse whether last year’s policies had been effective. The Council reasoned that the governmental research institutes were better at providing that type of instrumental knowledge anyway. Rather, it wanted to identify *strategic* opportunities and gaps in long-term policy concepts. For such purposes, vision and historic awareness were considered more important than facts certified by peer review (Agger 2002).

<sup>23</sup> Note the parallel with the Flemish case, where a government research institute was installed to accommodate nature NGOs.

## Samfund og natur

Udvikling i sektorernes påvirkning af naturen i Danmark - situationen år 2000 sammenlignet med situationen for 10 og 50 år siden.\*

Påvirkninger fra	Tendens		Indikatorer
	siden 1950	siden 1990	
Forbrug	😊	😊	Forbrug af energi, areal og materialer
Bosætning	😊	😊	Byernes arealforbrug
Transport	😊	😊	Trafikkens areal-og energiforbrug
Rekreation	😊	😊	Arealforbrug (inkl. sommerhuse)
Landbrug	😊	😊	Brug af kunstgødning og pesticider, omdriftsareal
Skovbrug	😊	😊	Plantageareal, træproduktion
Fiskeri	😊	😊	Fangst-og bifangstmængder, fangstmetoder
Kystzonen	😊	😊	Ny bebyggelse i kystzonen

\* Her fokuseres på de miljøbelastninger som sektorerne forårsager.

- 😊: positiv udvikling  
 😊: delvis positiv udvikling men ikke tilstrækkelig  
 😊: negativ udvikling

Figure 4-3 Overview of sector influences on Danish nature over a period of 10 to 50 years - note the use of smileys in comparison to the Flemish report. The figure merely illustrates the generality of the indicators, and hence I have not provided a detailed translation (Holten-Andersen, Pedersen, Stensen Christensen, et al. 2000b, p. 11).

About 30 researchers were invited to write chapters with large authorial freedom. The eventual report consisted of three volumes, the third volume being the first report of the 'sages' themselves, *Danish Nature Policy: Visions and Recommendations* (Agger, Baagøe, Hamann, et al. 2000). The report identified general opportunities for nature policy, including expansion of protected areas, and made an explicit link to the consequences of climate change for nature conservation policy. One of the outcomes of the report, according to Agger, was the installation of a committee of stakeholders that was to suggest an action plan for biodiversity and nature management to government, the Wilhjelms Committee. To maintain its independent position, the Council chose not to get involved (Agger 2002).

The Committee was installed in March 2000 and named after its chairman Nils Wilhjelms, former Conservative Minister of Industry in the Poul Schlüter governments of the 80s. It consisted of 35 members, selected from organisations of farmers, fishermen, hunters, anglers, forestry, nature conservation NGOs, the labour movement, researchers, as well as senior civil servants from national and regional government administrations. One of the explicit goals was the preparation of the Johannesburg World Summit on Sustainable Development, but there was also a national agenda in supporting

the Danish Strategy for Sustainable Development. In line with the Nature Council, the Committee signalled the long-term deterioration of nature and biodiversity in Denmark, in spite of efforts in the previous decades.

The Committee proposed ambitious new goals for conservation policy, with the support of the organisations represented. Specific or quantified policy targets were avoided, but the propositions nevertheless constituted a recommendation for a reinvigorated conservation policy. Expectations among conservationists were high, but the publication of the report in 2001 was an anti-climax: 9/11 pushed the issue off the political agenda and after the elections, government chose a new course. Nevertheless, the report shows how the nature Council could function in a policy formation process along traditional lines of negotiation in Danish policy making (Wilhjelms Committee 2001; Agger 2006).

The conservative government abolished the *Naturrådet* immediately after it came to power, in January 2002, by means of the Prime Minister's public New Year's speech. At first reading, the action is in line with the political course of the new government that wanted to slow down the environmental policies of the previous government. To make things worse, one can see how comments linking nature conservation with climate change by the Nature Council would not be convenient: this was a government that had allied itself with Lomborg and his attempt to move climate change down the list of global priorities. The abolishment of the Council then becomes a story of a ruler removing a source of unwelcome news.

However, another interpretation of these events is also possible. The Nature Council was not the only council to be abolished. In fact, the government abolished over one hundred advisory councils in early 2002. Although the nature and environmental policy fields were targeted in particular, the complex system of advisory bodies around national government was presented as a remnant of Denmark's corporatist past that prevented decisive political action. In his New Year's speech, Fogh Rasmussen declared that the 'arbiters of taste' in 'unnecessary' boards and councils were to be removed (Agger 2002).<sup>24</sup>

Especially in times of populism, political leaders tend to present themselves with leadership and drive, rather than with deliberation and reflection. Irrespective of whether one agrees with the views of the new government, one can see how a council of sages that produces do-able problems for nature conservation becomes an obstacle on the road of a leader with a mission. In the most sympathetic reading, abolishing advisory councils can

<sup>24</sup> A similar 'clean up' occurred in the Netherlands in 1997, also in an attempt to do away with corporatist structures. However, whereas in Norway the operation occurred overnight in a populist style, the Dutch operation was the outcome of years of consideration (Halffman and Hoppe 2005). However, in 2007, plans for merger and abolition of a lot of advisory councils were launched, not after very serious thought.

even be interpreted as a *tabula rasa* that reoriented Danish democracy to a representative rather than participatory logic and redefined the rules of public accountability, although the outcome of this process is by no means clear.

Still, such a reading may be too sympathetic for what was clearly also an anti-environmental move. Other advisory councils, such as the similarly structured Economic Council, remained firmly in place ([www.dors.dk](http://www.dors.dk)). Meanwhile, the Nature Council saw economists and cost/benefit analysis at Lomborg's Institute of Environmental Assessment taking over their advisory role.

But this is not the end of the story. Remarkably, the Council did not accept Fogh Rasmussen's decision. The members of the Council wanted to make a statement and show frustration about being abolished and hoped to reach the media with their action. At the same time, they were convinced that there was a need for a long-term vision of nature protection with a scientific basis. Taking their independence literally, the four sages decided to continue to write reports irrespective of the government's decision. This meant they had to work without the secretariat, the 5 million kroner annual budget, and without the board of representatives. After the Ministry of the Environment froze the Council's website, the Council got a commercial host and became *Naturrådet.com* ([www.naturraadet.com](http://www.naturraadet.com)), effectively turning into an NGO (Agger 2002; Agger 2006).

After these events, the *Naturrådet* produced another five reports. Three of these were follow-ups of the 2001 Wihjelm Committee report, subtitled Wihjelm+1, +2, and +3. These reports were produced on the basis of research conferences in which progress of the Wihjelm themes was monitored, almost as if the Wihjelm recommendations had become policy. However, two further reports were more influential. *Det Fede Landskab* ("The Fat Landscape"), the "Sages' Report" of 2002, dealt with the pressure of manure on nature. The report assessed the progress of past policies and concluded that further reductions would be needed to achieve a sustainable agriculture (Agger, Christensen, Reenberg, et al. 2002). The last report addressed the identification of EU Habitat Directive areas, questioning the government's policy of focussing on these areas at the expense of nature elsewhere in the country. These reports became documents used by environmental organisations, rather than by government. The work of the Council now provided knowledge that could be used to criticise government policy, but was also used by environmental organisations to develop their own nature management plans (Agger, Christensen, Reenberg, et al. 2005; Agger 2006).

In 2006, the remaining four sages of the Nature Council decided to finally disband the organisation. They found it impossible to combine full-time jobs at universities with an advisory body with no budget and no administrative support. From a council offering strategic and reflective policy advice, the Nature Council had become a fierce critic of government policy. Cut loose by government, it reinvented itself as an NGO that provided environmental

organisations with ammunition for criticising government, as well as with knowledge for their own nature management. In the end, the council found that there were insufficient resources in such a niche to survive as an organisation.

#### 4.2.2 NGOs and the state of nature

Voluntary organisations play a major role in the collection of data on nature in Denmark, as in many other countries. Relevant organisations include the Danish Ornithological Society, which manages an extensive database on the condition of birds. This database includes species descriptions, populations, and distribution data for over 200 species of birds. A small team at the main office of the organisation manages the database, but active members and the local branches provide the data. The data are subjected to cross-assessment by the active members, but also by the main office and specialists. Although the database has been on-line, the monitoring activities of the organisation go back a lot further, with the systematic surveys in the 1960s, and bird atlases in the 70s and 90s (Heldbjerg 2006; Grell, Heldbjerg, Nyegaard, et al. forthcoming 2007).

Towards the end of the nineties, the government extended its financial support of the Ornithological Society to include money for its monitoring activities. This financing was discontinued under the Fogh Rasmussen government in 2002. The Ornithological Society had to resort to a private foundation to maintain its database activities, even though it judged bird monitoring a public responsibility (Heldbjerg 2006).

The bird data of the Ornithological Society are sporadically used by researchers (e.g. Fox 2004) and, via research reports, in government policy documents. Overall, researchers in biology seem still a little suspicious of data collected by enthusiasts, mostly worried about the quality of the data in terms of sample validity. However, governmental research programmes are planning to make more use of these data and on the basis of this use, the Ornithological Society has managed to convince the Environment Minister to resume partial funding of the database activities from 2007 (Heldbjerg 2006; Grell, Heldbjerg, Nyegaard, et al. forthcoming 2007).

Similarly, the Danish Botanical Society started collecting data on plants already in 1904. In 1992, it began work on a botanical atlas, the *Atlas Flora Danica* project. It is an inventory of plant distribution throughout Denmark, based on boxes of 5 by 5 kilometres. The project aims to provide a complete overview of Danish plant life. The completion of the inventory is planned for 2008, but collected data are updated and available through the Internet. The atlas went through a similar phase as the bird monitoring programme, with support from the same private foundation and is also intended to be used in government monitoring ([www.botaniskforening.dk](http://www.botaniskforening.dk)).



The Society for the Conservation of Danish Nature has recently decided to start its own monitoring programme, also focused on plant life. In addition to the floristic focus of the *Atlas Flora Danica*, this project will attempt to make an integral assessment at a series of localities throughout the country, using its local membership. The project was partly motivated by dissatisfaction over the selectivity of the government's monitoring programme, which focuses on NATURA 2000 areas. The main aim is to make visible the situation of the cultured landscape and identify problems and areas of deterioration, with an eye on putting such problems on the political agenda (Stoltze 2007).

However, the NGOs go further than the collection of data. In 2005, a report that presented an overview of the state of nature in Denmark was produced by four NGOs, including the Danish Society for Nature Conservation, the Danish Ornithological Society and the local chapter of the WWF (*WWF Verdensnaturfonden*). Professional biologists wrote most of the chapters in the report. One of the authors was Annette Reenberg, professor of geography at Copenhagen University and one of the four 'sages' of the Nature Council. The report was presented and discussed during a conference that included a representative of agriculture, and introduced by the environment minister (WWF, Friluftsrådet, Dansk Ornithologisk Forening, et al. 2005).

The report included a chapter on the status of plants in Denmark, provided by a biologist from the Danish Botanical Society; and a chapter on breeding birds of Denmark by biologists from the Danish Ornithological Society. It listed positive as well as negative developments in biodiversity and especially rare species. Further chapters assessed reptiles and amphibians, butterflies, lichens, and fungi. The report therefore mainly gave an assessment in terms of species and biodiversity, using the knowledge of the NGOs involved. It concluded with a list of priorities for future nature conservation policy (WWF, Friluftsrådet, Dansk Ornithologisk Forening, et al. 2005).

The initial timing of the report aimed for the 2005 national elections. The plan was for the conservation world to set up an event that would bring nature under political and media attention during the election campaigns. However, the scheme failed when the Prime Minister announced elections earlier than foreseen. By the time the conference was held, in March 2005, the next liberal-conservative Fogh Rasmussen cabinet had already been formed (Agger 2006; Heldbjerg 2006).

Nevertheless, the report of the conservation NGOs shows how state of nature reports can be used for advocacy or for setting the political agenda, and even be organised for such purposes by a group of stakeholders. This is an example of a set of actors organising their own knowledge, their own account of nature, for use in politics. With the Nature Council no longer available as a forum for producing such an account, nature organisations produced it themselves, even with the help of at least one Council member.

In fact, the Danish agriculture sector started to do the same: Danish Agriculture, the amalgamation of the main organisations of the agriculture sector, also presents its own accounts of the state of affairs in the countryside. Its main office produces facts and research that supports its members as well as its national negotiations. This research takes the form of fact sheets (Lauridsen, Christensen and Ahrensbach 2006), but also targeted research to prepare policy reports. In 2003, Danish Agriculture presented its own nature policy report, including proposals for voluntary schemes for nature development by agriculture. The agriculture representative at the NGO conference could therefore present some proposals of the agriculture sector. There have been similar attempts by NGOs to engage in dialogue with agriculture, partly to circumvent the doors closed to them at the agriculture ministry. However, this interaction has been limited to the top of Danish Agriculture and does not seem to lead to concrete changes in agriculture (Dansk Landbrug 2004; Stoltze 2007).

While the Nature Council was in its last stages around 2005, expertise advising nature conservation showed an element of the traditional corporatist knowledge organisation: highly organised civil society groups put forward their own assessments of the state of nature, by means of their own knowledge infrastructure. This resulted in competing accounts that were used in negotiations, even though the old negotiation forums constituted by the advisory councils had been abolished. Meanwhile, the government's own nature monitoring activities were being reorganised, bringing a new element to the story.

#### 4.2.3 Monitoring of nature by agencies of the Ministry of the Environment

Over the last two decades, the Danish government has run a number of initiatives monitoring the state of nature, with a major interruption when the Fogh Rasmussen government came to power, followed by a reconstitution in recent years. I will describe the development of these programmes to establish how they related to environmental policies and political shifts.

The first attempt to get a systematic overview of ecological conditions started with a monitoring programme for water quality in 1988. This monitored water pollution in view of health, environmental, but also ecological impacts. It was part of the Action Plan for the Aquatic Environment that was adopted in 1987. The rationale for the aquatic monitoring scheme was to assess progress of policy targets and to assess whether reduced discharges actually led to ecological improvement. These policies were the outcome of the conflict over water pollution of the mid-80s that had, for the first time, put the impact of agriculture on the political agenda and were constructed around quantified reduction targets.

The monitoring programme was set up in cooperation with the counties, responsible for policy implementation, through a national grant. It focused on analysis of water and wastewater, including atmospheric depositions of



pollutants. During the nineties, hazardous substances (such as especially pesticides) and heavy metals were included and after the 1998 revision (“NOVA-2003”) as well as limited biological assessment. Prior to 1998, biotic monitoring was limited to macro-invertebrates as indicators of pollution. Hence the original focus was on pollution, only to expand gradually to the monitoring of aquatic wildlife. The revised programme was no longer set up as an assessment of policy targets of the 1987 Policy Plan, but became a general aquatic monitoring scheme. It formed the basis of the annual report on the state of the aquatic environment by the Danish Environmental Protection Agency to Parliament (National Environmental Research Institute 2000; Friberg, Baattrup-Pedersen, Pedersen, et al. 2005; Svendsen and Norup 2005).

In the nineties, environmental policy plans started to integrate the various sectors of environmental policy, initiated by the comprehensive plan of 1988, the *Action Plan for Environment and Development* (Jänicke and Jörgens 2000, pp. 617-618). Strategic planning reports every four years were based on state of the environment reports, which included a chapter on nature (Danish Ministry of Environment and Energy 1995; Holten-Andersen, Christensen, Kristiansen, et al. 1998; Bach, Christensen and Kristensen 2001; Bach, Christensen, Gudmundsson, et al. 2005a; Bach, Christensen, Gudmundsson, et al. 2005b). These reports were published in cooperation between the Environment Ministry and its research institute, NERI, based on information available in the government and the research literature. Starting in 1993, the Ministry also started to publish yearly reports with selected environmental indicators, some of which pertained to nature, managed by the Danish Forest and Nature Agency, but written by ad hoc teams of up to ten specialist from various government agencies (Danmarks Miljøundersøgelser 1992; Wichmann, Christensen, Olsen, et al. 1995; Wichmann, Christensen, Olsen, et al. 1996; Utzon-Frank, Andersen, Hansen, et al. 1998; Wichmann, Christensen, Andersen, et al. 1998b; Wichmann, Christensen, Andersen, et al. 1998a; Utzon-Frank, Andersen, Lausen, et al. 2000; Utzon-Frank and Andersen 2001; Utzon-Frank, Andersen, Kristensen, et al. 2001; Miljøministeriet 2004).

Both sets of reports, the four-year progress reports and the selected indicators, contained modest chapters on the condition of nature (roughly one chapter out of ten). Most attention was given to environmental problems such as pollution. The data provided on nature and wildlife, consisted of systematic data on land-use and forestry, and development of species, as available in the literature. The main focus remained on water, forestation, and land use. A more encompassing monitoring programme was announced in 1995 (Danish Ministry of Environment and Energy 1995) and reorganisations in 1998 led to some expansion. Apart from the aquatic programme NOVA 2003, monitoring was now to cover national biodiversity, including “the total recording, about every five years, of selected, rare types of vegetation, as well as monitoring population trends of selected indicator species and groups of species, in a selection that is as representative as possible of the

nature types in which they occur.” (Ministry of the Environment and Energy of Denmark and National Forest and Nature Agency 1998, p. 23)

The structure and style of the reports followed that of the policy plans they were meant to support. These environmental policy plans were not as detailed as, for example, the Dutch policy plans of the same period. In general, they lacked operationalised policy targets – although there were a few exceptions, such as quantified targets for reduction of pesticide use and nutrient loads, and for expanding forests. In line with this style of policy plans, indicators were rarely presented as performance indicators for specific policies, but mostly as signals for the overall condition of nature and the environment: an alarm system that would signal problems early. When the DPSIR system<sup>25</sup> was introduced to the reports around 1997, the programme was explicitly limited to Driving forces, Pressures, and States. Impacts and Responses were to be dealt with in policy plans, rather than the state of nature reports. This implied that a boundary was drawn between the responsibilities of the experts and of the policy makers, by which experts were largely prevented from assessing policy target achievement.<sup>26</sup> In spite of these restrictions, with the 1998 expansion in monitoring activities, the Ministry of the Environment seemed on its way to more encompassing reporting on the state of nature, albeit distributed across its agencies.

The change in government of 2002 had an impact on these monitoring activities too. The annual reports of selected indicators were discontinued and all monitoring activities were transferred to NERI. In 2003, the old “NOVA 2003” water monitoring programme came to an end and needed to be updated, if only to meet legal reporting requirements. The Nature Protection Act specified that the Ministry of the Environment was required to report regularly on the state of nature in Denmark – in addition to the requirements to report on biodiversity that flow from international agreements, such as the Convention on Biological Diversity. The programme was expanded with a terrestrial section and would become the new monitoring tool for nature and environment.

By 2004, NERI could launch NOVANA, the Nationwide Monitoring and Assessment Programme for Aquatic and Terrestrial Environment. It is an encompassing environmental monitoring scheme that means to keep track of the state of Danish nature in the context of environmental policy. As its predecessors, it is intended for use in periodic policy and monitoring reports. The main addressee is the Parliamentary Committee on the Environment and Planning, but the report is also intended for parts of government involved

<sup>25</sup> Driving Forces, Pressure, State, Impact, Response, see chapter on Flanders.

<sup>26</sup> Note how this is precisely what the Flemish ecologists are trying to achieve in their indicator set: identify policy targets in policy documents, translate these into quantified targets, and monitor these systematically to create policy performance indicators. In this respect Flemish nature reporting is more similar to the Dutch planning bureaus attempt to ‘discipline’ policy makers to stick to their self-proclaimed targets (Pesch, Hisschemöller and Huitema 2006).

in environmental policy, as well as a wider public and NGOs. Data are produced in cooperation between the regional authorities and agencies of the Ministry of the Environment (Geological Survey of Denmark and Greenland, Danish EPA, Danish Forest and Nature Protection Agency, and the National Environmental Research Institute). However, since the changes in 2002, the majority of the research and the coordination of the programme lie with the National Environmental Research Institute (Svendsen, Van der Bijl, Boutrup, et al. 2005; Svendsen and Norup 2005; Andersen, Boutrup, Bijl, et al. 2006).

NERI is the research agency of the Ministry of the Environment. It was set up in 1989 and has over 400 researchers in environment and nature research, spread over eight departments and three different locations. The Department of Policy Analysis (50 staff) studies interactions between society and environment, but also performs 'strategic research and counselling' to the Ministry of the Environment, including state of the environment reports.<sup>27</sup> The Board of Governors of NERI decides on the overall course of the institute and to this extent negotiates four-year research programmes and management targets with the Ministry of Environment. However, NERI also performs contract research and participates in various international research programmes, amounting to half of its budget. As such, it is not only the Ministry that has a say in the research agenda of the Institute, but NERI is the prime source of technical and scientific knowledge for policy decisions. In 2007, NERI is expected to amalgamate with the University of Aarhus, as an independent institute within a larger university, instead of its present position directly under the Ministry. The departments on terrestrial ecology and biodiversity perform research relevant for conservation policy and provide data for NOVANA, but the report itself is the responsibility of a separate department of monitoring ([www.dmu.dk](http://www.dmu.dk), [www.neri.dk](http://www.neri.dk)).

NOVANA was to reorganise environmental monitoring and build it up from the bottom. The first two years were invested in preparatory reports, for example designing new classifications for reporting. As a consequence, the first comprehensive report appeared only in May 2006, accounting for the state of the Danish environment in 2004. Somewhat bridging the gap of environmental reporting that had been discontinued in 2002, the Ministry of the Environment brought out one more selected indicators report in July 2005, also reporting on 2004, including one indicator based on the observations of the Ornithological Society (Miljøministeriet 2004).

The 2006 NOVANA report integrated a series of eight partial reports on specific topics that were published since 2004 and was built around various chemical pressures on nature, including pollution by nitrogen, phosphorus, organic matter, heavy metals and hazardous substances. Description of these

contaminants were followed by chapters on the condition of water (streams, lakes, groundwater) and eventually an analysis was made of habitats and species (Andersen, Boutrup, Bijl, et al. 2006).

However, biological information was still limited in the reports, especially for the terrestrial environment. This was reported in a sequel that appeared later in 2006, which provided monitoring data on selected plants and animals relevant for NATURA 2000, as well as species for which more than 20% of the population occurs in Denmark ('responsibility species' in international agreements). For the first time, a NOVANA report presented information on terrestrial as well as aquatic habitats and species with the intent of longer term monitoring. The species monitored were highly selective and focused on the protection of threatened species.<sup>28</sup> Several of the species involved had been topics of research at NERI before, or of previous monitoring programmes, and could therefore be presented as time series. However, for most of these species, it was only possible to present a simple baseline for potential future time series (Søgaard, Pihl and Wind 2006).

NERI had monitored the status of a selected list of species and habitats over longer periods. These were species that were threatened or legally protected, such as Danish orchids. These programmes formed input for NOVANA. One of the uses of these data is to update the Danish red list. Another use is to study the effect of abiotic factors on populations (such as landscape changes, recreation, wind farms, or oil activities). These monitoring activities are therefore not focused on indicators for the development of Danish nature in general, but focus on a few species of particular interest. For example, currently monitored animals are the harbour porpoise, Minke whales, pink-footed geese, and seals, but also sea turtles in the Azores. Some of these include satellite-tracking projects. NERI also maintains the Danish red list of endangered species, for the purpose of reporting to the Convention on Biodiversity, following the red list system of the World Conservation Union IUCN. The red list is maintained by researchers who are responsible for certain taxons and who will update data based on published literature ([www.dmu.dk](http://www.dmu.dk), [www.iucn.org](http://www.iucn.org)).

NOVANA therefore integrated previously existing monitoring programmes to include a wider range of monitoring activities. However, the legacy of the previous programmes remained visible. Rather than a full-fledged state of nature report, this was a programme that monitored the development of ecologically relevant pollution, of selected habitats, and a set of species either relevant as indicators of biodiversity or as indicators of pollution. As such, it only provided limited tools to assess the progress of nature conservation policy in general.

<sup>27</sup> The departments are: Policy Analysis, Atmospheric Environment, Marine Ecology, Environmental Chemistry and Microbiology, Arctic Environment, Terrestrial Ecology, Freshwater Ecology, and Wildlife Ecology and Biodiversity.

<sup>28</sup> The species included consisted of four mammals (European Otter, Dormouse, Harbour Seal and Grey Seal), two butterflies, six other insects, one spider, six vascular plants (including the rare Ladies Slipper orchid), one moss, thirteen rare breeding birds (such as Cranes), and a larger group of migratory water birds.

NOVANA is divided in nine sub-programmes (Svendsen and Norup 2005):

1. background monitoring of air quality and atmospheric deposition: air concentrations of various substances, deposition measurements and modelling;
2. point source water pollution, including municipal and industrial wastewater, storm water, as well as fish farms and modelled discharges for sparsely populated areas;
3. agricultural catchments, focusing on use of fertilisers and pesticides in relation to the hydrological cycle (leaching etc.) at six agricultural catchments in the country;
4. groundwater monitoring, through chemical analysis
5. watercourses, with a chemical section (nutrients, pollution, etc.) and ecological quality indicators, including macro-invertebrates, fish, plants, physical conditions, and NATURA 2000 habitat types, including chemistry with some modelling (nitrogen);
6. lakes, with the most detailed analyses of nutrients, pollutants, habitats, biota from plankton to water birds, sediment chemistry, especially for larger lakes;
7. marine waters, with physico-chemical analysis, nutrients nutrient transport models, and biota with plankton, benthic fauna and fish;
8. species and terrestrial natural habits, with wetland birds, seals, cormorants, selected red list species, and plants and animals specified in the Habitats and Birds Directives;
9. the Nationwide Air Quality Monitoring Programme, with about ten priority pollutants in combination with meteorological parameters, with an eye on the development of models.

The governance of NOVANA is entirely in the hands of government organisations, cooperating in the Management Board, with a secretariat hosted by NERI. The same constituency of this Board forms Steering Committees for most of the listed sub-programmes. Regional authorities are mostly responsible for data collection and sampling, while NERI manages some specific data collections (marine, air, species) and integrates the data. Where needed, consultants and laboratories are hired to perform specific tasks. This distributed data production and gives rise to detailed requirements of laboratory certification, quality assurance, and complex data exchange structures. There are scientific forums and meetings and international evaluation, but apart from the hearings at the design of NOVANA, stakeholders outside of government seem entirely absent. The only mention in the design of NOVANA is that 'external parties participate as required' at scientific meetings (Svendsen and Norup 2005).

NOVANA was not without its critics. After the elections, the new government announced a lower priority for environmental issues, but also that it would meet prior international environmental agreements. While it decided to go through with the expanded monitoring project, it also reduced the Ministry share of the monitoring budget by 10% and maintained the county budget

for monitoring at the same level.<sup>29</sup> Hence NOVANA had to deliver more monitoring with fewer resources. This required new prioritisation in the monitoring scheme that led to extensive discussion between the Programme Management Board (consisting of researchers from government agencies involved) and the Board of Directors of the Ministry.

Criticism also came from outside the institutions of government. Between December 2002 and January 2003, NOVANA was proposed in meetings with a series of stakeholders, 31 of which prepared a hearing response. This included several research institutes, but also the Nature Council, the Danish Ornithological Society, the Danish Society for the Conservation of Nature and individual naturalists and scientists, with some critical remarks on the budgetary restrictions. Especially the nature conservation organisations objected to the highly selective nature of the monitoring programme, as well as to the way specific indicators had been selected. For example, NOVANA distinguishes between 'actively' and 'passively' monitored species. The Ornithological Society objected to the fact that even the actively monitored species would not be assessed every year and the passively monitored species would not be monitored systematically at all. The primary objection from the Nature Council and the Society for the Conservation of Nature was that the monitoring activities were focused on NATURA 2000 areas, at the expense of other valuable nature, typically in cultured areas. These organisations pointed out that the programme was primarily set up to meet specific prior legal commitments, rather than as an overall assessment of Danish nature. NOVANA met the minimum administrative reporting requirements and in some cases even fell short of these (Svendsen and Norup 2005; Stoltze 2007).

Interestingly, NOVANA also makes a selection in the DPSIR scheme (European Environment Agency 1999), but one that is slightly different from its predecessors. NOVANA explicitly focuses on pressure, state and impact. It excludes trends in agriculture, industry or urbanisation as driving forces, as well as policy plans or other forms of political and societal responses. These are referred to the national statistics agency and to four-year reports related to the environmental planning cycle (Svendsen and Norup 2005, p. 18). Although the monitoring data may form an input for policy evaluation, a direct link with policy as well as politically sensitive societal developments among driving forces is therefore somewhat avoided.

Combined with the pre-NOVANA monitoring history this implies that, at least from a nature conservation point of view, the pressures on nature are presented as mostly caused by pollution and not by, for example, agricultural practices or land use patterns. Even where species are monitored, they are

<sup>29</sup> In 2001, the annual budget for NOVA was 24 million Euro from the regional budget and just under 8 million from the Ministry, representing a total of about 223 full time equivalent staff (Svendsen and Norup 2005, pp. 41-42).

often seen as indicators of pollution rather than as indicators of wildlife, especially in river testing. For example:

*“Fish densities are monitored on a 100 m reach using multiple run electro fishing. Densities of all species are estimated. However, Trout (Salmo trutta) is the only useful indicator in small Danish streams and is therefore the primary target species.”(Friberg, Baattrup-Pedersen, Pedersen, et al. 2005, p. 38)*

For a monitoring scheme focused on nature conservation, the priorities would be inverse: the common Trout is an interesting indicator of water quality, but the less common fish species the more interesting for biodiversity or conservation. To the extent that NOVANA is a state of nature report (rather than a state of the environment report), it seems strangely disconnected from nature conservation policy. Most of the monitoring of species and habitats flows from international obligation, such as the Water Framework Directive. There are a few exceptions, for example the river Skjern is monitored intensely to assess the effects of re-meandering in 2000-2001 (Friberg, Baattrup-Pedersen, Pedersen, et al. 2005). Otherwise, the focus on landscape protection, regional planning and afforestation in nature conservation policy seem very remote from the pollution focus of NOVANA.

