European Social Science Fisheries Network

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Northern Waters: Management Issues and Practice

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School of Geography and Earth Resources

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Contents

0.0 Summary

0.1 *Introduction*

The second European Social Science Fisheries Network (ESSFiN) workshop - and the first on a regional theme - was held in Aarhus from the 29th to 31st May 1997. It attracted a total of 36 participants, of whom 17 were new to the work of ESSFiN, from a total of 11 countries.

0.2 *Proceedings*

24 papers were presented in seven sessions over a two day period and a visit to the North Sea Centre in Hirtshals was arranged for the third day. For the purpose of this report, the grouping and sequence of the papers has been altered to give a more coherent structure. They are now arranged in one thematic and three regional sections. No attempt was made initially to influence the content of the workshop - except through the invitations to keynote speakers and in ensuring a balance of contributions from the different geographical sub-regions. It was therefore hoped that the workshop would reflect the prominence of particular issues in current social science research in northern Europe.

0.3 *Analysis*

Four major themes are identified from the content of the workshop viz.

(a) *Flexible strategies and institutional inertia.* This theme follows closely upon Hanna's diagnostic framework in which management scope - in terms of the aims and objectives of fisheries management - lacks stability while the management structures display institutional inertias which render them less able to cope with the increasing pace of change. The flexibility needed to respond positively to internal and external pressures in the harvesting, processing and advisory sectors of the fishing industry is impeded by the institutional inertia.

(b) *Discordant rationality.* Differences in the focus of the presentations on the 'Far North' and other areas suggest a centre : periphery structure to the discourse on management issues. The centre's perspective tends to shadow recent 'consumer trends' relating to environmental and market issues - thus increasing the instability of management scope as generated by the central institutions, while the periphery's perspective focuses more on the basic relationships between production, employment and incomes. Dependence on production means that institutions located in the periphery are less likely to change their management scope. Discordant relations are also noted in political and bureaucratic processes: central political institutions are sensitive to changing policy trends, whereas administrative systems, designed within the more stable tradition of bureaucracy, provide a greater influence for stability - possibly helping to explain why new political initiatives seldom manage to achieve their desired effects.

(c) *Integrated fisheries management* (IFM) An important issue running throughout the workshop was the need to reintegrate fisheries management in a much wider context. At its basic level, IFM is concerned with the integration of fisheries and environmental objectives and requires areas like the Baltic and North Seas to be managed as single ecosystems. Conceptually IFM goes much further, requiring closer integration of recreational and commercial interests and with regional development organisations. The implementation of IFM objectives raises questions concerning the need for institutional reform and the possible relocation of responsibility for fisheries management in government departments concerned primarily with environmental rather than production policy.

(d) *Global : local tensions*. The globalisation effects on local societies remains a powerful theme in social science research in northern Europe. Many of the problems identified in individual papers reflect the global restructuring of the fisheries and significant shifts in the balance of power between different regions and sectors. At the same time, policy making is increasingly taking place at international rather than national or regional levels. The pressures faced by the local fishing communities occur simultaneously on two separate planes: horizontally (fisheries v other interests) and vertically (local v national and/or international interests). As a result the fishermen perceives himself to be the victim rather than beneficiary of fisheries policy and local communities are being put at risk.

0.4 *Research priorities*

A number of future research areas can be identified from this analysis, viz:

* implications of competing institutions in fisheries management;
* how flexible strategies may be operationally facilitated or constrained by different management regimes;
* relationships between political and bureaucratic institutions and processes in fisheries;
* conflicting policy goals and the processes that create them;
* new institutional frameworks for IFM;
* compatibility of policy agendas within IFM;
* changes to regulatory regimes and the socio-economic consequences of IFM;
* integration of relationships between harvesting and processing at local, regional, national and international levels;
* cultural change in coastal communities;
* new community dynamics.

1.0 Introduction

1.1 The following report summarises the proceedings of the Workshop on *Northern Waters: Management Issues and Practice*, held in Aarhus, 29-31 May 1997, as part of the Concerted Action Programme for the European Social Science Fisheries Network (FAIR CT95 0070). This is the second in a scheduled series of five workshops and the first of two focusing upon particular regional issues. The series of workshops is intended to bring together social scientists from Europe and the North Atlantic region working on fisheries in order to present and discuss their research findings and to explore the relevance of such findings for the development of fisheries policy and management strategies.

1.2 The aim of the *Northern Waters* workshop is to review the main issues relating to management systems in the prolific, well established but increasingly endangered fisheries of the North Atlantic region. The North Atlantic is one of the most productive regions in the world, exploited by industrially advanced fishing nations and characterised by a diverse range of structural attributes. It has been a major centre for research and development in fishing technology and innovatory forms of management. Several of the coastal states (or sub-state regions) situated in the 'far north' of the North Atlantic are truly fisheries dependent in the sense that fishing is the principal, if not the only, resource based wealth creating activity and source of employment. But is also the ocean region most sorely troubled by the recent failures to sustain fish stocks and levels of fishing activity: the North Atlantic is the only one of the world's ocean regions to record a more or less continuous declining trend in the level of landings of fish for human consumption.

1.3 No attempt was made to predetermine the issues for discussion, though care was taken to ensure a reasonable balance of contributions from the different geographical sub-regions. No theme paper was prepared for prior circulation. An initial announcement in FiNESSE, the Network's newsletter, in October 1996, yielded a total of 19 submitted papers, all of which were selected for presentation. To guarantee a sufficient breadth to the final programme, five keynote speakers were invited from fairly diverse professional backgrounds including fisheries scientists, conservation organisations and the fishing industry. Although these guest contributors greatly enriched the proceedings, the submitted papers alone would have afforded a broad basis for discussion. Of the 36 participants attending the workshop - from a total of 11 different countries - 17 were new to the work of ESSFiN.

1.4 A total of 24 papers were presented in 7 sessions over a two day period, together with a final summary discussion on the workshop theme. More papers were in fact presented than at the previous workshop in Seville, yet rather more time was found for the discussion of individual papers and common themes than had previously been the case. This was due, in no small measure, to a more disciplined schedule, good time keeping on the part of all presenters and strict - but by no means severe - control exerted by the chairpersons. On the final day of the workshop, most participants took part in a visit to the

North Sea Centre in Hirtshals, including the Danish Institute for Fisheries Technology and Aquaculture, the Aquarium and museum, and a highly entertaining and very informative tour of the fishing port of Hirtshals conducted by Mogens Larsen, Chairman of Hirtshals Fiskeriforening.

1.5 The following report is organised in two main parts: (i) the proceedings of the workshop, including extended summaries of the papers presented in five sections - the order of the papers has been altered from the original programme to give a more coherent structure to the report and (ii) a discussion of the key issues arising and proposals for future research. The original programme and list of all participants are included as appendices.

1.6 A selection of the papers presented at the Aarhus workshop is to be published in book form by the Fishing News Books division of Blackwell Science under the title *Northern Waters: Management Issues and Practice*. Publication is scheduled for Spring 1998.

1.7 The co-ordinator of ESSFiN wishes to pay tribute to the excellent work of Torben Vestergaard and his assistant Maríanna Traustadóttir, in making the arrangements for a hugely successful workshop. Our thanks are also due to the Danske Fiskeres Producentorganisation who provided an informative and sumptuous reception and to Jesper Raakjaer Nielsen for coordinating the field visit. Finally all the participants are to be congratulated for a truly stimulating exchange of views.

David Symes
Hull, July 1997

2.0 Proceedings

2.1 Management issues

2.1.1 *Introduction*

Although almost all the papers address issues which are common to a range of countries and regional seas, most do so from a national or sub-national perspective. A significant minority, however, are constructed around a broader theoretical perspective: these form the first two sections of this report. Two invited keynote speakers, from very different disciplinary backgrounds, help to frame the content for the workshop: the first by critically reviewing the nature of fisheries management - and its failings - on both sides of the North Atlantic. According to *Susan Hanna's* paper, there is little doubt as to where the underlying causes of management failure lie; it is in the inadequacies of the management institutions, which lack a long term vision of where fisheries should be heading and which also suffer structural rigidities making them extremely sluggish in adapting to change.

By contrast, *Tine Kjaer Hassager*, a scientist from the Danish Institute of Fisheries Research, lays emphasis not on the past failures of fisheries management but on the emergence of new management objectives, including the need to view fish stocks not simply as intrinsic resources but as integral parts of the marine ecosystem and also the concept of 'consumer safety' focusing not only on fish as a healthy food but also the public's increasing concern that fish harvests should reflect environmentally friendly methods of production.

To these two invited presentations is added *Einar Eythorsson's* paper which reexamines the implications of the shift in approaches to fisheries management implicit in the commoditisation of fishing rights. He points out that ITQ systems, allied with the conventional single species stock assessments, fail to recognise the interdependency of different species within the ecosystem and thus understate the ecological value of the resource.

2.1.2 *Parallel institutional pathologies in North Atlantic fishery management: Europe and the USA.*

Susan Hanna, Oregon State University, USA.

Fisheries management in Northern Europe and the United States is challenged by an array of problems. Fisheries are overcapitalised; many stocks are depleted; the integrity of biological assessment is under attack; and management objectives are in dispute. The fisheries management problem is often characterised as a common pool problem, soluble by well specified property rights. It is also characterised as a human problem, reflecting the lure of greed, the power of false expectations and the failure of political will. But the problem is not so much a failure of property rights or of human nature, although both are important. It is more fundamentally a failure of institutions

to plan and coordinate the long term use of variable, multi-component fishery systems. There are two fundamental institutional pathologies in fisheries management that lead to predictable and common outcomes - an unstable scope and an inert structure. Both leave fisheries vulnerable to changes in technology, markets and information.

Fisheries management has failed to keep pace with post-war changes in the economic, social, biological and ecological environments. *Management scope* is the long term vision expressed in a set of operational objectives that specify how the fishery is to be used over time. Management scope has been expanded from relatively simple, localised input controls to more complex combinations of input-output controls. But management is confused by a lack of clear vision or the specification of long term objectives. It presents a shifting, unstable scope and is thus left in a vulnerable reactive mode. Effective management institutions are able to accommodate change, yet, in fisheries, *management structures* are typically rigid, relying upon formal processes enacted according to prescribed 'rules of the game'. The trade-off between stability and flexibility is a familiar dilemma in fisheries; although clearly there are benefits from a stable time horizon, in fisheries the overwhelming characteristic is its variability. Effective management must be able to accommodate three basic incentives: to reduce uncertainties of imperfect scientific knowledge and unspecified property rights; to reduce and redistribute transaction costs; and to reduce the impacts of adverse forms of competition (scramble competition and interference competition). In the North Atlantic, management scope and structure has been the opposite of what is desirable: scope has been variable rather than consistent; structures have been sluggish rather than adaptable. Management objectives provide the 'road map' for the fishery. They represent the vision of where we want the fishery to be and serve to define a collective core against which short term management actions are evaluated. Rigid structures represent 'road blocks' that prevent the driver from adapting to troubles in the road ahead. Management structures in fisheries are inert in an environment that demands flexibility. The environment is slowly forcing fisheries management into a more generalist direction in which all components of the system are represented. But, at present, the rate of management change remains much slower than environmental change.

2.1.3 *Changes in fisheries management and scientific advice.*

Tine Kjaer Hassager, Danish Institute for Fisheries Research

The precautionary approach and the concept of responsible fishing have played a central role in international agreements in recent years (Rio Declaration, 1992; FAO Code of Conduct, 1995; UN Agreement on Straddling Stocks and Highly Migratory Species, 1995). Most recently, the Statement of Conclusions from the Intermediate Ministerial Meeting in Bergen (1997) reflects the public concern over environmental issues. Current management objectives for fisheries throughout Europe will need to change and there is therefore a need to review and evaluate the scientific basis of management advice. To establish and maintain the scientific basis for advice to assist new developments in

fisheries management, research will have to be oriented around four emergent concepts: sustainable fisheries, responsible use of resources, consumer safety and effective documentation.

The sustainability of many fisheries is questioned today, particularly in relation to the issues of 'industrial fishing' and by-catches. The traditional management objective was based on the maximum yield per recruit per fish stock, meaning that the scientific advice was based on single species assessment models, with only little attention paid to biological interactions (predator-prey relations), technical interactions (mixed species fisheries) or the impact of fishing on the marine eco-system. New management objectives are more complex and, as yet, not well defined. The need is to consider fish stocks as integral parts of the marine ecosystem and the impacts of fishing have to be assessed in terms of birds, marine mammals and the benthic fauna as well as the fish stocks.

A definition of sustainability might be that fishing intensity is adjusted to a level which assures a high yield of quality food and a very low probability of negative and irreversible impacts on the eco-system. Fisheries research must therefore focus on defining the objectives for sustainable management and to agree on operational targets and new reference points. This will require an inter-disciplinary approach to fisheries research.

Responsible use of resources requires the protection of young fish and the avoidance of unintended bycatch. An estimated discard of 0.5mt out of an annual catch of 2mt of fish in the North Sea illustrates the problem. Emphasis in gear technology research must be shifted from catch efficiency to selectivity of gears in correlation with knowledge of fish behaviour. Concern for the handling and storage of fish after capture is also important if unacceptable wastage of the resource is to be avoided.

In the quest for consumer safety and the pursuit of healthy and 'clean' (i.e. additive free) food, fisheries research must focus on specific microbiological and hygiene conditions in fish and shellfish products both onboard the fishing vessels and in subsequent stages of the fish processing chain. Eco-labelling, sell-by dates and quality labels are increasingly impinging on the consumers' conscience in creating a credible quality product. This requires reliable documentation based on precisely defined criteria. As processing becomes more complex, the need for documentation 'from sea to table' becomes even more important. The Marine Stewardship Council initiative provides an example of such a development.

2.1.4 *Metaphors of property: the commoditisation of fishing rights.*

Einar Eythorsson, Finnmark College, Norway.

