Policy options

This section aims to identify feasible policy options that target key components identified in the Causal chain analysis in order to minimise future impacts on the transboundary aquatic environment. Recommended policy options were identified through a pragmatic process that evaluated a wide range of potential policy options proposed by regional experts and key political actors according to a number of criteria that were appropriate for the institutional context, such as political and social acceptability, costs and benefits and capacity for implementation. The policy options presented in the report require additional detailed analysis that is beyond the scope of the GIWA and, as a consequence, they are not formal recommendations to governments but rather contributions to broader policy processes in the region.

Definition of the problem

Pollutants are transported to the Faroe Islands by the atmosphere and by the marine currents. Main sources of marine pollution are the industrialised areas in Europe. Local sources of pollutants in the marine environment at the Faroe Islands play a minor role.

Situated far from the European continent, the Faroe Islands environment is generally characterised by low levels of industrial pollutants. As a result, the Faroes can provide a useful baseline reference for other regions exposed to higher levels of pollution. Establishing environmental baselines to assess any future environmental damage is especially important in light of the on-going exploration for offshore hydrocarbons around the Faroes. The exploitation of hydrocarbons could result in adverse environmental effects.

Because pilot whales, which contain high concentrations of environmental pollutants such as mercury and polychlorinated biphenyls (PCBs), also make up an important part of the Faroese diet, the health effects of exposure to these chemicals is an important topic for research and for dietary advice.

Research in ecosystems and natural resources is important for several reasons. The ocean surrounding the Faroe Islands borders on the prime areas for deep-water formation in the North Atlantic. It is therefore of major importance for the global ocean circulation, and hence for the regional and global climate. In addition, the currents that result from the exchange of huge volumes of warm and cold water in this part of the ocean mean that the area is also important in terms of marine fauna.

The recent near collapse of the Faroese fishing industry highlights the importance of carrying out studies of the dynamics of the marine ecosystem. It also emphasises the importance of conducting surveys of the commercial fish species and the environment to foresee changes in the fish productivity and geographic distributions.

Establishing of policy option

Chemical pollution

The main conclusion of the Human Health Programme in AMAP phase 2 was that the current human exposure at the prevailing levels and mixtures of contaminants influences the health of Arctic populations in a negative way (Deutch and Hansen, 2003). Subtle effects have been demonstrated to be present at a sub-clinical level. In consideration of the potential effects on future generations, efforts to reduce the entry of persistent substances into the ecosystems of the world should be accelerated. Furthermore, the process initiated through the AMAP

under phase 1 and 2 should be continued and expanded to involve all relevant disciplines with the goal of pursuing a more holistic assessment of the health of the Arctic Peoples.

Overexploitation

Sustainable fishing

In 1987 the Brundtland Report, also known as Our Common Future (World Commission on Environmental and Development, 1987), alerted the world to the urgency of making progress toward economic development that could be sustained without depleting natural resources or harming the environment. The report provided a key statement on sustainable development, defining it as: development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

In the North Atlantic considerable investments have been and continue to be made to manage fisheries. Yet, despite these substantial investments, the fishery management processes, including scientific advice, can hardly be described as successful, particularly for the important cod fisheries that have been the backbone of demersal fisheries in the North Atlantic (Maguire, 2001). However, at present the Faroes fisheries management system started in 1987 are considered be one of the best in the world today (Reinert, 2001a; Chuenpagdee and Alder, 2001).

Fishery management has neglected the influence of the environment. According to Maguire (2001) it would benefit from a more humble evaluation of what it can reasonably expect to achieve, recognising the large role of oceanographic and hydrographic variability. Fishery management should formally and explicitly incorporate the social, economic and environmental components of fishery management in addition the presently dominating stock assessment component. This should help put back the fishermen as one of the component of the ecosystem whose functions fishery management is trying to protect.

Steele and Hoagland (2003) have recently discussed the concept of sustainability in fisheries. One of the main difficulties in fisheries management is the "ratchet" effect (Ludwig et al., 1993). When the abundance of a stock increases, the fishing capacity goes up. But when later the stock decreases, the effort stays the same, usually with disastrous consequences for the stock and the economy. This general sequence occurs on top of a trend for "improved" gear technology. The critical scientific problem is to distinguish between these two causes: natural environmental variability and changes in effort, fishing boats and gear. According to Steele and Hoagland (2003) the time scale of natural changes in the sea (a few decades) is comparable to the economic scales of human adaptation; specifically the "lifetime" of a fishing vessel. It is this resonance in time scales that makes the attribution of cause to the quasi-cycles in stock abundance more than a purely scientific problem. There is a need to understand the natural physical and ecological causes of these "cycles" in marine ecosystems. And then devise sufficiently long-term management to ameliorate rather than amplify the economic consequences (Steele and Hoagland, 2003).