One of the causes of the limited ecological reporting is the lack of data. One of the potential solutions lies in the wealth of data managed by volunteer nature conservation organisations. Until recently, these data were used occasionally, such as when biologists decided to include them in research projects. The government has announced that NGO data will be integrated in nature reporting (Grønnegaard and Bruun 2005) and it is for these purposes that the Environment Ministry has accepted to resume funding of NGO monitoring activities. From the side of NGOs, there is the initiative of the Society for the Protection of Danish Nature to start its own monitoring to complement, but there are no concrete plans to see if such results could be integrated at this point (Stoltze 2007).

### 4.3 The reconstitution of state of nature reporting in Denmark

The practice of developing accounts of the commons continues to go through complex changes and shifts. It may not be easy to stick a label to the Danish case as it is developing, but with the benefit of an overview of the developments since the early nineties, some interesting patterns come to the fore.

First, we can reconstruct the development in terms of the content of policies. We then see the shift from the environmental policy of the ‘green majority’ in the *Folketing* of the end of the 80s and the discourse of high ambitions of the social democrat governments of the nineties, to the disinvestments in environmental policy of the liberal-conservative government after the

2001 elections. In the nineties, the high priority for environmental policies meant that there was substantial political support from the Ministry of the Environment for environmental research, such as the formation and expansion of NERI, as well as expert advice at some distance from policy makers, but sympathetic to policies of nature conservation, as with the Nature Council. These experts were given the resources to keep track of the state of the environment, through monitoring programmes, yearly indicator reports, as well as four-yearly progress reports in the context of long-term environmental policy plans. The Nature Council was even encouraged to signal problems for conservation policy, while at the same time it could be a channel for expertise outside of government, as well as a way to set up a dialogue with the conservation sector, cast in a discourse of independence.

In this frame of analysis, the change in government meant a much lower priority for environmental issues, which in turn meant budget cuts in environmental policy and environmental expertise. A government that wants to reduce the relative importance of environmental problems has no need for an advisory council that identifies new problems, even if these are developed with the practicalities of policy in mind and in negotiation with relevant stakeholders. By abolishing the Nature Council; by discontinuing yearly reporting on environmental indicators; but also by reorganising environmental monitoring so radically it did not produce results for a few years, the new government created a period of three to four years without bad news about failing environmental policies or new problems, at least from its own institutions. When the government returned to accounts of the commons with the NOVANA monitoring scheme, it was in a form that fitted the redrawn policy priorities. In the end, the design of NOVANA corresponded to the new status of environmental policy and the commitment levels of the government, aiming for nominal compliance with national and international legal obligations for the protection of nature and the environment.

The stubborn continuation of the Nature Council and the attempt of NGOs to set up alternative nature reports can then be seen as attempts to fill a gap of missing state of nature reports, in an attempt to keep nature conservation on the political agenda.

A second account of these changes draws our attention to the patterns of governance involved in Danish accounts of the commons. Throughout the nineties, nature NGOs acquired status as recognised spokespersons for the environmental sector. They were further integrated into policy circles, an accommodation that was partly performed through the Nature Council and especially through its board of representatives. In other words, we can see this as the construction of corporatism in nature conservation. As in Flanders, nature reports played a vital role in this process, although with a different focus. First, the Nature Council offered more long-term reflection for the sector. Second, the Nature Council to some degree even offered a forum for stakeholder mediation.



The Fogh Rasmussen government broke through these arrangements and pushed environmental representation out of the corporatist channels of policy making. As an alternative, there was a shift to a discourse of politicians in control, cost/benefit rationality, and science-based indicators, moving monitoring out of the policy agency and into the research agency NERI and eventually even NERI in its entirety into a university.<sup>30</sup> Intentionally or unintentionally, but in any case against the background of anti-corporatist discourse, the Danish government has reconstituted the nature conservation policy field. From a freshly established corporatist negotiation structure around the Nature Council, it became a policy field with a separation between political responsibilities and indicators considered technical and instrumental, while keeping interest groups at a distance. Rather than partners in policy development, these groups have now become activists arguing for an interest.

This strict division of roles has some clear disadvantages. Politics remains in charge as long as it has the power to do so, but when nature conservation organisations set up their own negotiations with agriculture, as they did around their own 2005 nature report, they threaten to connect with an ally of the government and displace its policy agenda. Similarly, conservation NGOs are potential partners in the monitoring of nature. Until recently, NOVANA was set up as a monitoring scheme that would be performed by professionals. Especially for wide scale monitoring of wildlife, this leads to considerable costs, whereas a lot of knowledge is available in volunteer monitoring.

In both of these accounts, 2001 appears as a watershed change, fundamentally altering policy priorities and even reconstituting the positions and rules of the game in this policy field. However, on second sight, there are also some remarkable continuities. Already before 2001, corporatist institutions were acquiring a negative aura in Denmark. In fact, what the network of ‘green actors’ achieved in this period is, among others, a disruption of another bastion of corporatism: agricultural policy. Rather than the construction of an *environmental* corporatism, the institutions set up in the nineties can also be considered to be an institutionalisation of a new policy alliance, that was mobilised to break into former closed off corporatist circles of agricultural policy.

In addition, the newly acquired positions of the environmental organisations were not even that corporatist. They acquired acceptance as important policy actors and were consulted, but even around “their” Nature Council, they were only one of the actors represented in the board and even then only in an advisory role. The Environment Ministry was organised into agencies with performance agreements already before 2001 and with its reflective

role conception, bringing new actors together and finding creative solutions, the Nature Council can be understood as an example of deliberative policy processes also.

Lastly, it is important to note that also in the nineties, social-democrat governments avoided detailed policy targets in its policy plans. These governments set up new environmental policy, cast in an ambitious discourse, inviting reflection on new environmental policy problems. However, at the same time, they nevertheless made sure government maintained a wide margin of political manoeuvrability, without getting tied to detailed policy targets by its own network of expertise.

## 4.4 Analysis

### 4.4.1 Types of activities

In the development of state of nature reports in Denmark, it is remarkable to see that within a few years’ time, nature reports are used in completely different ways. These changes follow the rise and fall of organisations advising government.

In the monitoring and indicator reports of the nineties, nature reports are used *instrumentally*: either as alarm bells for the overall state of nature, or in a few cases as indicators of policy performance (such as with the annual targets for new forests). These indicator reports fed into four-yearly reports with some reflection, but these generally steered clear of political prerogatives of the Ministry. If we stretch the categories, we could say that there was some degree of *review* activity, but this was restricted to collecting available data, rather than assessing and certifying knowledge.

With the installation of the Nature Council, we find a richer mix of different types of activities. Most visible is the *reflexive* accounting of nature. The focus is on the long-term developments, such as the development of land use over several decades. Nature reports ask where Danish nature is coming from and where it should be going to, deliberately leaving more instrumental forms of reporting on the state of nature to government institutes. In order to achieve this, the Nature Council sets up *review* activities – not in the typical sense of certifying knowledge, but of asking guest editors to review the state of knowledge on a topic of Danish nature. Through its board of representatives and the conferences it organises, the Nature Council performs some modest degree of *mediation*, although directed at the professionals in various organisations. In the end, the stress was more on *advocacy*, defending the case of nature conservation. *Instrumental* activities were explicitly avoided and were left to the Ministry and its agencies.

<sup>30</sup> Given the problems with overly academic advisers in the old advisory councils on nature, this move could spell trouble. Then again, universities are no longer the kind of institutions they were fifteen years ago.



The NGO initiative *Natur Retur* has clear elements of advocacy, but the report and its presentation at a conference are used at the same time to engage in *mediation*, trying to find a level of agreement with agriculture. For this purposes, different authors presented an overview of information, but not in the form of a group of scientists certifying knowledge.

The NOVANA programme, lastly, steers nature reporting back into an instrumental direction. NOVANA is first and foremost a set of systematic indicators that produce monitoring data according to legal commitments. Even as NGOs are pulled into cooperation in the monitoring scheme, this still is a matter of *instrumental* activities, providing clearly defined information for clearly defined purposes. Perhaps NOVANA can lead to development of other types of activities, for example at the occasion of disagreement over the selective nature of the indicator set. Meanwhile, the more reflective aspects, including the role of nature reports in preparing policy reports, have been separated and moved to the Ministry or abolished (see overview in Table 4-1).

	Nature reports 90s <i>Selected indicators</i>	Nature Council 1998-2005	NGO initiative <i>Natur Retur</i> 2005	NOVANA 2004 -
Review		*		
Instrumental	***			***
Mediation		*	*	
Advocacy		***	***	
Reflection	*	***		

Table 4-1 Overview of types of activities in Danish state-of-nature advice

#### 4.4.2 Key issues of expertise

##### 4.4.2.1 Four-yearly reports on Nature & Environment/Selected Indicator reports

It could be argued that the annual and four-yearly reports of the nineties should be considered separately, for example because the yearly indicator reports were produced under the auspices of the Ministry, while the Nature and Environment reports were produced by one of its agencies. However, on the whole, they are part of the same advice system, designed to operate in the same planning cycles, following similar patterns.

##### Value issues

Value issues were generally avoided: by drawing a boundary in the DPSIR-scheme, issues perceived to be political choices were referred to the Ministry. Reporting on Nature was largely presented as a matter of measuring and collecting neutral information.

##### Accommodation of different kinds of knowledge

The source of information was government statistics and scientific research (generally published articles and research at government institutes, such as monitoring activities). On a few occasions, data collected by conservation organisation enthusiasts were used. In general, the knowledge was focused on what was available in and around government agencies.

##### Uncertainty

Uncertainty is not addressed, or at best as a matter of limited knowledge. The idea is to give an overview of the general state of nature as an early warning system. In many cases, data are reported as they are available, not necessarily even as systematic time series.

##### Institutional design

The institutional design seems to have been relatively unproblematic, set up as loose inter-agency working groups under prime responsibility of either and agency of the Ministry. The model seems predominantly statist.

##### Policy learning

How much policy learning occurred is hard to assess, but it is clear that nature reporting was integrated in the planning cycle of environmental and nature policy. Clear policy changes can be indicated for pesticide and nutrient discharges of agriculture, when these failed to meet targets at the end of the nineties, as indicated by this reporting system.

##### Trust

The degree and nature of trust in this system is not clear and hard to reconstruct (perhaps with additional interviews?). I have found no controversies over the reporting, but this is most likely due to the difficulty in accessing the materials.

##### 4.4.2.2 Nature Council

##### Value issues

The Nature Council strived to make values explicit, including its own predisposition towards nature conservation, in order to come to a reflexive dialogue. The Council did attempt to maintain neutrality towards short-term political goals and interests, through a discourse of reflection and a positioning as council of scientists and academics. The conservative government did not see the Council as an actor aiming for neutrality, but rather as rooted in the green values of the conservation movement.

##### Accommodation of different kinds of knowledge

The Council tried to accommodate diverging knowledge and information, through conferences and dialogue, but always in an academic mode of interaction. After the Council was abolished, it became one of the main organisers of oppositional knowledge challenging government policy.

**Uncertainty**

Uncertainty was not a major issue, although the council stressed long-term developments.

**Institutional design**

The council was initially set up in reaction to overly-academic predecessors that were too remote from policy and hence became a small council with policy experience and an active secretariat. This institutional design became very controversial when the government abolished it and the Council turned into an NGO. The model moved from a modest corporatist form (dominated by professionals) to a deliberative one, pushed out of the policy elite into NGO position by the government.

**Policy learning**

There are clear indications of policy learning, even new approaches being developed, as the reports of the Council fed into the Wilhelm Committee. This Committee worked on political support among stakeholders for a new nature conservation policy. However, the change in government meant little of this work led to new policies. There are occasional references to the Wilhelm report in policy documents, but these seem to be mostly legitimacy. Only recommendations on national parks and public participation in them correspond to later policies. After 2001, the Council organised oppositional knowledge. As such, it was of use to the conservation sector, but the effect of this opposition on policy is not clear.

**Trust**

Trust was high in the conservation sector, which had found an ally in the advisory sector. This was based on the dialogue of the Council through its board of representatives and through the reputation of the Council members. Obviously, trust was very low among the government after 2001.

**4.4.2.3 NGO initiative Natur Retur****Value issues**

Value issues were explicit: this was an attempt to put an issue on an agenda, but performed by presenting knowledge available to NGOs.

**Accommodation of different kinds of knowledge**

The initiative itself is an example of oppositional knowledge being presented in an attempt to fill what was perceived as a gap in government policy and monitoring of nature.

**Uncertainty**

Addressed as missing data, lack of research.

**Institutional design**

Organised as an ad-hoc initiative: a conference with a dialogue with the Minister of the Environment and agriculture, therefore best described as an example of deliberative governance.

**Policy learning**

The report seems to have had minimal effect, mainly due to unfortunate timing, although perhaps it was one of the elements that prepared the cooperation of conservation NGOs on nature monitoring.

**Trust**

Not very clear: this was an attempt to change the political agenda from the opposition of conservation NGOs, but at the same time set up as a dialogue.

**4.4.2.4 NOVANA monitoring programme****Value issues**

Value issues are avoided. On the one hand, indicators are set up to meet legal obligations, on the other hand, the DPSIR scheme is once again restricted to avoid more controversial issues, albeit now in different ways. The knowledge produced is seen as largely instrumental.

**Accommodation of different kinds of knowledge**

NERI is in charge of the programme and the programme teams decide where additional information will be collected. Initially, this was a matter of administrative coordination and of hiring commercial laboratories; since recent, there is an initiative to include information of conservation NGOs. In general, knowledge is seen as information that can be bought, based on the overall organisation and design of the scheme at NERI.

**Uncertainty**

Uncertainty is addressed as measurement problems, for example in the design of samples, the location of measuring stations, etc.

**Institutional design**

Designed as a research programme for a government research institute, under the contract arrangement with the Ministry. Recently, it was announced that NERI will resort under a university in the future, but it is not clear yet how big the consequences of this change will be. For the time being, NOVANA seems best described as statist governance of expertise.

**Policy learning**

Probably too early to assess, but the ambitions seem low: NOVANA seems mainly designed to comply with reporting obligations. These reporting obligations are designed to make governments face the situation of nature and wildlife, or to 'name and shame', but whether this has effect cannot be assessed in this context. There are no clear institutional mechanisms to

support a learning process based on these indicators, such as a systematic response from government to environmental reports.

Trust

It is not clear how high the trust is in the administration, although there have been conflicts within the administration over the design of the scheme, particularly of the need to prioritise indicators in the context of a tight budget. Among conservationists, there is suspicion with respect to the highly selective nature of the indicators.

	Nature/ indicator reports	Nature Council	NGO initiative <i>Natur Retur</i>	NOVANA monitoring
Values	instrumental- ised, avoided	made explicit, academic neutrality	explicit: influ- ence policy agenda	instrumental- ised, reporting obligations
Accommodation of knowledge	limited: mainly agency information, some research and limited use of conservation data	attempt to be open: confer- ences, dialogue	presentation of oppositional knowledge	under hierar- chic control, knowledge as information, new initiative to work with NGO knowledge
Uncertainty	as limited knowledge	long-term developments	lack of research	measurement problem, sam- pling issues
Institutional design	unproblematic, inter-agency working groups, statist	council of 'sages', then highly contro- versial and NGO, from corporatist to deliberative	research papers and conference with dialogue, resulting in a report, deliberative	hierarchically structured research pro- gramme, low funding levels controversial, statist
Policy learning	integrated in planning circle, mostly instrumental?	attempt to set up new policy frame, largely oppositional after 2001	oppositional, limited effect	at best instru- mental so far, but probably a bit early to assess
Trust	? no indications of disagreement	High among conservation sector (based on access to dialogue and reputation), later low from government	oppositional move, but pos- sibly a move towards inclu- sion of NGOs in monitoring	selectivity of indicators controversial

Table 4-2 Overview of Rethinking characterisation of Danish state-of-nature reporting

5 Advice on European Fish Stocks

5.1 Problems of fishery management

Fisheries management presents fascinating problems for the organisation of expertise for public policy. Fisheries scientists operate in a web of difficult tensions, constituted by considerable economic interests, political sensibilities, problems of food supply, environmental protection, and capricious, complex ecosystems that are difficult to measure and model. As policy makers, experts, and fisheries organisations try to find new ways to reduce the dramatic over-exploitation of global fisheries and ward off the chronic collapse of commercial fish stocks, fishery biologists are developing new tools and approaches to manoeuvre in this complex policy field. This section will analyse the continual realignment of fisheries expertise and fisheries policy, after which I will deal specifically with fish stock assessment for North Atlantic fishery management. I will focus here on capture fisheries and not aquaculture, or 'fish farming', which presents a distinct set of problems and actors.

The coastal waters of densely populated areas have been fished intensely for centuries, leading to recurrent conflicts over fishing rights, but also episodes of over-exploitation. Attempts to regulate access and exploitation in response to conflict and crisis go back as far as the Middle Ages. However, with increased growth in fishing fleets and harvesting technologies, some of the most dramatic crises in fisheries occurred in the 20<sup>th</sup> century. For example, by the end of the 1970s, North Sea herring stocks were in such dramatic condition, that governments had to resort to a controversial fishing moratorium. The stock slowly recovered, but in the mid-1990s emergency measures were again required. Even more spectacular was the collapse of the Californian sardine stocks in 1942, which took 40 years to show the first signs of recovery. These stock collapses are devastating events, not only for nature conservation, but also for food production, income, jobs, and in many cases they even threaten the very survival of coastal communities. When the Newfoundland cod stock all but vanished in 1992 and the Canadian government implemented a complete moratorium on cod fishing, the estimated cost amounted to several billion Canadian dollars and over thirty thousand jobs lost. With some minor exemptions, this fishery has been closed ever since and still shows little signs of substantial recovery (Finlayson 1994; Kurlansky 1997; MacGarvin 2001; Charles 2002).

Apart from such dramatic collapses, important commercial fisheries have witnessed a gradual erosion. This includes significantly reduced yields; smaller and younger fish caught from populations that largely rely on recent

age groups for reproduction;<sup>31</sup> the erosion of jobs in the fishing industry<sup>32</sup> and the decline of coastal fishing communities; higher costs from having to fish further from shore and from fishing deeper; loss of biodiversity leading to stock fluctuations and collapse (Worm, Barbier, Beaumont, et al. 2006); and ‘fishing down the food web’, targeting ever less valuable species, and even species only suitable for fish meal and oil (used in agriculture and increasingly in aquaculture). Another consequence has been increasing tension between nations, competing over dwindling natural resources.<sup>33</sup> On a global level, marine resources are now heavily over-exploited, with one in four fisheries depleted (United Nations Environmental Programme 2006). The North Atlantic was the first to reach extreme levels of over-fishing: fishery biologists estimate that eight out of ten commercially interesting species here are fished beyond sustainable levels (International Council for the Exploration of the Sea 2005c; Kooiman, Bavinck, Jentoff, et al. 2005).

Governments have responded to the problems of over-exploitation with regulative policies and financial incentives. For example, fishing authorities have tried to regulate fishing equipment, such as types of nets and mesh size; they have tried to limit catch capacity by influencing the size of the fleet; and they have established fishing quotas. Especially policies based on fishing quotas require fisheries biologists to establish the precise condition of a fish stock as a basis for meaningful quota. This implies an assessment of the current and future size of the stock, based on reproduction, natural and fishing mortality, as well as an assessment of a viable population size. Over the last decades, fisheries biologists have developed computer models based on population dynamics to assess stock sizes, using catch and sampling data. Their increasingly complex tools have made possible policies of controlling fisheries via a ‘Total Allowable Catch’ (TAC) for every stock and a quota system to distribute this catch among fishing fleets. However, in spite of ever more refined population assessment tools, fisheries still collapse. The 1992 disaster of the Newfoundland cod occurred after years of fishing quotas and expert debate over precise fishing mortality. Over the last decade, an increasing number of fishery scientists have argued that regulative fishing policies based on catching fish up to a limit of population survival have failed and need to be replaced (Finlayson 1994; Rose 1997; MacGarvin 2001; Kooiman, Bavinck, Jentoff, et al. 2005).

<sup>31</sup> The size of fish caught in the North Sea has declined considerably in the last 30 years. Prior to 1980, over 25% of the catch weight was from fish over 25cm. Currently, this is less than 10% (RIVO/MNP figures, see <http://www.mnp.nl/mnc/i-en-1247.html>, data of 2001, accessed June 2006).

<sup>32</sup> E.g. employment in sea fishing in Scotland dropped 40% from 1993 to 2002 (The Royal Society of Edinburgh 2004, p. 21).

<sup>33</sup> The ‘Cod Wars’ are one extreme example: a series of naval conflicts between especially Britain and Iceland, involving naval bravura such as cutting of nets and ramming of ships (Rozwadowski 2002, pp. 197-202). During the late 1970s, new national exclusive economic zones were drawn at 200 nautical miles (370 km), which allowed countries to exert more control over fishing grounds and trade these rights between countries, which eventually pacified most naval disputes.

The reasons why this fishery policy and its fishery biology have not been able to provide adequate protection of stocks are complex, but informative (Daw and Gray 2005). First, decades of attempts to reduce fishing capacity have largely failed. Fleets were kitted out with electronic equipment for navigation and fish location, larger and more nets on larger and more powerful ships, that are able to go on longer fishing trips, for longer periods of the year and under worse weather conditions (Johnsen 2005; Commissie van de Europese Gemeenschappen 2006). In spite of expert recommendations, European fishery ministers are under considerable pressure from the fishing industry to continue subsidies to ‘modernise’ fishing fleets with more powerful engines and better equipment, with the argument of international competitiveness and job protection. Meanwhile, regulative policies continue to struggle with destructive fishing techniques, large bycatches, and illegal landings.

Second, the uncertainties involved in fish population modelling are staggering. As in conservation issues in general, it is not possible to find an obvious historical baseline for the natural size of fish populations. There are indications that fishing pressure has reduced stocks not over a period of decades, but of centuries and that hence fishing pressure has been severely underestimated (Jackson, Kirby, Berger, et al. 2001). An historic baseline predating fishing would also predate records of population size. Even for estimating present stock sizes, the problems are considerable. Uncertainties include difficulties to determine precise catch data, for example due to illegal landings; difficulties to determine stock size based on catch data, for example due to ever-improving fishing technologies or changing fishing patterns; large natural fluctuations of stocks; interactions between species; shortcomings in knowledge about fish biology, population, age composition, and behaviour; difficulties in defining populations and sub-populations; differences between schools of fishery biology, such as between population and community ecology; difficulties of assessing the effects of habitat destruction, e.g. – as some claim – by beam trawling; the effects of climate change, since fish tend to be very sensitive to water temperature; the large variability of resilience and stability between different types of aquatic ecosystems (e.g. tropic vs. arctic); etc. The experience of the Newfoundland cod, but also evaluations of past predictions in stock assessment, suggest that these uncertainties tend to lead to serious over-estimations of stock size and under-estimations of fishing mortality (Finlayson 1994; International Council for the Exploration of the Sea 2004; Kulbicki 2005).

Third, even if fishery biologists do manage to come up with what they consider to be reliable numbers, in one reading of fishing policy, the political pressures are often so high, that regulators buckle in. Catches are hard to restrict when there is over-capacity in the fishing fleets and fishers are vehemently trying to defend their investments. For example, North Sea cod is at its lowest point on record (Figure 5-1), well below reproduction limits according to the International Council for the Exploration of the Sea (ICES). Marine biologists warn that the North Sea cod stock is seriously depleted and



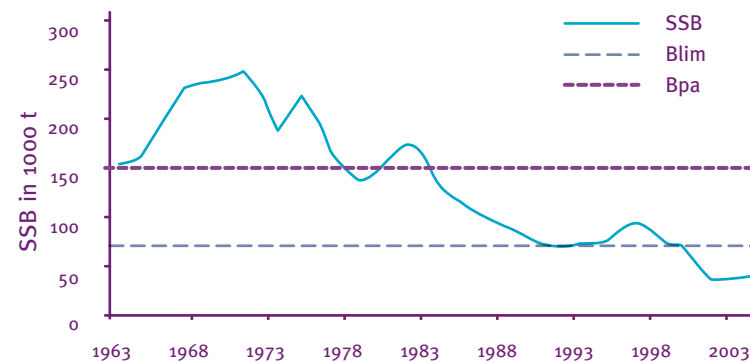


Figure 5-1 Development of mature biomass (SSB) of North Sea Cod (Blim=biological limit; Bpa=precautionary limit, seen to compensate for uncertainties) (Copied from International Council for the Exploration of the Sea 2006a)

that damage to the population may become irreversible: the stock is likely to collapse and may not return to commercially viable size in the foreseeable future. There is even a possibility that such ecosystems find a new local equilibrium, in which the once dominant cod is a minor species. In spite of urgent advice by the ICES for a total ban on fishing cod in the North Sea since 2002 (a proposal supported by environmental organisations), the EU Council of Ministers has continued to issue fishing quota for North Sea cod. Even though the Total Allowable Catch has gradually decreased, the level for 2006 was set at 23,205 tonnes, while the current estimated biomass of mature fish left is about 50,000 tonnes. Short-term fishery interests manage to block decisive action, with the uncertainties of fishery biology as main argument and with national governments defending the interests of their national fishing industry (International Council for the Exploration of the Sea 2005c; Commissie van de Europese Gemeenschappen 2006; Raad van de Europese Unie 2006b).

As a result of failing policies, there is now a considerable discrepancy between the realities of fisheries and official policy targets. For example, it is official policy of the European Union, in agreement with Norway, to rebuild the North Sea cod stock to 150,000 tons (the 'precautionary level'), including TACs that are likely to induce growth of the stock (International Council for the Exploration of the Sea 2006b). Agreements in the context of the Johannesburg Declaration on Sustainable Development have committed Europe to the concept of Maximum Sustainable Yield: levels of fishing that would give high returns, on the basis of a healthy population. This would imply an even larger stock than the 150,000 tons safe survival limit. The agreement states that by 2015, stocks should be rebuilt to return high catch levels on the basis of an ecosystem approach to fishery management. The failure to break out of annual cod TACs that cannot even guarantee a non-precautionary survival level, how disconnected actual policy is from the official targets.

## 5.2 Fish stock assessment

So how do fishery biologists establish the size of fish stocks? The question of how many fish there are in the sea may seem simple, but is actually impressively complex (Finlayson 1994). The initial problem is to get reliable data. A first set of data consists of catch records. Fishers report their landings upon arrival at shore. However, not all fish caught is reported. By-catches, under-sized fish that is thrown back (usually dead), and illegal landings are typically not included in these data. In addition, the problem with catch data is that they are not only an indicator of how many fish there are in the sea, but also of how good fishers are at locating and catching them. Especially the industrialised ocean fishing vessels uses high tech locating equipment, such as acoustic sounding and in some cases even aerial reconnaissance, information that can then be passed on to other company vessels to optimise the catch. Hence fishing boats are anything but random samplers of marine resources. Another complication is that fish landings data are commonly reported in weight and not in numbers of fish. Biologists can acquire additional information by sampling the landed fish to research age structure, size, or even stomach contents, provided the fish was not already gutted at sea. Determining the age of fish requires skilled analysis of fish scales or otoliths, small bones in the ear of the fish. These display a structure of rings, similar to growth rings in trees. For such purposes, sample from landings are taken into the laboratory. In special research programmes, even the by-catch can be analysed (Kaiser, Attrill, Jennings, et al. 2005).

Second, there are data from biological surveys, through systematic test catches. In the North Atlantic and adjacent seas, research vessels fish for a pre-set amount of time in grid boxes of one degree Longitude by half a degree Latitude. For example, a major and long-standing survey is the International Bottom Trawl Survey of the North Sea, involving vessels from Denmark, England, France, Germany, the Netherlands, Norway, Scotland, and Sweden. Alternatively, biologists also perform surveys of eggs or fish larvae, and acoustic surveys, which are especially used for schooling fish such as herring or whiting. In Europe, these surveys typically use the research vessels of national fishery research institutes in combined efforts (although sometimes fishing vessels are hired), funded by the Fisheries Directorate of the European Commission and collated under auspices of the International Council for the Exploration of the Sea (ICES) (European Commission - Directorate General of Fisheries and Maritime Affairs 2005; International Council for the Exploration of the Sea 2006a).

A third and more controversial source of data is knowledge from fishers themselves, which can be collected through interviews, questionnaires, or self-reporting through logbooks. Large, industrial fisheries tend to collect a lot of systematic data for management purposes in their logbooks. Industrial fishing vessels often have observers on board from fisheries authorities. However, small-scale fishers, typically fishing inshore, are harder to consult and also tend to have a style of work and reasoning that does not correspond

well with the bureaucratic-rationalistic style of fisheries managers and researchers. Nevertheless, fishers too can provide indicators for the condition of a fishery. According to some analysts, inland fishermen were even the first to signal the imminent collapse of the cod stock of Newfoundland (Finlayson 1994, pp. 101-127; Kurlansky 1997).