The present conditions of fisheries are characterised as an accelerating process of disembedding and globalisation. The construction of resource management models and the practical consequences of modelling fish resources as capital, subject to property rights, has led to an awakening of political dilemmas and

social conflicts arising from the redistribution of wealth, income and negotiating power. Defining resources simply as a means of production ignores the interdependency of the various components of ecosystems and understates the ecological value of resources. The notion of management of natural resources depicts man as the master of nature; the basic metaphor of marine resource management is that of a farmer managing livestock and grazing land.

Scientific management of fisheries, encapsulated in the Gordon-Schaefer model, implies a need for state intervention to regulate fishing effort in order to prevent overexploitation of stocks and dissipation of resource rents, and establishes a tradition of treating fish resources as the equivalent of capital from which different levels of resource rent can be extracted according to the management strategies chosen. Because the model is applied to separate stocks, it fails to address the interdependence between species in the ecosystem. Furthermore, the ability of management schemes of provide ecologically sound resource use is limited by reliability of research data. The accuracy of stock estimations is questioned as a result of faults within the scientific system itself and also on account of the perceptions of natural systems as equilibrium systems. Predicting the outcomes of stock building, in terms of a calculated return to equilibrium levels, is not realistic in complex marine environments.

Various authors have come to the conclusion that the fundamental problem of fisheries management is the lack of property rights - a notion basically drawn from the metaphor of agriculture and Ricardian rent theory. Since farmers think in the long term and take good care of their land, other renewable resources might be better managed as a result of privatisation. But there is a danger in neglecting to note that fish stocks are not land, fish resources are not capital and ecosystems are not economic systems. The failure of previous attempts to regulate overfishing has led some writers to advocate ITQs as a solution to the commons dilemma and a means of reducing fishing capacity without recourse to public funds. But, as with other simplistic models,. the implementation of ITQs has uncovered a host of unexpected side effects, concerning the nature of fishing rights and their distributional effects, culminating in a partial refeudalisation of fishermen.

Deregulation of trade and capital has reopened national fisheries to exploitation by multinational fishing enterprises. Coastal states, regarding fish resources as state property and the equivalent of capital, now have the choice of allocating fishing rights to their own coastal populations or to foreign companies who pay for the rights in hard currencies. Fishing rights within national exclusive zones thus become marketable commodities in a global market. The shifts from closed national systems to global enterprise dominated by multinational companies radically alters the power relations within fisheries. Commoditisation is used to justify a global system which threatens to deprive fishing populations of the rights to feed themselves, while consumption of fish protein is a privilege for affluent regions. There is no evidence that commoditisation is the road to sustainable development.

2.1.5 *Discussion*

In the United States, Regional Management Councils had been set up under the Magnuson Act 1976 to resolve the kind of institutional crisis outlined in *Hanna's* paper. Their mission had, however, been frustrated as a result of interference both by user groups and by politicians. The unstable focus of fisheries management makes it particularly vulnerable to manipulation by short term political objectives. Further, American fisheries are still treated as 'garbage can' resources: if you want to create more employment, then let fisheries take the strain; if the State Department needs to cut a deal with the Russians, then let fisheries form part of the trade off. It is important to reshape the perspective on fisheries as valuable resources in their own right and not simply as a residual in a wider political process. Legitimacy for the management institutions thus needs to be sought at levels higher than those of the fisheries agencies themselves.

The use of agricultural metaphors to portray the behaviour of fishermen under conditions of privatisation of use rights can be misleading. The assumption that, under a system of ITQs, fishermen will act to conserve stocks if only to protect the asset value of their shares may be false. The 'owner' of the ITQ may, for example, be an asset fund and the fishermen may become alienated from the resource as the links between the 'ownership' of use rights and strategic behaviour are broken by short term leasing arrangements.

Pressures to change the style of fisheries management and the approach of fisheries science is coming from outside the fishing industry *per se*. The 'customer base' for fisheries science is being shifted away from producers (i.e. the fishermen) to consumers of both environmental goods and fish as a food. Fisheries science has been ill prepared for the challenge. It has lost credibility in face of demands from its new clients. Asked to assess the impact of fishing on ecological systems, for example, requires the identification of new criteria and the development of new models. Fisheries research institutes are being directed to search for new management paradigms. It is therefore a matter of some regret that some private institutions are marketing the concept of 'sustainable fisheries', without any link to the established scientific community.

Many of the issues raised in this first section were revisited and elaborated in subsequent sessions.

2.2 **Regional dimensions**

2.2.1 *Introduction*

A second set of papers address the international and macro-regional perspectives of the North Atlantic. Although the extension of sovereign national jurisdiction to 200 nautical miles in the second half of the 1970s reduced the area of high seas fishing to only a small fraction of its former

extent, the issue of international management has been reinvigorated by the UN Agreement on Straddling Stocks and High Migratory Species reached in 1995 but still awaiting ratification. *Juan Luis Suarez de Vivero* examines the trends in international collaboration since UNCLOS II arguing that despite the reduction of the North Atlantic to the status of an 'inland sea', the sustainability paradigm has meant that defence of national fishing interests has come to rely on political action in an international context with the coastal state facing a dilemma in the defence of both national (EEZ) and external (high seas) interests.

Sevaly Sen re-examines the role of international commissions in the management of high seas fisheries through a historical analysis of NEAFC in three distinct phases. Arguing that the latest phase, initiated by the UN Agreement in 1995, gives renewed significance to regional commissions, she casts doubts on whether NEAFC is an appropriate organisation to assume responsibility for high sea fisheries management in the North Atlantic.

Taking a rather different view of 'regionalism', *Jennifer Bailey* poses the question as to whether recent developments in the 'far north' of the Atlantic basin reflect a genuine regionalist approach, noting that horizontal linkages forged between the coastal states are cut vertically by specific trade relations to the outside world. She concludes that the basis for regional identity lies in an alliance of common interests rather than any form of political integration.

2.2.2 *Political geography and politics in the North Atlantic: from UNCLOS to sustainable fisheries*

Juan Luis Suarez de Vivero, University of Seville, Spain

Since the mid 1970s, the North Atlantic (FAO Areas 21, 27) has evolved towards greater geographical integration, assisted by closer political collaboration. The establishment of EEZs had initiated (and the UN Agreement on Straddling Stocks and High Migratory Species has completed) the conversion of the North Atlantic into an 'inland sea' between North America and Europe. Also since the 1970s, the evolution of the region's fisheries has relied rather more on political strategy than on scientific or technological progress: the sustainability paradigm has made the defence of national interests - and trans-national corporations - heavily reliant on instruments of political action.

The countries which border the North Atlantic are all industrialised nations, based on a free market economy and parliamentary democracy. However, specific forms of geographical asymmetry lead to differing opportunities and conflicting interests between the different fishing nations. At a basic level, only two states make up the western shoreline of the North Atlantic, contrasting with 11 coastal states on the eastern seabound - although this fragmentation is, in part at least, offset by the development of the European Union and the CFP. All three major powers - USA, Canada and the EU - rank among the world's largest EEZs. Although the North Atlantic is the second

most productive global fishing region after the NW Pacific, it exhibits a general declining trend in the level of catches. Recent developmental trajectories for national catch levels show conflicting tendencies: one group of coastal states (Belgium, Germany, England and Wales) have recorded a progressive decline in landings since 1970; a second group (Canada, Norway, Portugal, Spain) show a more or less stable tendency; and the third group, comprising the majority of coastal states, have exhibited sustained development. All North Atlantic catches have, however, maintained a high level of activity in fish related trade: exports have tripled and imports have increased two and half times.

In 1982 UNCLOS confirmed the state as the political authority to promote and defend national interests to guarantee the continued development of fishing. At the same time, UNCLOS also initiated the state's commitment to protect and preserve high seas resources. The dichotomy between fishing in sovereign EEZs and high seas fishing puts the state in something of a dilemma as guarantors of both national and international interests simultaneously. The primacy of the former role is evident in the UN Agreement 1995. Governance of fishing has acquired a deeper political dimension. Political negotiations and the framework of international relations have become the arena for the resolution of national interests. Despite the reduction in the area of high seas fishing, most important new initiatives in fisheries management have been created within the international arena.

2.2.3 *The North-East Atlantic Fisheries Commission: a creature with no teeth?*

Sevaly Sen, IFMCCD Hirtshals, Denmark

Over the last one hundred years, regional management of high seas fisheries in the NE Atlantic can be analysed in three distinct phases. The first phase, characterised by narrow coastal state jurisdiction and eventual recognition of the need for cooperation between fishing nations, ended with the conclusion of the 1959 North-East Atlantic Fisheries Convention and the establishment of the North-East Atlantic Fisheries Commission (NEAFC). The second phase reflected changes in the international law of the sea and the extension of coastal state jurisdiction out to 200 nautical miles. During this phase, NEAFC was discredited as an effective fisheries management organisation and its role reassessed by the Contracting Parties. The Convention on Future Multilateral Cooperation in the North-East Atlantic Fisheries, signed in 1980, was concluded to take into account changes both in the international law of the sea and the role of NEAFC. During this period, cooperation between Contracting Parties was characterised by difficult and often obstructive decision making procedures, by a rejection and/or distrust of scientific advice and by poor enforcement of recommendations. The third phase began in 1995 following the conclusion of a new international legal framework for the management of high seas resources, based on the UN Agreement on Straddling Stocks and Highly Migratory Species and the FAO Code of Conduct for Responsible Fisheries.

Regional cooperation on the high seas fisheries of the NE Atlantic was initiated as a way to resolve conflicts and, as the fisheries developed, to conserve stocks. However, over the three phases of fisheries management, such cooperation was beset with difficulties. Whilst some of these difficulties were related to the general historical changes in high seas fisheries management - such as the extension of coastal state jurisdiction to 200 nm - some are the result of the nature of regional cooperation. The result has been the development of a regional organisation which has been ineffective in both fisheries management and enforcement. High seas management is now entering a third phase which places a renewed emphasis on regional and sub-regional organisations. At first sight, NEAFC might seem the most obvious organisation for the NE Atlantic region, because it already exists and has a history of regional management. However, it is because of that history that the question should be asked as to whether it is, in fact, the most appropriate institution.

2.2.4 *The Far North Atlantic and the will for regionalism*

Jennifer Bailey, Norwegian University of Science and Technology, Trondheim

Regionalism is a multifaceted phenomenon which can take on a variety of meanings. It generally indicates the emergence of sub-state geographic areas with an identity distinct from that of the state. The processes of regionalism may be driven by either top-down or bottom-up initiatives, or by a complicated mixture of the two. The question forming the basis of this paper is whether there are functional and cultural forces driving this emergence of regionalism for the Far North Atlantic, comprising Newfoundland, Greenland, Iceland, the Faroes and North Norway. The area concerned is divided and unified by a series of arrangements, partly linked to historic ties, cultural linkages and political associations. One of the key common denominators is their heavy dependence on fisheries, and especially the North Atlantic cod fisheries. At least one in five jobs relies upon the continuation of the fishing industry. The five constituent areas have other features in common. All are marginal areas, spatially and economically, characterised by small isolated communities set in relatively large, sparsely populated territories. Most were slow to modernise and to restructure their fishing industries - and the persuasive influence of the small boat fishery remains. Each has suffered, in some degree, from the consequences of the decline in North Atlantic cod stocks.

North Atlantic fisheries have always been among the most productive in the world and their exploitation was a major factor in the settlement of the North Atlantic rim. Today, most of the Far North's catches are taken within their own 200 mile economic zones and landed at their own ports. Most of the five territories are linked by networks of fishing agreements of similar pattern. Reciprocal treaties have been of particular importance to the Faeroes which, more than any other of the territories, relied relatively heavily on distant water fisheries and was most adversely affected by the declaration of 200 mile EEZs. What remains of the high seas fisheries are regulated by regional fishery

organisations (NAFO, NEAFC, NASCO) and multilateral agreements, with most of the Far North's territories having modest quota entitlements.

With all the territories under consideration relying heavily upon the exploitation of living marine resources, and as many of the stocks fished are straddling or shared stocks, a common concern for this shared marine environment and its ecosystems would seem inevitable. Indeed, several of the territories were proactive in achieving the UN Agreement in 1995. On whaling and marine mammals, there has been a tendency for the Far North territories to resist international attempts to impose moratoria on certain hunting activities, most notably the IWC's commercial whaling ban: all five countries advanced cultural as well as socio-economic reasons for harvesting whales and other marine mammals. On the other hand, the same declines in stocks that created a common sense of concern have also intensified competition for both shared and straddling fish stocks: quota negotiations have been tough - even acrimonious - and Norway and Iceland have sharply disagreed over the international waters of the Barents Sea (the Loophole) and, to a lesser extent, Norway's policies on Svalbard.

The countries bordering the Arctic rim depend not only upon the supply of fish but also upon access to markets. All but Newfoundland rely mainly on trade with the EU and discussions on fish quotas with the EU has always to take this linkage into account. Any horizontal linkages among the territories of the North Atlantic, based on the sharing of common characteristics, are cut vertically by trade relations which must link them to countries beyond the region. In some sense, too, the countries of the Far North are in competition with each other for market access. The basis for regional unity is thus best conceived as an alliance, based on the recognition of common interests, rather than as integration.

2.2.5 *Discussion*

Discussion focused around three themes: first, the question of whether recent developments on the international scene represented rhetoric or action; secondly, the relevance of existing international regional organisations (NEAFC, NAFO) for the newly redefined remit of high seas management; and thirdly, whether there were alternative scenarios for coping with high seas fisheries.

It was generally agreed that although developments like the UN Agreement on Straddling Stocks and Highly Migratory Species (1995) still awaited ratification, the level of international concern for responsible fishing on the high seas was an encouraging sign and would hopefully prove a necessary preface to effective action. What was significant was that coastal states are increasingly becoming more involved in international action rather than becoming simply preoccupied with aspects of domestic management. The UN Agreement and the FAO's Code of Conduct, *inter alia*, do clearly put considerable pressure on organisations like the EU and NEAFC to ensure the adoption - in principle - of more sustainable practices. The real problem,

however, lies in their implementation and the lack of resources to enforce them.