Recently FAO has given technical guidelines for responsible fisheries and fisheries management using an Ecosystem Approach to Fisheries (EAF) (FAO, 2001, 2003). These guidelines have been adopted to reflect the merging of two different but related and – it is hoped – converging paradigms. The first is that of ecosystem management, which aims to meet its goal of conserving the structure, diversity and functioning of ecosystems through management actions that focus on the biophysical components of ecosystems (e.g. introduction of protected areas). The second is that of fisheries management, which aims to meet the goals of satisfying societal and human needs for food and economic benefits through management actions that focus on the fishing activity and the target resource. Up until recently, these two paradigms have tended to diverge into two different perspectives, but the concept of sustainable development (Brundtland Report, Our Common Future) requires them to converge towards a more holistic approach that balances both human well-being and ecological well-being. EAF is, in effect, a way to implement sustainable development in a fisheries context (FAO, 2003).

Identification of the recommended policy option

Chemical pollution

The pollution stemming from the industrial regions of Northern Europe, America and Asia is caused by a complex of causes and the solution is to stop/reduce the chemical pollution which leads to problems for the biota and human population on the Faroe Plateau. The latter calls for international cooperation and action such as AMAP and OSPAR (AMAP, 2002; OSPAR Commission, 2000). It may be an important target area for GEF projects.

Heavy metals

Current international actions on metals

In addition to national regulations concerning emissions and use of heavy metals, some significant steps have recently been taken

internationally to address the heavy metals. The United Nations Economic Commission for Europe (UN ECE) Convention on Long-Range Transboundary Air Pollution adopted a Protocol on Heavy Metals in 1998. The protocol targets mercury, lead, and cadmium. Countries that are party to the protocol will have to reduce total annual emissions to below the levels they emitted in 1990.

As of June 15th, 2002, there were 36 signatories to the protocol, including all the Arctic countries except Russia. Of these, 10 had ratified it, including Canada, Denmark, Finland, Norway, Sweden, and the United States. For the protocol to enter into force, sixteen countries must ratify it. At its meeting in 2000, the Arctic Council called on the United Nations Environment Programme (UNEP) to initiate a global assessment of mercury that could form the basis for appropriate international action. This request was based on the findings of AMAPs first assessment.

In 2001, the UNEP Governing Council agreed to undertake such a study. The study on mercury will summarise available information on the health and environmental impacts of mercury, and compile information about prevention and control technologies and practices and their associated costs and effectiveness. In addition, the UNEP Governing Council requested, for consideration, an outline of options to address any significant global adverse impacts of mercury. These options may include the reduction and/or elimination of the use, emissions, discharges, and losses of mercury and its compounds; improving international cooperation; and enhancing risk communication.

POPs

Several important steps have already been taken to address the threats POPs pose to the North Atlantic environment, such as the Stockholm Convention and the UN ECE POPs Protocol. The AMAP (2002) assessment shows the continued need to bring Arctic concerns about POPs to the attention of these international policy fora to ensure continued emphasis on Arctic needs.

Conventions regulate some POPs

At a national level, the use and emissions of many POPs have been restricted since the 1970s. In 1998, the United Nations Economic Commission for Europe (UN ECE) negotiated a regional protocol on POPs under the Convention on Long-range Transboundary Air Pollution, the Aarhus POPs Protocol, which covers Europe, all states of the former Soviet Union, and North America. All AMAP countries except Russia are signatories to this convention. As of August 1, 2002, the following AMAP countries had ratified the POPs Protocol: Canada, Denmark, Norway, and Sweden.

The regional UN ECE agreement paved the way for global negotiations on banning POPs under the auspices of the United Nations Environment Programme. The Stockholm Convention on Persistent Organic Pollutants was opened for signature in May 2001. All AMAP countries have signed the Stockholm Convention. As of July, 2002, Canada, Iceland, Norway, and Sweden had ratified it.

Both agreements identify a number of specific POPs to be banned or whose use or emissions are to be restricted. They include industrial chemicals and by-products, such as PCBs, dioxins, furans, and hexachlorobenzene. Also included are a number of organochlorine pesticides: aldrin, chlordane, dieldrin, DDT, endrin, heptachlor, mirex, and toxaphene. Together, these are often called the 'dirty dozen'. Some POPs, most notably the pesticide hexachlorocyclohexane (HCH), are covered in the UN ECE Protocol but not the Stockholm Convention. For several of the listed substances, some limited use is allowed, for example DDT for fighting malaria.

The conventions also define criteria for including new chemicals based on their persistence, bioaccumulation, potential for long-range transport, and adverse effects. The Arctic is well suited as an indicator region for long-range transport. Monitoring data that provide information about the fate of chemicals in the Arctic will therefore be critical in identifying new POPs to be considered under the agreements.