Of key importance for establishing fishery quota is not just how many fish there are in the sea this year, but especially how many fish there will be in the sea *next* year. These data do not merely involve numbers of fish, but crucially also age distributions. The traditional approach to assess fish stocks, population analysis, analyses the age structure of the fish population and from that deduces its likely reproduction rate, compensated by the expected fish mortality (both natural and through fishing). To know how many fish are in the sea is therefore more than a matter of sampling, counting, and statistic extrapolation. These data go into population models, which combine contemporary data with data from previous years, in order to establish the likely number of fish in the future. Stock assessment therefore involves considerable amounts of calculation, leading to complications of model assumptions, model boundaries, or model structure (Finlayson 1994; Lassen and Medley 2001; International Council for the Exploration of the Sea 2006a).

More recent models used in fish stock assessment try to incorporate a larger number of factors than just population size, mortality, and age composition, for example by including predator-prey relations. Once again, cod is an interesting example. First, because mature cod are near the top of the marine food chain and consume fish that are themselves of commercial interest. Second, because there are indications that northern cod populations are crucially limited by the availability of certain prey species, such as capelin. Currently, Norway and Russia are experimenting with community-level models for the management of their northern cod stock (Norwegian, Arctic, and Baltic Sea). Such differences between attempts to model single species populations or communities consisting of various species actually hark back to different schools in ecology that are almost as old as the discipline (Hagendijk and Cramer 1986; Bramwell 1989).

### 5.3 The fisheries policy field

The decision-making institutions of fishery policy are distinctly multi-level, ranging from very local to trans-national. In some parts of Europe, local fishing societies that go back centuries still regulate parts of fisheries, such as the French prud'homies or the Spanish cofradías (Pascual-Fernández, Frangoudes and Williams 2005). I will focus here on the national and the international level to describe the general layout of the policy field of fisheries around the North Atlantic and tributary seas.

On the national level, important actors are fisheries ministers and their administrations, fishing sector organisations, and increasingly environmental

and consumer groups. The specificity of the fishing sector requires extra attention. Throughout the EU, the fishing sector is roughly organised in fishers' organisations on the one hand and producers' organisations on the other. Fishers' organisations group regional fishers, ranging from a single port to the entire country. In some cases, they include some actors from further down the market chain, such packaging and processing. They represent fishers' interest to government, take part in advisory organisations, do lobby work, and provide (financial) services to their members, occasionally even regulate fishing activities. Producers' organisations regulate the market for fishing products, for example by regulating prices and first hand fish sales, but in some cases they are also involved in quota management. These organisations are voluntary, typically cooperative, financed through levies on landings (Symes and Phillipson 1999).

On the international level, we find regional fishing management organisations such as the North Atlantic Fisheries Organisation or the EU Council of fisheries ministers. There are also a large number of organisations for cooperation on protection measures, such as specifically for Atlantic tuna (International Commission for the Conservation of Atlantic Tuna) or marine mammals (North Atlantic Marine Mammal Commission, International Whaling Commission). A third group includes more general organisations such as the UN Food and Agriculture Organisation (and specifically its Committee on Fisheries), which provide expertise as well as a platform for treaties. Lastly, there are organisations that structure the context for fishery policy, such as by regulating legal access to fishing grounds (the United Nations Convention on the Law of the Sea), or by regulating trade (World Trade Organisation) (Suárez de Vivero, Rodríguez Mateos and Florido del Corral 2005). Apart from these governmental structures, there are also international associations of the fishing industry and (of increasing importance) the food processing industry, as well as NGOs. The main NGOs currently active in European fishing policy are the World Wide Fund for Nature - WWF, Greenpeace, and Birdlife International. Fishers' organisations are federated on a European scale in *Europêche*. Stakeholders are represented in and advisory committee to the European Commissions fisheries directorate. Since November 2004, industry and NGO stakeholders also meet in regional advisory councils, such as the North Sea Regional Advisory Council (see <http://www.nsrac.org>).

Some of these international organisations include their own expert advisory bodies, typically composed of nationally appointed experts, such as in FAO. However, there are also international expert organisations with exclusive missions in research and expert advice. The single most important marine research organisation for the North Atlantic is the International Council for the Exploration of the Sea (ICES). I will return to this organisation and its role in EU fisheries policy in more detail below.

The strong international institutionalisation of fisheries policies is based on a double development. On the one hand, marine resources have come

under increasing national control since the end of the seventies with the introduction of 200 nautical mile exclusive economic zones. This means that nation states now control more fisheries and international, uncontrolled waters have been greatly reduced, while states have also imposed more regulatory power over fishers. On the other hand, states have initiated cooperative management of straddling and shared fish stocks in regional regulatory organisations. International fishing policies are therefore first and foremost intergovernmental fishing policies, in which national states negotiate quota and fishing rights. One result of this double development is that the European Union and individual member states now buy fishing rights from states in developing countries, from West Africa to the Pacific, in some cases at the expense of local fishers who have seen their off-shore food supply sold to subsidised, industrialised fishing fleets. In spite of the internationalisation, national states in many cases continue to play a prominent role, as representatives of national interests and in the implementation of regulative policies (Jentoft 2005, p. 150).

In this international regime, the stakes are high for fisheries research. In the logic of regulatory policy, the experts are expected to establish the condition of fish stocks beyond reasonable doubt as a basis for a rational management of marine resources by state structures. The expectation is that:

*“(…) fisheries research institutions relieve management agencies from some of the political pressure they would otherwise be exposed to. Knowledge validated by the institutions of science makes the state more confident and less vulnerable when controversial management measures are implemented.” (Jentoft 2005, p. 149)*

However, as regulatory policies fail to deliver, even by their own standards, calls are made for fishery policies that are organised along entirely different principles. I will analyse some of these in the next paragraph, specifically in order to illustrate how arrangements in policy making are connected with the arrangement of expertise.

## 5.4 Alternative policy approaches

In trying to find ways out of traditional policy models, various alternatives have been identified and suggested. Van Vliet and Dubbink have argued that mainstream fishing policies are typical of hierarchical modes of governance: states try to manage a policy field centrally and ‘from above’, if need be against pressure, based on detailed scientific evidence and by means of rules and regulations, such as Total Allowable Catches. One alternative to hierarchy is that of the market, based on extended property rights and individual transferable quota. The logic behind a market form of governance is that hierarchic fisheries policies fail because they do not make fishers responsible for the fish stocks, but rather encourage them to fish as much as possible as fast as possible, while stretching the rules to the limit. Market

advocates argue that fishers would manage stocks better if they owned them. A third option is that of participatory modes of governance, involving citizens and stakeholders in the formulation and implementation of fishery policy. Advocates of this mode of governance argue in favour of organisation of fisheries policy through *co-management*. Co-management proponents argue that the model of the individual rational actor that underlies market and hierarchy models leads to an exaggeration of the Tragedy of the Commons effect, as policy gets stuck in ever more complex regulation of failing markets. Co-management seeks alternatives in community-based management of natural resources, involving users of natural resources as co-managers rather than as merely regulated harvesters (Hardin 1968; Ostrom 1990; Van Vliet and Dubbink 1999; Dietz, Ostrom and Stern 2003). Co-management advocates will point to examples of traditional regulation of fisheries. However, Holm et al. point out that “there is a general tendency to read too much resource management into traditional fishery regulations”, whereas in many cases the issue is regulation of markets, prices, fishers’ access and competition (Holm, Hersoug and Rånes 2000, p. 361). This threefold distinction maps out three competing camps of fishery policy analysts, although concrete examples of alternative policies often form more complex mixed patterns than these pure types would suggest.

One example of new initiatives that cut across the traditional configuration of fisheries policy is the mobilisation of consumer awareness. Environmental organisations provide consumers with wallet-sized lists of fish products that can be consulted when buying fish in shops or restaurants. These lists are typically organised along three colours, red/orange/green, to symbolise the sustainability of current harvesting practices.

[illegible]

Figure 5-2 One side of the Dutch “VISwijzer”, which consumers can download, print, cut out, and put in their wallets to guide consumption (from [www.goedevis.nl](http://www.goedevis.nl), December 2007). The other side contains general information on fisheries, labelling, and partners of the scheme.

These cards typically are one link in a wider set of information resources. In this Dutch example (Figure 5-2), there is a web page with some general background information on fish and fishery policy, including a list of fish that was not evaluated. There is also a book with additional information on fisheries and 80 fish species, including some fish recipes (Klootwijk 2005).

Whereas wallet cards imply that consumers carry information around, sustainability certification produces eco-labels on fish products. In some countries, national certification agencies provide labelling for sustainable fish products, but the major international initiative is the label of the Marine Stewardship Council (MSC), which provides a label based on an extensive evaluation of not just the condition of the fishery, but also the chain of marine food production. The label is based on a joined initiative of WWF and Unilever, a multinational with major stakes in the food processing industry. Started in 1997, MSC became an independent non-profit organisation in 1999, with an elaborate governance structure, including a technical advisory board and a stakeholder council, involving scientists, NGOs, and the fish food sector from fishers to retailers ([www.msc.org](http://www.msc.org)). The MSC label is mentioned on the Dutch wallet card (Figure 5-2), but currently only two labelled products are available on the Dutch market ([www.msc.org](http://www.msc.org)). In the US, similar coalitions were formed in the mid-90s after disappointment in failing state regulation, in this case between environmental NGOs, aquariums, and the culinary seafood sector, resulting in the Seafood Choices Alliance, which developed very similar wallet cards (Iles 2004).

Fishing quota work with information provided by public research institutes, but the labelling and certification schemes typically work with more distributed schemes of consultants, commercial or non-profit. The MSC scheme works with two tiers: it provides accreditations to specialised certification companies worldwide that perform the actual certification. The NGO that produces the assessments for the Dutch wallet card also uses the MSC methodology. In the US, the aquariums such as the Monterey Bay Aquarium have performed a key role in providing reviews. The information these consultants rely on partly does come from public sources and fisheries research institutes such as ICES, especially for the assessment of the health of the fish stock, but are expanded with industry reports, supermarket and even restaurant surveys, the Food and Agriculture Organisation, and research literature (Iles 2004).

Critics such as Alistair Iles have argued that, although wallet cards and labelling do mobilise consumer choice for more sustainable fisheries, although mostly among elite consumers, they also contain considerable limitations and drawbacks. The information contained on a wallet card is inherently very limited: it is condensed to only two or three categories (red/orange/green) for a limited number of species. Evaluation criteria for classification exclude some effects, such as for the US certification: human health effects, food input in fish farming, or impacts of transport – arguably

as a consequence of having to provide clear-cut categorisations. Meanwhile, the precise details of the certification are shielded from consumers and only condensed information is publicly available. The certification is based on available market options and do not allow citizens to get involved more deeply in choices that are made before fish reaches the fish monger. Although such choices might ‘trickle up’ the chain of food production, Iles argues that people are addressed in their role as consumer, with an economic logic rather than as politically empowered citizens (Iles 2004).

In other words, although these schemes suggest participatory and co-management governance structures, from the point of view of the consumer, they are rather a redefinition of the market, whereby environmental information has been added to the product. Meanwhile, NGO initiatives have re-ordered the market parties, introducing the food-processing sector in a new key position. Large companies, such as food processor Unilever<sup>34</sup> or large supermarket chains have sufficiently bundled negotiating power to achieve changes in the fish production chain. For example, fishers are currently confronted with the announcement by UK supermarket chain Waitrose that it will stop buying fish from beam trawlers by the end of 2007. In these schemes, the dominant mode of governance remains the market, but consumer preferences and the desire of retailers to present their products as ‘green’ translate these interests into market terms (Jentoft and McCay 2003, pp. 296-297).

In addition to consumer activism, other changes are suggested for the fisheries sector. One is the proposal to set up marine reservations or ‘no take’ zones: areas at sea where all fishing is banned to protect breeding grounds, although in practice not all such areas have a complete ban on fishing. From such protected areas, other fishing grounds could be recolonised, while protecting biodiversity (Worm, Barbier, Beaumont, et al. 2006). Norway has a 12 nautical mile protected zone around Svalbard (Spitsbergen), and California has Marine Protected Areas which serve nature as well as fishery conservation policy goals (Scholz, Bonzon, Fujita, et al. 2004; Weible and Sabatier 2005). The EU briefly experimented with this model for cod in the North Sea in the early nineties, the so-called ‘cod box’, but when this resulted in more intense fishing around the box and no immediate signs of recovery, the policy was abandoned the next year. Fish biology is an important factor in the success of protection areas, as migrant fish like cod are less protected than more localised species. The North Sea has a more successful semi-protected area for sole and plaice around the Wadden Sea and German Bight area, seasonally closed to protect spawn since 1989 and year-round for ships above 300 horse power since 1995. Similar arrangements exist for Norway pout and herring. Environmental organisations such as Greenpeace are advocating much larger areas with more complete protecting, but new plans for protected areas in the North Sea have raised strong opposition from

34 Although Unilever recently decided to sell its deep-freeze foods division.



fishers. (Pomeroy 2003; International Council for the Exploration of the Sea 2005c, p. 134).

Some of the advantages of marine reserves are that fishing regulation could be more straightforward than the complex rules of fishing equipment or quota. Theoretically, fishing vessels can be monitored remotely and can even be denied access to reserves. Once marine reserves are firmly established, they do not require an annual renegotiation of conditions, such as fishing quota do. Similarly, from the perspective of fisheries expertise, reserves do not push fishery biologists to provide precise numbers against the background of large uncertainties. In this sense, the expertise involved in marine reservations is more robust. However, as the European and Californian example show, establishing reserves in what were once prime fishing grounds does not incite big enthusiasm among fishers, who tend to undermine the political support for this policy at every occasion (Weible and Sabatier 2005).

Another policy arrangement that is currently defended is that of co-management. The argument is that stakeholders can be made co-responsible for maintaining marine resources, while avoiding the ever more complex body of regulations. This leads to management schemes in which there is more room for negotiation, including interaction with experts. Examples of co-management can be found in several areas of fishery policy. One example is devolved quota management, whereby sector organisations manage allocation of EU-established quota, such as the Dutch system of “Biesheuvel Groups”, a system of trading individual fishing quota within highly self-regulated and self-controlled groups, as a way to implement EU fishing quota.<sup>35</sup> Other examples of co-managed fisheries in Europe can be found in Denmark and in the Lofoten cod fishery in Norway, although here too the co-management seems to concern mainly distribution of resources, rather than effective management of stocks. Although the state often maintains a key role in setting up a regulatory framework, stakeholders are expected to take responsibility for fisheries, rather than being the passive objects of regulations (Holm, Hersoug and Rånes 2000; Wilson, Nielsen and Degnbol 2003).

In all of these examples, there does remain a large role for centralised quota and the expertise and advisory system that supports it. In its pure form, co-management implies that platforms of negotiation over fishery policy also serve as a platform for exchange of knowledge. The key arguments of proponents of co-management are that fishers have valuable knowledge to contribute; that fishers will be more readily convinced of the quality

of professional stock assessments if their counter-arguments are taken seriously and they get a sense of how stock assessments are made; and that the kind of stock assessment that is required for hierarchical regulation is so excessively expensive (transaction costs) that it is becoming too high an overhead for the fishery to bare. In co-management schemes, the different organisation of fisheries management therefore goes hand in hand with ways of organising knowledge that are more integrated with decision making. (Symes and Phillipson 1999; Wilson, Nielsen and Degnbol 2003; Larsen, Ojaveer, Knapman, et al. 2006).

In spite of such attempts to find alternatives, the hierarchic mode of policy, via regulation, subsidies and fish quota, remains dominant. Actors from as wide a field as fishery biologists, NGOs and government bureaucracies acknowledge failure in current policies, but often seek solutions by pushing current approaches further, for example in increased surveillance and policing of current regulations. For example, Greenpeace argues for vessel monitoring systems on all high seas vessels and tougher regulatory action, after having invested a lot of effort in tracking illegal activities of fishing vessels (“illegal, unreported, unregulated”, this includes fish brought to harbours where the quota is not checked, transfers at sea from fishing boats to traders, and various other evasion techniques). An NGO cooperating with Greenpeace on this issue, the Environmental Justice Foundation, has collected data to suggest that as many as 50% of all cod, mackerel, and herring landed in the UK is caught illegally, outside EU fishing quota. Estimates for illegal landings of cod from the Baltic range from 30 to 40%. Both NGOs insist that the situation is far worse off the West African coast, where developing countries have very little means to monitor the fishing agreements with the EU.<sup>36</sup> In a similar hierarchic model, some fisheries scientists argue for more refined models to establish sustainable fishing levels more precisely, including more parameters (McGlade 1999), with a larger role for experts to set quota, even going as far as to suggest that fisheries should be controlled technocratically, in a model such as the American Federal Reserve Board.

After this analysis of the general tensions in fisheries policy, the connection between stock assessment and the quota system, and some of the alternatives, I will now analyse European fisheries policy in more detail, looking specifically at the role of fisheries expertise of the Copenhagen-based International Council for the Exploration of the Sea in European quota policy. There is recent and extensive research on European fisheries policy and the organisation of its expertise, which has been used here for secondary analysis.

<sup>35</sup> Although one could argue that the Dutch system is a creative mix of modes of governance, including hierarchical elements of the EU fish quota, a market for tradable fishing quota, but co-managed by the fishers. However, this co-management concerns implementation of quota and does not extend to stock assessment. The Biesheuvel groups were introduced in 1993 to prevent quota violation and resulting Commission fines, as well as a race to catch fish before the others would. The groups divide Dutch fishers into eight groups, largely regional (Symes and Phillipson 1999, pp. 124-126). For a list, see: <http://www.visserij.nl/groepen.php>.

<sup>36</sup> Environmental Justice Foundation ‘pirate fishing’ info: <http://www.ejfoundation.org/page357.html> (accessed August 2006), Greenpeace: <http://oceans.greenpeace.org/raw/content/en/documents-reports/headed-and-gutted-illegal-cod.pdf> (accessed August 2006) on illegal cod.

## 5.5 ICES and European fishery policy

### 5.5.1 The Common Fisheries Policy and quota

The core of fisheries policies for EU countries is organised at a European level in the Common Fisheries Policy (CFP). A first CFP was set up in 1971, on the eve of membership negotiations with a series of new candidates with rich fishing grounds: Denmark, Ireland, the UK and Norway. The policy was to regulate access to fishing grounds for some of the old members by identifying fish as a common resource. Although the first concrete measures under the Common Fisheries Policy date back to the early seventies, a substantive shift of fishery policy to a European level came around 1976, when European countries expanded their exclusive economic zones to 200 nautical miles, codified in the United Nations Convention on the Law of the Sea in 1982. This created a large marine area where fish was to be managed as a collective resource, to be traded in a common fish market. However, countries held on to historic access to fishing grounds for their fishing fleets and countries with rich marine resources wanted some degree of access control. After long and conflict-ridden negotiations, this resulted in the CFP of 1983 (Holm and Nielsen 2004b).

Since 1983, the cornerstone of the EU's fish management scheme are Total Allowable Catches (TACs), a weight limit of how much fish can be caught of every species in particular areas. These TACs are divided between countries: the national quota. Flanking these national quota are regulations of fishing gear, such as minimum mesh sizes for nets or allowable fishing methods, minimum sizes of fish landed, and restriction of fishing periods. TACs were the major innovation in the policy, compared to previous regulatory approaches of the 1950s and 60s that regulated by restricting fishing effort only (place and time restrictions). At this point in the fisheries policy, quota were foremost a means of pacifying conflicts over fisheries in the North Atlantic, as well as a way to stabilise the fish market and income for fishers. Other elements of the Common Fisheries Policy include measures for the common organisation of the market (price stabilisation measures through producers organisations, quality and packaging standards); enforcement; relations with third countries (access to fishing grounds of countries outside the EU); and a programme to manage fishing fleets through financial instruments – which seems to focus mainly on modernisation and competitiveness rather than reduction of fishing pressure (Holm and Nielsen 2004b; Daw and Gray 2005; Wilson, Bailly, Christensen, et al. 2006).

Since the end of the nineties, when it became clear that fish stocks were taking strain, the fisheries policy started to shift its focus to stock protection and not just allocation of quota, market stabilisation and pacification of conflicts over fishing rights. The concept of precaution entered stock assessment, using uncertainty in stock assessment to increase the level of what was considered a viable population, based on agreements made in the

Food and Agriculture Organisation in 1995 (Food and Agriculture Organisation 1999; MacGarvin 2001, p. 23).

The next move came with the reform of the Common Fisheries Policy of 2002, after Europe had committed to the rebuilding of fish stocks to levels that would render sustainable high yields in the Johannesburg Declaration on Sustainable Development and in the context of the Food and Agriculture Organisation. The consequence of this Maximum Sustainable Yield (MSY) approach is that fishing pressure needs to be reduced substantially for a period, by a series of substantially lower annual Total Allowable Catches (TACs), after which recovered populations should be able to sustain large catches for a longer time. Other principles for the new policy were an ecosystem approach, paying more attention to the destruction of habitats (beam trawling had been a hot topic of debate) and interactions between species. From annual TACs, fisheries policy was to move to multiyear management plans for rebuilding stocks. Regional advisory councils would advise these new policies. Meanwhile, fleet subsidies would be ended, to slow down the ever growing capacity of the fleets, and the inspection effort would be increased, including through a vessel monitoring system.

The implementation of this new policy has proven slow and very difficult. The European Commission is trying to move policies towards longer-term plans to allow populations to grow so that a large fish harvest would once again become possible and sustainable, but these plans meet with a lot of resistance. The European Commission has announced it wants to implement the MSY for sole and plaice, two species of key importance to the Dutch flatfish industry. The first appraisal of the situation of the Dutch fishing associations illustrates the concerns of fishers about this plan:

*“The models show that there is a large chance that there will be larger fish stocks and barely higher TACs, but no more fishermen, because in the period leading there, 50 to 70% will have to be given up. In other words: no more fishermen to catch the TACs.”<sup>37</sup>*

One of the main concerns from fishers at moment, are the large fluctuations in TACs from year to year, making it hard to plan fishing and regulate prices. They fear that achieving an MSY would create an even larger fluctuation in TACs, in spite of a proposal to limit TAC changes to 15%. Understandably, fishers are still looking for some of the original functions that fishery policy served: stability of market and income and they are not reassured by current policy initiatives that focus on sustainability.

The introduction of an ‘ecosystem approach’ faces problems too. Research by Wilson shows a ‘broad but shallow consensus’ for the need to move

<sup>37</sup> Newsletter of the Dutch Federation of Fishery Organisations, 25 August 2006, <http://www.visserij.nl/artikel.php?artikel=177>, my translation.

beyond the single species population models of stock assessment and stock management, but little agreement on what parameters to include or which indicators from 'ecosystem health' to select (Wilson and Hegland 2005, p. 29). There is now some degree of assessment that combines species, but in spite of such attempts to modify fisheries policy, the main instrument has remained quota regulation.

Stock assessment is crucial to this policy: a precise assessment of the available fish reserves for every species for which a TAC and technical restrictions are to be set. The dominant approach for stock assessment in the CFP is a family of modelling techniques called Virtual Population Analysis (VPA). The technique analyses annual catch data and samples of age distributions of fish caught and has given rise to a series of models. From these data, the sizes of fishes' age groups are estimated, which are then calculated back to the number of fish born in past years. In other words: the size of the catch is used to produce an estimate of how big the population must have been to produce such a catch. For this purpose, fish mortality is crucially divided between a part due to fishing and 'natural' mortality.

The annual backtracking from newly observed age group sizes means that the data of every consecutive year may lead to reassessments of original 'recruitment' to the population. Every year, when the new catch data are analysed, the estimate of the past population improves drastically. This makes it particularly difficult for biologists to provide what TAC based policy needs: an accurate estimate of the size of the stock in the *next* year, when actually their best estimate is only made several years down the line. On the basis of this estimate and on the basis of what is considered a minimum viable population of a species, VPA stock assessment results in a recommended fish mortality rate and from that, combined with desired population size, a recommended maximum catch for a species. Although the technique has roots in research throughout the 20<sup>th</sup> century, it was mainly developed in the 1960s and was put to use for North Atlantic stock management for the first time in the early 1970s. By the end of the 1970s, VPA-based TACs had spread throughout the Atlantic fisheries management organisations (McGlade 1999; Lassen and Medley 2001; Holm and Nielsen 2004b).

In European fisheries policy, the specific way of organising regulation via annual TACs and a particular way of organising research have developed together and have become attuned to each other. Some even argue that TACs and virtual population analysis models together form a 'machine', an institutionalised conglomerate that has become so entrenched that it resists all major policy innovations in the last decades. This 'machine' consists of single stock TACs, anchored in legal definitions, part of a regulatory system based at the EU council of fisheries ministers, supported by virtual population analysis and a particular way of coordinating fisheries research and data collection at the International Council for the Exploration of the Sea,

as well as a particular way of organising enforcement and surveillance of quota (Holm and Nielsen 2004b).

### 5.5.2 ICES and stock assessment

Stock assessment for the CFP is performed by the International Council for the Exploration of the Sea. Concerns of over-fishing have been at the heart of this research organisation, ever since its foundation in 1902. ICES promotes and coordinates marine research and provides advice to its 19 member countries, all bordering on the North Atlantic and adjacent seas,<sup>38</sup> as well as to international fishing organisations. These members are represented in the Council, the decision and policy-making body of ICES, together with observers from the Worldwide Fund for Nature and Birdlife International. Each member has two delegates on the Council, generally one from the national fisheries research institute and one from the ministry of agency responsible for fisheries. ICES coordinates research of over 1600 marine biologists in national research facilities, including laboratories and survey vessels. With an eye on stock assessment, ICES also manages fisheries databanks, including the results of surveys and catch data since 1973, all available through its website ([www.ices.dk](http://www.ices.dk)).

However, the core of the ICES organisation itself is very small, with a staff of only some 40 people at its Copenhagen office. These include office staff, research coordinators and chair people for committees, but only a few assessment specialist and data managers. The actual research is performed by institutes all along the Atlantic shores, the integration of research is performed in the Working Groups, and advice to policy in Advisory Committees, all composed of scientists who do not formally work for ICES, but national fisheries organisations. Member states control both research budgets, the ICES council, and even fund participation in ICES meetings. In sum, ICES is a networked research organisation, an advisory structure, as well as the main professional organisation for fisheries scientists in Europe, with an academic as well as policy profile (Rozwadowski 2002; International Council for the Exploration of the Sea 2005c; Wilson and Hegland 2005; International Council for the Exploration of the Sea 2006c).

Within ICES, there are over a hundred Working Groups on various topics in marine research, ranging from the impact of climate change on cod stocks to mapping of marine habitats. In recent years, ICES has been criticised for not including sufficient amounts of social science in its integrative network of researchers, but recent EU funded research projects coordinated through the ICES have involved some social science research, including a few extensive studies of how the CFP advisory system works, reflexive and critical of the

<sup>38</sup> The 19 ICES Member Countries are: Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, The Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, the United Kingdom, and the United States of America. There are also six ICES Observer Countries: Australia, Chile, Greece, New Zealand, Peru, and South Africa ([www.ices.dk](http://www.ices.dk)).

ICES itself, and on which much of this analysis is based (Wilson, Bailly, Christensen, et al. 2006). Most of the Working Groups concerns biological fisheries research and oceanography. Organising meetings, integrating research, managing databases, and supporting the advisory work is therefore the bulk of the work done by ICES (Daw and Gray 2005; International Council for the Exploration of the Sea 2006c).

Of key importance for policy advice are the ICES Advisory Committees. The most important one for the CFP quota system is the Advisory Committee on Fishery Management (ACFM), which produces the annual ICES stock assessment and TAC advice, the basis for the major fishing quota negotiations of the North Atlantic and tributary seas.<sup>39</sup> ACFM bases its advice on data provided by the Working Groups of ICES involved in stock assessment and catch statistics. For example, the Working Group on the Assessment of Demersal<sup>40</sup> Stocks in the North Sea and the Skagerrak prepares stock assessments of a series of species in its particular zone of the ICES activity (Figure 5-3). Of the more than a hundred Working Groups at ICES, about forty provide major input directly to ACFM. Of these, about seventeen perform stock assessments and the others discuss secondary issues, such as methodologies for surveys. The stock assessments Working Groups perform their tasks during weeklong meetings, often at the ICES offices. The research on which their assessments are based, is typically performed in ICES-co-

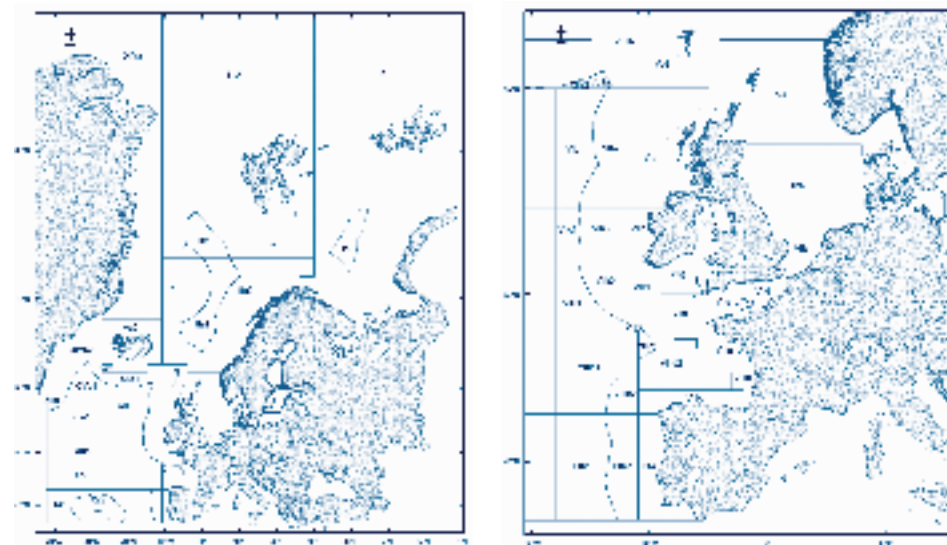


Figure 5-3 Areas for which ICES advises (www.ices.dk).