Criticism of the existing international organisations like NEAFC for their past inactivity was not seen as a sufficient reason for dismissing their future role in high seas management, though it was recognised that there was a problem of continuity and a risk of carrying the historical baggage of failure into the future. Over the last two years NEAFC has being taken more seriously and had made a limited number of important management decisions after a long period of apparent inactivity. The pressure was now on NEAFC to demonstrate that it has the ability to underpin the various international high seas agreements.

Empowering and enabling the regional commissions to act with the same level of authority as coastal states was seen as the most encouraging way forward. The alternatives of retreating from the responsibility of attempting to regulate the high seas and allowing anarchy to prevail or an extension of coastal state responsibility beyond the existing 200 mile limits were seen to be either irrelevant or impracticable.

2.3 The North Atlantic

2.3.1 *Introduction*

The largest and most diverse group of papers refers to the North Atlantic. Surrounded by some 13 coastal states, including some of the world's major fish producers and some of the most heavily fisheries dependent states or provinces, the region includes Newfoundland, Greenland, Iceland, Faeroes and Norway. The bulk of the papers refer essentially to the North Norwegian experience.

Sveinung Eikeland addresses an issue of particular importance to fisheries dependent areas, namely the need for flexibility in response to changing conditions in the fisheries - and one which is echoed in several other presentations. Flexibility (and deregulation) are seen as essential conditions for maximising the economic returns from participation in the fisheries, but these are tempered by the need for closer regulation to ensure ecological sustainability.

The paper by *Petter Holm et al* reflects very closely Hanna's analysis of institutional inertia, focusing on the management dilemmas following the inconclusive debate on whether Norway's coastal cod stocks are independent of the main North East Arctic cod. The attempt to treat coastal cod as a local management issue ran into stiff opposition from the established national management hierarchy intent on preserving the *status quo* and thus protecting their own positions.

Whereas the institutional processes concerned with the formulation and implications of management policy continue to attract considerable interest from social scientists, the issues of enforcement receive much less attention.

Geir Hønneland examines the nature of compliance and non-compliance in the Norwegian sector of the Barents Sea where, despite disputed jurisdiction, a high level of compliance with regulations is noted. Although no one set of factors can adequately explain this situation, it seems likely that discursive rather than coercive measures are largely responsible.

The historical development of the system of the crew's remuneration from the fishing trip in Iceland is traced by *Thorolfur Matthiasson*, who also compares the current situation across a wide range of countries in the North Atlantic region and beyond. Share systems, based on the returns from the individual ships, are a near universal form of remuneration in present day fisheries.

Comparatively little attention is paid by social scientists to the ways in which the processing system either responds to or helps shape changes in the harvesting sector. *Ketil Hanssen* therefore provides a timely reminder of the fact that the problems of institutional inflexibility and inertia are as much a feature of the processing activity (see also Vedsmand *et al*, below). Using examples from North Norway, he describes changes in the processing industry leading to greater specialisation and less flexibility, especially in the labour market.

Finally, the paper by *Kenneth Awebro* moves the attention away from contemporary problems of North Atlantic fisheries to a picture of whaling in the Arctic seen from the historical perspective of Swedish involvement in the seventeenth and eighteenth centuries. It serves also to remind us that the problems of overexploitation and the need for flexibility of response by the exploiting populations are not new.

2.3.2 *Flexibility in northern waters*

Sveinung Eikeland, Norwegian Institute for Urban and Regional Research, Alta, Norway

Modern fisheries must be both ecologically stable and economically effective. Fishermen must therefore adjust to market changes without affecting the biological diversity or the renewal of the ecosystems. Flexible strategies are widely recognised as a response to economic change but while economic development requires flexibility and deregulation, ecological sustainability demands stricter regulation. There is some disagreement in the field of common property resource use as to whether stricter regulation is the correct strategy for sustainability. Quota regulations, for example, do not normally encourage fishermen to switch from over- to under-exploited species. Analysing the relationships between economic flexibility and ecological sustainability of fisheries calls for more understanding of both the socio-economic systems of flexibility and their incentives for realising sustainability.

In fisheries, flexible strategies usually refer to the ability to exploit alternatives where fishing is seen to be failing. It is generally acknowledged that traditional Norwegian fisheries were based on flexible adaptations to marine systems;

those who made a living from the sea also had the means of livelihood - usually in small scale farming - if fishing failed. This was part of the flexible rural economy in which different forms of enterprise remained open to new participants and labour markets were elastic. Such traditional systems were sustainable but are now largely closed off as a result of regulation. Today, flexible strategies refer to modes of participation, diversification and mobility.

Flexibility in participation or the movement in and out of the fishery remains widespread among the small scale fishery where it still forms part of the flexible rural economy. But it is governed by three preconditions relating to access to different species, access to alternative incomes and the regulatory framework. In Norway, the Participation Law has reduced the threshold of non-fishing incomes to a level which would mean serious hardship if the returns from fishing should be low, while quota regulations compel fishermen to remain in fishing even when catches are low. Non-fish related jobs are limited to relatively inelastic opportunities in agriculture, the construction industry and public sector employment and household incomes have become more dependent on women's earnings from the public sector. Opportunities for the diversification of fishing activity depend essentially upon vessel type and gears. Large vessels tend to combine non-selective technology and mobility to exploit a great variety of species, whereas the smaller, less mobile boats tend to be more selective in their fishing strategies based on specialised technology and detailed local knowledge. As deployed in north Norway the greater flexibility of the offshore trawlers does not contribute to resource sustainability. Finally, flexibility by mobility has formed part of the traditional strategy of fishing in northern waters. In Iceland, today, the lack of flexibility induced by ITQ has led to the deployment of larger vessels in high seas fishing, while leasing their transferable quotas to the inshore fleet. Such strategies clearly fail to reduce the pressure on both domestic and high seas fisheries. Overall, the preconditions for sustainable fisheries based on flexible strategies - in terms of technology, mobility, the structure of the rural economy and the regulatory system - have not yet been fulfilled in northern waters.

2.3.3 *Creating alternative natures: coastal cod as fact and artefact*

Petter Holm, Stein Arne Rånes and Bjørn Hersoug, Norwegian College of Fishery Science, Tromsø

Once a management regime has been established, it becomes committed to images of nature on which it was originally constructed even when these prove to be inadequate. Such is the case with the coastal cod stocks along Norway's west coast, whose separate existence was first recognised in 1933 and later confirmed through separate quota allocations of coastal and NE Arctic cod. Within the resource regime established for the Barents Sea, the cod was defined in terms of three distinct components: NE Arctic cod, coastal cod and Murman cod. Each played a rather different role within the management regime. Only NE Arctic cod was subject to stock assessment and while the Murman cod allocation to the USSR was subtracted from the total TAC for NE Arctic cod, the Norwegian coastal cod allocation was set independently. At

the end of the 1980s, the major fish stocks of the Barents Sea declined dramatically. TACs and quotas were sharply reduced and attempts were made to reevaluate the separate components. ICES asserted that there was no evidence of reproductive isolation between the cod groups. Notwithstanding this, the Norwegian coastal cod retained its independent status for management purposes. The new 'orthodoxy' was challenged by scientists at a newly established institute - the Centre of Marine Resources (CMR) based in Tromsø and responsible for research on coastal resources - who focused attention on an operational definition of coastal cod. They criticised the irrationality of a regime in which coastal and NE Arctic cod were managed jointly and went further by suggesting that coastal cod was not one but several local independent stocks and recommending a decentralised system of management. In a reaction to the introduction of new management regulations to combat the resource crisis of the 1980s, a local management system sponsored by the neighbouring local authorities - the Lyngen Fjord Project - was proposed for a trial period of five years. Following opposition from the central research directorate in Bergen and the Director of Fisheries in the county administration, both of whom feared the repercussions of a successful trial in terms of proliferation of local schemes, the proposal was rejected by the Fisheries Ministry on grounds that the basic premise of separate fish stocks indigenous to the areas was invalid. In fact, the Ministry clearly perceived the project as a fundamental attack on key features of the established fisheries management system and as undermining its own authority through the proposed transfer of management powers from central to local organisations. Thus the Ministry championed the principle of fish as a national resource and the CMR was put under pressure to redirect its research towards the mainstream view that coastal cod is not independent of NE Arctic cod.

As an example of institutional entrepreneurship, this attempted construction of the coastal cod was flawed. But the existing regime currently faces problems which could be addressed by a reconstruction of coastal cod. These problems include the trend away from simple one stock models, pressure to reform the Barents Sea regime to take account of the UN Agreement on Straddling Stocks and, finally, the emergence of the Sami nation with acknowledged property and management rights to fishery resources.

2.3.4 *Enforcement and legitimacy in the Barents Sea*

Geir Hønneland, Fridtjof Nansen Institute, Norway

Management institutions adopt deliberate strategies to encourage compliance to their regulatory measures, through mechanisms which seek to structure the incentives for fishermen to choose between compliant and non-compliant behaviour. These incentives take varied forms including punishment along with inspection systems to reduce the probability of violation, on the one hand, and efforts to influence the underlying criteria in decision making about compliance, on the other. Seven bases of compliance can be recognised: self-interest; enforcement; inducement; social pressure; obligation; habit; and conviction based on the principle of communicative action. Each varies in its

degree of manipulation by public authorities, with enforcement, inducement and conviction the more amenable to manipulation. Two broad streams of compliance mechanisms can be identified: *coercive measures* (enforcement, inducement) which are more suited to the logic of Hardin's analysis of the management of common property resources, and more *discursive measures* (obligation, habit and conviction) which are more appropriate in the context of theories relating to cooperative action.

An application of this thesis is attempted in respect of the Barents Sea - one of the world's richest fishing grounds - where since 1976 management has been shared between Norway and the Soviet Union/Russian Federation. As the two states were unable to agree the basis for delimiting their respective EEZs, a temporary 'grey zone' was negotiated in 1977 to avoid unregulated fishing in the disputed area. A second area of contention is the Protection Zone around Svalbard, established by Norway in 1977, but disputed by other signatories to the Svalbard Treaty. To avoid prosecution in international courts, Norway refrained from penalising violations in this area. A management regime based on Russo-Norwegian cooperation in research, regulation and compliance control has proved successful in recent years, with TACs and quotas agreed by a Joint Fishery Commission and implemented through national ministries.

In the Norwegian sector, the fisheries are subject to control both on shore and at sea, using passive control through a paper chase of catch and landing statements and active controls through inspections. From data covering the period 1986-92, the level of inspections resulting in warnings and prosecutions indicate that an overwhelming majority of fishing vessels in the Norwegian zones do comply with regulations. To explain this situation three possible explanations are considered: (i) compliance is unaffected by management measures and is largely based on self-interest; (ii) compliance results from the coercive measure actually in place, i.e. the risk of detection, arrest and punishment; and (iii) compliance results from discursive measures in which fisheries perceive the regulations as legitimate and respect the non-coercive roles of the Coast Guard. Actual compliance probably cannot be explained by any one single factor: different mechanisms are activated in different situations often simultaneously with a mixture of obligation, habit and conviction at work. The fact that compliance is achieved even in the Svalbard zone, where coercive measures are absent, suggests that coercion alone cannot explain compliance behaviour among fishermen.

2.3.5 *Sharing of revenue in Icelandic fisheries*

Thorolfur Matthiasson, University of Iceland

International comparisons suggest that shares are almost a universal form of remuneration in fisheries. Fishermen in Iceland are remunerated by a share of the revenue from the catch - a system which has been used for a very long time. The rules governing the sharing of the catch value between the boat owner and the crew have varied through time and space but have usually depended on the number of men required to man the boat, the size of the boat

and the gear in use. With the introduction of trawlers in the early twentieth century, the sharing system tended to be replaced by fixed wages, sometimes augmented by bonus payments. Since 1960 two different remunerations systems have been used concurrently: on the smaller trawlers under 500 DWT, crew members have been paid through a share of the revenue while on the fewer but larger boats fixed payments together with a complex bonus system was in use but has all but disappeared. The rules governing the share system are determined by the organisations representing the vessel owners and the crew members through a collective bargaining system. These rules rest on two pillars: first, the division of the value of the catch between the vessel and the crew and, secondly, the distribution of the crew's share. The ratio of crew income to total revenue will differ according to vessel type, gears etc. but the relative share paid to the various categories of crew is virtually uniform. Costs may also be shared, usually on the basis of trip-related costs.

In Iceland, the relative size of the share parameters for different fisheries is held more or less constant. Thus the relative size of the share parameters for the crews of a 25 ton longline boat and a 250t trawler are constant. Where the overall profitability of the fleet is reduced or increased, the revenue shares in all fisheries are changed either through automatic rules or renegotiation of contracts. The relative wages of crew member categories are fixed and practically unchangeable; thus, the relative wages of a mate and a deck hand are fixed. Almost no cost sharing occurs within the Icelandic fleet. Although sharing arrangements do have a tendency to disappear when new technologies or needs of production are introduced, they also have a tendency to resurface later on as a response to adverse external conditions for the fisheries.

2.3.6 *Modernisation of the fish processing industry in Finnmark: impacts of formal education and challenges for resource management.*

Ketil Hanssen, Finnmark College, Norway

Fish processing in Finnmark is an international industry with its main markets overseas. In competition with processes world wide, it has undergone two major changes in the last two decades: towards less flexibility and more specialisation and towards a greater dependence on high seas fishing. Modernisation of the fishing industry involves three interacting processes: modernisation of the fleet, the processing industry and the workforce. The number of processing plants has decreased by around one third since 1980 and the labour force has declined by 45%: smaller factories have gone out of existence.

Fishing settlements in Finnmark have been described in terms of open labour markets, with an open production system based on a local knowledge system. Flexible use of labour and the ability to mobilise additional labour in peak seasons were essential features. The recent tendency has been for an increasing closure of the system through environmental regulation, hygiene regulations, limited use of casual labour *inter alia*. Labour requirements are more specific and the pattern of work more segmented; production processes are more

efficient, automated and less transparent. There is less interaction and cooperation between factory and local society; even in communities where more than 20% of the workforce is employed in fish processing, there is a striking lack of relations between different parts of the working life. Formal knowledge, through education, is strengthened at the expense of both local knowledge and 'learning on the job', especially among top manager and section heads.