Overexploitation

The high dependency in the Faroe Islands of the marine resources requires proper resource assessments and management. The advice on management of the resources has so far been based solely on fisheries and fishery independent survey data. However, the great variability in individual growth and recruitment to the fish stocks in the area makes an ecosystem approach to resource management relevant for the Faroe Islands.

A preliminary work by Zeller and Reinert (2004) is an example of how an ecosystem approach to fisheries may be useful in fisheries management in the Faroes:

The Faroe Islands utilise a spatial- and effort-based system of fisheries management, explicitly incorporating ecosystem considerations in their policies. This management system was introduced relatively recently (mid-1990s) (Reinert, 2001a,b). Given the exceptional importance of marine resources to the Faroese culture and economy, effective and sustainable fisheries management is of paramount importance to the Faroes. Of particular interest in this regard at the present are ecosystem-

level evaluations of the effects of the seasonal and gear-specific closure systems. By spatially explicit simulations using an ecosystem model of the Faroese waters, Zeller and Reinert (2004) found that the current area closures could be considered beneficial in conserving major stocks of demersal species, with biomass for cod, haddock and other demersal species increasing over the 10-year simulation period. Simulated removal of the closure system reduced the effect of the projected stock increases considerably. Greenland halibut, one of the major deep-water species, and blue whiting, one of the main pelagic species, did not benefit from the existing spatial management. Simulated additional offshore closures of at least 20% of habitats deeper than 200 m benefited Greenland halibut only. Both Greenland halibut and blue whiting stocks benefited from drastic reductions in fishing effort (between 20-50% reductions from 1997 effort levels). According to Zeller and Reinert (2004) the simulation results suggest that the current management regime, which limits effort and spatial access by certain gears (trawls) is likely to be effective for demersal stocks. Furthermore, the simulations were also in line with single-species assessment advice, which indicated that the deep-water fisheries for Greenland halibut and the pelagic fisheries for blue whiting are being heavily overfished. The simulations suggest that significant management changes would be required to halt the current declining biomass trend for Greenland halibut and blue whiting, including considerations for extensive spatial closures for deep-water fisheries, as well as drastic reductions in real effort for both pelagic and deep-water fisheries.

To improve fisheries resource management there is a need for better understanding and predictions of the impact of global climate changes on the Faroe Plateau marine ecosystem. Therefore, modeling the coupling between climate, ocean circulation and marine productivity has high priority for the Faroese Fisheries Laboratory (Jákupsstovu et al., 2003).

Global climate change

The Kingdom of Denmark comprises Denmark, Greenland and the Faroe Islands. The UN Framework Convention on Climate Changes has been ratified on behalf of all three parts of the Kingdom (Anon., 2003c).

In the Faroe Islands there is no energy policy or plan in place (Anon., 2001). The Islands' lack of a specific legislative framework on energy use is recognised as an impediment to promoting energy efficiency measures throughout the Faroese economy. According to Anon. (2001), necessary measures that will in part demand an extended regulatory regime may include:

- Establishing a regulatory framework for energy production and use and setting clear targets on renewable energy sources. Establishing realistic CO_2 emission reduction targets for the different sectors of the Faroe Islands economy.
- Promotion of fleet reduction and rejuvenation measures in an effort to improve the long-term sustainability and fuel efficiency of the fishing fleet.
- Promoting energy efficiency measures and the use of cleaner fuels in the fishing sector.
- Promoting wind energy schemes and eliminating barriers to third party access to the electricity grid.
- Promoting cooperation between the joint municipal company, SEV, the Faroe Islands Government and the oil sector regarding energy production on offshore installations.
- Investigating ways of reducing CO_2 emissions associated with offshore energy production.
- Improving and enlarging the available range of energy and environmental indicators and statistics, and including regular figures for CO_2 emissions, broken down by sector.

It is evident that global climatic change, in particular related to ocean temperature, salinity and currents, may have a potential very severe impact on the fisheries resources and the economy of the Faroes. However, the main causes for these effects shall be found outside the Faroes, and only determined international action by the large emittants of greenhouse gases will be able to address this issue efficiently. Here, The Faroes share fate with the cause of Small Island Development States (SIDS)

Conclusions

Climate change and chemical pollution from outside the Islands impact the natural resources on the Faroe Plateua by increasing the risks of overexploitation and by contaminating the natural resources to levels above the safe limits for human consumption. Both chemical pollution and climate change are caused by the industrialised world and they are global international problems to be solved in international cooperation. It is important for Faroe Islands to inform the UN and the world about the impact of chemical pollution and climate change and to take active part in solving the root causes to the problems. The Faroese are very aware of the threats to habitats, biota, human health due to climate change, chemical pollution and overexploitation through its membership and active participation in international organisations concerned with resource management (e.g. ICES, NAFO, NEAFC, NAMMCO, Arctic Council) and pollution (e.g. AMAP and OSPAR).