<sup>39</sup> Apart from the European Commission, the ACFM also advises the North Atlantic Salmon Conservation Organization and the North East Atlantic Fishery Commission, including the negotiations between EU and Norway over quota, as well as the International Baltic Sea Fishery Commission, and even individual member countries of ICES (www.ices.dk).

<sup>40</sup> Bottom-dwelling fish, as opposed to pelagic fish.

ordinated research efforts, based in national fisheries research institutes (www.ices.dk, Wilson and Hegland 2005).

The ACFM committee, who provides the actual advice, has 19 members, one scientist from each ICES member country, although additional experts can be invited. These scientists are nominated by ICES member countries' delegates. Since a few years, a series of observers are also present at ACFM meetings, representing Greenland, the Faroe Islands, the European Commission, WWF, as well as from sector organisations, such as regional fishers' organisations or Europêche. The fact that stakeholders can now be present and observe the deliberations at ACFM is a new development, part of a move to increase trust through more insight in the procedure, based on the idea that ACFM is not appreciated because stakeholders do not know how it operates (Daw and Gray 2005).

ACFM sets the terms for the Working Groups, organises a review process and meets twice per year, culminating in the annual advice in Autumn. The review process uses referees from outside the Working Groups concerned and normally not from countries with a strong interest in the stock under assessment. The annual report includes stock assessments and advice on management for 135 aquatic species. The end product, the complete report, consists of eleven volumes, totalling over 1300 pages. The report also contains answers to ad-hoc requests for advice (e.g. for 2005 ranging from the effect of sonar on whales to marine endocrine disruptor pollution), but the bulk of the report are stock assessments and stock management advice (International Council for the Exploration of the Sea 2005a).<sup>41</sup>

ICES is trying to shift the expertise it provides to policy makers to a more ecosystem-based approach. This would include more species interactions (predator-prey relations) in models, more attention for marine habitat preservation, connected with pressure of human use of ecosystems. The integration of the work of all advisory committees in one report is part of this move. However, such a shift will require an enormous effort, rebuilding models and restructuring advice. ICES acknowledges that one overall model of ecosystem health is 'not practical', so the approach will have to be developed based on components of ecosystems. However, even such an approach lead to considerable complications. As the 2005 report states:

*"ICES accepts that our understanding of the functioning of the ecosystems is confined to certain ecosystem components and that this will remain so in the foreseeable future, although our understanding of the systems improves. (...) Before an ecosystem approach can be implemented ecosystems must be defined. The identification of marine ecosystems for management advice must be based on their oceanographic and*

<sup>41</sup> Since 2005, the annual advice combines the advice on stock assessment of ACFM with the other two ICES advisory committees: the Advisory Committee on Ecosystems and the Advisory Committee on the Marine Environment, with the reasoning that this will allow for more integrated marine management (International Council for the Exploration of the Sea 2005a).



biological coherence, but must also be practical by corresponding as well as possible to existing area definitions as used in management. ICES has adopted a regional definition of ecosystems for its advice. This form of definition is not practical for all populations, e.g. widely migrating stocks of fish and sea mammals which occur in several of the regional ecosystems illustrating that the systems are open systems.”(International Council for the Exploration of the Sea 2005a, p. 2)

ACFM stresses that, before such an approach can be fully developed, its stock assessments is the best instrument available:

“The most effective way to achieve ecosystem objectives regarding fisheries is to implement the measures advised for years based on single-stock fisheries considerations namely to reduce the exploitation of fish stocks considerably.” (International Council for the Exploration of the Sea 2005a, p. 2)

This means that the advice to policy makers is built around two central elements. The one is the assessment of the current state of affairs through assessment of each individual stock. The second is an assessment of what are desired levels for these stocks, based on principles of precaution. Some interactions between stocks are already considered, for example in human impact through mixed fisheries, when the most threatened stock in a mixed fishery can become the basis for quota for the entire mixed fishery; or when effects related to food chain interactions or habitat destruction are known.

Two important indicators are produced for every stock. The first is the limit below which a stock is likely to collapse and be very difficult to reconstruct (the biomass limit reference point). Because of the considerable uncertainties involved in stock assessment and in setting this limit, a second indicator is placed at a higher point, the biomass precautionary approach reference point. This precautionary reference point is the biomass limit plus a margin of error, compensating for uncertainties. The assumption is that a stock will survive when above this level. However, both of these indicators are indicators of lower limits of population survival. The official policy targets aim for much higher population levels, the levels that would render the Maximum Sustainable Yield. With current levels of over-exploitation, even quota that would lead to stock survival seem out of reach of current policy and ICES advises measures to bring biomass above the precautionary reference point. Only for a few stocks, including Norwegian spring-spawning herring, levels for higher long-term yields have been identified that give rise to longer term management plans (International Council for the Exploration of the Sea 2005a, p. 7).

ACFM makes an annual assessment, providing information for fisheries management in the consecutive year. This implies not only a prediction of the

stock in the consecutive year, but even an extrapolation for the current year. The uncertainties in these predictions are many (Figure 5-4).

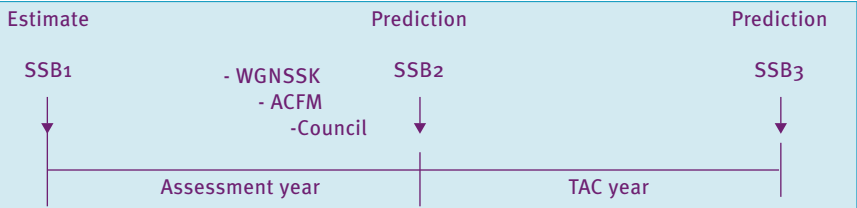


Figure 3.6.1 Schematization of ICES short term forecasts

Table 3.6.1. List with sources of assessment and prediction uncertainty (see figure 3.6.1 for explanation of terms)

<b>SSB1</b> <ul style="list-style-type: none"><li>• Stock definition</li><li>• Total catches<ul style="list-style-type: none"><li>- Statistical recording error</li><li>- Black landings</li><li>- Discards</li><li>- High-grading</li><li>- Misreporting (weight, species, time, area)</li><li>- Multiplication error (number of boxes * weight in a box)</li></ul></li><li>• Age composition<ul style="list-style-type: none"><li>- Errors in ageing technique</li><li>- Sampling error (areas, fleet segments)</li></ul></li><li>• Natural mortality</li><li>• CPUE surveys<ul style="list-style-type: none"><li>- Unidirectional change in catchability over the years, e.g., gear change</li><li>- Sampling variance, incl. area coverage</li></ul></li><li>• CPUE commercial fleet<ul style="list-style-type: none"><li>- Unidirectional change in catchability over the years, e.g., gear change, effort, efficiency</li><li>- Sampling variance</li></ul></li><li>• Weighting of index series</li><li>• Mathematical/statistical choices – structural model uncertainty<ul style="list-style-type: none"><li>- Model choice</li><li>- Choice for statistical distributions</li><li>- Mathematical stability; in search for an optimal solution</li></ul></li><li>• Size/Age at maturity</li></ul>
<b>SSB2</b> <ul style="list-style-type: none"><li>• Catches in assessment year (AY)</li><li>• Size at age in assessment year</li><li>• Recruitment to exploitable stock in assessment year</li><li>• Size/Age at maturity in assessment year</li></ul>
<b>SSB3</b> <ul style="list-style-type: none"><li>• Catches in TAC year (TY)</li><li>• Size at age in TAC year</li><li>• Recruitment to exploitable stock in</li></ul>

Figure 5-4 Analysis of sources of assessment and prediction uncertainties in ICES stock assessment (International Council for the Exploration of the Sea 2004, p. 26).

<b>Stock</b>	Sole in the North Sea	
<b>State of the stock</b>	Spawning biomass in relation to precautionary limits	Full reproductive capacity
	Fishing mortality in relation to precautionary limits	Harvested sustainably
	Fishing mortality in relation to high long term yield	Overexploited
<b>ICES considerations in relation to single-stock exploitation boundaries</b>	In relation to agreed management plan	No management plan
	in relation to high long-term yield	The current fishing mortality (Fsq) is estimated as 0.35, which is above the rate that would lead to high long-term yields. Fmax is not well defined and Fo.1 is 0.13. Fishing at Fo.1 is expected to lead to landings in 2006 of 5 600 t and SSB in 2007 of around 41 300 t.
	in relation to precautionary limits	The exploitation boundaries in relation to precautionary limits imply human consumption landings of less than 11 900 t in 2006, which is expected to lead to an SSB equal to Bpa (=35 000 t) in 2007.
<b>Upper limit corresponding to single-stock exploitation boundary for agreed management plan or in relation to precautionary limits. Tonnes or effort in 2006 and % reduction in F.</b>	<b>TAC &lt; 11 900 t.</b>	

Figure 5-5 Example of ACFM advice on Sole in the North Sea (F = fish mortality, Bpa is precautionary biomass level, SSB is spawning stock biomass), data from the overview table of all species. (International Council for the Exploration of the Sea 2005c, p. 17).

To a large extent, ICES is dependent on the cooperation of the fishing industry for data. For accurate assessments, this does not only include data on fish landed, but also on fish discarded at sea, or bycatch. This implies access to records of fishers and fishing agencies, and even periodic access to the actual catch for sampling. ICES tries to correct these data with estimates of misreported and unreported landings. ICES reports:

*“It is becoming increasingly difficult to assure the quality of the data when the fishing industry is involved. There are numerous examples of such problems, e.g., access to discard data from the Dutch beam trawl fleet, and in previous years access to Danish discard data. There are reports of misreporting of landings from areas, e.g., for the fleet fishing herring in Division VIa and in Subarea IV, and there are non-reported landings in several fisheries, e.g., Scottish fishing around 2000 and recently in the Baltic cod fishery. (...) Simply, ICES has no monitoring apparatus at its disposal. Likewise ICES has no legal authority to demand access to existing data. The responsibility for discards and non-reporting and the uncertainty regarding the extent of these phenomena rests with the national authorities and the industry.” (International Council for the Exploration of the Sea 2005a, p. 10)*

So what does the advice look like? A more detailed example of an assessment clarifies this. For the 2005 assessment of sole in the North Sea, the Working Group reviewed catch data, indicators of the fishing effort, survey data with research vessels, as well as data from a survey among fishers. These data were analysed with one of the standard stock assessment techniques used at ICES (extended survivor analysis or XSA, related to VPA modelling), which leads to short-term predictions for the sole stock in 2007, depending on various levels of fishing mortality. A comparison of precautionary levels and fishing mortality leads to an advice for an upper limit of the TAC. The report

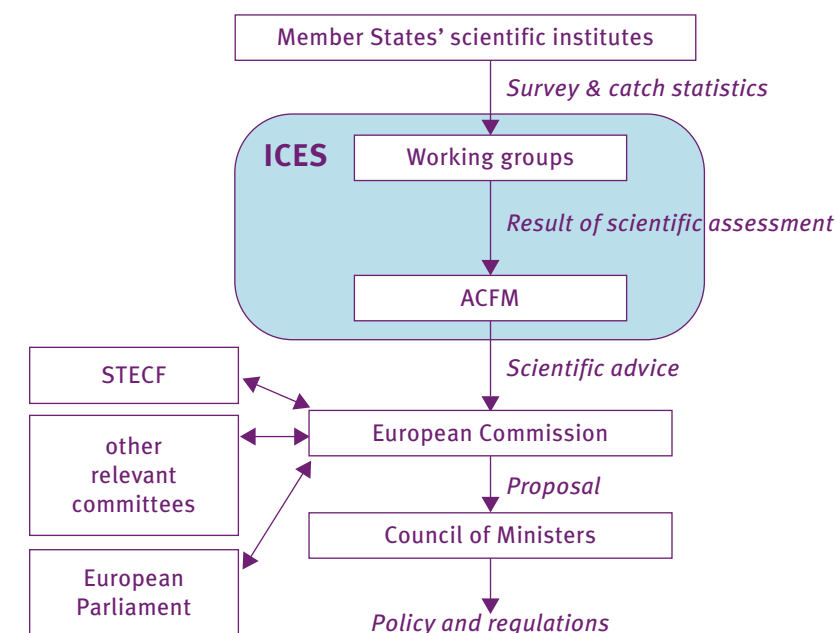


Figure 5-6 ACFM advisory process (permission pending) (Daw and Gray 2005, p. 190)

presents the sole assessment results in some detail, including statistics of recent years, and a summary of the advice for this species (Figure 5-5). (International Council for the Exploration of the Sea 2005c, pp. 131-142)

The document is consequently submitted to the European Commission's directorate of fisheries for the next step in the TAC procedure that will eventually produce national quota (see Figure 5-6).

### 5.5.3 The European quota

After the Commission receives the ACFM advice, the DG Fisheries holds a round of consultations, with the European Parliament Fisheries Committee, but more crucially also with its own advisory committee, the Scientific, Technical and Economic Committee on Fisheries (STECF).<sup>42</sup> This results in a proposal for TACs and other policy measures to the Council of Ministers (Daw and Gray 2005). Many of the scientists that are part of ACFM working groups are also a member of the Commission's STECF. These scientists typically work at national fisheries institutes and perceive their participation in these advisory committees as 'volunteer work', although these institutes generally value their participation highly. Scientists involved in this double committee structure see STECF as a chance for policy makers to push experts further in the direction of convenient advice. STECF seems to be more willing to provide advice than ACFM when the scientific underpinnings are considered weak (Wilson, Bailly, Christensen, et al. 2006, pp. 9-11).

In addition to Parliament and experts, the Commission can also consult a committee of stakeholders. This Advisory Committee on Fisheries and Aquaculture has 21 members of fish production, processing, trade, as well as representatives for consumers and the environment. Since 1999, two experts of STECF are also invited to these meetings, to increase interaction with experts. However, stakeholder consultation is not formally part of the procedure. The Commission does consult its stakeholder committee on key issues in fishery policy, but this seems to have little influence over the development of the Commission's quota proposal:

*“Europêche, the European Federation of Fishermen's Organisations, has proved incapable of melding a robust common position among the Member States and bringing any collective influence to bear on policy making at the European level. Likewise, the Commission's own Advisory Committee on Fisheries and Aquaculture, recently reformed to accommodate other stakeholders including environmental NGOs, while*

*having the ear of the Commission, does not appear to make much impact on key issues. Indeed, it is arguable that international NGOs – like WWF – with offices in Brussels are better organised and positioned to lobby the Commission effectively.” (Symes, Steins and Alegret 2003, p. 122)*

Evidently, stakeholders and especially the fishery industry does have a big influence on the outcome of the quota setting process, but this appears to occur especially at the end of the line, at the Council of Ministers. Crucially, this means that fisheries interests are articulated as *national* interests, defended by national fisheries ministers in the Council.<sup>43</sup>

The meeting of the Council of Ministers uses the proposal from the Commission to negotiate TACs, divide these into national quota, and discuss additional management measures. For these purposes, national delegations meet for negotiations that can last several days, supported by national fisheries experts. The result is published as a binding regulation, indicating exactly how much of every species every country is allowed to catch, in which area, and under what technological restrictions. It is then up to the national states to implement these decisions (Council of Europe 2005).

### 5.5.4 The reception of the advice

So how does this procedure work out? Analyses of how ACFM advice has been dealt with since 1980 shows that there is a strong tendency to allow higher catches than what ACFM advises, even after the CFP was reviewed in 2002 to address this problem. The advice on cod is a case in point: in 2002, ACFM advised a moratorium on cod fishing in the North Sea, Skagerrak and Eastern Channel. The STECF advice to the Commission was to reduce the TAC by 80%, and eventually the Council of Ministers decided on a reduction of 45% of the 2003 cod TAC (Daw and Gray 2005, p. 190). ACFM continued to advise a moratorium in the consecutive years, because the cod was believed to have fallen below the safety limit of 70.000 tonnes (Figure 4-1). In December 2005 the Council of Ministers decided to set the 2006 TAC for cod at 23.205 tonnes, a little under the 2005 TAC of 27.300 tonnes. Meanwhile, the EU Council cod recovery plan of 2004 puts the official aim for North Sea cod at a minimum of 150.000 tonnes, based on an agreement with Norway of 1999. Although the TAC has been gradually reduced since 1998, the gap between advice and official policy targets on the one hand, and the TACs adopted by the Council of Ministers is considerable (International Council for the Exploration of the Sea 2005c, p. 37 et seq.).

In the case of sole (Figure 4-5), ACFM advised a TAC below 11.900 tonnes for the North Sea in 2006. Sole is considered to be out of immediate danger of collapse (i.e. above the precautionary limit of 35.000 tonnes), but it is caught in a mixed fishery with plaice, largely by use of beam trawlers. Plaice

<sup>42</sup> STECF was installed in 1993 (Commission Decision No. 93/619/EC) and renewed in 2005 (Commission Decision No. 2005/629/EC). It consists of 28 members, fishery scientists from all over Europe. Members are appointed on personal a titre personnel, but: “The members of the STECF shall be appointed on the basis of their expertise and consistent with a geographical distribution that reflects the diversity of scientific issues and approaches within the Community.” (CEC 2005/629/EC, art 4.2) STECF meets twice a year in a plenary session, once in March-April, once in November. For details, see: [http://ec.europa.eu/fisheries/cfp/governance/stecf\\_en.htm](http://ec.europa.eu/fisheries/cfp/governance/stecf_en.htm)

<sup>43</sup> For more details on the Advisory Committee on Fisheries and Aquaculture, see: [http://ec.europa.eu/fisheries/cfp/governance/acfa\\_en.htm](http://ec.europa.eu/fisheries/cfp/governance/acfa_en.htm)

is not as valuable and small plaice are often discarded, up to 80% in the Southern North Sea. Hence ACFM advice combines considerations for both species and advised a low TAC. In December 2005, the Council of Ministers set the TAC for sole in the North Sea at 17.600 tonnes, roughly the same as the official landings in the year before, 17.149 tonnes.<sup>44</sup> (Council of Europe 2005; International Council for the Exploration of the Sea 2005c). Because the advice of ACFM is water down at the Commission and then again at the Council in these ways, fisheries biologists often claim that stocks are threatened because politicians will not listen.

The TAC regime does not only fail to prevent over-exploitation of fisheries, it also leads to conflict. In spite of the large effort of ICES to enrol experts from all over Europe and to generate agreement (in advice and research, but also in extensive standardisation of methodology), stakeholders frequently and vehemently question the resulting advice. There is increasing criticism of the assumptions underlying the research among fishery biologists and fishing organisations are picking up on this disagreement to argue that the ACFM advice is incorrect. Since 2002, fishers from Denmark, France, Ireland, Italy, the Netherlands and the UK have formed an Action Group, questioning not only what they see as unrealistic policy measures, but also the stock assessments of ICES for being based on outdated models (Daw and Gray 2005, p. 194). This has lead stakeholders to try and organise their own expertise in an advocacy structure, hiring expertise to question the ICES scheme, or lobbying governments to investigate fisheries assessment practices (The Royal Society of Edinburgh 2004; Wilson and Hegland 2005).

There is a lot of reflection on the state of fisheries regulation by fisheries scientists involved in ICES, also by social scientists and also by people directly involved in the ACFM work. Nevertheless, the main strategies of ICES to deal with criticism has been to explain better what it does. Fish stock assessment is explained in colourful brochures (International Council for the Exploration of the Sea 2006a), ICES has an extensive web page, through which reports of committees and proceedings can be accessed, as well as its primary data. In addition, ACFM now has stakeholder observers who can come and witness that nothing untoward is going on. Similarly, STECF is experimenting with public meetings since June 2006 (<http://stecf.jrc.cec.eu.int/>).

At the same time, some of the data ICES uses are very sensitive, such as results of inspections, some catch data, or data on discards and bycatch. These data, generally provided by the industry or national agencies, can and have been used in the past to accuse the providers of these data of avoiding

regulations. With this in mind, Scottish and Irish fisherman have at some point physically prevented the collecting of sampling data. Their use for ICES assessments has been very controversial in the past. Some national fisheries institutes as a rule only work with official catch statistics. For these reasons, inspection data are now secret at ICES and can only be used for stock assessment purposes, without reference to specific region or specific member states (Wilson and Hegland 2005, pp. 26-27; Wilson, Bailly, Christensen, et al. 2006).

In addition, uncertainties and accusations of partisanship are met with the development of more detailed methods, standardisation, more extensive research, and more frequent surveys. Although this makes it possible for researchers to claim objectivity and neutrality because they followed a standard procedure, it also can make research processes more obtuse and less prone to non-specialist participation. Standardisation of methodology also has limitations, as not all methods are suitable for all research problems. In ICES stock assessment, there is increasing diversification of methods, tailored for the specific assessment problems of specific stocks (Wilson and Hegland 2005, p. 18).

It is important not to lose sight of the history of how this TAC regime came about and what purposes it served: attempts to displace it will have to address the fact that it is still used at the Council of Ministers to pacify the potentially explosive conflicts over fishing rights between countries and to guarantee stability for fishers.

## 5.6 Analysis

### 5.6.1 Task conceptions and strategic positioning of expertise

The dominant discourse around the ACFM advice is that it is to be a neutral provider of objective advice to policy makers. Although ICES is keenly aware of having to produce advice that is cast in terms that are useful to policy makers and that is delivered in time to feed into the policy making process, notions of independence and objectivity are key to the way it has conceived its advisory mission. This becomes clear from its ICES mission statement and strategic documents (International Council for the Exploration of the Sea 2002), but is also part of the way its experts conceive of their task, and the way the Commission has articulated it (Wilson and Hegland 2005). In line with this task conception, the advisory procedure has been structured so as to keep the science and the management separate, using the STECF as a buffer to perform the still technical, specialised work of translating advice into policy measures: ACFM advises the Commission and STECF adds a layer of advice, closer to policy concerns.

Nevertheless, this does not mean that ACFM experts operate in complete isolation from policy. The Commission does provide the resources for the

<sup>44</sup> Technically, this EU TAC is for zones IV and II, but sole only occurs in most southern tip of zone II, south of the Trondheim Fjord. ACFM does not advise on a sole TAC for zone II. ICES estimates that the actual landings were 18.758 tonnes (International Council for the Exploration of the Sea 2005c, pp. 131-142). In January 2006, the Commission proposed to reduce catches of sole and plaice as part of a long-term plan for stock regeneration.



operation of the ACFM and of many ICES research programmes, and the Commission does make its wishes clear to ACFM, as client of the advisory reports, for example with respect to prioritisation of assessments for most over-fished species. In 2004, the Commission and ICES agreed upon a memorandum of understanding, regulating its mutual relations, especially with a view of the advisory process, specifying the format of advice. The Commission is also in discussion with ICES about providing longer term advice, inclusion of some uncertainty information in the advice (a difficult discussion, since the Commission also wants less room for interpretation in the advice), and the transparent and public character of advice. However, the Commission has to compete with national control over researchers, both through the national delegates at the Council and through the policies of the national fisheries institutes where the actual research is performed. In addition, the Commission is not the only client of the ACFM advice (Wilson, Bailly, Christensen, et al. 2006, pp. 9, 12-13, 18).

The fact that expertise is organised separately and distinct from policy makers therefore does not mean that the expertise is completely independent of assumptions and fundamental selection of policy approaches. ACFM may try its best to be as objective and neutral as possible within the framework of its methodologies and VPA modelling, but some argue that this very framework itself is based on assumptions that are matched with the specific policy of regulation that hinges on TACs and its specific way of conceiving regulatory fishery policy (Holm and Nielsen 2004b; Holm and Nielsen 2004a; Wilson and Hegland 2005).

The scientists at ACFM are very much aware of the policy context in which their advice will function and be used. One consequence is that textual details of reports can be discussed at length in ACFM. In some cases, this is even the case in the meetings of ICES Working Groups that feed into ACFM stock assessments. Observations by Wilson and Hegland show that ICES experts want to discipline their readers, by consciously trying to prevent misreading and liberties, leading experts to prefer quantitative information and paying a lot of attention to precise wording (Wilson and Hegland 2005, pp. 20-21). In addition, a survey among scientists involved in the stock assessment processes has indicated that they have experienced colleagues arguing in ways that were ‘consciously biased by national interests’. Similarly, these scientists have expressed concerns that national research institutes withhold information for the ICES review processes (Wilson and Hegland 2005, p. 22). Much of the consensus-generating procedures of review and cooperation at ICES seem designed to deal with precisely such biases and conflicts.

In the past, debate over ACFM advice has been cast in terms of failings in the quality or independence of the advice. This has resulted in an ongoing process of purification, of sorting out the “science bits from the policy bits” (Wilson and Hegland 2005). Part of this process has been an ongoing standardisation of stock assessment methodologies, of data gathering,

sampling in trawling survey procedures, and of further refinement of the VPA models, work performed in the ICES working groups. Accusations of partisan experts have therefore been countered by methodology and standardisation, as stock assessments can be defended because they were done ‘by the book’. The extensive structure of working groups could be mobilised to generate high levels of agreement among key fishery researchers in Europe (cf. Halffman 2003; Holm and Nielsen 2004b).

ICES acknowledges the need to interact with interested parties, but this is mainly either to make sure advice is cast in useful terms or to guarantee that data keeps coming in. It is as yet unclear how the new observer status of stakeholders will affect perception of the assessments. In this policy making process, expertise is therefore organised at a distance from policy makers and is seen to have an entirely different logic: experts assess the size of the stock, policy makers divide up the available stock for fishing.

The key strategies for dealing with contestation are therefore increased transparency and proceduralisation, purifying the science from the policy, and maintaining clear demarcations between experts and policy makers. The track record of these strategies suggests that access to experts and insights in expert procedures may be one precondition for increased trust, but is not likely to provide a solution to lack of trust in experts, as is argued extensively in research on public understanding of science (Jasanoff 1990).

This leads to a curiously ambivalent conclusion for the position of the relation between experts and policy makers in this case. On the one hand, there are those with the strong impression that ‘policy makers are not listening’, leading to demands for more certainty, better methods and accusations of irresponsible and weak policy makers. On the other hand, there is the analysis that the ACFM advice and the knowledge that supports it is entirely geared to this particular policy making process and the international bargaining that is at its core, in other words: that the experts have been too subservient to the policy.

### 5.6.2 Types of expert activities

#### Review

A lot of the advisory activities of ICES have a review character, especially in the Working Groups and occasionally in the ad hoc advice to its clients. This implies bringing together literature, research results, and data to analyse the state of fisheries. The review activities are not always sharply separated from the more instrumental activities, such as ACFM, as some of the review activities clearly have more instrumental advice purposes in mind. ICES organises these review activities in a selective format, based on scientific reputation of participants (although national representation does appear to play a role), without direct representation of lay knowledge or policy concerns. Given the external contestation of ICES, the review activities apparently do not carry the same weight as that of some of the typical review

organisations, such as Academies of Science. Nevertheless, ICES does remain one of the most authoritative organisations in the world of fisheries.

### **Instrumental**

The bulk of the instrumental activities of the ICES involve advice in the setting of TACs: stock assessments and the deduction of TAC advice based on targets defined in policy. There are review elements in these assessments as well, as TAC advice is more than the application of pre-defined methodologies, especially with respect to the assessment of uncertainties. Even though the advice of ACFM is watered down in the decision making process that follows, the annual assessment does provide the framework, data, and initial advice on which the 'TAC machine' (Holm and Nielsen 2004b) thrives.

### **Mediation**

ICES was not found to have major mediation activities.

### **Advocacy**

ICES does not have major advocacy activities, although there are some minor qualifications to this: ICES data is used in advocacy (e.g. by Greenpeace); ICES may be perceived as pro-conservation in some fisheries circles; ICES scientists have indicated that they would prefer a stronger advocacy role for the organisation, making a stronger case for fishery conservation (Wilson and Hegland 2005); and some of the ICES scientists are involved in supporting national positions in negotiations, but although there are traces of advocacy for national interests even within ICES, the organisations strength is that it has managed to control these and remain neutral between nations.

### **Reflection**

In recent years, ICES has developed a new research line reflecting on the organisation of fisheries policy, including research on the role of scientific advice in the CFP that is willing to acknowledge shortcomings of dominant regulatory approach (International Council for the Exploration of the Sea 2004). Some of this reflexive work seems to be finding its way into policy circles, but the degree to which this will lead to a learning process that can pull the CFP out of its present deadlock remains to be seen.

## **5.6.3 Six key issues of expert advice to policy**

### **Value issues**

The organisation of the stock assessment advisory process is geared towards purification: the gradual exclusion of value judgements from the realm of the experts, or at least a situation in which the value judgements are decided by policies, in order to become instructions for the experts. For example, experts refer to policy documents to find a target for fishery policy, such as Maximum Sustainable Yield. One of the results of such a process is that value-laden choices end up in technical details, such as the precise construction of indicators or the design of models, that then become hard to track down for re-evaluation ('black boxed'). Evidently, this purification process is never

finished. As policy makers try to find ways out of the deadlock of fisheries policy, they even confront the experts with new kinds of questions leading to a feeling of stretching the boundaries: going beyond what they can safely say.