Several factors account for these changes: the volume and specification of raw material supplies: the development of specialised freezing and filleting technology; the logistical outcomes of economies of scale; and the impact of legislation controlling vessel ownership, export monopolies, factory safety and hygiene. Recent policy statements by the State Development Bank have reinforced the need for the deployment of more capital intensive processing and for more formal training of the industry's workforce.

The labour market is divided between a small core of skilled persons (managers, foremen, technicians and skilled workers), most with formal education and who are, to a degree, functionally flexible, and a large periphery of unskilled workers many of whom work part time and among whom turnover is high. Skilled workers are required to handle 'simple uncertainty'; they cope with most tasks satisfactorily and even unskilled workers can accomplish many of the tasks after only a short period of training. But an increasing minority of workers must be able to handle a wider range of uncertainty, requiring more formal training. Formal education can help to build communication networks which facilitate the transfer of technical information both within and outwith the factory.

Finally the paper addresses a number of challenges for resource management - including access to both national and international systems of raw materials on an all year round basis - in which it is recognised that changes to the structure of the processing industry may imply significant impacts.

2.3.7 *Early Swedish whaling in the North Atlantic and the Arctic*

Kenneth Awebro, Luleå University of Technology, Sweden

Whaling as an economic activity has been known from prehistoric times in Arctic waters and possibly in the North Sea. From medieval times onwards both the areas and the methods of whaling have been expanded, initially for the valuable whale oil used as an industrial lubricant and as lamp oil. In the middle of the eighteenth century, London - with its population of over a million inhabitants - had street lighting based mainly on whale oil. A lively period of increased activity occurred in the seventeenth century with organised hunting off Svalbard where, in the 1630s, as many as 300 vessels used the harbour at Smeerenberg. English, Dutch, German, French and Danish whalers were the most active. By the end of the seventeenth century, whaling at Svalbard had declined as a result of ruthless levels of exploitation. The range of whaling expeditions in the Arctic, especially by British ships, was extended

into the undisturbed waters or Novaja Zemlja, Greenland and Labrador. Whaling and its related industries increased rapidly in the first half of the nineteenth century, but small catches in Arctic waters and greater chances of successful hunting elsewhere gradually led to a reduced level of dependence on the Arctic.

Swedish participation in whaling was encouraged by royal charter in the seventeenth century, with several of the chartered companies having their origins in Swedish controlled areas on the southern shore of the Baltic (e.g. Lübeck). Within Sweden, Gothenburg became the principal whaling port in the eighteenth century. The whalers' knowledge of navigation in Arctic waters made them invaluable members of Arctic exploration expeditions.

More research is needed to document more fully the importance of whaling in Sweden. New archival materials have come to light which detail Arctic whaling expeditions from Gothenberg in the eighteenth century. These may well shed more light on Sweden's role in the European race to exploit the northern waters.

2.3.8 *Discussion*

A key feature of the above group of papers is the emphasis - explicit or implicit - on the need for flexibility in response to changing conditions, whether this applies to the coping strategies of individual fishing enterprises, the spatial scales of management, the remuneration of the crew or the structural characteristics of the processing industry.

The question of how governments might best act to create a basis for greater flexibility of response within the harvesting sector was answered, somewhat surprisingly, with an argument for more regulation - or rather more discriminatory regulation - distinguishing between different user groups and allowing the less specialised coastal fishermen easier access to alternative forms of activity both within and outwith the fishery.

Too much 'flexibility' and too much local autonomy in the management of Norway's coastal cod stocks is clearly not only a threat to established management systems (and to the state's overall control) but also posed real risks of disorganisation. It also conflicts with Norway's self-image as the 'world champion' of effective fisheries management; it was difficult to challenge the system when it was winning praise for the recovery of the NE Arctic cod stocks. The opportunity for the construction of local management systems may have passed but any new attempt might be more effectively tied to the issue of Sami fishing rights in order to contain the risk of contagious spread of local management systems.

The customary sharing of revenues from the fishing trip and the introduction of ITQs do not sit easily together: the relative contributions of vessel owners, skippers and crew are distorted. A period of intense debate between the quota owners and the fishermen can be anticipated, with the idea of fixed pay for

crew members becoming increasingly likely. There are other questions: who, for example, should pay the costs of renting quotas? what about the question of equity over the sale of ITQs and the payment of compensation to crew members for loss of livelihood? Overshadowing these questions is the bigger issue of ownership of natural resources - whether in public or private hands - and the kind of society which is implied.

In seeking greater diversity in the product mix emerging from the processing sector in North Norway, the best chance, it was suggested, may come from the development of new, knowledge based, private companies with strong market intelligence concerning niche products - rather than through changes within the existing forms specialising in block production (see also 2.4.3 and discussion at 2.4.7).

Two other questions were explored: firstly, the extent to which it would be possible to customise the principal bases of compliance within the regulatory system; and secondly the assumption that the population of whales in the Arctic actually sought out 'more peaceful waters' in the eighteenth century. It was suggested that overexploited waters are seldom, if ever, recolonised because the memory store controlling migration patterns is removed through extinction of a particular stock. Oceanic climate change may also have contributed to the decline of whale stocks in the seventeenth and eighteenth centuries.

2.4 **The Baltic Sea**

2.4.1 *Introduction*

The Baltic represents something of a new area of interest and concern for the EU. The accession of two new member states (Finland and Sweden) and the reunification of Germany together create a significant group of coastal state interests now represented by the EU in negotiations within the International Baltic Sea Fisheries Commission (IBSFC). None of the five independent coastal states were represented in the workshop. The Baltic is, in some ways, a microcosm of the problems and issues of fisheries management facing the North Atlantic region in general, suffering as it does from fluctuations in the levels of stocks and the consequent challenge of economic uncertainty. More than the North Atlantic as a whole, the Baltic also faces specific threats of environmental degradation from varying sources of pollution and disruption to the ecosystem.

Birger Rasmussen, a representative of the fishing industry on the Danish island of Bornholm, provides an industry perspective on some of the management issues in the Baltic, contrasting the fortunes of the cod and salmon fisheries and highlighting the disputes over management objectives for the salmon fisheries which reflect the very wide range of interests involved (commercial and sports fishermen, conservationists and scientists, *inter alia*).

The case of the Baltic cod fisheries is developed further by *Tomas Vedsmand et al.* Their analysis on the 'boom-bust' scenario and of institutional inertias on Bornholm reflect quite closely Hanna's thesis concerning the inert structures of management institutions. On Bornholm such inertias allowed investment in both harvesting and processing capacity to continue well beyond the period of maximum harvest and so contributed to the steepness of the subsequent decline.

Two papers on Finnish fisheries analyse the strategic responses of fishermen from two contrasting theoretical perspectives but reach broadly similar conclusions. *Juhani and Pekka Salmi* base their analysis on the 'lifemode' approach. The traditional cultural dimensions of small scale, family based enterprises, embedded in a highly fragmented fishing sector, continue to exert a strong influence on the strategies of adaptation to changing circumstances. By contrast, *Anna-Liisa Toivonen's* thesis is that Finnish fishermen can no longer continue to fish as before and stand in urgent need of more clearly defined business strategies in order to survive. She concedes that the fragmentation of the fisheries sector is a key problem, negating many of the conditions required to promote pro-active, entrepreneurial strategies and concludes that coastal fisheries will survive, at least in past because of the strength of traditional values.

Marita Alatalo and Håkan Appelblad's paper adds an important new dimension to the discussion of fisheries management by introducing the concept of recreational fishing in the context of the exploitation of wild salmon stocks in the few remaining undisturbed rivers in northern Sweden. Optimising salmon fisheries as a regional recreational resource depends on a system of regulation which protects wild salmon from capture by commercial fishermen during their seabourne migrations. The inclusion of recreational fisheries in the spectrum of fisheries management is not uncommon in North America but has remained a subdued theme in European literature.

2.4.2 *Problems in Baltic Fisheries: the cases of cod and salmon*

Birger Rasmussen, Danmarks Fiskeriforening, Bornholm, Denmark

Fisheries regulations, TACs and quota allocations for the Baltic Sea are negotiated annually by the International Baltic Sea Fishery Commission (IBSFC), involving delegates from all nine coastal states. Denmark, Germany, Sweden and Finland, however, do not participate as independent countries but as members of a EU delegation. With only one vote to represent these four countries there is a high risk of being voted down, though to date this has not presented a problem for Danish interests. Prior to the meeting of the IBSFC representatives from the Danish Fisheries Association meet with scientists and officials from the Danish Ministry to discuss the strategy for the coming negotiations, against the background of ICES advice. Thus the Danish FA has the opportunity to influence the Danish position with regard to technical rules, seasonal regulations and TACs. A Baltic working group, comprising the four EU member states, has been formed with the aim of finding a common stance

on matters to be discussed in IBSFC. Overall it is a system that has worked well, though there are a number of important policy issues.

Fishing opportunities for Danish fishermen were generally curtailed by the introduction of EEZs in the late 1970s. From a position of being able to fish throughout the Baltic, Danish waters were restricted to a radius of 20 nm around the island of Bornholm to the west and 40 nm to the east. Attempts to reduce the levels of fishing effort in the Baltic failed: total landings of cod more than doubled from 150,000t in the mid 1970s to around 360,000t in the early 1980s, encouraged no doubt by favourable changes in stock abundance. Under such pressure, the fishery collapsed, with only 40,000t landed in 1993. Since then catches have gradually been improving towards the 'normal' level.

For salmon, the situation is different. There has never been a time when so much salmon could be caught in such a short period of time, but existing TACs impose very severe limitations. Establishing a sensible TAC for salmon in the context of sharply falling market prices, is one of the bigger problems facing the IBSFC and Danish fishermen. Their present unsecured position is the result of the diverse range of organisations which participate in discussions concerning the Baltic salmon fishery, including not only commercial fishermen but also sports fishermen, conservationists, consultants, local politicians and the scientists, whose concern is limited to the wild salmon populations only. One reason for the Baltic salmon problem is the building of hydro-electricity power stations along many of the Swedish rivers. The result has been that many of the natural spawning grounds have been destroyed and their migration routes blocked. To compensate for the loss of natural production, vast numbers of reared salmon smolts are released into the Baltic Sea each year, with strict regulation over the origins of the present stock to preserve the original genetic material. 'Genetic pollution' is considered by some to be a particular risk. Indeed, a hysterical and almost religious fervour attaches to the regulation of the salmon fishery. Some groups demand the end to salmon netting because of the incidental bycatches of sea birds and mammals, though there is little evidence to support this argument. In February 1997, IBSFC agreed a Salmon Action Plan for the period up to 2010 to secure the future of the Baltic salmon fishery; hopefully this will provide the basis for increased TACs.

2.4.3 *Growth and decline in fisheries: the case of the Baltic cod fishery*

Tomas Vedsmand, Peter Friis and Jesper Raakjaer Nielsen, Denmark

Fisheries which consist of few species but very productive fish stocks are prone to fluctuations which may have severe impacts on the fishery dependent populations. Such has been the case with the Baltic Sea where cod has played a dominant role in the development and decline of the fishing industry. Cod landings rose sharply at the end of the 1970s to reach a level of around 400,000t in the early 1980s; thereafter they declined steeply to a low of less than 50,000t in 1993. One area which has suffered extensively from this downturn is the Danish island of Bornholm. Significantly, however, the

Bornholm fleet continued to expand well into the 1980s reaching its maximum in 1987; fleet capacity had virtually doubled between 1981 and 1987, although landings peaked in 1984. It is clear that there is considerable inertia in the social processes accompanying an increasing or decreasing fishery which can result in new investment in vessels and processing plant continuing for some time after the resource has reached its climax and started its collapse.

Several institutional factors had assisted the growth of the industry: access to capital was fairly easy both through the local banking system and through public subsidies; access to labour was also easy - alternative employment opportunities were meagre; a specialised mass production system had evolved with technological developments in harvesting and processing (block production, single frozen fillets); and the resource management system itself did little to restrict output from the fishery during the growth period, despite the introduction of TACs in 1978.

The increasing fishing and processing capacity made possible by such factors put the cod stock under considerable pressure, which was further aggravated by the fishermen's investment structure. Fishermen have the economic incentive to continue a high level of fishing in order to pay back the interest on investments in vessels and equipment, thus extending the pressure on the stocks and helping to precipitate the collapse. Under conditions of declining stocks, several of these institutional factors reveal perverse behaviours. It becomes difficult to obtain loans and credits for fishing related activities even though these may be intended to change the production strategy away from the old patterns to more appropriate forms (quality related, value added processing). The labour force characterised by a high proportion of low skilled workers makes redeployment into alternative occupations difficult. The strategic response from the sector is continued mass production - there is no qualitative change in the composition of output which remains overwhelmingly dominated by codfish blocks. Choices made during the growth period are largely irreversible - bound by past technologies, routines and learning, which impede change to alternative strategies. The industry continues a resource based approach even when a knowledge based approach is a clear precondition for future development.

The underlying question is whether fisheries management can cope with fluctuating resources. The 'cycle phenomenon' evident in the cod fishery seems to be a self-perpetuating process with an inbuilt inertia. No institutional arrangements have been able to control the process and prevent the collapse. The present institutional approach in fisheries management is inadequate: it builds entirely on a biological rationale and neglects the significance of social and economic institutions which facilitate factor endowment and overcapacity. Among several possibilities for improvement are: (i) regionalisation of the management system to improve flexibility and speed of response; (ii) incorporation of economic institutions (fiscal measures), and (iii) integration of fisheries management within regional industrial development policies.