### **Accommodation of knowledges**

According to its critics, the current stock assessment system is entrenched in particular styles of modelling, evolved from VPA techniques, but still focused on short-term single stock assessments. The system has accommodated new forms of data beyond catch data, such as sampling surveys, sonar surveys, and even data from surveys among fishers, or data about illegal fishing practices. However, this remains limited to data harvesting that is added on to an entrenched assessment practice. Innovative thinking and different kind of scientific knowledge is developed in ICES circles, but these do not seem to change the advisory practice. Wilson has even suggested an increasing gap between the research science and the regulatory science of the ICES network.

### **Uncertainty issues**

Uncertainty is resolved with additional research and more refined procedures. The large scale surveys with research vessels are a good example: the number of surveys is increasing (in some cases from twice per year to four) and the procedure for doing sampling has become so standardised, that they are only possible with research vessels, not normal fishing vessels. In assessments, uncertainties are controlled through the use of precautionary limits.

### **Institutional design**

In policy-making circles, the design of the annual stock assessment process is discussed mostly in terms of marginal adjustments. There is a proposal from the Council of Ministers to change the timing of the procedure, to allow for more time for the Council to reach agreements and for the Commission to consult with stakeholders. In other words, the concrete plans for changes involve minor adjustments, where only more stakeholder consultation can be seen as some substantial change (Raad van de Europese Unie 2006a). There are also proposals for more radical innovations, as announced in the 2002 change in the CFP and as called for by proponents of more co-management or ecosystem approaches. Some of these proposals could still fit in the current arrangements, such as more multi-species analysis or attention for longer-term management plans (e.g. the reconstruction of cod and sole/plaice stocks). Elements of co-management or greater stakeholder involvement go much further and could shift some of the policy to other arenas, such as regional fishery councils. For now, the concrete plans for redesign of the expertise for the CFP involve minor adjustments to the existing institutional arrangement. This is predominantly statist in nature: expertise is organised in public research facilities and feeds into a decision making process that is localised in the executive. There are minor elements of a deliberative model (reflexive debate in some parts of ICES, some hesitant consultation), of a neo-liberal pattern (market steering of fisheries research on the level of national

institutes that feed into ICES), but these are marginal in comparison to the dominant pattern.

### Policy learning

The existing European fisheries policy is highly focused on the annual TAC cycle. There are many suggestions for different approaches, some of them have even been adopted in the 2002 new CFP, but for now policy change seems mostly a matter of incremental changes within the existing frame. There is general agreement that the CFP is failing, even in the world of fishers, but the concrete policies are better characterised by paralysis than by learning.

### Trust

Trust in the experts and the CFP is highly problematic. This is not unusual in the fishery world. Marine biologists are faced with a highly sceptical fishing industry all over the world, especially in times of heavy over-fishing. Nevertheless, there are indications that this need not always be the case, as I will point out in the next Norwegian case, and experience from expertise in other policy fields would certainly suggest some possibilities. Currently, the main strategy to increase trust in the experts is through strategies of transparency and explanation, combined with more research to create more certainty where uncertainties are used to question the validity of expertise.

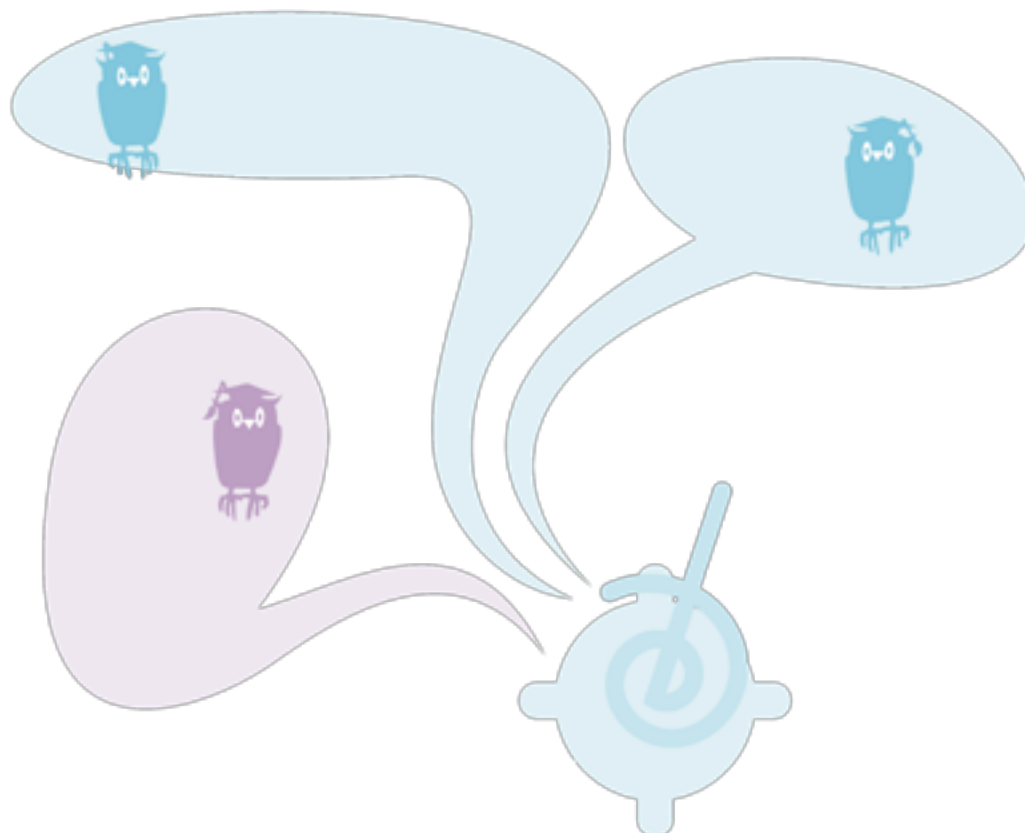
## 6 Advice for marine fishery policy in Norway

### 6.1 Fisheries policy in Norway

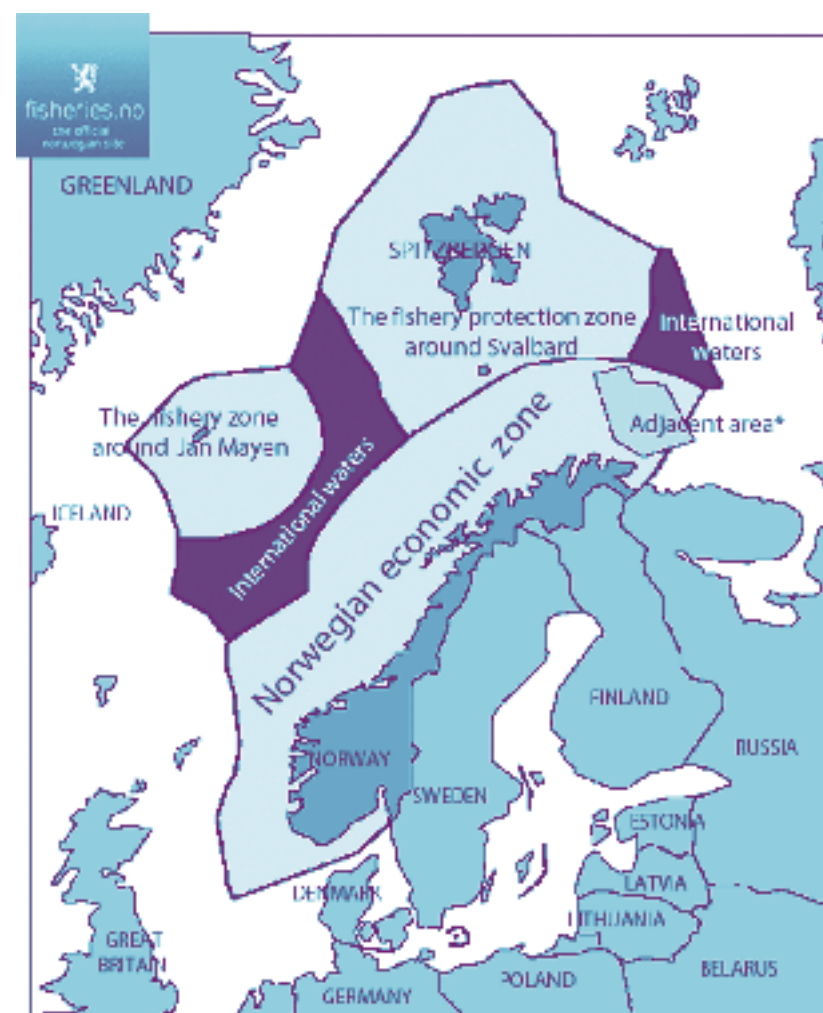
Fishery is an important economic sector in Norway, especially in the Northern and North-western coastal areas. With a fleet of about two thousand full-time vessels, it provides work to over fifteen thousand fishermen. This is about the same as the total employment in Norway's massive oil industry. However, the fish processing industry provides an additional ten thousand jobs on shore, in fish processing and trade. The economic value of the fishing industry is not as big as the oil industry, but nevertheless still significant. In 2002, the export value of Norwegian fish was 3.7 billion Euros, 5.7% of total exports, with the EU as the biggest market. While the number of boats and fishermen has been in steady decline for decades, the value of the fish export continued to grow until the beginning of the 21<sup>st</sup> century. The tenth biggest producer in the world, Norway is the fisherman of Europe (Norwegian Fishermen's Association, Norwegian Seafood Association and Ministry of Fisheries 2003; Norwegian Ministry of Fisheries 2003; Statistics Norway 2006a; Statistics Norway 2006b).

After Norway established an exclusive maritime zone of 200 nautical miles in 1977 (Figure 6-1), its fishing grounds cover most of the Norwegian Sea, as well as large sections of the Greenland Sea, the Barents Sea, and the North Sea, an area of about two million km<sup>2</sup> (Arnason, Hannesson and Schrank 2000). Although this was in line with expansions elsewhere in the world, creating new possibilities for resource management, it also created a source of boundary conflicts. Several countries continue to dispute Norway's control over the 'the fishery protection zone' around Svalbard and Norway has only recently found a precarious settlement with Russia and Iceland over disputed areas in the Barents Sea (Churchill 1999). The economically prime species are cod, herring, mackerel, and saithe ('coalfish'), but Norwegian fishers also catch dozens of other species, including haddock, halibut, prawns, sandeels, or mussels, as well as the more controversial seals and whales (Statistics Norway 2006a).

Since the take-off in the early nineties, fish farming has gradually become more important for the Norwegian fishing industry. Apart from the more traditional shellfish farming, aquaculture has particularly boomed for salmon and rainbow trout, but forays were also made into raising other species, such as char, halibut, and especially cod, which has surged in recent years. In 2003, the share of farmed salmon and trout had grown to 43% of Norway's total fish export value, providing work for three thousand people (Statistics Norway 2005b; Statistics Norway 2005a; Statistics Norway 2006b).



Nevertheless, in spite of this dramatic growth of fish farming, fishing at sea remains a key economic sector to Norway, as well as an important part of Norwegian culture. It should come as no surprise that the country has developed an elaborate set of institutions and policies to administer its fisheries. Its Ministry of Fisheries proudly claims to be the first of its kind in the world, going back to a directorate in 1900, established as a specialised Ministry since 1946. The Ministry has substantial research capacity in its own research organisations. However, the fishery sector also consists of an elaborate set of institutions (Norwegian Fishermen's Association, Norwegian Seafood Association and Ministry of Fisheries 2003, pp. 24-25).



\*Adjacent area in the Barents Sea which is covered by a temporary agreement between Norway and Russia.

Figure 6-1 Norwegian fisheries, from [www.fisheries.no](http://www.fisheries.no).

Norway also has a respectable tradition in fisheries research. In fact, among marine ecologists, Norway is credited for being the country where fisheries research started in the mid-nineteenth century. At the time, the Norwegian government wanted to know the cause of fluctuations in the catches of cod, which would cause economic damage that rippled throughout the economy. By 1860, Norway had an advisory committee of scientists investigating fisheries problems (Rozwadowski 2002, p. 3; Kaiser, Attrill, Jennings, et al. 2005, p. 406).

Although Norway has exclusive control over a large part of its territorial waters, 90% of its open sea fishery resources are managed in collaboration with others. Norway has fishery agreements with the EU, Russia, the Faeroe Islands, Iceland, and Greenland. Most of these take the form of annual negotiations over quota and flanking regulatory measures with national delegations consisting of civil servants and fishery researchers in the framework of regional fishery organisations such as the Northeast Atlantic Fisheries Commission, the Northwest Atlantic Fishery Organisation, or the EU Common Fisheries Policy framework. Especially for the so-called 'straddling stocks' require extra attention: the stocks that live or migrate across borders of exclusive economic zones (Norwegian Fishermen's Association, Norwegian Seafood Association and Ministry of Fisheries 2003, p. 24).

Current practices in fishery policy build on a long tradition, but a significant moment was the drastic drops in fish stocks at the end of the eighties. Especially the threatening collapse of cod stocks, traditionally one of the most important species for Norwegian fishermen, hit home the message that things were not going well. Drastic measures have proven reassuring, although there are still worries about fluctuations, such as low catches of herring in 1997. Whereas total catches were at a low in 1990 with 1,6 million tonnes, by 1995, they had raised to 2,5 million tonnes and have fluctuated around that level since (data Fishery Directorate, Norwegian Ministry of Fisheries 2003, p. 16).

Fishing regulations in Norway are complicated and vary per stock and per fleet. On the one hand, this allows for measures that are tailored to local conditions, but in practice, many of the complex variation is also simply the result of a long history of bargaining and compromises in the fishing sector (Sand 2002).

An important element in overcoming the stock crisis of the eighties was a reduction of subsidies to the fishing fleet and a policy of fleet reduction. Triggered by the specifications of the European Economic Area on state support of industries that went in force in 1994, subsidies to the fleet decreased drastically between 1991 and 1993. By 2005 had all but disappeared. Between 1995 and 2005, the number of fishing vessels has almost halved from fourteen hundred to just under eight hundred. Fishermen are given economic incentives to take vessels out of the fleet, such as the



possibility to transfer a vessel's individual quota to other vessels belonging to the same owner. Because fleet reduction has concentrated on older and smaller vessels and remaining vessels have been technically upgraded, this has not reduced actual catch capacity, but the stock data seem positive (Årland and Bjørndal 2002; Sand 2002; Johnsen 2005).

Apart from the efforts to reduce subsidies and fleet size, regulatory instruments include Total Allowable Catch (TAC) quota, access restrictions to the different fisheries, individual quota, and technical restrictions, such as for fishing gear. Seasonal restrictions also apply and fisheries can be closed intermittently in light of bad signs, such as reduced size of fish. The fleet is divided in three sections, for which different regulations apply: the purse seiner fleet and the trawler fleet operate at open sea, as opposed to the coastal fishing fleet that consists of smaller vessels and that is of special importance to local fishermen. This includes many part-time fishermen who combine fishing with other economic activities. In principle, there is open access for most of the coastal fleet, while the seiners and trawlers require licenses. Licenses do apply for some traditional sections of the coastal fleet, such as for sprat, saithe, or cod. The number of licenses was drastically reduced after the eighties fishery crisis and after the introduction of a new fishing law in 2000, government tried to create a more direct link between the availability of resources and the catch capacity (Årland and Bjørndal 2002; Statistics Norway 2006a, p. 15).

While licenses regulate access to fisheries in time and space, quota regulate how much can be caught once access is gained. The Norwegian TAC is divided between the three main segments of the fleet and then further divided. Once again, the process is complex and varies per fleet, with individual vessel quota in the purse seining fleet. In the trawler fleet, individual vessel quota apply only for ground fish species (their main target species), with maximum quota for pelagic species and further limitations for large vessels fishing cod. Vessel quota do not keep pace with vessel size. The distribution of quota over the fleet favours smaller purse seiners over large ones. For trawlers too, the allocation of individual quota takes into account many factors, including alternatives work opportunities for crews. The coastal fleet works with TACs, but here too there are special provisions and exception guaranteeing smaller vessels some share of the fish and specialist cod fishermen get larger share of the cod (Årland and Bjørndal 2002).

Illegal, unreported and unregulated fishing is high on the agenda of Norwegian fishing authorities. Vessel quota are strictly controlled, including coast guard inspections<sup>45</sup> and an elaborate registration system that involves fish sale organisations from the sector as well as government agencies. In addition, Norway maintains 24-hour satellite tracking of all vessels over

24 meters of its fleet, obligatory since 2000.<sup>46</sup> Currently, this involves 400 vessels, but Norway has made agreements with the EU to introduce mutual tracking of vessels for smaller ships as well. However, a large part of illegal fishing is caused by foreign vessels, especially vessels that operate in the Barents Sea and transfer fish at sea or take it to harbours outside of the regional fishing control. Since 1994, Norway maintains a blacklist of fishing vessels that are no longer welcome in its harbours and the country is trying to convince other countries to do the same ([www.fisheries.no](http://www.fisheries.no)).<sup>47</sup>

The official goals of this complex regulatory system are formulated in general terms (and not in the form of hard, quantified targets):

- 1 Increasing the profitability of the fisheries sector.
- 2 Protection of the resources base.
- 3 Securing employment opportunities in coastal communities.
- 4 Maintenance of the settlement along the coast.

(Årland and Bjørndal 2002, p. 309)

After the industry had started to lose money by the end of the eighties, the fishing industry now has a small profit margin. Decrease in profits over the last three years seem primarily caused by general economic conditions (a strong Krone and high interest rates), combined with fierce international competition with countries such as China ("Why Norway needs stable fish quotas" 2004). Unfortunately, employment has gone down at the same time. Since 1985, the number of Norwegians with fishing as main occupation has halved to about twelve thousand in 2005. In recent years, the number of part-time fisherman is also decreasing, a form of employment that is especially relevant for coastal communities in the North. Spawning stocks biomass for most species seem to be recovering slowly, even for cod (data Fishery Directorate). Norway has managed to maintain a modestly profitable fisheries sector and stocks show some signs of revitalization (Figure 6-2). Hence the first two goals for policy look positive. However, this seems to be happening at the expense of goals three and four, as employment is decreasing (Figure 6-3) and concentrating in the most advanced part of the fleet.

<sup>45</sup> The Norwegian Coast Guard spends an estimated 50 million dollars per year on monitoring and enforcement of fisheries regulations at sea (Arnason, Hannesson and Schrank 2000).

<sup>46</sup> Satellite tracking is not only useful to keep vessels out of restricted areas, but can also be used to register fishing patterns, e.g. beam trawlers typically move between 5 and 8 knots when fishing (Kaiser, Attrill, Jennings, et al. 2005, p. 423).

<sup>47</sup> [www.fisheries.no](http://www.fisheries.no) is the official portal of the Norwegian fishery authorities, produced for the Ministry of Fisheries and Coastal Affairs. It contains detailed and information on the organisation of Norwegian fishery policy in English, of which I have made extensive use for the description of fishery institutions.

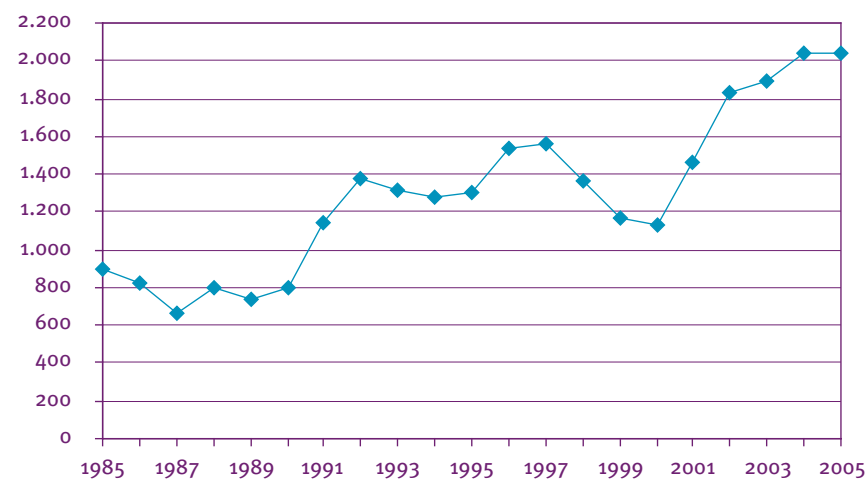


Figure 6-2 Spawning stock biomass (in 1000 tonnes) of all main ground fish species (cod, haddock, saithe, Greenland halibut) in Norwegian fisheries (adapted from Norway Fisheries Directorate).

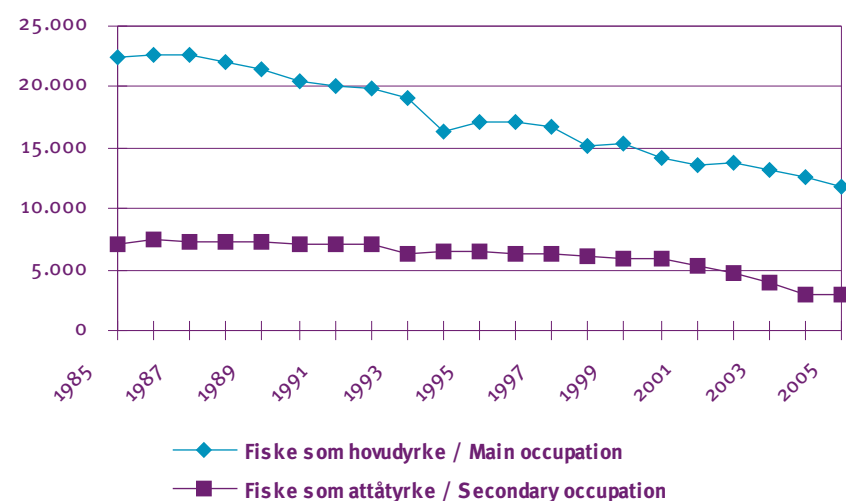


Figure 6-3 Number of registered main and secondary occupation fishermen in Norway, 1985-2005 (adapted from Norway Fisheries Directorate).

In addition to the regulatory instruments of fishing policy, Norway has also set up marine reserves – especially around Svalbard, the archipelago to the north of Norway that includes Spitsbergen. Some of the cold-water coral reefs are protected from trawling and several of the coastal reserves along the mainland contain marine elements. The Svalbard reserves are also marine components of national parks on land. Originally, they stretched four

miles into sea, but this was extended to 12 miles in 2004. Around the island of Bjørnøa, fishing is even prohibited within a 20-mile radius. Together, this creates a marine conservation area of over 60.000 km<sup>2</sup>. However, these marine reserves were primarily intended for the protection of arctic wilderness, rather than as an instrument of fishery policy. In some of these areas, there are still provisions for mollusc and shrimp fishing, which implies intensive bottom trawling. Some fishing has been reduced to create reserves, but in several cases the reserves have been created where fishing was not viable in the first place, or existing practices have been accommodated. Environmental organisations such as Greenpeace and WWF campaign for the complete protection of Svalbard and for more extensive use of marine protected areas in Arctic waters, with more explicit goals of creating nursery chambers for fisheries. The official position of the fishers' organisation is that protected areas are perfectly acceptable for the protection of biodiversity, but not necessary and even counter-productive for the protection of fisheries (www.mpaglobal.org, Royal Norwegian Ministry of Justice and the Police 2000; Schany 2000).

Although the employment goals of Norway's fishery policy seem out of reach, it is remarkable that it seems to have some success in protecting natural resources, especially in contrast with the failing results in the part of the Atlantic under control of the EU. This contrast becomes even more remarkable given that Norway has so many shared stocks and has to negotiate its share of TACs with others. These negotiations are based on the same ICES advice as the EU TAC procedure and, for stocks shared with the EU, even conducted through the same procedures.

Throughout the nineties, the part of the fishery policy concerned with resource protection has been based on a general precautionary approach. However, this was before ICES had defined precautionary population levels. The policy was therefore one of reduction (of fleet size, of landings), without detailed specification of limits. Some fishery economists have criticised this policy for not optimising catches in light of a safe population limit (Årland and Bjørndal 2002), but in contrast with the EU, Norway's fish stocks seem to be doing better.

## 6.2 The organisation of Norway's fishery policy

Norway participates in the ICES network for monitoring fish stocks, but invests considerable resources in the assessment of the stocks in its waters. In addition to the dominant data gathering through catch data, Norway performs systematic stock monitoring for twenty of the eighty species caught in Norwegian waters. The Institute of Marine Research (IMR) is the key research institute in stock assessment and in the development of multi-species models. With a staff of about 700, it is the largest marine research institute in Norway. It advises government on marine fisheries and aquaculture and monitors fish in Norwegian waters, which includes input for

the working groups in ICES, as described in the previous chapter. I will return to this institute in more detail later. Based on ICES stock assessment and advice, international agreements are made over the TAC per stock, mainly in the negotiations with the EU and bilaterally with Russia for the Barents Sea. (The multilateral approach through the North East Atlantic Fisheries Commission has been fraught with conflict and deadlock, leading countries to return to bilateral agreements.) After TACs have been set, the Fisheries Directorate goes to work on national allocations ([www.fisheries.no](http://www.fisheries.no)).

The Fisheries Directorate is an agency of the Ministry of Fisheries and Coastal Affairs, with both advisory and executive tasks: it is responsible for policy preparation, analysis and statistics of fishery policy, policy implementation, and monitoring of fisheries regulations. It is an organisation with a long tradition, founded in 1900, as one of the first regulatory agencies of fisheries in the world. It is, in fact, much larger and much older than the Ministry and has a strong orientation towards the fishery science profession, creating occasional tension between the hierarchical/bureaucratic logic of the Ministry and the professional culture of its agency ([www.fisheries.no](http://www.fisheries.no), Gornitzka 2003, p. 147)

After international agreements have been reached, the Directorate prepares a proposal on the distribution of the quota over the fleet and suggests fishing periods and seasonal quota. Apart from the ICES assessments, this process is intensely supported by advisory processes set up for this purpose in the MRI. The proposals are then passed on to the Regulatory Board, representing the stakeholders of the fishing sector. The Board has 12 representatives covering the fishermen's organisations, the fishing industry, the trade unions and the Sami Parliament.<sup>48</sup> It meets twice a year at the Fisheries Directorate in Bergen (Sand 2002).

In spite of the high-stake bargaining that goes in this Board, participants claim that there is a strong culture of accepting need to base fisheries management on the science advice: "research stands out as neutral information that is accepted by most parties" (Gornitzka 2003, p. 194). In addition to the voting members representing fishing interests, a number of non-voting observers are also present, including employees of the Fisheries Directorate, scientists, and representatives of the sales organisations. Proposals for regulatory action are commonly submitted to a hearing procedure, allowing the sector to prepare written comments. After consultation of the Board, the final regulatory policy is decided by the Ministry ([www.fisheries.no](http://www.fisheries.no), Sand 2002).

<sup>48</sup> The Sami Parliament is the representative body of the indigenous population of northern Norway, in existence since 1989. There are similar Sami Parliaments in Finland (Sámediggi) and Sweden (Sametingslag).

The fishing sector is tightly organised. The Norwegian Seafood Association (*Fiskeri- og Havbruksnæringens Landsforening*) is the national organisation of employers in the fishing sector, representing the fish processing and export sector, aquaculture, as well as related industries such as fish meal and fish feed. In the corporatist structures of the Norwegian fishing sector, this organisation has gained in weight through the creation of one sales organisation for all exports, the internal disagreements in the Fishermen's Association under the pressure of catch restrictions, and the rise of aquaculture ([www.fhl.no](http://www.fhl.no), Holm 1995; Norwegian Fishermen's Association, Norwegian Seafood Association and Ministry of Fisheries 2003).

The Norwegian Fishing Vessel Owners' Association (*Fiskebåt*) organises the all owners of fishing vessels over 27,5m. It acts as an employers' organisation and defends the interests of the more industrial, offshore section of the fleet. This interest can be at odds with the interests of smaller, coastal fishers, for example when disputes arise over shares of the TAC. In the past, this has led to protracted and fierce negotiations, such as over the allocation of the mackerel quota during the fishery recovery period in the mid-nineties. It is functional group within the Norwegian Fishermen's Association and one of its main contributors ([www.fiskebat.no](http://www.fiskebat.no), Sand 2002).

The Norwegian Fishermen's Association (*Norges Fiskarlag*) is the largest organisation of fishers, grown over the years as local and functionally specialised fishers' organisations joined. It has an extensive network of functional groups and local chapters, which both send representatives to the national meeting according to elaborate allocation rules. Within its governing structures, conflicts of interest in different sections of the fishing industry can be worked out, leading to solutions that can then be negotiated with government. The Association is the sole recognised representative of fishers at the Regulatory Board. In addition, the Association provides social and financial services to its members and negotiates tax and subsidy arrangements with the Ministry. Sales of fish are regulated through the fishers' mandatory sales organisations, installed by the Raw Fish Act of 1951, with a legal monopoly on all first-hand sales. Originating with two authorised organisations during the economic crisis of 1929, this system was installed to guarantee price stability for fishers, under their control. The sales organisation negotiates price levels with the buyers and when this fails, has the authority to set a minimum price. Originally, these organisations even had the right to impose catch restrictions to regulate supply. The dominance of the cooperative structures of the fishers gave way to a stronger regulatory intervention by the state in response to the 1980s cod fishery crisis. Historically, the Fishermen's Association was close to the social democrat party that currently controls the Ministry of Fishery and Coastal Affairs (Holm 1995; Sand 2002; Norwegian Fishermen's Association, Norwegian Seafood Association and Ministry of Fisheries 2003).