2.4.4 *Livelihood and lifemode: social and economic aspects of Finnish commercial fisheries in the Baltic Sea.*

Juhani Salmi and Pekka Salmi, Finnish Game and Fisheries Research Institute

Commercial fisheries in Finland have been facing substantial changes especially in relation to markets and management. However, transformation of the meanings of occupation and culture have been slower. The concept of 'lifemode' is used to represent the cultural dimensions of commercial fishing. Despite its marginal role in the national economy, fisheries occupy a significant place in everyday life, with one third of Finns involved in fishing as a recreational or subsistence activity. Commercially, fishing remains a family based, small scale enterprise exploiting a combination of species on a seasonal basis. The mainstay of the commercial fisheries, accounting for over 90% of landings, is the Baltic herring - largely dependent on the demands of the fur industry which takes c75% of the catch. Other important fisheries are salmon and whitefish. Fisheries in Finland, as elsewhere, are characterised by uncertainty, though the cause is mainly attributable to the effects of coastal management and markets rather than the fish stocks or the natural environment. The decision making system involves several actors at local, regional and state levels and is complicated by private ownership of inshore waters. While the state is responsible for offshore fisheries, statutory fishery associations representing private owners are the effective decision makers for coastal fisheries. Compared with Norway and Sweden, the Finnish commercial fishermen are weakly organised. Not until 1980 was a national organisation representing commercial fishermen formed and to date no producers' organisation has been established.

Based on interviews with over 200 commercial fishermen, an insight into the lifemode of Finnish fishing can be obtained. Traditional fishing culture still exerts a strong influence over modern fisheries. Peasant motivations aiming at securing the needs of the family, rather than making a profit, prevail: many commercial fishermen will avoid economic risks to secure only a modest level of income. Entrepreneurship is rarely stressed among the fishermen's self-evaluation. Inshore fishermen value working in natural surroundings while offshore fishermen choose fishing because of the independence and traditions of the occupation.

Coastal fishing is a fragmented sector of the economy in which no one individual has a significant market share: the number of fishermen is high and the daily level of purchasing by wholesalers and processors often very low. Many fishermen feel powerless and alienated in the context of changing market conditions and regulation of the industry. They are more closely related to their own fishing, nature and environment, fish resources, other fishermen and the local community and it is through these factors that they have more or less successfully adapted to the prevailing conditions. Adaptation has been achieved in three main ways: (i) by combining fishing with other income sources - a traditional means of combating seasonality and uncertainty; (ii) by intensifying and rationalising the fishery on a year round basis through

improved technology; and (iii) by engaging in processing and marketing of their produce (smoking of salmon and whitefish). Adapting to future uncertainties will require the development of stronger representative organisations and a system of co-management - a major challenge for an industry characterised by highly diverse structures and traditional lifemodes.

2.4.5 *The going gets tough - strategies of coastal fishermen in Ostrobothnia*

Anna-Liisa Toivonen, Finnish Game and Fisheries Research Institute

Fishing has always been economically and socially important along the Finnish coast of the Gulf of Bothnia where catches are dominated by salmon and whitefish. The conditions under which fishing is carried out are becoming increasingly uncertain; the business environment is changing with 'external' factors becoming increasingly prominent. The going gets tough as fishermen can no longer continue to fish as before - they need strategies to survive.

Finnish fishermen most value their freedom and independence - but regulation of the fisheries is becoming increasing tight and unpopular. Management of the salmon fishery involves regulating the season, gears and quotas. Coastal fishermen claim that regulation of their activity has been greater than for the offshore sector; competition among coastal fishermen is strong. Low prices for salmon and negative price elasticity are particular problems. The need to husband resources through careful regulation and to restock certain species (trout, turbot) is widely appreciated by the fishermen but the full time fishermen strongly disapprove of those who get their main income outside fishing and can therefore afford to sell their catches at lower prices. Seen as something of a buffer economy, fishing offers flexibility and opportunity during periods of unemployment. Everyone, it is generally recognised, is entitled to fish as a hobby or for household consumption but selling the catch is a different matter. Among the fishermen's own strategies to sustain or improve their livelihood, improving cost efficiency is recognised as increasingly important. Traditionally this has meant reducing operating costs by fishing close to home but this is no longer a universal view. Use of more appropriate fishing gear, expanding the size of the operation by increasing the number of nets used, home processing of the catch and direct selling of the product to supermarkets and private customers are other means of improving the economic performance of fishing.

As entrepreneurs, fishermen should aim to develop a viable and competitive position for their business. According to Porter (1980, 1985), the range of strategic alternatives available will depend on five competitive forces: internal competition, supplies, markets, barriers to entrants and substitute products. Internal competition is not seen as a problem by Finnish fishermen except for the disturbance to markets caused by the occasional trade from part time fishermen. The availability of supplies requires the adoption of flexible fishing patterns, careful regulation of resources and the restocking of certain species. Markets controlled essentially by wholesale dealers, provide a secure well functioning system in which the harvesters' influence will remain very limited

unless they are able to organise themselves more effectively. Creating barriers to the new entrants is a problem. As there is no requirement for formal education, registration or major investment, it is easy to enter the fishery but obstacles to leaving the industry are high. Competition in food markets has proved tough, with reduced prices for white meats and the imposition of VAT on fish products since 1995 having a major impact.

Fragmentation of the industry is a problem. If it cannot be overcome through economies of scale and business concentration, it must be adapted to. But competitive strategies such as cost leadership and product differentiation rarely apply in a fragmented industry, especially when it is in the mature stage of its life cycle. A third strategy - focusing catch effort only on high season fishing - would require the fishermen to have access to additional incomes during the low season. Coastal fishing will survive not only because of the scarcity of alternative jobs, but also because of the strengths of its social and cultural values.

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2.4.6 *Wild Swedish salmon: a regional development resource by recreational use*

Marita Alatalo and Håkan Appelblad, Umeå University, Sweden

Recreational fisheries may well become a cornerstone of the globally burgeoning tourism industry. Recreational fisheries oriented towards salmon angling have already emerged as important 'industries' in Norway, Ireland, Scotland, Russia and Canada, *inter alia*. Salmon anglers are willing to spend time and money on their activity and thus make a valuable contribution to the local economy. In Sweden, only a few waters have been developed for sport fishing. The activity depends on rivers with good reproductive capacity and strong flows of spawning salmon. But these conditions are being degraded. Around 70 salmon rivers around the Baltic Sea have been damaged by hydro electricity development and other environmental impacts. At present, considerable potential for salmon angling is available in northern Sweden, though the stocks of wild salmon are threatened from several sources. Over exploitation of wild and released salmon by commercial fishermen in the southern Baltic is a particular problem because some of the wild stocks are not strong enough to withstand high levels of exploitation. Reared salmon, released under compensation programmes to take account of losses from hydroelectric development, dominate recruitment in the Baltic where wild salmon account for less than 10% of total stocks. The other serious threat comes from the M74 syndrome which causes mortality among newly hatched yolk-sac fry. Although present for many years, in 1990 losses dramatically increased.

The IBSFC has reduced the salmon TAC every year since it was first introduced: in 1997 the TAC allowed a catch of 410,000 individuals, of which Sweden's allocation was 28%. But the TAC is disputed. Anglers and fisheries biologists argue for a halt to the offshore fishery to prevent the extinction of wild salmon stocks. Others argue that this would have a severe negative impact on the commercial fishing industry.

In Sweden it is estimated that there are 2.2m recreational fishermen (25% of the population). Those involved in salmon angling form a well defined sub-group of between 10 and 25 thousand specialist anglers, with perhaps as many as 100,000 potential participants, given favourable conditions (i.e. good catch prospects). Most of the existing anglers are local people resident in northern Sweden, while most of the 'potential' anglers, living in the urban areas of southern Sweden, are more likely to travel abroad (Norway, Scotland and Ireland) for their salmon fishing. In the northern counties of Norrbotten and Vasterbotten, given optimum conditions for wild salmon stocks, an estimated annual harvest of 300t from sports fishing is feasible, supporting an angling activity of c300,000 days. The aggregate economic revenue from client and secondary expenditure, together with an economic multiplier, is estimated at around 198m SEK per annum and would support roughly 180 full time jobs in the tourism sector.

The realisation of such a scenario is dependent upon effective regulation of the Baltic salmon fishery. The National Board of Fisheries in Sweden has proposed a more structured system of regulation including permanent closed areas with commercial fishing directed towards reared salmon. But such regulations would require international agreement involving countries with less interest in salmon angling than Sweden.

2.4.7 *Discussion*

Apart from revisiting the discussion on flexibility and the need to develop more entrepreneurial strategies to cope with the changing conditions in the Baltic Sea fisheries, two main questions dominated the discussion: the 'salmon issue' and the need for a switch to 'knowledge based' industries in the processing sector.

One constraining factor in the improvement of marketing systems in Finland is the small volume of landings involved, which effectively rules out the introduction of auction markets but suggests at the same time an important role for producers' organisations.

In the case of Bornholm, it was felt that regional management systems could have the effect of mobilising a more comprehensive industrial strategy based on the exploitation of 'local' resources and a greater emphasis on added value. One of the problems of institutions associated with the promotion and management of the fishing industry is their isolation from other more dynamic sectors of the regional economy. There is perhaps a need for the 'genetic manipulation' of fisheries institutions to infuse more commercially oriented

business instincts into their organisation. Regional management systems - in the fullest sense - could provide the catalyst for this. The question was raised as to how easy it would be to switch to value added production at a time of declining landings and when the existing processing firms were reliant on purchasing raw materials at relatively low prices. The most obvious examples of knowledge based processing in the fishing sector were multi-national firms with their knowledge base rooted in sources of raw materials, technology and markets. Firms like the Norwegian Resource Group International buy up local knowledge and redeploy it in their global strategy. At present, it is the food manufacturing industry, using similar strategies, which exploits the harvesting sector as primary producers existing on comparatively low margins.

Possibly the most contentious issue, touched on during the Workshop, is the 'salmon question' where there are two interrelated problems: the release of smolts bred in hatcheries to replenish salmon stocks in the Baltic and the problem of 'genetic pollution'; and the conflicting claims of commercial and recreational interests for preferential recognition in the management system. In part, the latter issue is linked to comparative economic returns, where it is estimated in Norway, for example, that river caught salmon is 'worth' three times more than sea caught salmon - though such calculations are subject to a wide range of interpretation. The issue is also linked to the question of flexibility: most commercial fishermen are engaged in catching salmon for only one to three months a year, but they may still need the incomes from this seasonal fishery to survive. In Sweden regulation of the sports fishery is undertaken by 'management units' - some in private, some in public (municipal) ownership. In response to the assertion that it was perverse to target salmon during their spawning migrations - at a time when conservation would have its maximum benefit - it was noted that in the large Swedish rivers it was difficult to capture more than a small proportion of the salmon on their migration routes. It was estimated that c35% of returning fish could be taken without risking any decline in stock levels.

2.5 The North Sea ... and other northern waters

2.5.1 *Introduction*

The North Sea is probably the most intensively fished area in the world. It has been a centre of technical innovation and, more controversially, the point of origin from which the problem of overfishing has been diffused throughout the North Atlantic region, through the development of increasingly efficient, capital intensive and highly mobile forms of fishing. Despite the early warnings of overfishing in the 1880s, the North Sea continues to yield harvests of over 2 million tonnes of fish each year, mainly as the result of 'trading down' from high to low value species. In particular the growth of industrial fishing has targeted stocks of fish not favoured for human consumption. This, in turn, has led to mounting concern over the effects of modern fishing patterns on the North Sea ecosystems.

Several papers deal directly or indirectly with the increasing pressure to integrate fisheries management with the broader concern for marine environmental management. Two invited keynote papers develop this issue: the first from the perspective of fisheries science and the second from the viewpoint of the conservation of marine fauna, specifically seabirds. *Henrik Gislason and Eskild Kirkegaard* question the sustainability of industrial fishing in the North Sea with particular reference to the prolific sandeel fishery and argue the need to regulate the fishery through a precautionary approach involving a detailed management plan which takes into account spawning stock size and the dependency of seabird populations on the species.

Taking up this theme in more detail, *Euan Dunn* reasserts the growing consensus for an ecosystem approach and assesses the impacts of current fishing patterns on the seabird population in the North Sea. He points out that integrated management is difficult - the relationship between fishing patterns and seabird populations are far more complex than is often assumed - and seabird populations may indeed prove extremely vulnerable to radical changes in fisheries management aimed at restoring dwindling stocks of commercial fish.

The Netherlands provides a rare example of a coastal state which has gone some way to reforming its fishing policy so as to incorporate an integrated ecosystem approach, following the 1993 White Paper, *Balanced Fisheries*. Two papers examine some of the difficulties encountered in effecting this change of approach. In the first, *Martijn van Vliet* takes a critical look at the concept of integrated fisheries management and the shift away from the conventional, economically rational policy to one which attempts to guarantee safe biological levels for fishing with minimum levels of damage to other species in the marine ecosystem. Opposition to the new policy underlines the problem of relatively inflexible management structures and also the lack of understanding among the new actors of the behaviour of the fisheries sector.

Rob van Ginkel's paper focuses upon the same issue, but in a rather narrower context of the competition between mussel growers and harvesters and conservationists in the intertidal areas of the Easter Scheldt and the Wadden Sea. Since 1993, the allocation of mussel banks in the Wadden Sea has been divided between commercial fishing and the populations of resident and migrating wading birds - one of a number of potential conflicts emerging in the coastal zone.

Environmental concerns are also prominent in *Nathalie Steins'* appraisal of the crisis in the flat oyster population in Western Europe, caused by a combination of overfishing, pollution and disease. Based on a detailed case study from the south coast of England, she argues that attempts to regulate the fishery through EU Directives and national legislation are failing through a lack of careful integration and enforcement.

The last two papers move away from ecosystem and environmental issues. *Mark Nuttall and Kathryn Burnett* return to what is rather more familiar

territory for social scientists, namely the process of negotiation and management crisis in the North East of Scotland's fishing industry and the leading roles of community and culture. Of particular interest is the recent involvement of religious groups - a powerful influence in most fishing communities - in pronouncements on the morality of current fishing practice and policy.

Finally, *Villi Wiium* examines the present and future relationship between Ireland's fishing industry and the CFP in terms of staying within or withdrawing from the common policy framework. He argues that any real improvement to Ireland's situation can only come about through a reallocation of TACs to favour Ireland's developing fishing industry and this is only feasible under a return to coastal state management.

2.5.2 *Is the industrial fishery in the North Sea sustainable?*

Henrik Gislason (Copenhagen University) and Eskild Kirkegaard (Danish Institute for Fisheries Research)

Since the industrial fishery in the North Sea began in the early 1950s, it has been the subject of intense debate. On the one hand, it is argued that the fishery provides a good way to harvest resources that otherwise would remain untapped: today, it accounts for two thirds of all landings from the North Sea. On the other, it is argued that large catches of small fish deplete the food supplies for other populations in the marine ecosystem. In the early years, herring made up the bulk of industrial landings, but gradually shortlived species such as sandeel, Norway pout and sprat became the most important species. At present, sandeels constitute c60% of industrial landings.

The sandeel fishery, conducted with bottom trawls with a mesh size of ≤10mm, peaks during spring and early summer. Since 1976 annual landings have fluctuated between 0.5 and 1 million tonnes, with a fishing mortality of around 0.6. Recruitment varies without any definite trend, with alternating good and bad year classes. However, the sandeel fishery is subject to considerable uncertainty. The biology of the sandeel makes it difficult to apply traditional fish population models to assess the state of the stocks. No estimate of the 'minimum biologically acceptable level' (MBAL) is available. Moreover the impact of the sandeel fishery on the marine ecosystem is inadequately understood both in terms of other fish species, cetaceans and seabird populations. It is thought that a significant reduction in the sandeel fishery would have only a minor effect on the biomass of other fish species.

At present the industrial fishery is regulated by precautionary TACs for Norway pout and sprat, but there is no TAC for sandeel except in the Norwegian sector of the North Sea. Technical measures have been introduced to limit the bycatch of protected species and areas of the North Sea have been closed to certain types of industrial fisheries as for example, the Norway pout box where small mesh trawls are banned and the seasonal Danish sprat box. In the light of the biological and ecological uncertainties surrounding the sandeel

fishery, the sustainable exploitation of the sandeel would seem to call for a precautionary approach to its development. This would involve the elaboration of a detailed management plan, with the specification of clear management objectives and agreement on operational targets and constraints in the form of limit and target reference points. The fact that the sandeel fishery has been maintained at roughly the present level for the past twenty years might suggest that arguments to reduce overall fishing effort are not very compelling but this view ignores the ecological interactions of the sandeel fishery. A precautionary approach for the fishery should be elaborated in which an upper limit on total fishing effort and other reference points, related to spawning stock, size and impact on seabirds, are specified.

2.5.3 *The impact of fisheries on seabirds*

Euan Dunn, Royal Society for the Protection of Birds, UK

Not only is the current pattern of fishing unsustainable for many fish stocks but it also has a disrupting influence on the marine food web. The most publicised pressures on seabirds are the direct impacts of entanglement in nets and lines but the pervasive effects of overfishing itself are easily overlooked. Fisheries management must restore the balance between fishing effort and available fish resources and thereby ensure long term sustainability of stocks and a more stable ecosystem for marine wildlife.

Sustained over fishing of predatory fish such as cod, herring and mackerel has relaxed pressure on prey species like sprats and sandeels, allowing their stocks to increase - to the advantage of seabird populations which exploit these same prey near the base of the food chain. Of the 270,000t of live prey consumed annually by seabirds in the North Sea, over 80% comprise sandeels and sprats. The growth of industrial fisheries is now threatening to reverse the advantage to seabirds. The present management regime cannot guarantee sustainability of the sandeel at the local scale, where stocks could be fluctuating widely, partly because of the uneven fishing effort of the industrial fleet. A precautionary TAC for the North Sea as a whole, likely to be set at a very high level, would not meet the problem and could, perversely, lead to increased exploitation on particular grounds. The Wee Bankie sandeel grounds in the outer Firth of Forth, close to a major concentration of seabirds, illustrates how a sensitive area can suddenly attract unfettered industrial fishing. Catches have risen strongly since its 'discovery' in 1990 to over 100,000t. This flies in the face of the precautionary principle because there is no way of anticipating the impact on the marine ecosystem. So far there is no evidence of an adverse impact but the lessons of the collapse of the Shetland seabird population in the 1980s would urge caution. A recent management plan for the outer Firth of Forth addresses all marine activities likely to impact on seabirds, drawing attention to the lack of statutory, area based protection for UK seabirds below the low water mark and demonstrating how such areas can be managed by a combination of overarching measures to promote better practice and site specific measures.

Up to half of the fish caught in the North Sea are discarded; of the 600,000t of fish food eaten by seabirds, over 100,000t comprise discards and a further 70,000t offal. As a result, several seabird species have become part scavengers, increased their number and widened their geographical range. Waste production supports between 2.5 and 3.5m seabirds. Measures to reduce discards - technical conservation measures, a shift away from TACs to direct effort control and a ban on discards - have attracted considerable attention. The effect on seabird populations of a major reduction of discarding could be highly significant. In particular, the North Sea community could change to one dominated by the more successful scavengers, with some of the larger gulls switching to preying on small seabirds.

Apart from these indirect impacts on seabirds through effects of fisheries on the food chain, seabirds are also affected directly by fishing gears. For example, with the decline of shelf fish stocks and the consequent growth of shelf-edge longlining, bait-snatching seabirds are being taken as bycatch on longline hooks. Here, the search for technical solutions is driven not only by the desire to eliminate this incidental mortality of seabirds but also to reduce costly bait loss to fishermen, representing a potential win-win situation in terms of both socio-economic benefit and seabird conservation.

Seabird populations this century have thus been vulnerable to radical changes in fishing patterns, the common factor in all of which is excessive fishing effort. The IMM in Bergen recognised this dysfunctional state and provided a first, tentative step towards the necessary policy response for integrating environmental objectives into fisheries management. The effects of fishing on the marine environment are not well known and will always be, to a degree, unpredictable. There is a growing consensus for applying the precautionary approach and for fisheries management to reflect on an 'ecosystem approach'.

2.5.4 *From economic fish stock management to integrated fishery management: a communicative miracle or a Tower of Babel*

Martijn van Vliet, Erasmus University, The Netherlands

The Dutch government's 1993 White Paper, *Balanced Fisheries*, provided a new start for fisheries policy in the Netherlands aimed at more enforceable objectives and an integration of ecological concerns within fisheries management, thus reflecting the diverging tendencies of Dutch politics in the 1980s and 1990s. In the 1990s new stakeholders entered the fisheries policy arena - including environmental organisations and the Ministry of Transport, Public Works and Water Management, The course of fisheries management changed, with the plurality and diversity of views making for livelier debate but also greater difficulty in defining the content of integrated fisheries management with the need to take on board new scientific disciplines and new world views.

Critical of 'economic fish stock management' as practised within the EU, *Balanced Fisheries* proposes a system of biological fish stock management, in

which the government's responsibility is limited to safeguarding the biological minimum (MBAL). The management costs and political effort of trying to ensure sustainable levels of profit were deemed too high for what is only a small economic sector. The policy document also recognises that it is no longer possible to ignore the ecological consequences of fishing activity and the considerable public and political attention that environmental issues now attract. Not only would fisheries policy aim at guaranteeing the safe biological levels for fishing and the minimising of by-catches of non-commercial species, but it should also seek to minimise damage to other species within the marine ecosystem. In particular, *Balanced Fisheries* sets out specific policy objectives for the Wadden Sea, in which the primacy of environmental values are fully recognised, including the allocation of shellfish resources between the bird populations and the commercial fishing industry.

Not surprisingly the new policy met with strong opposition from fisheries scientists who judged it to lack both scientific and economic rationality. Responsibility for framing environmental policies rests essentially with the powerful Rijkswaterstaat - located within the Ministry of Transport, Public Works and Water Management - essentially an engineering and planning based department with a mission of integrated water management. Although scientifically well informed, its entry into fisheries management is handicapped by its lack of knowledge of the fisheries sector and the political economic and social dynamics that surround it. It is thus viewed with some scepticism by the Fisheries Directorate, for whom the dominant policy approach is problem solving and keeping the sector within the legal limits rather than directed towards the attainment of predetermined objectives. In an attempt to move closer together, an interdepartmental working group established in 1994 has advocated an approach which focuses on the concept of 'integrated fish stock management' and the need to strike a balance between the 'use' goals of stock conservation and the 'system' goals relating to the aquatic ecosystem within the North Sea as a means of achieving sustainable development.

2.5.5 *The political economy of marine resource management: Dutch musselmen, the state and the environmentalists*

Rob van Ginkel, University of Amsterdam, The Netherlands

One of the few examples of sustainable marine resource use in the Netherlands concerns mussel fishing and farming. It is a well organised economic sector in which the state, producers, dealers and processors participate in the management process. Nonetheless, mussel farmers face several problems related to multiple use conflicts. Mussel farming in the Netherlands is a semi-culture in which reproduction is left entirely to nature but where the musselmen plant the harvested seed and young mussels on plots rented from the Crown Land Office. The natural beds are usually productive enough to permit the harvesting of seed mussels annually, but in the early 1990s mussels on the natural beds have been in short supply, triggering multiple use conflicts.

In the early 1950s the Zeeland mussel fishery was ravaged by an infection of *Myticola intestinalis* with some musselmen losing 80% of their stocks. Paradoxically, this crisis was the prelude to a period of expansion with the relocation of production to the unaffected seed mussel areas of the Wadden Sea. The great floods of 1953, responsible for huge material damage, eventually gave rise to the Delta Plan for the creation of large freshwater lakes where previously mussel cultivation had taken place. In the 1960s and 1970s several estuaries were closed, though lobbying by fishermen's organisations and environmentalists prevented the enclosure of the E Scheldt and thus granted a reprieve for a major mussel production area. Relocation of production to the Wadden Sea meant the use of larger boats, changing the balance in the factors of production from labour to capital and an increasing concentration of production in fewer but larger units.

Co-mangement of the fishery, in which the state retains jurisdiction over shellfish grounds, polices the waters, monitors the pollution of shellfish areas and finances research and the industry's own Board of Fisheries is responsible for quality standards and the operation of a minimum price system, has so far proved successful. Since the late 1980s, however, musselmen have faced growing opposition from environmentalists, especially in the Wadden Sea, over alleged degradation of the marine environment and the loss of food supplies for the large populations of immigrant and resident birds which use the intertidal areas. Environmentalists have established their claims on the resources of the marine environment and a battle of words between musselmen and environmental lobbyists has ensued. Since 1993, fishermen's organisations and state representatives, in consultation with environmental groups, have agreed to restrict fishing in the intertidal areas: 26% of the intertidal areas of the Wadden Sea and 14% of the E Scheldt are currently closed for shellfisheries.

Conflict with environmentalists is not the only multiple use problem affecting the musselmen. Competition with shrimp and cockle fisheries also occurs and it is possible in the future that musselmen may have to cede some of their territory to the tourism industry. The dilemma for the mussel industry is that while it still has potential for expansion in an insatiable market, this can only be at the cost of diversity and the exclusion of other users from the intertidal areas. Maintaining diversity is the present imperative.

2.5.6 *Ostrea edulis in crisis: the state of Europe's oyster fisheries and lessons from management systems in the Solent (UK)*

Nathalie Steins, University of Portsmouth, UK

Europe's flat oyster (*ostrea edulis*) fisheries are in crisis. Output has fallen from 100,000 tonnes in the 1950s to around 12,000 tonnes in the early 1990s. Overfishing, environmental pollution and disease (notably bonamiasis) are identified as the main causes of the crisis. Protection of the oyster fisheries is vital: regulatory measures are needed to protect the wild oyster fisheries since cultivation techniques are still in the development stage and disease free

fisheries are required to produce juveniles for relaying in the infected fisheries. But regulatory measures vary between different countries, although standards for shellfish hygiene and shellfish movements to prevent the spread of diseases are laid down through EU Directives. At the operational level, however, management institutions are often poorly developed, resulting in overfishing, poaching and illegal shellfish movements.

A detailed case study of the Solent oyster fishery in southern England identifies a number of interrelated operational problems relating to existing regulation. EU Directives, for example, lack overall co-ordination - regulations target one specific area without taking into account the wider effects of their implementation. The implementation of Directives is inadequately monitored; in many instances, implementation is the responsibility of agents who have a vested interest in the Directive's target area as, for example, the UK Water companies' responsibility for the designation of shellfish waters. Some member states have failed to implement Directives which hinder the attainment of the desired standards - not every member state demands health certificates for oysters destined for consumption or laying. In some instances, national and EU regulations are simply just not practicable, as with the shellfish harvesting classification system. Finally, the prosecution of individuals who break the rules is often extremely difficult and existing penalties have little deterrent effect.

The protection of the flat oyster fisheries can only be achieved if existing EU Directives and national regulations are redefined in an approach where individual regulations are not considered only on their individual merits but also take into account their impacts on other sectors. Effective regulation can only be achieved through co-operation between all stakeholders - administrators, scientists, the fishing industry and the water authorities *inter alia* - and a devolved system of implementation which can respond quickly to specific conservation problems without the threat of being overruled by more powerful actions at national and EU level.

2.5.7 *The negotiation and management of crisis in the Scottish fishing industry: a case study from North East Scotland*

Mark Nuttall and Kathryn Burnett, Aberdeen University, Scotland

North East Scotland is, in some senses, a fisheries dependent region in which many coastal communities have failed to benefit form the wealth generated by the offshore oil and gas industry that has transformed the regional economy. Traditionally, local fisheries along the Banff and Buchan coast have been small scale and family based, with communities developing distinctive forms of social organisation centred on close knit kin groups. The fishing communities have remained separate from the surrounding farming and urban communities. Migration patterns and commuting have blurred the social and spatial boundaries. Private rather than company ownership is characteristic with the skipper and other kin members who serve as crew sharing ownership of the vessel. As fishing has become more technologically complex and vessel

size larger, many vessels no longer fish out of the 'home port' but from larger regional ports, and well qualified non-kin crew members have become wage earners.

Viewed from the fishing ports, the crisis in the fishing industry is attributed largely to the CFP. Yet, different views on the future of the CFP have split the Scottish fishing industry, with the Scottish Fishermen's Federation representing a majority of Scottish fishermen favouring reform of the Policy while the Fishermen's Association Limited formed in 1995 as a breakaway group working for the complete withdrawal from the CFP.