Norway has a multi-party system with a low access threshold. Since the elections of October 2005, there are seven parties in the *Storting*, which functions as a unicameral Parliament. The Norwegian Labour Party controls 61 of the 169 seats. As in other Scandinavian countries, minority governments are quite common, but after these elections, it formed its first coalition government since the Second World War. Cooperating with the Socialist Left Party and the Centre Party, it was dubbed the ‘red-green alternative’. Since the middle of the 80s, Norwegian politics had been heavily dominated by the Labour Party, especially from 1986 to 1996 under Prime Minister Gro Harlem Brundtland, of sustainable development repute. The Social Democrat dominance was interrupted by coalitions of the Centre Party, the Christian Democrats, and Liberals, eventually even with the support of the populist Progress Party, particularly in the period from 1997 to 2005.

The Norwegian political landscape follows patterns similar to Denmark (see chapter 3). Apart from the importance of a social democrat party on the left and the formation of right-of-centre coalitions around liberal-conservatives, there is a significant populist force. With 38 seats in the *Storting*, the second largest fraction, the right-wing populist Progress Party has built its position among the electorate on anti-immigration campaigning, as well as anti-tax, free market-thinking and social and cultural conservatism. In spite of sex scandals and internal fights, it continues to attract discontent voters. On the other side, as in Denmark, traditional parties have accommodated environmental issues before a significant green party could gain a foothold. A party was established in 1988, the “Environment Party the Greens” (*Miljøpartiet De Grønne*), but it has no seats in Parliament (Anderson 1996; “One very popular populist” 2002; [www.wikipedia.org](http://www.wikipedia.org), Heidar 2004b).

As in Denmark, the political force field has become more unstable, bringing up issues that cut across the traditional political left-right opposition, such as the position over the EU. The traditional corporatist institutions organised around the Norwegian state have found it hard to deal with these new issues. Coalitions have become more volatile and voter dissent more explicit (Matthews 1999).

Fishery policy is one of the key issues in the debate over possible ascension to the EU, dividing parties on the left as well as parties on the right. One of the fears is that EU membership will compromise much of the current fishing policies. This not only includes the protection of fisheries resources, but also the protection of small fishermen from outright competition with industrial fishing, and the protection of the local fish (and agriculture) products by high import taxes. The EU issue and the consequences for fisheries were a major dividing issue in the previous coalition, which explicitly chose to ignore the matter of EU ascension as long as possible. At some point the parties even agreed to disband the coalition if further postponement should become impossible. The present government too has such a ‘suicide paragraph’ in the coalition agreement, this time exacted by the anti-EU parties on the left,

implying that the government will fall as soon as one of the parties should begin a new debate on the EU ([www.wikipedia.org](http://www.wikipedia.org), Bartlett 2003).

Among the fishery policy priorities of the new government, there are fishery conservation measures through a ‘ecosystem based’ approach, trying to get beyond traditional single species stock management, especially in an extensive plan for the Barents Sea; and intensive international negotiations to combat illegal fishing, especially with the EU.

### 6.3 Research and advice in Norway’s fisheries policy

The Institute of Marine Research (*Havforskningsinstituttet*, IMR) has a central position in Norwegian fisheries research. It advises on stock management for the Barents Sea, the Norwegian Sea, the Norwegian coastal waters, and the North Sea. Apart from the main office in Bergen, the Institute has several research stations along the coast and a fleet of eight research vessels. It participates intensively in ICES, currently even providing its director as the vice-president of ICES, and cooperates with Russian researchers in the North. Some of the members of its Board are the Fisheries Directorate, the Fishermen’s Association, researchers, and the oil industry. IMR was formerly part of the Fisheries Directorate, but since 1988 it has gradually obtained agency status. For its advisory tasks, it has long-term contractual arrangements with the Ministry. Among its many research topics are improvement of stock assessment models, marine genome research, plankton, observation methods including acoustic sounding, monitoring of marine mammals, efficient fish capture technology, fish health, and aquaculture techniques ([www.imr.no](http://www.imr.no), Gornitzka 2003).

Every year IMR produces an overview of the condition of Norway’s seas, the report “Marine Resources and Environment” (*Havets ressurser og miljø*), the environment part having been added recently. The report presents a full overview of the ecological conditions in the Barents, Norwegian, and North Sea, ranging from physical condition of the seawater, pollution levels, biological activity from primary production (phytoplankton), all the way up the food web to the condition of commercial fisheries and the whales. Its new structure, divided between the various seas in Norwegian waters, follows the idea that the ecosystem should be the key unit to organise marine resource management. In addition, the report deals with selected themes of current importance, such as the melting polar ice cap, and presents background information on stock assessment methods or quota setting. The report is written by researchers at IMR and reports on the basis of IMR research, so it also partially has the character of an annual report of IMR. Although older reports contained policy recommendations, such as for TACs, the present tone is factual, although ICES recommendations are mentioned (Iversen, Fossum, Gjøsaeter, et al. 2006).



One of the programmes at IMR concerns the development of multi-stock models. The models aim to get beyond the focus on one fish population. They include predator-prey interaction between species and aim to create a more holistic ecosystem approach to stock assessment. The idea that species interactions should be included in stock assessments started with the analysis of stomach contents of fish at the end of the seventies, in research with Norwegian and Dutch participation, organised under ICES (Rozwadowski 2002, p. 245 et seq.). A classic example, is the strong interaction between cod, its main prey, capelin, and herring populations in the Barents Sea, where simple multi-species assessments have been used since the end of the nineties (Bogstad and Gjøsæter 2001). However, so far, complex multi-stock models have proven somewhat ambitious for policy purposes and are used at best for research purposes (Sinclair, Arnason, Csirke, et al. 2002). There has even been some criticism from policy makers, claiming that fisheries researchers have been over-selling the predictive capacities of multi-stock models for funding purposes, while the practical applications are disappointing (Gornitzka 2003, p. 187), a phenomenon that has long plagued (ecological) modellers (Kwa 1989; Kwa 1991). Now that notions of 'ecosystem based' fisheries management are coming up in Norwegian fisheries policy as the way forward, interaction between species remains an important research interest, together with other ecosystem effects on fish populations, including fluctuations in water temperature (Sinclair, Arnason, Csirke, et al. 2002; Misund 2006).

Apart from the MRI, there are many other fishery research institutes in Norway and marine research is high on the national research priority list. There is a strong split in this research sector between research focused on food production (catch and aquaculture techniques, food safety) and resource conservation, but both issue domains occasionally connect. For example, in 2004, the Norwegian Institute of Fisheries and Aquaculture Research (*Fiskeriforskning*) issued a report that recommended more stability in the fishing quota, both from year to year and between fishing seasons, even if this meant staying below biologically achievable harvest levels. (Stable quotas have been a general concern of fishermen in tightly regulated fisheries.) The argument was that this would increase profitability by making maximum use of equipment and by preventing the need of seasonal over-capacity in the processing industry. The Institute's main remit is in R&D for the aquaculture and processing sector, and part of a network of semi-public and private research organisations working for the fishing industry, allowing it to formulate needs of the industry for regulatory fishing policy, even while being somewhat of an outsider in the resource management sector ("Why Norway needs stable fish quotas" 2004).

Between 1972 and 1993, there was a separate fishery research council, but in a reorganisation process of research financing, five research councils were merged into one, under the responsibility of the Ministry of Science,

Education, and Church Affairs.<sup>49</sup> Nevertheless, the fishing research world has a strong pattern of sector integration, with user involvement in boards of research programmes and long-term cooperation agreements between researchers and the bureaucracy. The Ministry of Fisheries is still responsible for developing a science policy for the entire sector of fisheries, implying not just itself as user of knowledge, but the fishery sector in its full width. A large part of this policy is operated through its own research institutes, but also via earmarked programmes in the research council, or through commissioned research (Gornitzka 2003, pp. 20-23, 150).

The organisation of research and expert advice on conservation of fisheries resources is set up as a resource for the sector, providing knowledge not just to government, but to all actors involved. The Ministry manages the research, via programming and increasingly also via long-term contracts with agencies at arm's length to government. The research sector still bears the history of a state resource managed at the service of a corporatist policy sector, but the model has shifted to contract management and partial privatisation.

The overview of Norwegian fisheries policy and research so far, points to a few interesting contrasts with the previous chapter. First, Norway's fishery policy seems better able than EU fishery policy at preserving fish stocks. The precise reasons for the relative success could involve a number of factors, including intensive enforcement, high levels of sector involvement and co-management, or the existence of highly diversified policies, according to the specificities of fleets, stocks, and local conditions and practices. Evidently, the evaluation of the fisheries policy in general goes beyond the scope of this report, but the question remains how it is possible that expert advice seems valued, respected, and integrated in decision-making, especially in contrast with experiences in the EU TAC regime. Second, the experiments with marine protected areas, whether they are seen as instruments of fishery management or not, are a different form of policy, avoiding the problems of the regulatory policy of what Petter Holm has called 'the TAC machine' (Holm and Nielsen 2004b). For these reasons, a closer look at two specific episodes of producing accounts of nature offer good avenues for more detailed comparison. One is the advice for the establishment of marine protected areas around coral reefs. The second is the stock management advice for the Barents Sea, home of the last remaining healthy cod stock.

49 The Research Council of Norway now has a research area for Marine research and programmes on fishery research within that. Whereas participation of users was organised around the old fisheries research council, this has now been replaced with programme boards for specific research programmes ([www.forskningsradet.no](http://www.forskningsradet.no)). In 2001, the government installed a new research fund supporting research for the fishing sector, the Fishery and Aquaculture Industry Research Fund, financed through a levy of 0,3 % on all exported fish. However, this fund is intended for industrial R&D for the fishing sector and put under a Board of representatives of the fishing and aquaculture sector ([www.fiskerifond.no](http://www.fiskerifond.no)).

## 6.4 Accounts of the commons

### 6.4.1 The coral reefs of Norway

The best-known coral reefs are tropical, warm water reefs that develop at low depths. However, there are also corals that live in deep and cold water. Only a few species actually form communities big enough to create reefs. One of these species is *Lophelia pertusa*, a coral long documented as living in the Northern Atlantic, but on a scale that became clear only recently (Fosså, Mortensen and Furevik 2002).

In 1990, long-line and gill net fishermen contacted IMR because they were concerned about the effects of trawling on coral reefs. Coastal fishermen had long known about coral reefs. In fact, they liked to set out their lines and nets next to these reefs, as the rich fish life gave them good catches. They would not fish *on* the reefs, as the coral caused snares and damaged their gear. In the 1980s, as the North Atlantic cod was facing bad times, bottom trawlers technology advanced quickly, to reach new areas and deeper water. Rock-hopper gear allowed the more powerful vessels to fish rocky bottoms and coral reefs, without damaging the nets. By the early nineties, boats were pulling double trawls, to cover more ground in one haul. Coastal fishermen were worried that the declining catch from their best fishing grounds was caused by large-scale destruction of coral by trawlers. They wanted the fisheries researchers to check if perhaps the nurseries for their fish stocks were being destroyed (Fosså, Mortensen and Furevik 2002).

During the 1980s, marine biologists had seen the first glimpses of *Lophelia* reefs on video images. These images were made with remotely operated underwater vehicles (ROVs), used by the oil companies to survey the seabed. The images showed a rich and colourful marine life, sheltered by the habitat of the reefs. Marine biologists knew about the occurrence of the coral in various places in Norwegian waters, but relatively little was known about their size and ecological importance. IMR started a survey project to get a better sense of the distribution of these reefs. By May 2002, they had discovered Røst Reef, off the Lofoten Islands, 35 km long and 3 km wide, the largest known *Lophelia* reef in the world. Other large reefs were discovered west of Trondheim (Sula Reef) and in the Skagerak (Tisler Reef), followed by many smaller ones. Soon after their discovery, the Norwegian fisheries authorities implemented strict bans on trawling on the reefs, as well as on oil and gas exploitation (www.imr.no/coral, Deep water corals 2006).

*Lophelia* occurs typically between 200 and 1000 meter. For example, Røst reef lies between 300 and 400 meter deep. However, the coral has also been found growing on oil platforms. *Lophelia* grows very slowly: a branch grows by 5-10 mm per year, but due to predation and mechanical damage, the overall reef grows by as little as a millimetre per year. Large coral reefs take thousands of years to grow, implying that they are even potential indicators of climate change. Over even longer periods, these corals form underwater

mounds from eroded material. Species surveys on these reefs have found as many as 1300 different species living on them and there are strong indications that their presence leads to higher biological productivity closer to the surface. However, these reefs are vulnerable, threatened not only by bottom trawling, but also by gas drilling and seabed mining, and by ocean acidification (Husebø, L.Nøttestad, J.H.Fosså, et al. 2002; Roberts, Wheeler and Freiwald 2006).

IMR started to take stock of known reefs in 1997. There were various sources of information to start with, but all incomplete. First, there were a few publications in marine biology, indicating places where *Lophelia* had been found. Second, there were the ROV surveys of the State Oil Company, that had identified seventy reefs of Trondheim (*Haltenbanken*). Third, there was information from the Fishery Directorate, which recorded where gill nets were lost to prevent future damage. There was also some information from survey trawls by IMR itself, but fishers themselves were the more valuable source of information. During 1997 and 1998, researchers consulted fishermen all along the coast and asked them to indicate where they knew coral could be found, where they had gotten 'glass coral' in their nets, or where they had reason to suspect lower catch because of coral destruction. The researchers considered to send out a questionnaire through local fishers' organisations,

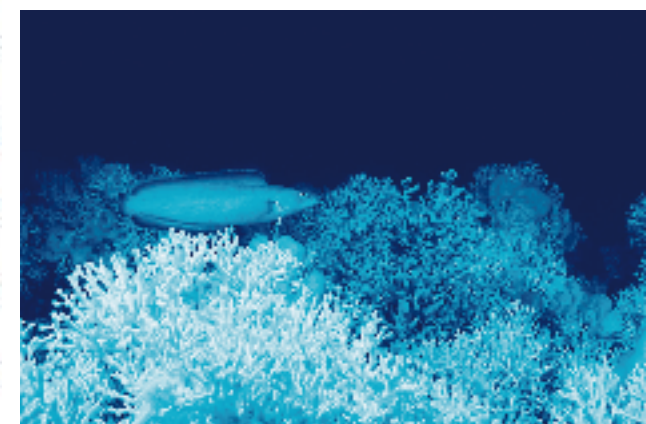


Figure 6-4 Confirmed and unconfirmed locations of reefs in Norwegian waters, left (www.fisheries.no), and *Lophelia* coral, right (www.mareano.no).

but deemed this cumbersome and expected little result. Rather, they relied on their own network and contacts among fishers along the coast. They provided the fishers with bathymetric charts and refined the information where needed over the phone. This led to a selection of most promising sites, which were consequently surveyed with ROVs and side scan sonar. Apart from getting an idea of coral distribution and reef size, the researchers also focused on traces of fishing damage, such as ensnared nets or furrows in the bottom. The damage was sizable, especially at the least deep sections of the reefs (Fosså, Mortensen and Furevik 2002).

Soon after the first reefs were 'discovered' in 1998, the government implemented restrictions on trawling. ICES responded with a Study Group on Mapping the Occurrence of Cold Water Corals in the Northeast Atlantic and issued protection recommendations (ICES Advisory Committee on Ecosystems 2004). The reef survey is incomplete and biologists suspect there are many more reefs even the fishermen do not know about. Hundreds of reefs have been identified, adding up to over 2000 km<sup>2</sup> and sonar data suggest there may be 1300 reefs in Norwegian waters. The five largest reefs are protected from trawling and there are general regulations for the use of marine resources near the others, while further protection measures are being considered. Meanwhile, several other countries are also prospecting parts of the seabed, to find coral reefs in hundreds of locations all over the North Atlantic (ICES Advisory Committee on Ecosystems 2004). Throughout the initial years of the coral survey, the process involved fishers. Fishers signalled the problem. Fishers also assisted in identifying interesting locations for detailed surveying and their information turned out to be reliable. When more detailed surveys of these locations were undertaken, the experience of fishermen helped to assess how much of the coral had been destroyed and when the damage had occurred. They would describe where the reefs were in the past and where they suspected damage (Fosså, Mortensen and Furevik 2002).

Between 2005 and 2010, a large section of the Norwegian seabed will be surveyed systematically with sonar scans to produce detailed bathymetric charts, combined with ROV surveys of specific locations. While the sonar scan has various commercial uses for oil, gas, and bio-prospecting, the survey will also look for coral reefs, but this time covering the seabed bit by bit with high tech means (the MAREANO programme, see [www.imr.no](http://www.imr.no) and the portal [www.mareano.no](http://www.mareano.no), in Norwegian).

#### 6.4.2 Cod in the Barents Sea

In 2002, the Norwegian government decided to set up a new management strategy for the Barents Sea, based on 'ecosystem-based' management principles. The plan was to devise ecological quality objectives covering all the critical aspects of the Barents Sea ecosystem. This went far beyond stock management or even multi-stock assessments, to involve pollutants, effects of fishing, aquaculture, gas and oil drilling, and climate change. At the same

time, the management strategy of the fisheries resources of the Barents Sea that was negotiated with Russia in the Joint Russian-Norwegian Fisheries Commission (JNRFC) was shifting from stock management to ecosystem protection (Misund 2006).

The Barents Sea, roughly between Norway, Svalbard, Novaya Zemlya and Franz Jozef Land, lies entirely above the Polar Circle, but remains partly ice free due to the effect of the North Atlantic drift. The Sea is roughly 1,4 million km<sup>2</sup>. The Barents Sea ecosystem is under threat from pollution, climate change, and over-fishing. One the main pollution hazards is the oil and gas industry that is keen to explore the resource in the relatively shallow sea. Pollution threats are from radioactive waste, and non-degradable organic pollutants such as DDT and PCBs. Climate change is monitored closely in the Barents Sea, as changes in temperature and marine chemistry can have drastic effects on the ecosystem. Overall, the sea is relatively clean and has high levels of biological production, but is vulnerable. The ecosystem consists of relatively few but abundant species: Northeast Arctic and polar cod, capelin, saithe, haddock, and Norwegian spring-spawning herring. The simple structure means the system can shift quickly in response to physical changes, such as the inflow of Atlantic water, with changes in salinity and water temperature (Matishov, Denisov, Dzhenyuk, et al. 2004; International Council for the Exploration of the Sea 2005b).

The Barents Sea is home to one of the most valuable resources in Norway's fisheries, the North-East Arctic cod stock (Figure 6-5). Cod is the top predator fish in the Barents Sea, feeding mainly on capelin. When capelin stocks are low, cod stocks drop too, reinforced by cod's cannibalism. Driven by such ecological mechanisms, the cod population fluctuates considerably. In the Barents Sea, cod is mostly caught with otter trawls, but when the cod gathers to spawn off the coast of Lofoten, it creates the most important fishing season for Norway's coastal fleet, managed by a classic example in the co-management literature that has banned trawls and certain types of seine nets (Holm, Hersoug and Rånes 2000; International Council for the Exploration of the Sea 2005b). This cod stock is managed together with Russia in the JNRFC.

The Joint Norwegian-Russian Fisheries Commission was installed in 1976 to manage the Barents Sea fisheries. It took over management from the multilateral North-East Atlantic Fisheries Commission, as the expansion of the 200-mile Exclusive Economic Zone was becoming a reality. The Joint Commission is composed of members of Norwegian and Russian fishery authorities, ministries of foreign affairs, marine scientists, and of fishers' organisations. Both countries compose delegations of this composition, and they meet with their Fisheries Ministries as delegation leaders. The Commission meets for a week annually, during which time several working groups discuss separate matters. For example, there is a working group of scientists and one for statistics (Ronning 2002).



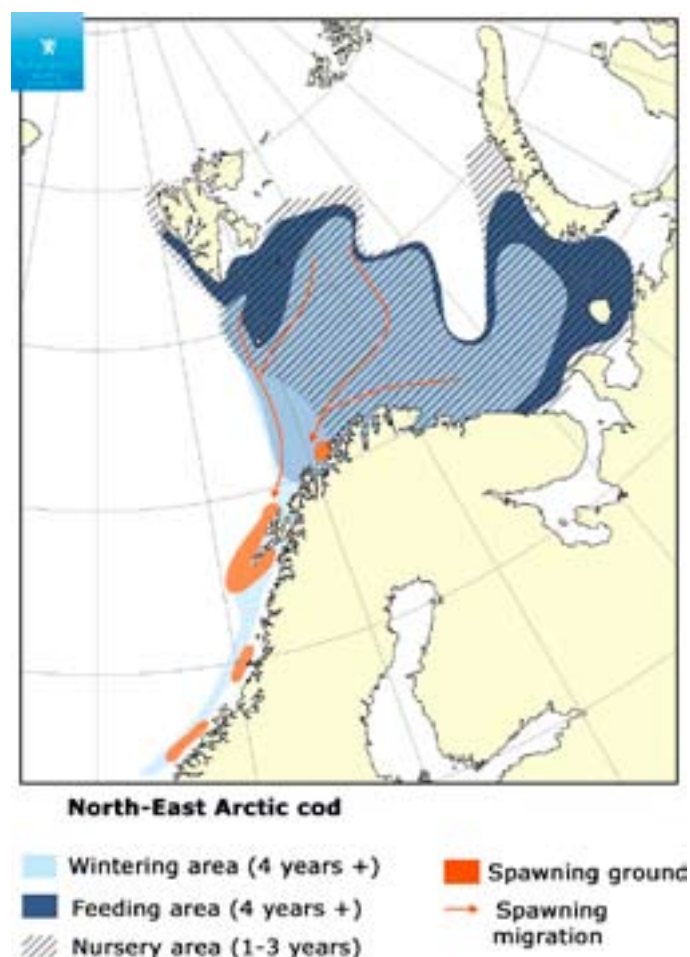


Figure 6-5 Cod distribution in the Barents Sea ([www.fisheries.no](http://www.fisheries.no)).

Through the Commission, Norway and Russia coordinate research, regulation, and enforcement in the Barents Sea fishery. The Commission meets annually to set TACs. For the all important cod stock, a TAC is decided and then allocated on a 50-50 basis, while Norway gets 60% of the capelin. In addition to TAC agreements, there are some additional regulations on mesh sizes and by-catch, but generally, regulatory implementation of the TAC is a matter of national policy. A small part of the TAC is set aside for third countries, mainly through agreements with Iceland. With an eye on predictability for their industry, Russia and Norway have agreed to in principle keep TAC fluctuations within a 10% range from year to year (Ronning 2002).

Coordination of research implies agreements, priorities and joint programmes between IMR, *Fiskeriforskning* in Tromsø, and the Polar Research Institute of Marine Fisheries and Oceanography in Murmansk. (Russian-Norwegian

scientific cooperation on the region dates back to the 1950s, with geological surveys of the Barents Sea.) TAC advice is provided by ICES, but it is important to note that most of the relevant research for the Barents Sea is performed by Norwegian and Russian researchers, and as far as fish stocks are concerned mainly by the IMR. ICES therefore acts as a reviewer, certifying local research (Ronning 2002).

In March 2006, the Russian and Norwegian fisheries research institutes decided to start the production of an annual report on the condition of the Barents Sea ecosystem. The report provides a comprehensive analysis of the ecosystem, in line with the annual report style of the IMR, but in more detail and connected with a new survey programme. One of the envisaged applications for the report is to provide input for the Arctic Fisheries Working Group of the ICES, the group that prepares arctic stock assessments, but the report is publicly available. The work also reports on several (joint) research projects that are attempting to improve stock modelling in multi-species terms, especially for cod (Stiansen, Aglen, Bogstad, et al. 2005).

During the nineties, the main disagreements between Norway and Russia were about fishing technology. The Russian fleet consists mainly of large trawlers, owned by a handful of companies, competing with the more diverse Norwegian fleet. The Norwegians wanted to increase the minimum mesh size on the Russian trawlers. A second source of disagreement is over illegal fishing (Ronning 2002). After the problem seemed to have been brought under control towards the end of the nineties, large illegal catches have been discovered in recent years. The Fisheries Directorate estimates that Russian vessels have exceeded their quota by 100.000 tonnes in 2002-2004 (ICES merely observes the quantity of unreported fish, without passing blame, and estimates it at 20% of total catches). Such margins make it hard to manage the stock, but also increase the uncertainties of stock prediction. Discarding, illegal in Norway and Russia, is also believed to occur, but there are no clear data. In recent years, at the insistence of Norway, both countries have agreed to increase surveillance of the fishery, including satellite tracking (International Council for the Exploration of the Sea 2005b; Iversen, Fossum, Gjørseter, et al. 2006, p. 171).

The Joint Commission presented itself as an exemplary way to manage fisheries, rebuilding the cod stock after the near-collapse of the early nineties with low levels of conflict between the two countries. However, throughout the nineties the Commission found it hard to reduce TACs to levels recommended by ICES. Seven out of ten TACs exceeded ICES recommendations. Especially when the stock decreased again towards the end of the nineties, the discrepancy became bigger (Ronning 2002).

*“While TACs quickly increased to levels far above recommendations as soon as the stock started to recover (..), the quotas were set in the immediate vicinity of the recommended levels during the ‘prosperous’*



*years of the mid-1990s (...). When signs of crisis again emerged at the end of the decade, decision makers did not take immediate action.” (Hønneland 2004, p. 70)*

In 1999 in particular Russia demanded higher TACs and the Norwegians eventually gave in, ‘out of pity’ for ‘the difficult conditions of the population of Northwestern Russia’ In 2001 again, cod TACs were well above what ICES considered sound. The Russian government and the Norwegian Fishermen’s Association both argued that ICES knowledge was too uncertain to set such low standards and that, in fact, TACs above ICES limits would still be sustainable. The Norwegian Minister of Fisheries argued along the same lines. Nevertheless during the same meeting, Norway and Russia agreed to rebuild the cod stock to 500.000 tonnes and agreed on a maximum fishing mortality level. At that point, they also asked ICES to re-evaluate its precautionary biomass level ( $B_{pa}$ ) in light of longer data-series. Meanwhile, the Commission agreed on a three-year quota of 395.000 tons, while the recommendation was 263 tons (Ronning 2002, p. 47 et seq.; Hønneland 2004).

Hønneland has painted a grim picture of this period through a discourse analysis that reconstructs the story lines of mutual distrust. Norwegian authorities talked in terms of sustainability, even when they exceeded quota recommendations. The Russians saw this as a ploy of the West to take advantage of a country in disarray (the ‘Cold Peace Discourse’). Meanwhile the sea faring community of both countries saw itself united in distrust of bureaucracy. Hønneland claims that this deadlock was eventually resolved with a ‘pity the Russians’ discourse that compromised in favour of Russian interests (Hønneland 2004).

However, in contrast with the situation in the North Sea, this may be too harsh a judgement. The management regime has pulled through these difficult years and seems to have learnt from it. In 2004, the JNRFC agreed on a set of strict stock management principles. From the perspective of resource conservation, it planned to stick to the sustainable fishing level recommended by ICES, but also to limit the year-to-year fluctuation of the TAC by 10%, to accommodate the short-term interests of the fishers. This limitation on the TAC fluctuation effectively reduces the uncertainty of the management system for fishers, as they are better able to anticipate future regulatory conditions. However, if the population falls below the precautionary limit, a more drastic TAC reduction regime will apply. A management plan based on these principles was submitted to ICES for review and got a positive response (International Council for the Exploration of the Sea 2006d).

The 2005 spawning stock biomass is at 700.000 tons, above the precautionary limit and above the reconstruction target of 2001. The TAC for 2006 was set at 471.000 tons, in agreement with ICES recommendations

År	Råd fra ICES	Anbefalt TAC	Avtalt TAC	Fangst
1995	Ingen gevinst ved å øke F	681	700	740
1996	Ingen gevinst ved å øke F	746	700	732
1997	Godt under $F_{med}$	< 993	850	762
1998	$F < F_{med}$	514	654	593
1999	Reduser F til under $F_{pa}$	360	480	485
2000	Øk SSB til over $B_{pa}$ i 2001	110	390	414
2001	Høy sannsynlighet for SSB > $B_{pa}$ i 2003	263	395	426
2002	Reduser F till under 0.25	181	395	535
2003	Reduser F till under $F_{pa}$	305	395	552
2004	Reduser F till under $F_{pa}$	398	486	579
2005	Advend fangstregel, ta hensyn til ky sttorsk og uer	485	485	
2006	Advend fangstregel, ta hensyn til ky sttorsk og uer	471	471	

Table 6-1 Northeast Arctic cod. Recommended catch, agreed TAC and actual catches in thousand tonnes. Catch figures of 2004 include an estimate of 90.000 tons of unreported catches. (Iversen, Fossum, Gjøsæter, et al. 2006)

(Iversen, Fossum, Gjøsæter, et al. 2006). Targets have failed in 2005, due to unexpectedly high illegal landings, leading ICES to propose a lowered TAC of 309 kttons for 2007. In response, the JNRFC lowered the 2006 TAC to 424 kttons, a reduction by just over 10% compared to the previous year, in accordance to the stability conditions of the policy. So far, the JNRFC is sticking to its plan (ICES advice May 2006, JNRFC meeting Nov 2006).

The Northeast Atlantic cod stock is doing relatively well and the population is currently above what ICES considers to be the precautionary limit (see Figure 6-6). Current fishing levels are called unsustainable due to illegal landings, but both countries have agreed to increase surveillance and enforcement.