To what extent are fishing communities in NE Scotland at risk, as depicted by leaders of the fishing industry? Fears for the future sit uneasily with the image of the industry as something which bonds people together in community and culture. It is increasingly difficult to claim that NE Scotland's fishing communities exist as clearly defined entities; it may be more accurate to describe the region as one typified by networks of associations - potentially fluid, temporary and multi-faceted. Fishing communities are increasingly represented by language which undermines their permanency. But the ability to draw upon a common source of identity of interest remains a powerful resource. Behind the scenes, however, fishermen are managing tensions and personal histories which may divide them from one another as much as unite them. NE Scotland's fishing communities are renowned as deeply religious and this remains a potent factor as to how individuals evaluate their industry. But recently, the morality of the fishing industry and its practices have come under fire from within the Church of Scotland's General Assembly.

A greater understanding of the dynamics and make-up of the fishing industry, and of the social fabric and networks of associations, is necessary if constructive negotiation is to take place between fishermen, industry managers, policy developers, environmentalists and others.

2.5.8 *Irish fishing communities and the Common Fisheries Policy: can they co-exist?*

Villi Wiium, University College, Galway, Ireland

The CFP, characterised by compromises that arise from political logrolling, has engendered hostility among fishermen from different member states who feel betrayed by what they see as the appropriation of 'their' resources and who sense a continuing threat to their livelihoods. As elsewhere in the EU, the fishing industry in Ireland is small, accounting for less than 1% of GDP. Ireland receives only 8% of the total EU total allowable catch, although it contributes some 16% of the common pond (excluding Finland and Sweden). At the time of entry to the EC, Ireland's fishing industry was clearly underdeveloped with its fleet comprising largely inshore vessels. Development of its potential was disadvantaged by membership and the constraints imposed by the CFP, despite some attempts to ameliorate the situation through the Hague Preference.

For many coastal communities where local dependence on fisheries is high, discussions over the future of the fishing industry are, in effect, discussions over rural development and the problems of high unemployment, low incomes and out migration. In regions where employment relies on a single natural resource, there is a temptation for government to try to sustain employment levels through subsidies, even though it may be questionable whether the resources can withstand further exploitation. However, under the existing CFP, the Irish government's freedom of action is curtailed.

The future of Ireland's fishing industry as a basis for regional development is examined through two alternative scenarios. Remaining within the CFP, opportunities are more limited. Increasing employment and income would depend on the ability to increase catches through the exploitation of new grounds or new species or the modification of existing quota allocations to favour fisheries dependent regions. Only the last named presents a real opportunity for improvement but it is politically improbable. The only alternative for such regions is to rely on the introduction of new industries; there are few basic opportunities other than highly seasonal tourism and the preferences of 'new' industries are for urban rather than remoter coastal locations.

The second scenario is for Ireland to claim back some of its lost resources through coastal state management at the expense of a common fisheries policy. While recognising that the exercise of sovereign rights over the 200 mile EEZ is no automatic guarantee of prosperity, an increase in harvest levels through the transfer of quotas from other states, better management and more effective monitoring offers a better long term prospect for Ireland's fishing industry and its coastal communities. Clearly, there will be increased costs to the state as a result of losses in EU funding and the transfer of development and transaction costs. Further analysis of the costs and benefits of coastal state control and the application of the principle of 'comparative advantage' through intra-Community trade is called for.

2.5.9 *Discussion*

The collection of papers on the North Sea focuses attention on the rise of the 'ecological imperative', which is now beginning to displace the conventional productivist approach to fisheries management, and to the problems facing the established management institutions in trying to accommodate this new tendency.

Industrial fisheries, it was pointed out, require high catch rates to remain viable. The location of fishing activity thus reflects those areas in the North Sea where the industry can sustain high catch rates. Such concentration of activity raises particular concerns for the local sustainability of stocks in sensitive areas, e.g. where other marine wildlife is dependent for food on sandeels. The industrial fisheries are, in some senses, a particularly easy political target: with 80% of the catches taken by the Danish fleet, no other EU

member state has a significant stake in the fishery. At the same time, the management system itself lacks transparency.

Not surprisingly, the question of which is the more endangered species - the seabird populations or the fishermen - was raised. In reply, it was admitted that no seabird populations were at risk in the NE Atlantic as a result of fishing practice. Although organisations like the RSPB work within a framework of scientific information, the wider public tend also to bring a welfare argument into the equation. Thus industrial fishing becomes an emotive subject. Political parties tend to be rather more influenced by public opinion; most conservation organisations are concerned to promote rational rather than emotional debate. Part of the problem, however, relates to the lack of scientific information on which to base both the criteria and the thresholds required in a precautionary approach to environmental and natural resource management.

In terms of the specific issues of shellfish harvesting in the context of ecologically based approaches to fisheries management, it was pointed out that in the case of the Wadden Sea the three coastal states - Denmark, Germany and the Netherlands, while committed to an ecologically sensitive approach, have introduced quite different management systems. The level of integration is perhaps strongest in Denmark, where management rests with the Environment Ministry. In the Netherlands, a strict regime for the issue of licences for mussel harvesting has been in force since the early 1970s in line with a policy of non-expansion of fishing effort. The musselmen have benefited from high prices induced by scarcity of supplies set against increasing levels of demand.

A broadly similar situation also obtains in the oyster fisheries of the English Solent, where the number of licences has been reduced, through negotiation, from over 200 to a lower limit of 90. The adoption of the EU Habitat's Directive provides a powerful tool for the integrated management of fisheries in environmentally sensitive areas: in the UK, the development of management plans for marine Special Areas of Conservation will take socio-economic factors into account when trying to determine the extent to which fishing may be damaging the ecological and conservation value of a site.

The discussion also turned to the role of fisheries in the broader regional economic development of remoter rural areas and especially the provision of infrastructural facilities (quays, marketing and processing facilities) where the level of basic production resources are themselves inadequate. The need to apply the test of 'comparative advantage' was stressed.

3.0 Analysis[1]

3.1 *Introduction*

The purpose of a regional workshop is to focus attention upon particular areas and upon issues which are specific to those areas and thereby identify topics for future research. In effect, the Northern Waters Workshop has embraced three quite distinct sub-regions - the North Atlantic and the semi-enclosed Baltic and North Seas - each of which may be seen as a separate sub-system, both ecologically and in management terms, and characterised by different management issues. The papers presented in the workshop represent only a very small sample of the research currently being undertaken by social scientists in these three geographical areas - too small, perhaps, to identify sub-regional themes with any confidence. It is nonetheless interesting to note the different emphases apparent in the three regional sub-sections of the report (2.3, 2.4 and 2.5 above). The following analysis reinterprets the content of the workshop by moving attention away from what are essentially regional perspectives to redefine the key issues relating to the Northern Waters as a whole. Four themes can be identified: (i) flexible strategies and institutional inertia; (ii) discordant rationalities; (iii) integrated management; and (iv) global : local tensions. To varying degrees all four themes reflect upon the interplay of the basic concepts of sustainability, uncertainty, flexibility and integration.

3.2 *Flexible strategies and institutional inertia*

This theme follows on very closely from the initial diagnostic framework encompassing the relationship between management scope and management structure. Basically, according to *Hanna*, management scope - in terms of the aims and objectives of management policy - has lacked stability and thus fallen prey to short term political vicissitudes, while management structures have displayed institutional inertias which have made them unable to respond effectively to an increasing pace of change affecting the fisheries. Faced with the paralysis of management institutions, the different actors within the fisheries system - whether in harvesting or processing - lack both the confidence and the opportunity to develop effective flexible strategies. A key question, therefore, is how can the fishing industry avoid the worst consequences of inflexible management. This theme frames many of the issues presented in subsequent papers, whether they relate to the strategic options for individual fishing enterprises (*Eikeland, Salmi and Salmi, Toivonen*), the recalibration of share systems, initially designed to guarantee distributional equity, under conditions of privatised use rights (*Matthiasson*), the restructuring of the processing sector (*Hanssen, Vedsmand et al*) or the reconstruction of stock assessment and management systems (*Holm et al, Gislason and Kirkegaard*), *inter alia*.

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[1] This section has been compiled with the invaluable assistance of comments provided by the session chairpersons and the two invited commentators: Elisabeth Vestergaard, Aarhus, and Ellen Hoefnagel, LEI-DLO, The Netherlands.

3.3 *Discordant rationalities*

A second thematic complex places the issues of flexibility and management scope in the wider context of centre-periphery structures and the impact of globalisation processes. The discord between management scope and management structures is partly related to the heterogeneous spheres of activity in which policy goals are determined and administered and to differences between the public apparatus and the fishing industry, together with conflicting local and national perspectives. The different rationalities and institutions involved are also related to the locations occupied by the various actors within the system and the unequal rates of change that apply to the different components of the system.

One example of this relates to the actual spatial location within the centre : periphery system. Early in the workshop it was noted that there was a difference in focus between presentations on the 'far north' and other papers. The former concentrate more narrowly on management impacts within the fishing industry itself, while the latter are more preoccupied with the integration of fisheries management with environmental and consumer interests. Is this merely coincidence? Or does it, in fact, suggest a centre : periphery structure, in which the centre's perspectives tend to keep pace with recent 'consumer trends' in the globalisation process - thus helping to account for the instability of management scope generated at the centre? Such instability is clearly evident in the changing management objectives in the Netherlands (*van Vliet, van Ginkel*) and the discordant rationalities can also be seen to imply threats to established research institutes (*Kjaer Hassager*). By contrast, the periphery focuses more on the basic relationships between production, employment and incomes. Although inevitably involved in the global processes affecting markets, technologies and public policies, this dependence on the production of raw materials means that institutions located in the periphery are less likely to be persuaded to change the scope of management, which remains tied to the maintenance of livelihood and socio-economic values. It may also help to explain why the periphery places more reliance on self-management of the industry than on public institutions that may be 'contaminated' by newer, global values.

Discordant rationality is also evident in the relationship between politics and bureaucracy. Within the centre - as for example in the EU or the state authorities - there is an analogous conflict between the political process, which defines the management scope, and the bureaucracies which are in charge of the management structures. The processes which shape management scope are extremely sensitive to changing political trends and power balances, whereas the management structures are designed and implemented within the more stable traditions of bureaucratic institutions and are thus more likely to be oriented towards the system's requirements of predictability and control. Indeed, the management structures are intentionally designed to withstand short term changes in policy direction. This discordance between the political

and administrative processes may thus help to explain why new policy initiatives seldom manage to achieve their desired effects.

3.4 *Integrated fisheries management*

A number of problems which have arisen in fisheries of the North Atlantic can be traced back to the ways in which fisheries management has been abstracted from reality. Fish stocks, for example, have been detached from a broader consideration of the marine eco-system; single species management models have ignored species interactions; in economic terms, the development of fisheries has - with a few exceptions - been divorced from the wider issues of regional development; and the social dimensions of fisheries policy have been largely discounted. Recently, however, the concept of 'integrated fisheries management' (IFM) has come to prominence. In the broadest sense, it means putting fisheries management back into context. In such terms, IFM is a multifaceted complex of aims and objectives - so complex, in fact, that it is easy to understand why sectoral, rather than integrated, management has been the preferred option. IFM is an immensely challenging concept.

At its basic level, IFM is concerned with the integration of fisheries and environmental objectives, in which 'the primary aim of ... management is to ensure sustainable, sound and healthy ecosystems, maintain biodiversity and ensure sustainable exploitation of the living resources in order to achieve economically viable fisheries' (Assessment Report, 1997[2]). Areas like the North Sea and Baltic Sea should be managed as single ecosystems with long term objectives covering both the sustainability of the ecosystem and the commercial fisheries. Presentations by *Kjaer Hassager, Gislason and Kirkegaard* and *Dunn* point in this direction.

But IFM goes further than this. It involves incorporating a range of new stakeholders into the management system. These would, of necessity, include not only marine ecologists and environmental conservationists - where previously fisheries biologists were the sole source of scientific advice - but also recreational interests, primarily but not exclusively concerned with salmon and trout (*Alatalo and Appelblad*) and regional development institutions (*Vedsmand et al*). As papers by *van Vliet* and *van Ginkel* make clear, broadening the representational base of management institutions is, in itself, problematic, with inevitable hazards in managing a discourse which must now take place in several 'scientific' languages simultaneously. Here, there is a major communication problem to overcome.

If the nature of fisheries management is to be altered from one which emphasises production to one which lays stress on conservation and the precautionary approach, does this also raise questions as to the most appropriate location for fisheries management within the governmental

[2] Fifth International Conference on the Protection of the North Sea, Intermediate Ministerial Meeting 1997, *Assessment Report on Fisheries and Fisheries Related Species and Habitat Issues*, Oslo, 1997, p.99.

structures of departments and ministries? With the scope of fisheries management being widened to include concerns for marine environmental management, would it make more sense to relocate it away from the traditional, productivist agricultural ministry and place it centrally within an environmental department? This begs the question as to whether government environmental departments are any less narrowly constructed than the existing fisheries departments.

3.5 *Global : local tensions*

Running through a number of the papers presented in the workshop is the now familiar theme of globalisation effects impacting upon local societies. The problems identified in North Norway (*Eikeland, Hanssen*), Bornholm (*Rasmussen, Vedsmand et al*), NE Scotland (*Nuttall and Burnett*) or western Ireland (*Wiium*) are not created solely - or even in large measure - by purely local circumstances. Most of these problems reflect the global restructuring of the fisheries - the balance of competition between different species and different fishing areas, the internationalisation of the sourcing of supplies for processing plants and retail markets, and the redistribution of wealth from traditional stakeholders (fishermen and local processors) to global players in the form of multi-national companies. Policy making is increasingly being framed at international rather than national or regional levels (*Suarez de Vivero, Sen, Bailey*) through either international organisations (UN, NEAFC, EU) or bilateral agreements. Moreover, as section 3.4 above makes clear, policy formulation is now influenced by an expanding scope of aims and objectives.