The relatively precautionary stance is not limited to the ‘easy’ case of the recovering cod. Capelin (NL: *lodde*) is a small fish that lives in large migrating schools in the North-Atlantic. It feeds on plankton, migrating north as the ice retreats in spring and transporting accumulated biomass as it migrates back to the south. Apart from being the main food source for cod, capelin is also fished in its own right, for fish oil and meal, while its roe is highly valued in Japan. The Barents Sea capelin stock has been very low for several years in a row. In the autumn of 2005, the estimated stock was at 250.000 tonnes and ICES feared that by the spring of 2006, the stock would be below the biological limit of 200.000 tonnes, even without fishing (all capelin are assumed to die after spawning). ICES therefore advised the JNRFC in December 2005 not to fish for capelin in the spring of 2006. The Committee proceeded to close the capelin fishery completely for 2006, and in November 2006 decided to extend the ban to 2007 (www.odin.no, www.fishbase.com, Bogstad and Gjøsæter 2001; International Council for the Exploration of the Sea 2005b; Iversen, Fossum, Gjøsæter, et al. 2006).

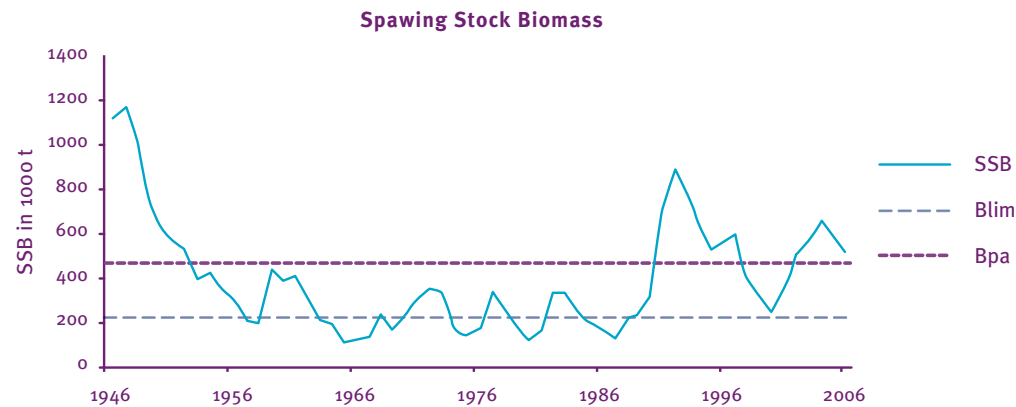


Figure 6-6 Northeast arctic cod stock, SSB=spawning stock biomass, Blim=minimum survival limit, Bpa=precautionary stock limit (International Council for the Exploration of the Sea 2006d).

The contrast with the response to the EU to ICES advice as described in the previous chapter is remarkable. Whereas the EU fisheries ministers tend to take the ICES advice as one input, to be balanced with short-term interests in the fishing industry, to come out somewhere halfway, here policy follows ICES advice much more closely, especially under the conditions of the 2004 management plan. The northern cod is above precautionary levels (see Figure 6-6), while the North Sea cod no longer makes minimum survival levels (see Figure 5-1, p. 112).

It is impossible to analyse the precise causes of the relative success of fisheries resource management, even if we accept the ICES indicators as true. There are a number of differences that could explain why the cod stock is healthy in the Barents Sea and in deep trouble in the North Sea. The ecosystem is radically different, there are only two countries to deal with, the fleet size is relatively stable, and there is enough fish to be able to close one of the minor fisheries (capelin) without bankrupting the sector.

However, there are a few things worth noting about the organisation of expertise in this management regime. First, this is also a 'TAC machine' (Holm and Nielsen 2004b), based on a recommended annual catch level as the key regulatory instrument. Some see the TAC logic as the core of the fisheries crisis, yet *this* TAC machine seems to produce sustainable fish populations.

However, there are two further elements in the structure of the Russian-Norwegian cooperation that strike me as radically different from the management regime of North Sea cod. First, the annual meetings involve the sector. In the EU, fisheries ministers represent their national fisheries interests. In the NRJFC, the fisheries ministers lead a *delegation*, creating a platform for a dialogue that goes deeper than just the executive.

Second, this dialogue extends to fisheries researchers. Although ICES remains important as the official provider of TAC advice, the locus where research is discussed and certified, Norwegian and Russian scientists produce the input together, share the annual Barents Sea ecosystem survey, including the discussion of fish stocks and illegal landings, and they are present at the annual meeting. Not only does this increase a mutually shared understanding of the state of affairs in the Barents Sea ecosystem, it also provides more opportunities for interaction between stakeholders and researchers. One example is the development of the 2004 management plan, in dialogue with researchers and the ICES. In contrast, the EU fisheries advisory system is much more structured around a one-directional model (see Figure 5-6, p. 131), pushing the scientists' assessment on to the policy makers. This approach offers far fewer possibilities of mutual adjustment between research and policy (Cash, Borck and Patt 2006).

## 6.5 To know the seas of Norway: analysis

The Norwegian system of fisheries expertise is responsive and integrative. It is *responsive* because it has a strong client orientation, as documented in survey research (Gornitzka 2003). The responsiveness is organised through the presence of clients in boards, through coordinated research programmes, through presence of fisheries scientists in advisory structures, through contractual relations, but also through personal contacts, ranging from the government administration to local fishermen, as illustrated in the coral case. Undoubtedly, this responsiveness is unequally distributed, as access to expertise also has an element of distribution of a scarce resource. Although the details of such selective access do not become clear from this case study, it is remarkable, for example, that environmental groups have not made an appearance in the scope of these stories. Fisheries research is responsive, but with a strong sector orientation.

The expert system is *integrative*, in that it seeks to bring expert knowledge together, rather than to steer for open confrontation. One example is the consistent pattern of working through ICES. Another example is the integration of Norwegian and Russian research on the Barents Sea ecosystem, research that is then in turn passed on to ICES working groups for discussion. There is also integration of research via the research system, through the fisheries research programmes of the Norwegian Research Foundation, in which both universities and government research institutes participate. However, probably the strongest integrative force is the IMR, by far the largest repository for research, knowledge and advice on fish stocks.

This does not mean that there is no opposition or dissent. One critical source comes from academic researchers, for example when they signal shortcoming in policy concepts. On occasion other parts of the research system do get involved in the discussion, as with the report on the importance of quota stability. Overall, as a research and advice system, the corporatist pattern

is still dominant, but modified to a governance pattern that includes more market coordination and a partial withdrawal of the state. Deliberative elements are added by especially academic researchers, from more reflexive positions. This advice and research functions in the context of a more varied fishery policy that includes a wider variety of instruments and approaches. The system provides integration and prevents polarisation through its corporatist structure, including productive integration between science and policy, but also allows open interaction that prevents the knowledge system from clogging up.

#### 6.5.1 Coral reefs

The predominant types of activities here were instrumental: finding solutions for the lack of knowledge about coral reefs, but this required some mediation between various sources of knowledge. There were some reflexive elements as well, as the coral reefs potentially have large consequences for nature conservation as well as conservation of fisheries resources, connecting to the debates over the value of marine protected areas. There were also some elements of advocacy: drawing attention to the ecological importance of the reefs

#### Value issues

Values are involved in initialising research (fishers concerned about damage to their catch) and conservation goals are explicit.

#### Accommodation of different knowledge

The case showed very high levels of reliance on fishers local knowledge, oil company surveys, historic data, and registers of lost nets at the Fisheries Directorate. The knowledge was therefore inclusive, brought together by tinkering. As the project goes on and turns into a systematic mapping effort, it becomes more structured around a relatively fixed set of techniques and knowledge areas (although still in interdisciplinary cooperation including geologists, biologists, ...).

#### Uncertainty

Uncertainty is acknowledged: unconfirmed reefs, uncertainty about ecological implications, large uncertainty margins about destruction levels, etc. At the same time, uncertainty is an occasion to argue for more research, in the form of a more extensive survey (cf. Shackley and Wynne 1996).

#### Institutional design

Response to concern, executed as a research project at IMR, continued as inter-agency research project. Statist, but with an open deliberative element, bringing a new set of actors together?

#### Policy learning

Resulted almost immediately in a new protection programme for coral reefs, including new legislation, extended to other countries.

#### Trust

An interesting trust issue here was the relation between researchers and local fishermen: contacts ran along informal lines. The relation with the policy makers is not clear.

#### 6.5.2 The Barents Sea cod

Precise details of expert activities at the JRNFC are not available (the meetings are held in strict confidence), but the analysed secondary material points at a mix of instrumental activities (stock assessment, ecosystem surveying), some review (the Barents Sea ecosystem survey and ICES work involves review of research), and mediation (strong indications that experts mediation between positions at the annual meetings). There is also mediation through the construction of a shared frame of reference in the Barents Sea ecosystem survey. There is reflection on the process, but from social scientists in outsider positions.

#### Value issues

Value issues are very explicit, as conservation issues are confronted with interests of the fishers, including differences between Norwegian and Russian fishers' positions. The ICES resource conservation advice implies the possibility of large fluctuations in TACs, while the fishers require stability. The solution to conflicting values is bargaining and accommodation.

#### Accommodation of different kinds of knowledge

The core of the management scheme is based on ICES advice, in turn largely based on research and data provided by Russian and Norwegian researchers. The circle of involved researchers and knowledge seems therefore relatively tight, but the introduction of the ecosystem-based approach has opened up the range of factors considered in stock assessment, as well as the range of measures considered for management of the ecosystem. The final verdict would therefore have to be that this advisory trajectory is at this point rather inclusive when it comes to other knowledge.

#### Uncertainty

The ICES advice uses a safety margin as the precautionary limit for its TAC advice. Rather than to attempt to resolve uncertainties, TAC advice seems to be focused mostly on robustness, based on strong principles determined in the 2004 management plan. These include stability for fishers by limiting annual TAC changes to 10%.

Otherwise, IMR researchers are trying to reduce uncertainties with ecological approaches to the Barents fishery. However, the modeling techniques tend to become so complex that they so far have undermined the usefulness for policy, leading to lingering suspicion among policy makers about the usefulness of multi-species modeling.

### Institutional design

Inter-agency co-operations, between governmental research institutes, but supportive of negotiations with officially recognised interest representatives: statist, with corporatist functions.

### Policy learning

Throughout the nineties, the role of experts seemed mostly ritual. Since 2004, there are stronger commitments to follow advice, as well as attempts to find new ways to deal with the stock problems, culminating in the 2004 management plan. After a long period of policy failure and deadlock, the case therefore shows signs of both first-order (data uptake) and some second order learning (reframing of problems and solutions, although the TAC regime remains key).

### Trust

Very high levels of distrust between all parties in the nineties were overcome. It appears that in this particular case scientists were active in bridging the distrust, for example by cooperating in joint research projects (including fundamental research on the Barents Sea), making research results trustworthy in the eyes of the opponent.

#### 6.5.3 Summary table Norway

	Coral reefs	Barents Sea cod
Review		**
Instrumental	***	**
Mediation	*	***
Advocacy	**	
Reflection		

	Coral reefs	Barents Sea cod
Values	explicit, motivation	explicit, accommodated
Accommodation of knowledge	Very inclusive, tinkering, developed into more stable set	Rather inclusive: built around IMR/ICES/TAC network, but open to new ecosystem approach
Uncertainty	Acknowledged, explicit, occasion to call for more research	Robustness in TAC, attempts at refinement in multi-species modelling
Institutional design	Responsive, agency research project, statist/deliberative?	inter-agency: statist, but supporting corporatist elements
Policy learning	Quick protection of some reefs, legislation	initial failure, break-through after 2004
Trust	High with fishers. Policy makers not clear.	High throughout the nineties, much improved after 2004, important role for scientific cooperation

Table 6-2 Summary analysis Norway

## 7 Analysis and conclusion

### 7.1 Advice and wisdom

The position of an advisor is not an easy one. Clearly, a good advisor speaks to the policy maker with candour, bringing good news as conscientiously as bad news. However, it is equally clear that the policy maker is not always happy with the advice given, especially not if the news is bad. Even Machiavelli, openly on the side of the principal rather than the counsellor, insisted that the Prince should avoid flatterers, but surround himself by wise men and encourage them to speak the truth, albeit only at his request (Machiavelli 1966 (1532), Ch. XXIII). Advice, Machiavelli is suggesting, only works if there is wisdom on both sides of the equation.

This is not the 16<sup>th</sup> century and we don't live in an Italian city-state ruled by a visionary despot. One key difference is that, by now, nearly all the advice provided to the ruler is also available on his website. Once you know the way, it takes a few clicks to know exactly what ICES advised to the EU for anchovy in the Bay of Biscay (keep the fishery closed, the stock has collapsed). With a few clicks more, we know how ICES assesses the Biscay anchovy stock (acoustic surveys, anchovy is too short-lived for population models), and how much fishers were allowed to catch the year the stock collapsed (30.000 tons). Not only can we, citizens, companies, NGOs, political parties, and bored trouble makers, figure out what the advisers told the ruler, we can even use all the knowledge that the ruler chose to ignore, *against* the ruler. Or against the advisers. Or against our neighbour.

Given the plurality of voices, the public nature of knowledge and advice, the multiplicity of problems and positions in the modern polity, it is almost surprising that anything gets done at all; that people agree on anything at all. And yet we do. Fishery biologists manage to convince the Norwegian and Russian government to bring cod stocks above safe limits. Flemish policy makers roughly agree on the state of the environment and accept the state of nature as a reasonable account, although they do not agree on what to do. The cases described in previous chapters show a wealth of practices to construct more and less widely accepted accounts of how the commons are doing.

Unfortunately, it is not simple to define 'when advice works' and then to identify the characteristics of successful practices. As argued extensively in chapter 2, the success of scientific advice is itself a notion that is contested and that is as multifarious as the polity itself. It may seem nice that policy makers are listening to the experts, but what if that expert is Lysenko, or even more complicated: accused by other experts of being a Lysenko, as Lomborg was in Denmark?



What if we try to look at the position of advisers in our polity through the eyes of Machiavelli? Not for the sake of some ruler (here today, gone tomorrow), but rather according to Machiavelli's main concern: for the sake of the common good, through sound yet responsive policies. If recipes are not what we are looking for, then what is wisdom when it comes to the position of advisers in the polity, nearly half a millennium after Machiavelli?

## 7.2 Scoring the cases

If we bring the cases together, we can make an overview of expert activities in advising policy makers in each of the cases and sub-cases (see Table 7-1). The cases are scored in a very crude way, only as a general indication. While being careful not to stretch the interpretation too far: instrumental expert activities are dominant, while reflection and mediation seem more exceptional types. Half the time when instrumental activities occur, they are combined with review activities. The strongest mismatch is between instrumental and reflection activities – by definition opposite, but they also hardly ever occur together.

This analysis follows the observation of the connection between types of expert activities and policy priorities. Here too, we find some connection between review and instrumental expert activities, while instrumental and reflection specifically do not seem to mix. This is an important observation for advisory structures analysing their strategic niche in the advisory sector and shows the difficulty of reflective organisations to argue their policy relevance, most readily demonstrated in instrumental activities.

	Review	Instrumental	Mediation	Advocacy	Reflection
Flanders, NARA	***	**	*	**	
Dan, Nat reports		***			*
Dan, Naturrådet	*		*	***	***
Dan, Natur Retur			*	***	
Dan, Novana		***			
EU fisheries	**	***			*
Nor, coral reefs		***	*	**	
Nor, Barents Sea	**	**	***		
	8	16	7	10	5

Table 7-1 Overview of types of activities, scored very crudely

Table 7-2 shows how each of the advisory trajectories performed in terms of Woodhouse and Nieusma's key issues for expertise. What is most striking is that, based on these cases, none of the practices found in these advisory trajectories point to simple recipes for success. For example, making values explicit is no recipe for a successful advisory council (Danish Nature Council), but nor is the attempt to remove values from the advice as much as possible (EU fishery advice).

**Values** are explicit or acknowledged in almost all of these cases, with the exception of ICES advice in EU context and parts of the Danish case. However, how the expert advisers deal with values differs a lot: sometimes they accept values as motivation for research, try to accommodate values of actors, attempt to create neutrality, or even chase them out. This high level of value acknowledgement may be related to the policy issue at hand, as both nature conservation and fishery policy have been contentious policy fields and the experts have developed substantial reflection, especially under conditions of policy failure.

In general, outsider **knowledge** (NGO, fishers) is acknowledged in many of these cases and sometimes used in the advisory process. Generally, there is openness for other kinds of expert knowledge, such as from related fields of research, although social sciences are almost absent. The cases offered interesting examples of extended peer review (Flanders) and joint fact finding (Norway), suggesting that the reluctance against cooperation beyond the familiar circle of experts in some of the other cases is unwarranted.

**Uncertainty** receives little attention and is mostly seen as something that needs to be fixed with additional research, refined procedures, or improved techniques. The interesting case here is the case of the Barents Sea cod, where uncertainty has been extended to the uncertainty that concerns fishers, namely the need for predictable quota. The only other case where uncertainties are very explicitly addressed is that of ICES fishery advice. The approach here is highly analytic, unravelling different forms of uncertainty in order to find ways to reduce uncertainties in data gathering or modelling.

**Institutional designs** vary considerably and will require some separate attention below. What does become clear, is that in most of these cases the institutional format for advice has in the last decade gone through considerable changes, through reorganisations, mergers, and shifts towards privatisation or agency status. It would appear that governments continue to look for better ways to organise expertise. Against the background of this turmoil, the position and structure of the ICES seems exceptionally stable.

Most disappointing in these cases are the limited examples of successful **policy learning**. There are some examples of use of data (e.g. in the Danish nature reports), but the examples of true policy learning, leading to new policy frames or policy instruments, are limited to Norway. These cases showed close interaction between researchers and policy actors, suggesting good opportunities for integration of policy and research agendas.

	Values	Accommodation of knowledges	Uncertainty		Institutional design	Policy learning	Trust
<b>Flanders, NARA</b>	Acknowledged, but to be neutralised by extended peer review; 'green' bias.	Knowledge in the green sector is mobilised, also NGO volunteer science	Limited attention to uncertainty: reduce uncertainty through research.		Corporatist, with limited deliberative openings, government institute.	No clear learning, mainly used as reference work.	Trust is high in the sector, outside seen as a 'green' version of the facts.
<b>Denmark Nat reports</b>	Value issues are avoided and reports are limited to indicators.	Largely based on government research, some NGO data.	Limited: uncertainty is lack of knowledge.		Interagency working group, statist model in government bureaucracy.	Specific role in planning circle, as evaluation instrument.	Not clear, no visible conflict.
<b>Dan, Naturrådet</b>	Values made explicit and reflected on; the council presents itself as 'neutral'.	Open attitude, oriented to dialogue, also with agriculture, build support bottom-up.	Long-term focus, more reflexive on uncertainties.		Independent council of 'sages', then reconstituted as an NGO.	Attempt to create a new policy frame, then oppositional knowledge.	High in the sector and among its own network, low from new government
<b>Denmark Natur Retur</b>	Values are explicit: influence agenda setting in policy, timed for elections.	Oppositional knowledge: attempt to insert unacknowledged knowledge of nature.	Uncertainty is lack of research.		Conference by NGOs, published as a collection of papers.	Opposition, attempt to insert green knowledge, limited effect.	Oppositional, but a step towards including NGO knowledge in NOVANA?
<b>Denmark Novana</b>	Explicit values limited to legal, international obligations	Hierarchical, indicator selection in function of policy; NGO data use planned for the future.	Limited attention: measurement and sampling problems.		Government research institute, in function of policy commitments, moving to university.	Not clear, some uptake of data in the policy process? Criticised for being highly selective.	Controversy over selectivity of indicators: not considered adequate.
<b>EU fisheries</b>	Purification: attempts to remove values from the expert side of the advisory process	On knowledge dominant (TAC/VPA); some wider reflection in ICES workgroups.	Uncertainties can be fixed with procedures and reduced through better calculation.		Integrative network of government research institutes, statist.	Policy failure; experts complain policy makers are 'not listening'.	Low trust from the fish sector and even from agencies, accused of anticipating policy.
<b>Norway coral reefs</b>	Conservation and fishery protection are explicit values that motivate research.	Inclusive: fishers' knowledge, various sources of biology, explorative.	Acknowledged lack of knowledge, need for 'additional research'.		Responsive government agency, statist/deliberative.	Quick policy response to new knowledge: protection of some reefs, new legislation	Trust unproblematic? High trust in coastal fishers' network.
<b>Norway Barents Sea</b>	Values are explicit and are accommodated in interaction with experts and policy.	Rather inclusive: ecosystem based stock assessment, beyond VPA, diversified.	Robustness is an issue in TACs; reduction of uncertainty with new ecosystem approach.		Interagency research, Statist in form but supports corporatist negotiations.	Initial failure, later breakthrough and creation of new robust TAC regime.	Low trust in 90s, better after 2004: science as medium for cooperation.

Table 7-2 Summary of issues for expertise (Woodhouse and Nieusma 1997; Hoppe 2005).

**Trust** levels are also generally low, although the nature experts described here are trusted more in the conservation sector. Here too, the exception is Norway, where fisheries research institutes seem more widely trusted than the fishery research in Europe in general – although there is no quantitative evidence to back this up.

Table 7-2 also present some interesting connections between these key issues.

Policy learning and high trust seem to go together (although this may be a scoring artefact), but more remarkably: trust in the sector alone (Flanders) is not enough to lead to policy learning. Policy learning that leads to new approaches seems to occur where experts manage to organise a deliberative process, bringing new actors and knowledge together. However, this should not be read as a simple preference for deliberative patterns of expertise. At the same time, the Flemish example shows how a corporatist pattern

may not lead to radical policy innovations, but does support integration of actors and views into a policy field.

Higher levels of trust in the reliability of expertise also seem to coincide with accommodation of various kinds of knowledge. This also may be particular for the sector, with high levels of local knowledge on the basis of which to question 'the official version'. In the case of economic advice to public policy in the Netherlands, the economists of the Economic Policy Assessment Agency (CPB) have managed to achieve high levels of public trust on the basis of exclusive economic models.

A combination of types of activities and how they handled key issues also lead to a few connections. Mediation activities seem to engender trust, unsurprisingly, while advocacy has no connection to trust (it appears possible

to perform advocacy activities yet still be considered reliable). Instrumental activities also are not connected to policy learning or trust.

### 7.3 Policy contexts

At various points in the stories about nature accounts, the policy context – or even the political context – imposed itself with force. This is, of course, not surprising, as many of these nature accounts were produced with policy goals in mind. However, at several points in time, the policy context intervened in ways the adviser did not see coming. Evidently, the story of Denmark comes to mind: as the Nature Council installed itself with shiny new ideas about complementing the instrumental policy advice of government, the new Prime Minister announced in his New Year's speech that it was all over.

So how did policy contexts affect the organisation of expertise in the cases described in previous chapters?

#### 7.3.1 Priorities

Shifting political priorities play a very clear role in the development of the nature accounts described in earlier chapters. Just a few examples: apart from a reorganisation of corporatist advisory structures, the Danish conservative government that came to power in 2002 wanted to lower the priority of nature and environment on the national policy agenda. One of the ways to do this was to dismantle the advisory structures for nature and environment. The Nature Council in particular had seen its task as signalling and creating (do-able) problems for policy, a task conception that formed an obstacle for the new government's policy style and policy priorities. Abolishing the Nature Council (along with several other councils) was a way to remove a forum in which environmental problems could be identified and pushed up on the political agenda, while the new government was trying to reduce their priority.

The Flemish case offers an example of the opposite process. Here, the Research Institute of Nature and Forest is a forum to channel issues onto the policy agenda, an access point for the conservation sector to enter its account of nature, along with its priority problems, into mainstream policy and onto the agenda. From the side of established politics, the Institute offered a means to *accommodate* the conservation sector into the institutions of Belgian corporatism, by providing the sector with a source of certified knowledge.

In both cases, resources for expertise follow political priorities. This is perhaps somewhat counter-intuitive, as expert advice is often seen as a repository for issues that are pushed *off* the policy agenda, de-politicised, or put on ice. This is where it becomes important to start distinguishing between the kinds of activities that experts perform. The Nature Council raised attention for conservation issues through reflection, mediation, and

eventually advocacy. When the Danish government abolished the Nature Council, it replaced its mix of reflection and advocacy in time with the instrumental nature accounts of NOVANA. In the Flemish case, it was the mediation activities around the nature reports that brought conservationist organisations more into the policy field. A similar pattern appears in the Norwegian examples. Coral reefs were put on the policy agenda through that contained various activities, but that included mediation with fishers and some advocacy in showing the ecological importance of the reefs.

Apart from the issue of resources for expertise that follow policy priorities, it would therefore appear that especially advocacy, mediation, and reflective expertise are strong at increasing issues on the policy agenda. Review and especially instrumental expertise seem more associated with structured policy problems, or with attempts at policy closure by treating problems as if they were commonly considered to be structured problems (cf. Winsemius 1986).

#### 7.3.2 The governance of policy sectors and the governance of experts

Throughout this study, we have found interaction patterns between the governance patterns in the policy sectors of nature and fisheries, and the governance of expertise for these sectors. However, that interaction is not linear. We cannot say that expertise is organised along corporatist lines because the policy sector concerned is organised along corporatist lines, or the other way around. There are two reasons for this. First, the governance pattern of expertise is *one of the ways* in which governance patterns in a sector are constituted. The NARA reports (and the corporatist-style mobilisation of the sector to produce them) are *part of* the construction of a corporatist nature policy sector in Flanders. Second, some governance patterns co-exist very well. ICES statist patterns can accommodate corporatist arrangements in fisheries policy, such as in the Barents Sea. Third, competing patterns can exist next to each other, as different actors press for their politically preferred governance patterns, for example in the case of Denmark (Halffman 2005; Halffman and Hoppe 2005).

Rather than seeing one as the cause of the other, we can see the organisation of expertise as one of the ways to structure policy making. In the fisheries case, the TAC regime was originally installed as part of a resource allocation regime, trying to pacify fisheries conflicts by a bargaining process between countries. In such a logic, it makes perfect sense to structure expertise as negotiation between national expert representatives. In the Danish case, the reorganisation of expertise is part of a strategy to change policy priorities, reduce the leverage of the oppositional environmentalists, and create a neo-liberal governance structure for environmental issues, under Lomborg's motto 'more environment for the money'. One may want to identify governance patterns in expertise and in policy making that match nicely, but in the political force field, different actors will continue to manoeuvre for their preferred patterns.

We can now re-iterate the different governance patterns of expertise and show some strengths and weaknesses. The corporatist pattern is strong at setting up a relatively stable field of actors with a shared understanding of reality. In the case of Flemish nature reports and in the case of the Barents Sea cod, this occurred through a mix of mediation in the form of joint fact finding, research problems identified by actors, completed with strong instrumental research. The Flemish case shows that this is not a matter of idyllic consensus: an accepted account of nature does not preclude fierce political conflict over land use or ecological networks. The Flemish case also shows that corporatist patterns of expertise institutionalise quickly, after which it becomes difficult to cut across institutional divides, in this case with agriculture.

Statist patterns allow for a close integration of expertise in the administration, although the case of EU fisheries policy shows that this does not always mean that expert advice is followed or that a trust relation is established. (Although in this case, the intergovernmental logic of competition over aquatic resources may just be stronger than the other factors.) Statist patterns are vulnerable to accusations of deceit, as their operation tends to fall under executive secrecy. Value orientations and problem definitions also tend to be directed by executive needs, leaving alternative knowledge outside. In the case of EU fisheries advice, ICES has developed reflective capacity, suggesting reasons for policy failure and suggesting alternative policy frames, but these run parallel to the advisory process.

Deliberative patterns of expertise are especially strong at making values visible and discussable, may signal alternative knowledge more readily than the other patterns, but are typically weak at coming to firm and binding decisions. The stress is on openness and flexibility, rather than closure. Nevertheless, examples of extended peer review do show that some form of closure is possible, even with a wide array of actors involved.

In these cases, there have been no strong examples of market governance of expertise, a model that is quite common in, for example, the accountancy or management consultancy world. Experience from similar research suggests that market governance of expertise is typically weak in maintaining a memory of previous experience (learning) or that such a memory at best gets owned by a firm (Halffman and Hoppe 2005).

## 7.4 A variety of accounting practices

It is remarkable to see the variety of formats for accounts of nature that we have come across.

Quite a few of the accounts take the form of (semi-) annual **state-of-nature reports**. Quite a few of these are timed to slot into a decision making

cycle. These tend to be the most structured reports, such as the ICES stock assessments, which follow a tightly organised reporting format for each individual stock. Other reports follow a slowly evolving structure of chapters (NARA), possibly complemented with a set of issues that are hot at the moment. One common element is that state of nature reports tend to develop a structure that corresponds to policy needs and issues, such as indicators for policy targets (NARA, NOVANA), or policy concepts (e.g. ecosystem based fisheries management in the annual reports of IMR). The risk of this process is that new problems, or even unwelcome signals, are shut out: the concurrent policy agenda causes selectivity in knowledge. This situation tends to be repaired by scandal or contestation: processes outside of the too symbiotic policy/expertise horizon cause unexpected failure, or actors outside of this symbiosis will challenge the dominant frame. NOVANA provides the example of prioritisation of NATURA 2000 areas, including for monitoring, leading to criticism from conservationists who set up their own monitoring. (In this particular case in dialogue with the governmental monitoring programme.)

Nature reports range from a factual to evaluative or normative repertoires. Some of the bravest reports show policy failure, try to push issues onto the agenda, or try to discipline policy makers by reminding them of previously established policy targets. ICES almost uses a ‘naming and shaming’ system, providing overviews of TAC recommendations and policy targets, confronted with established TACs and actual catches. Whereas the ICES reports lead directly into detailed and quantified recommendations for stock management, other reports refrain from recommendations, attempting rather to create a widely accepted assessment of the state of nature, and some even refrain from reporting on governments’ conservation policies. However, all these reports therefore draw specific boundaries between what are considered the affairs of the reporting experts and what are considered the affairs of decision makers or other experts. A nice example is the various ways in which nature reports delimit the DPSIR scheme to demarcate their domain of authority: in Denmark, the reporting system tends to concentrate around the state of nature, avoiding government’s actions and an analysis of driving forces, whereas in Flanders the attention is shifting more and more towards policies and target achievement. Avoiding some issues for the report is a sacrifice that can be made to gain acceptance for a more modest set of accounts.

The variety of how reports achieve acceptance, create a position of authority, is also interesting. Some build on a unique repository of widely accumulated data, such as fish stock data or bird sightings. This unique access results from a unique network, whether it consists of the forms filled out by fishermen, the ocean surveys performed by research vessels, or the observations accumulated by naturalists. Authority can also be built on exclusive manipulation of data, which in natural sciences often implies experimentation, but in nature accounts calculative practices seem more important: fish stock models or pollution dispersal models. Another major



process is the generation of agreement, either among a wide range of experts as in ICES, or even extending beyond professionals in the Flemish Nature Report. A process far less prominent in nature accounts, and certainly one that turns out to be less convincing, is the mobilisation of cognitive authority. Although researchers are trusted with producing accounts of research and reviewing research results (such as the Barents Sea ecosystem survey), we have seen few examples of reports that rely on the weight of the reputation of their authors. Perhaps the Danish council of sages comes closest and the outcome of that story is not encouraging.

However, accounts of nature are not limited to reports. Increasingly, elements used in reports or presented in reports have started to live a life of their own, typically on the web. **Indicators and statistics** are such a separate type of nature accounts that get a life of their own. In periodic reports, they get updated once or twice a year, but on the web irregular updates become possible, as new data are processed. In some cases, users can even make their own cross-tabulations. Indicators specifically suggest a one-look overall assessment of an area of nature, the objectivity of a gauge, a manometer of environmental pressure, making them powerful signifiers of performance, or lack of it. With it come risks of selectivity and simplification (see chapter 2), or the forgetfulness about assumptions at the basis of indicators, or reification of indicators, as they become more real than what they are supposed to indicate.

Particularly interesting accounts new of nature are **interactive databases**, the type of data repositories that do not only provide statistics, but that actually allow a wide network of participants to enter, review, or even correct data. The databases of naturalists provide nice examples. Used by conservationist organisations all over the world, they too present some interesting variety that is the result of difficult design choices. A recurrent issue is the matter of reliability: how will data be checked? How will data vandalism be prevented? How will people who do not take the project seriously be banned? The issue deserves more attention in its own right, but the variety seems to range between complete expert control, screening data that is provided by others before it is put into the database, to relatively open access and peer checks, similar to the wiki-approach. A second axis of variety concerns the ownership of the data and how their use for policy purposes is negotiated, ranging from full ownership by government agencies, via some accommodation at government research institutes, to full NGO ownership, with data traded for conservation resources.

A form of nature accounts that is particularly popular among naturalists is the **atlas**: a book with an overview of species organised around maps of their distribution. They are used as a reference work to check species distribution over time and the likeliness of spotting species in a certain region, but the data on which they are based can also be used in the production of nature reports for policy purposes.

As with indicators that get lifted out of a report, so **maps** are increasingly lifted out of books and into computers, onto the web. Geological information systems are increasingly integrated to contain maps with information about nature, such as land use, land cover. Such maps provide an overview of the state of nature that is specifically important for the creation of ecological networks, to identify areas worth protecting. The Moreana project, mapping the Norwegian seabed and looking for more coral reefs, is an example of how maps are even used to produce accounts of underwater nature.

Since we have looked for boundary work between science and government, the form of accounts found no doubt has a bureaucratic bias and predominantly consists of documents and statistics. If we were to take the notion of accounts of nature even wider, then the list could be extended to a whole other range of accounting practices, involving more of the knowledge of farmers, fishers, hunters, naturalists, artists, anglers, and so on. These other forms of knowing nature may at times appear ‘soft’, idiosyncratic, or subjective, but such accounts of nature too can inform decision-making processes to manage nature. A Danish nature report starts with an analysis of landscape art by an art historian, illustrating different conceptions of what constitutes a beautiful landscape, looking to recycle frames of thinking for new application (Nørregård-Nielsen 2005).

The variety of forms of nature reports also serves as a reminder that accounts of nature have many audiences and many uses, far beyond the confines of government policy. Some of the nature reports are used by conservation NGOs for nature management, some are used for political activism, and some are used by enthusiasts to find nature, or even by hunters, to shoot it.

## 7.5 Local knowledge

One of the themes that runs through all of these stories, is the importance of local knowledge, whether it be from fishermen who know where the coral grows, from bird watchers, volunteer botanists, dragon fly enthusiasts, or perhaps even oil companies and their ROVs. It is difficult to catch a group so diverse in one name. They are more than enthusiasts, since some of them actually make a living with their knowledge. They are also more than amateurs: in some of these cases professional biologists are involved, such as in many of the naturalist groups. In addition, ‘amateurs’ suggests partial and second-rate knowledge, which is not always the case. Among highly specialised communities of observers of nature, sometimes the only difference is that the one gets paid and the other one does not. Some have suggested an ugly neologism to catch the problematic nature of the distinction between amateurs and professionals and call them ‘pro-ams’ (Leadbeater and Miller 2004). For now, I prefer a term that is imperfect, but comprehensible: the locals. Not all the locals know what they are talking about, but then again, neither do each and every one of the scientists.

Several of the nature reports described have benefited greatly from local knowledge. However, local knowledge is not perfect. The locals are good at knowing some elements of nature, and not so good at others. The Norwegian coastal fishermen went to professional biologists to find out more, precisely because their knowledge was incomplete. To varying degrees, the observations of naturalists are collected, filtered and integrated by professional biologists by means of the equipment at their disposal, making possible large-scale comparisons that the locals were not able to make (Latour 1983; Latour 1984).

So what is it that these locals are good at? First, they signal new phenomena: unknown forms of nature, including the rare or even unknown species found by Flemish botanists; and also including new problems, such as the consequences of cold water reef destruction for fish stocks. The locals may point to something new, even though some of the locals only point to old tales of legendary monsters.

Second, the locals are good at spotting things, in recognising organisms or signalling their occurrence. Local knowledge is often taxonomical, in that it classifies phenomena of observations. In doing this, the locals register things that the professional biologists cannot register by technological means: their cameras cannot tell a swan from a park goose, they do not have cameras at every pond, or satellite trackers on every gull. Professional biologists also lack the manpower to sit by every pond and count geese, or to ring all the geese in Belgium. The locals become the eyes and ears of the biologists and if they can get them to fill out forms, go to boring ponds where all the wildlife is long dead, and report their findings systematically, then the locals provide a measurement network that is unparalleled.

What are locals not so good at, at least from the perspective of the professionals? The locals seem not so good at bringing knowledge together, integrating it and making it systematic. However, this does not mean that the professional has the spider in a web, a central node in a data registering network. The locals can do some of the systematisation work, provided adequate tools are available. This starts with the registration forms used by naturalist groups, but it can extend to peer checks, as in the case of Danish bird watchers that can comment on each others' observations via the mail facilities of the registration software. Courses, handbooks, and field guides all assist systematisation of knowledge and even though one may need a laboratory to raise the world (Latour 1983), the equipment that makes up a laboratory is not reserved to researchers. Systematisation - and the analysis of causalities it leads to - may remain a weak point in local knowledge, but it is not absent from some practices of local knowledge gathering.

One thing the locals are not so very good at is getting their knowledge certified and recognised and this is where the professionals can make a connection, even though interests of government agencies and fishers are

not the same. The locals are more than remote sensors collecting data. As Waterton and Ellis have argued and observed, they experience nature differently from the professional biologists. They distinguish between organisms differently, identify local variation, or aspects that are considered trivial by the professionals. In addition, they have a stake in their local nature. They may want it protected, have a say in how it is managed, even ask resources in return for their local knowledge to protect local nature, or use the knowledge to campaign for their cause. Government research agencies trying to collect data to meet biodiversity monitoring obligations in international treaties sometimes find it difficult to relate to the conservationist concerns, such as when chummy locals become militant activists. Naturalists expect to be contributing to nature conservation by counting geese on an icy Sunday dawn. "By contrast, policy makers tend to imagine naturalists as a cartographically dispersed task force willing to impart their knowledge of the distribution of species throughout the UK to save a central political mandate." (Ellis and Waterton 2004, p. 96).

It is therefore important to note that in the cases described here, concerns of locals and professionals have been accommodated, *in light of* the course of governments and agencies. They have put new problems on the policy agenda, signalled policy shortcomings, along with the engagement in routine monitoring. The locals find in an alliance with the professionals ways of 'upgrading' their knowledge (Leroy 2006), although perhaps at the expense of the local flavour. Inversely, researchers can find in the locals an ally to design new research or to get additional research resources. It is interesting to see how this mutual accommodation takes place and there is much to be learnt from a comparison of practices in different contexts.

## 7.5 Experts and the common good

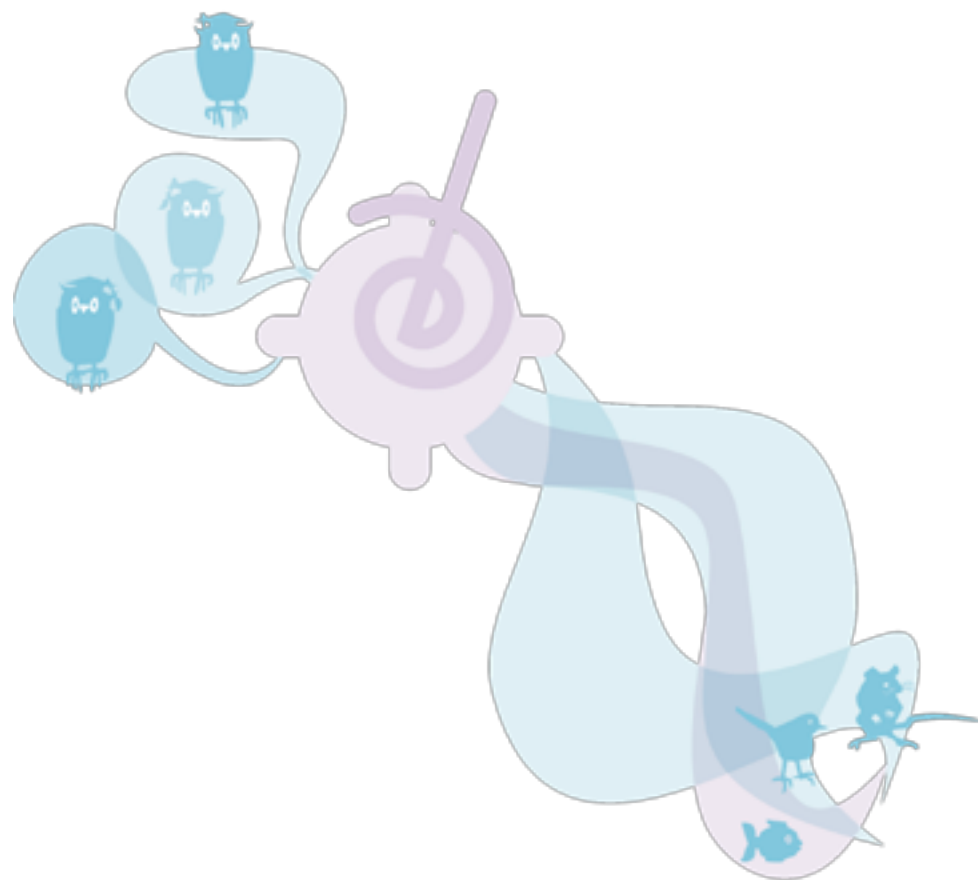
So what do we see through the eyes of Machiavelli, attempting to speak for the common good, rather than for a replaceable ruler or a questionable local interest? Policy making requires a variety of kinds of knowledge, depending on phase of policy development (Winsemius 1986), policy priority, levels of conflict, or problem structuration (Hisschemöller and Hoppe 1995-1996). In addition, as Woodhouse and Nieuwsma warn, their key issues sooner or later always reappear as problems for experts advising policy. Not all expert bodies are equally well equipped to deal with these issues or with the full range of knowledge required to make sound policy, from providing simple data, over warning for unexpected consequences, signalling unnoticed problems, to grasping the meaning of the larger picture.

I believe the cases show the importance of diversity in the knowledge of a policy sector. In order to describe that diversity, I have used the distinction between review, instrumental, mediation, advocacy and reflection activities of experts. All these activities are important for some aspects of policies that can learn and generate support. In addition, I have shown diversity in

patterns of organising expertise, of governance. On a more detailed level, the cases show a rich variety of practices of accounting the commons, of enthusiastic people developing creative new ways to study nature and to think about how natural resources can be managed soundly.

It has struck me how many of the people in these stories are motivated by what they see as the common good, by trying to preserve nature and natural resources for the future. During the week they make graphs for policy purposes, showing the development of a species over time, while in the weekends they go out, watch, and study live birds, salamanders, or fish, so much more than numbers in a graph. I do not think their passion for nature and for the common good it presents can easily be reduced to graph, performance indicators and impact factors.

In the final chapter, I will use this analysis to formulate general recommendations.



## 8 Recommendations

Recommendations are listed here on three aggregation levels. The first is the process of advice, on the level of the advisory trajectory, typically beginning with a request for advice and ending in a report. This leads to suggestions of how to write, time, and organise the production of advice. The second is the level of and advisory organisation and its direct client or principal. The recommendations here pertain to how advisory boards or research centres with advisory functions can be organised. The third aggregation level is that of a policy sector and the knowledge system that supports it. This level goes beyond a specific knowledge institute or user, to make suggestions for an improved knowledge function in a policy making field.

### 8.1 Advisory trajectories: interact.

There are some solid recommendations on these processes already, analysed with more experience than is accumulated in this report (In't Veld 2000; Hoppe, Jeliaskova, Grin, et al. 2004; De Wit 2005). If we assume for a moment that successful science advice is science advice that leads to policy learning by the client, then a key element in the organisation of fruitful interaction between policy makers and advisers on this level is, as shown time and time again, a high level of interaction between adviser and client. Knowledge produced by advisers that is left on the doorstep of policy makers, typically ends up not being used, misses the mark in policy requirements, or is at high risk of addressing the wrong problem (Cash, Borck and Patt 2006). Interaction implies a dialogue between the user and producer of knowledge, clarifying a range of elements in research or advisory trajectories:

#### 1. The context of the policy question: why is this knowledge needed?

Reports are produced for specific purposes and audiences and will have to take these into account. For example, a report produced for civil servants interested in improved implementation of fishery policy measures will take a different form and ask different questions than a report for parliament asking why fishery policy measures are failing to protect fish stocks.

An important limitation is that policy makers do not always feel at liberty to explain the complete policy context of a report, especially if politically sensitive issues are involved. The danger in these situations is that advisers end up asking the wrong questions. In the worst case, researchers may feel abused for political goals and become critics of policy processes at hand.

#### 2. The context of the research: how will this knowledge be produced?

Researchers and advisers equally do not operate in a void and it helps if the client of advice has an idea of the skills and parallel projects an adviser is working on, as this can lead to synergies on the positive side,

but also to diverted research funds on the negative side. The problem in the background is that advisers also follow an agenda. For example, when research is involved, researchers may work in a research programme and be looking for resources for projects that can be made to fit other research interests. One example from this report is the development of multi-species models for fisheries management by fisheries biologist, projects that lead to suspicion from policy makers on the actual practicability of such modelling techniques in fishery policy.

### 3. The framing of research

How is the research question framed: are the most relevant aspects addressed, or is it perhaps also required to look at the problem from another perspective? Does the research question lead to a level of analysis on which the client has some influence, or does it help the client to identify where action is possible. For example, the DPSIR scheme used in nature reports described in previous chapters creates a framework in which scientist and policy maker can discuss what kinds of parameters need to be included in the report.

Three of the evaluative issues in this report come back here as important points of attention:

- a) The problem of framing touches also upon the problem of alternative **kinds of knowledge** in this report: will the advisory process be sufficiently attentive to kinds of knowledge that perhaps the adviser does not have at his/her disposal? For example, the report has shown that, especially in nature conservation, valuable knowledge may be available among “the locals”, whether they be botany enthusiasts, volunteer bird watchers, or fishers. Should alternatives kinds of knowledge, alternative sources of knowledge, be considered? How can they be brought in?
- b) How will the advice deal with **uncertainties**? What are expected uncertainties related to measurement and in-exactitude and how will these be reported? What are uncertainties that stem from inherent unpredictability or gaps of knowledge?
- c) How will **values** be addressed? Which value issues are considered the responsibility of the policy maker, which the responsibility of the researcher? Here too, the DPSIR scheme shows how the same issues can end up on the side of policy or on the side of research, in the contrast between Flemish and Danish uses of the scheme.

### 4. Remit

Flowing from the preceding three points is the question of what the remit will be for the researchers. Apart from the formulation of precise and workable questions, the interaction should also address which type of activities are expected from the researcher. The RIMAR scheme is a useful way to map a range of possibilities, which may have to be specified in detail: is there a need for review, instrumental, mediation, advocacy, or reflective activities? Note that this too is an issue for interaction: for

example, researchers may signal a need for reflection, going beyond merely instrumental observations for policy. (It is not uncommon for academic researchers to decline a research commission because the project is seen as too instrumental.)

### 5. Coordination

These issues are not resolved once the advisory trajectory is en route, but require continued attention through ongoing interaction. This can range from informal contact between a researcher/adviser and a client, to extensive sounding boards or supervisory boards. Such interaction keeps advisory trajectories on track and prevents researchers from taking off on routes that are too abstract, too academic, reformulate questions, redirect research lines, etc. Here too, the road is not simple, as supervisory structures that get too much influence on advisory trajectories will tend to suppress bad news. This does not even have to occur through outright pressure, but can also occur through more subtle forms, such as providing feed-back by objecting to certain formulations of phrases, or by requesting more empirical support for undesirable statements (Köbben and Tromp 1999).

### 6. Timing

In the policy context, and even more so a political context, the timing of an advisory trajectory is of the utmost importance. Reports have to be timed for decision moments, to avoid coming either too early or too late to be considered. It is therefore crucial that researchers/advisers are aware of relevant meeting schedules, budget cycles, or legislative rosters. The *Natur Retur* episode in the Danish case shows that such timing is not always possible. Political events may just take a different turn, in this case through a new election date.

### 7. Presentation

One last issue to mention here is that researchers and policy makers should *together* pay attention to presentation. Will the end product of the advisory trajectory be a report, a set of on-line indicators, a database, or some other form? Where will the product be presented and who should be present? Is the audience just the client, or should other potential users be included? The interactive processes around the Flemish nature reports shows how consultation of policy makers and careful evaluation of previous reports through questionnaires and informal contacts, can lead to gradual improvement in presentation forms that are more suited for particular audiences.

This is a limited list, focusing on some key processes in this report. Nevertheless, this is quite a list already. Many issues have to be arranged for an advisory trajectory to produce policy learning. In steady relations of cooperation, such as between a ministry and a well-established scientific advisory body, many of these issues can become routinised, via personal



networks, protocols, or even just habits in the mutual interaction. Where such a history of cooperation is absent, many issues will have to be sorted out during the advisory trajectory. For example, an important alternative way to organise cooperation is through extensive contracts, detailing exactly what is expected when and from whom, creating the risk of over-regulating the advisory process. Both are two examples of how the large amounts of work involved in negotiating key issues in advisory projects (what economists call transaction costs) can be reduced through different ways of organising the advisory process, which leads us to the next level of aggregation.

## 8.2 Policy/advisory organisations

### 8.2.1 Make and discuss your profile of activities

The key recommendation on the level of organisations is for both organisations of advice and their principals to clarify what kinds of expert activities are involved. Negotiating and identifying expert activities structures mutual expectations and allows science advisers to look for a niche in the advisory sector. Here too the RIMAR scheme is useful to structure possible activities:

**Review of knowledge:** is the organisation strong in weighing and assessing the state of the art, leading to authoritative reports that are widely respected?

**Instrumental knowledge:** does the strength of the advisory organisation lie in reliable/certified measure, following relatively standardised procedures, perhaps even implementing highly specialised policy?

**Mediation:** is the advisory organisation good at bringing opponents together, facilitating debates, clarifying positions, and perhaps even creating common ground?

**Advocacy:** is the organisation strong in gathering the knowledge needed to make a case, does it take sides in debates, defend certain positions?

**Reflection:** does the organisation tend to take distance, analyse frames of thinking, find new strategies for future policies?

As the example of the Naturrådet shows, agreement between advisers and advised over the remit of activities that are deployed are not a guarantee for a trouble-free existence for advisory organisations. Political changes can quickly undermine such an agreement. This problem is particularly strong for organisations that focus on reflection tasks, as these may be seen as restrictive of the strategic manoeuvring space of policy makers and politicians.

In addition, some of these activities do not mix together very well. A profile in advocacy makes it hard to maintain a neutral position required for successful mediation. Reflective activities do not combine very well with instrumental ones, as these require a different approach to knowledge, including a different knowledge infrastructure.

### 8.2.2 Prepare for trouble

An important recommendation for both advisory organisations and their principals is to be prepared for the typical problems involved in science advice to public policy. The issues raised by Woodhouse and Nieusma are based on experience, including for the Netherlands, and all of them have appeared in the cases presented in this report, although not everywhere and not all the time. It is therefore prudent to maintain a basic level of reflection on these key issues:

**Values:** Expect people to ask questions about your values, even if you are convinced that you are only dealing with facts. Is there a normative position at the basis of the knowledge involved? Is there reason to try and balance this position with other values, to try and neutralise values with additional research, or is the normative position taken simply defensible with solid arguments?

**Alternative kinds of knowledge:** Every field of knowing has its outliers, its extreme dissidents, but are you perhaps trying to exclude too much? Is there knowledge that could become relevant, after shifts in problem definitions, quality criteria, or other boundary conditions?

**Uncertainties:** Where are the uncertainties in the knowledge base? What kind of uncertainties are involved (e.g. lack of knowledge, measurement uncertainty, inherent unpredictability)? Is it possible to assess overall uncertainties, such as through validation research?

**Institutional design:** Does the advisory structure find a reasonable balance between independence and policy relevance? Are there public concerns over secrecy of the advisory process?

**Policy learning:** Do the recipients of advice think the advice leads to policy learning? Do the advisers think so? Have policy errors been averted in the past based on advice, or can effective policy failures be traced back to failure in policy learning?

**Trust:** Is the advice trusted as robust and reliable by recipients of advice, or by other actors in the policy field? What about citizens in general? What trust enhancing strategies could be followed?

It may be unusual to have recommendation formulated as questions, but these are the kinds of questions that should be asked to and by advisory organisations.

### 8.3 Knowledge in a policy sector

#### 8.3.1 Maintain diversity of expert activities

In a policy sector, broadly delimited such as “nature conservation” or “fishery policy”, it is vital to maintain diversity in expert activities. Review activities provide building blocks, certifying bodies of knowledge, assessing whether newly signalled dangers are truly as ominous as is claimed, and (temporarily) settling disagreements over the state of affairs to be able to move on with policy. Instrumental activities provide the indicators to assess whether policy targets have been achieved, to assess whether specific policy instruments are performing as expected, or to support the implementation of regulations. Mediation activities restrict conflict or can be used to break through policy deadlock and bring actors in conflict closer together. Advocacy activities signal new problems or push problems up the political agenda. Reflective activities analyse overall policy assumptions, may signal shortcoming or fundamental causes of policy failure.

Over a longer time frame and from some distance to the day-to-day realities of policy making, it is clear that a combination of these activities is vital to a healthy advisory sector in a policy field. Fishery policy needs instrumental expertise assessing the size of stocks. It also needs expert advocates who keep the policy system sharp by pointing out shortcomings. It needs reflection of experts who look for alternative approaches to break through long-term policy failure. It needs mediating experts, to find policies that will accommodate fishers as well as conservationists and future fishers.

Not all of the expert activities are always equally welcome to policy makers. Advocacy may not be seen as an activity that should be supported by government institutions, but governments can at least tolerate niches of advocacy research, for example under the umbrella of the academic freedom of public universities. Policy makers also not always welcome reflective activities, as they can be seen as not immediately useful or inappropriately political. Mediation expertise can even be seen as a sign of policy failure, as policy makers themselves may seem to have failed to construct an alliance or a widely accepted solution. In contrast, the executive tends to prefer instrumental and review expert activities, as these tend to follow set problem definitions, produce relatively predictable advice, and aim for policy closure. It is wise to keep this tendency of the executive in check to maintain a healthy variety of expert activities, not only for the sake of producing well-reasoned policies that are prepared for surprises, but also for the sake of keeping executive power in check.

#### 8.3.2 Maintain some diversity in governance principles for science advice

Like other sectors of public policy, managing the relation between an advisory organisation and public policy institutions can also be seen as a problem of governance. Expertise can be provided as information bought on a market; as knowledge gathered in a hierarchical administration such as a traditional bureaucracy; as arguments shared in an open deliberation, or as knowledge produced to frame negotiations among a restricted number of actors. Because preferences for such patterns have ideological qualities, they can be called, respectively neo-liberal, statist, deliberative, and corporatist.

Each of these governance patterns has strengths and weaknesses. For example, statist models guarantee an integration of knowledge in the administration, but tend to restrict uptake from knowledge outside of the administration. Deliberative models are strong in raising new knowledge and suggesting unexpected strategies, possibly even new alliances, but tend to be weak in the certification of knowledge and hence in supporting concrete decisions. Market models can accommodate instrumental expert activities well, especially when these are sufficiently routine to be assessed by clear quality standards. Following the previous section, the recommendation here is therefore to maintain a level of diversity in governance of expertise in a sector, as this will support the diversity in expert activities.

What binds these recommendations is the principle that science advice for public policy requires a considerable amount of interaction to support integration, while these integrative tendencies need to be balanced by openness and flexibility, in order to keep an eye out for the unexpected, even if the news is inconvenient. As always when the unexpected is involved, there are, by definition, no ready-made answers. At best, there is wisdom and hopefully that will be enough.

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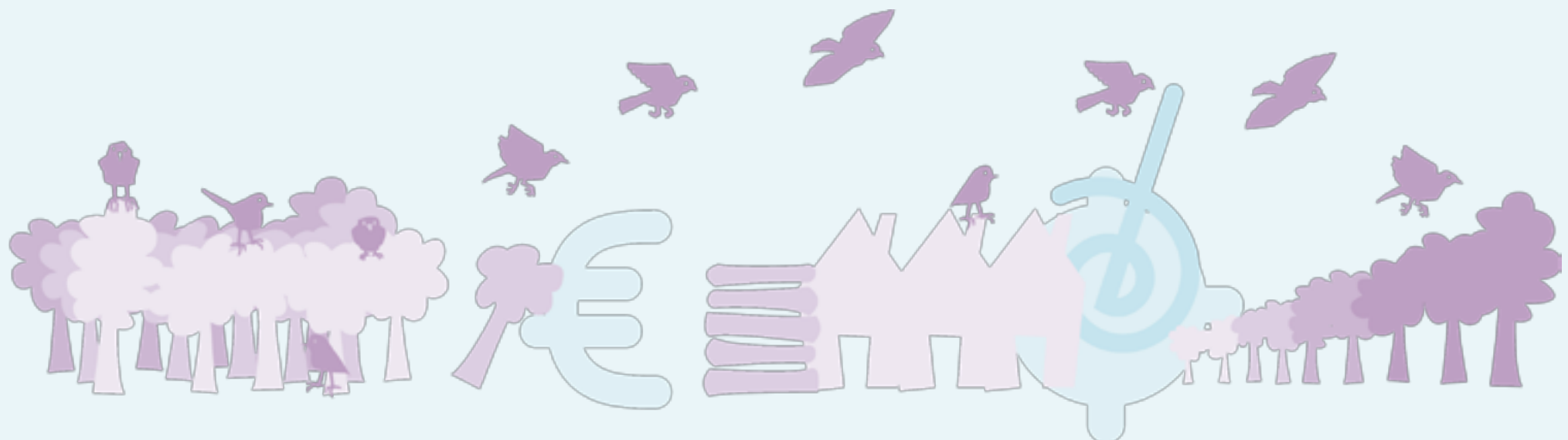
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### **RMNO, linking policy and research**

The Advisory Council for Research on Spatial Planning, Nature and the Environment (RMNO) advises the government, either on its own initiative or in response to requests from ministries, on the content and organisation of research concerning spatial planning, the environment, nature and landscape. Focusing on mid- to long term planning, RMNO tries to be a knowledge broker between science, politics and society. Preparing advice is often a complicated and time-consuming process. The publication of preliminary studies is a way to stimulate reflection, and is often a landmark in such processes. Therefore RMNO not only issues Advice, but also Preliminary studies and Background studies.

**States of Nature** is a report of a comparative study of how science and policy-making interact in some European countries, viz. Flanders, Denmark and Norway. The report focuses on nature policy and fisheries policy. In both policy domains, scientific data are sometimes or often the subject of political debate. The way scientific data are used for policy-making, can be quite different. The way local or lay knowledge is used or ignored is also an interesting difference.

These differences are to some extent understandable, if one considers the dominant repertoires for handling scientific advice in these countries.

This study provides also a framework for systematising and analysing boundary work.