In all this, the fishermen perceives himself as the victim rather than the beneficiary of fisheries policy. The industry is forced to retreat into a weaker position - locally and nationally - when competing interests are at stake. Wildlife conservation, aided and abetted by the weight of public opinion, the articulate presentation of the conservation lobbyists and the strength of the negotiating skills of the NGOs, outguns the commercial interests. Recreational interests compete successfully with commercial interests in the lucrative salmon fisheries and local interests have to give way to the established management institutions operating at the national level. In terms of their administration, fishery resources have been appropriated as 'common property' at the national rather than the local level. Thus, the pressures faced by the fishing industry occur on two separate planes simultaneously: horizontally (fisheries v marine wildlife) and vertically (local v national).

Local fishing communities are thus put at risk by the interplay of global forces and the broadening scope of fisheries policy. But they are also being challenged from within, through the changing community dynamics, divisions within local and national fishermen's organisations and by the censure of community institutions which previously reinforced the fishermen's value systems (*Nuttall and Burnett*). At the same time, there is a reluctant but realistic sense that in many cases coastal communities can no longer survive on the basis of fishing alone.

3.6 *Overview*

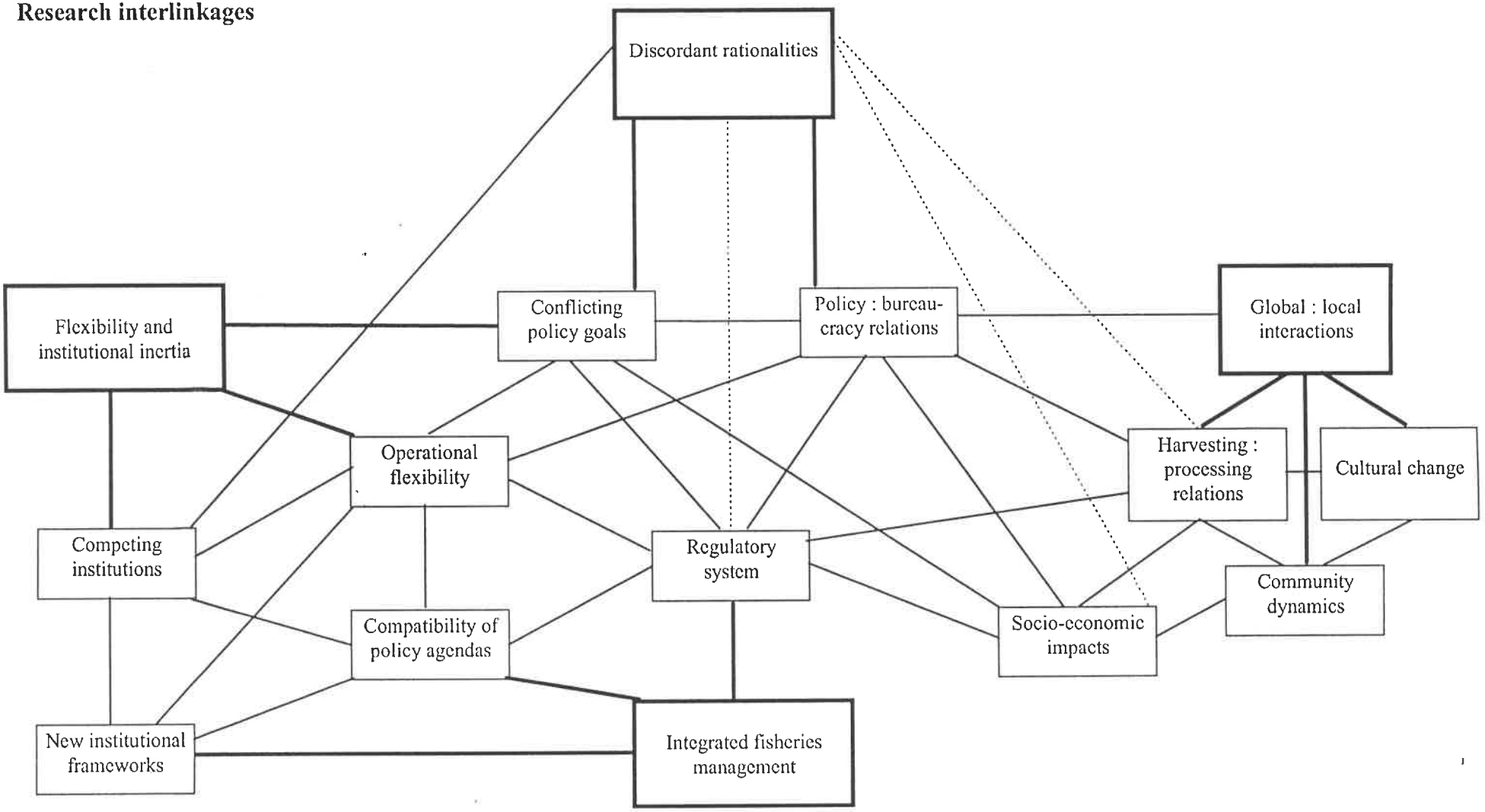
Each of the above themes reconnects the basic issue of 'sustainability' and the objectives of fisheries management in a multidimensional strategy for the marine environment. They reflect the dilemmas over institutional priorities and, in particular, the need to integrate new global values within the management system, set against the parallel need for a stable core of objectives by which to steer the management strategy. At the same time, they clearly demand a reexamination of existing management structures which have so far proved ill at ease in accommodating new stakeholders and changing priorities.

4.0 Research priorities

The above analysis indicates little by way of a radical departure from the established trends in social science research but rather a reorientation of existing work on devolved and regional management, policy formulation and implementation, the socio-economic impacts on fishing dependent regions and the dynamics of community relations. Research is needed on the relationships between the harvesting sector, public authorities, consumer interests and other stakeholders. The reorientation should aim to take full account of the pathology of management institutions as described by Hanna, the pressures to extend the scope of fisheries management into relatively uncharted waters and, in particular, the need for new institutional arrangements to accommodate integrated fisheries management. An outline research agenda is presented in two forms: (i) as a simple table relating the broad themes to general research topics and their more detailed aims and objectives; and (ii) a more complex representation in the form of a web diagram which attempts to indicate the linkages between the different research topics.

Themes	Research Topics	Broad aims and objectives
Flexibility and institutional inertia	* implications of competing institutions in fisheries management	- to determine whether competition impedes or promotes incentives to remodel roles and objectives of fisheries management
	* how flexibility may be operationally facilitated or constrained by different management regimes	- to evaluate different management systems and modes of regulation on the adaptive strategies of fishing enterprises
Discordant rationality	* the relationships between user group rationalities and those of the public authorities * relationships between political and bureaucratic institutions and processes * conflicting policy goals and the processes that produce them	- to understand more fully reasons for divergence of viewpoints between user groups and the policy community - to understand the development of policy objectives and the means for effective implementation
Integrated fisheries management (IFM)	* new institutional frameworks for IFM	- to define the stakeholders and how they are to be represented in IFM
	* compatibility of policy agendas	- to examine comparability of scientific methodologies - to analyse 'information chaos' and problem of communication
	* changes to regulatory regimes * socio-economic consequences of IFM	- to examine the problems of implementing new policy objectives in terms of regulation, monitoring and enforcement
Global : local interactions	* (dis)integration of relationship between harvesting and processing at local, regional, national and international levels, consequent upon changing patterns of commercialisation.	- to analyse changing patterns of raw material supplies, distribution systems and labour markets under conditions of global restructuring of the fishing industry
	* cultural change in coastal communities	- to understand how changes from fishing 'as a way of life' to an economic enterprise impacts on the values and behaviour of fishermen, their families and communities
	* new community dynamics	- to analyse roles of community institutions on the perceptions and behaviours of fishermen

Research interlinkages



Appendix A: Programme

European Social Science Fisheries Network: FAIR CT95 0070
Workshop on Northern Waters: Management Issues and Practice
Aarhus, 29-31 May, 1997, Konferencecenteret, Studenternes Hus, Aarhus Universitet

Coordinator: David Symes
Manager: Jeremy Phillipson

Local Workshop organiser: Torben Vestergaard

Thursday 29th May

0845 - 0915 Registration

0915 - 1015 Keynote addresses
Chair: David Symes (UK)

Tine Kjaer Hassager (Danish Institute for Fisheries Research): Changes in fisheries management and associated changes in scientific advice.

Susan Hanna (US): Parallel institutional pathologies in North Atlantic fishery management: Europe and the USA.

1015 - 1045 Coffee

1045 - 1230 Session 1: Theoretical Considerations
Chair: Petter Holm (Norway)

Martijn van Vliet (The Netherlands): From economic fish stock management to integrated management.

Sveinung Eikeland (Norway): Flexibility in northern waters.

Einar Eythorsson (Norway): Metaphors of property: the commoditisation of fishing rights under quota management regimes.

Thorolfur Matthiasson (Iceland): The sharing of revenue in Icelandic fisheries: a descriptive account.

1230 - 1345 Lunch

1345 - 1600 Session 2: The Baltic Fisheries
Chair: Torben Vestergaard (Denmark)

Keynote address: Birger Rasmussen (Danmarks Fiskeriforening): Problems in the Baltic fisheries policies - the cases of cod and salmon.

Juhani Salmi and Pekka Salmi (Finland): Livelihood and a way of life: social and economic aspects of the Finnish commercial fisheries in the Baltic Sea.

Marita Alatalo and Håkan Appelblad (Sweden): Wild Swedish salmon: a regional development resource by recreational use?

Anna-Liisa Toivonen (Finland): The going gets tough - strategies of coastal fishermen in Ostrobothnia.

Tomas Vedsmand, Peter Friis and Jesper Raakjaer Nielsen (Denmark): Fisheries management beyond centralised hierarchy: how can co-management deal with scale and sectoral interests? The case of the Baltic cod fishery.

1600 - 1620 Tea

1620 - 1730 Session 3: High Seas Fisheries
Chair: Oddmund Otterstad (Norway)

Juan-Luis Suarez de Vivero and Mayca Frieyro (Spain): Political geography and politics in North Atlantic waters: from UNCLOS to sustainable fisheries.

Sevaly Sen (Denmark): The North-East Atlantic Fisheries Commission: a creature with no teeth?

Jennifer Bailey (Norway) Regionalism and the management of international waters: the Northern Atlantic.

1800 Reception

Reception at the Danish Fishermen's Producers' Organisation, including a presentation on the work of the producers' organisation by Egon Sekkelund (Director).

Friday 30th May

0915 - 1015 Keynote addresses
Chair: David Symes (UK)

Eskild Kirkegaard (Danish Institute for Fisheries Research): Is the industrial fishery in the North Sea sustainable?

Euan Dunn (Royal Society for the Protection of Birds, UK): The impact of fisheries on sea birds in the North East Atlantic.

1015 - 1045 Coffee

1045 - 1230 Session 4: The North Atlantic and Arctic Seas
Chair: Peter Friis (Denmark)

Petter Holm, Stein Arne Rånes and Bjørn Hersoug (Norway): Technical attributes of modern resource management: the case of north east Arctic cod.

Geir Hønneland (Norway): Legitimacy and compliance in the Barents Sea fisheries.

Ketil Hanssen (Norway): Modernising the fish processing industry in Finnmark: effects of formal education and challenges for resource management.

Kenneth Awebro (Sweden): Early Swedish whaling in the North Atlantic and Arctic.

1230 - 1345 Lunch

1345 - 1530 Session 5: Other Northern Waters
Chair: Jesper Raakjaer Nielsen (Denmark)

Mark Nuttall and Kathryn Burnett (UK): Negotiation and management of crisis in the Scottish fishing industry.

Villi Wiium (Ireland): Irish fishing communities and the CFP: an overview.

Rob van Ginkel (The Netherlands): The political economy of marine resource management: Dutch musselmen, the State and environmentalists.

Nathalie Steins (UK): Ostrea edulis in crisis: the state of Europe's oyster fisheries and lessons from management systems in the Solent (UK).

1530 - 1600 Tea

1600 - 1700 Session 6: Discussion on Workshop Theme
Chair: David Symes (UK)

Discussants

Session Chairmen	Petter Holm (Norway) Torben Vestergaard (Denmark) Oddmund Otterstad (Norway) Peter Friis (Denmark) Jesper Raakjaer Nielsen (Denmark)
Invited discussants	Ellen Hoefnagel (The Netherlands) Elisabeth Vestergaard (Denmark)

1700 Close

Saturday 31st May

Excursion to Hirtshals and North Sea Centre

Appendix 2: Participants

Denmark	Peter Friis, Roskilde University Tine Kjaer Hassager, Danish Inst. for Fisheries Research Eskild Kirkegaard, Danish Inst. for Fisheries Research Jesper Raakjaer Nielsen, The North Sea Centre Birger Rasmussen, Danmarks Fiskeriforening Sevaly Sen, The North Sea Centre Tomas Vedsmand, Danish Inst. for Fisheries Research Elisabeth Vestergaard, Aarhus University Torben Vestergaard, Aarhus University
Finland	Juhani Salmi, Game and Fisheries Research Inst. Pekka Salmi, Game and Fisheries Research Inst. Anna-Liisa Toivonen, Game and Fisheries Research Inst.
Iceland	Thorolfur Matthiasson, University of Iceland
Ireland	Villi Wiium, University College Galway
Netherlands	Ellen Hoefnagel, LEI-DLO Rob van Ginkel, University of Amsterdam Martijn van Vliet, Erasmus University Rotterdam
Norway	Jennifer Bailey, Nor. Univ. of Science and Technology Sveinung Eikeland, Alta Einar Eythorsson, Finnmark College Ketil Hanssen, Finnmark College Petter Holm, University of Tromsø Geir Hønneland, The Fridtjof Nansen Institute Oddmund Otterstad, Senter for Samfunnsforsning Stein Arne Rånes, University of Tromsø
Spain	Juan-Luis Suarez de Vivero, Universidad de Sevilla
Sweden	Håkan Appelblad, Umeå University Kenneth Awebro, Luleå University of Technology
UK	Kathryn Burnett, University of Aberdeen Euan Dunn, Royal Society for the Protection of Birds Mark Nuttall, University of Aberdeen Jeremy Phillipson, University of Hull Nathalie Steins, University of Portsmouth David Symes, University of Hull
USA	Susan Hanna, Oregon State University