

Institutional Challenges for Common Property Resources in the Nordic Countries

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Preface

This report on the challenges of sustainable management of common properties was commissioned by Nordregio for the Faroese member of the steering committee of the Nordic Research Programme, “Future Challenges and Institutional Preconditions for Regional Development Policy”.

The research programme was commissioned by the Nordic Council of Ministers/Nordic Senior Officials Committee for Regional Policy (NÄRP). As part of this programme, four pilot studies were conducted on selected topics that were considered important for future regional development. These were designed as future scenarios with a forward looking range of 10-15 years. One of these studies looked at the challenges posed to regional development policy coherence from the numerous attempts, both ongoing and proposed, to ensure environmentally sustainable development during the period 1990 – 2010. As a follow-up to this scenario, the current report specifically analyses the institutional challenges for common property resources, in the light of this scenario, across the Nordic countries.

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Stockholm, August 2001

List of contents

| | |
|---|----|
| 1. Introduction – explanations by scenario | 7 |
| 2. The impact of global strategies for sustainable development | 11 |
| 3. The general dilemma of common property resources in Northern Europe..... | 22 |
| 4. The Northern fisheries – few species and large fluctuations in the light of a revised CFP..... | 26 |
| 5. Mountain pastures for reindeer, meat-sheep and milk-goats – the deep impact of the modernity trap..... | 30 |
| 6. Game hunting and inland fishing; urban public rights or local enterprise..... | 37 |
| 7. The institutional challenges to strategies for sustainable development – the limited scope of sector integration and the potential for ecological modernisation..... | 47 |
| References..... | 48 |

1. Introduction – Explanations by Scenario?

In the first book from the Nordic Research Programme, “Future Challenges and Institutional Preconditions for Regional Development Policy”, different scenario techniques were used to illuminate some of the future challenges for Nordic Regional Development Policies (Karppi 2000). Among the different scenarios, one was presented which particularly illustrated the Future Challenges to, and Institutional Preconditions for, Environmental Sustainability in Nordic Regional Development Policy (Hukkinen 2000).

This tableau, “At Ease in a Storm”, was not a complete scenario of the slow processes of change from the present date to the year 2015, but rather a montage of different snapshots of the future, where embryonic environmental events at the turn of the century have escalated to become major policy challenges. The events that, it is believed, will dominate the agenda in 2015 are:

- The climate-induced reindeer pasture crisis of 2015, which escalates into a Sami declaration of independence and the free movements of reindeer across district and national boundaries.
- The blue-green algae bloom crisis in the Baltic Sea in 2010, after which all tourist and recreational activities comes to a halt.
- The weather-induced natural disasters of storms, avalanches and landslides that lead to increasing risks in oil exploration, energy generation and communication, and to prohibitive costs for insurance companies.
- The dilapidated infrastructure of the slowly ageing and depopulating areas of the northern periphery, which does not in itself warrant maintenance, but which more and more frequently collapses under the burden of the summer tourist demand pulses.

The story told by these snapshots is one of increased environmental risks, mounting societal and economic complexity and a growing inability, in both the national administrations and political echelons, to handle increasing risk and complexity and sudden escalations in ecological crisis. The underlying processes behind our contemplation of this future abyss are the continuation of the present drive towards economic globalisation and the contemporary fashion of modernisation – such as can be seen for instance in the public management inspired rationalisation and “slimming”

of the public sector. Both these processes are believed to be unmanageable, but still their effect on environmental risk and societal complexity are believed to be inevitable. The general development of society is therefore in this scenario defined as contra-final and in line with the developments predicted in Ulrich Beck's "Risk Society" (Beck 1992). All the actors in food production, resource extraction and resource management are fully aware that their piecemeal rationality builds up to a collective result that is everything from suboptimal to catastrophic. Yet still they believe themselves to be unable to manage either the course of economic globalisation, or the effects of the "renewal of the public sector." Thus the environmental scenarios predict a neo-Malthusian squeeze on the withering nation states, where the *carrying capacity* of the states' territory gradually becomes more decisive for policy formation than the *caring capacity* of the welfare state institutions. Notwithstanding the potential of such insights however, scenarios that build on contra-finality often have low explanatory power. Moreover, without handles that can be moved, they often provide limited guidance to policy makers who are eager to change the course of events.

This report however adopts a rather different perspective. Fundamentally it sees no line of development as inevitable, rather developments emerge as a result of a continuous struggle for power among competing interests, and a continuous struggle for hegemony among different epistemologies. Who wins the agenda of the day – or of the parliamentary term – is often decided by situational factors in a seemingly unpredictable way. For instance, can sudden outbursts of mad-cow disease lead to temporary changes in consumer food preferences which can be exploited by vegetable growers and the ecological farming segment, leading perhaps to fundamental, and hitherto unexpected, changes in practical agricultural policies?

We must not however fall into the trap of believing that the future will be chaotic and thus unpredictable in any way. Plainly put, it is simply not the case that "anything can happen". The most important reason for this is that institutions really do matter, once society has started to do things in a certain way, it is likely to continue to do things that way until prevailing institutions are replaced by new institutions. This process of institutional change is often termed, a constitutional process; it is a struggle over which rules shall apply to the normal power struggle. As such it is "path dependent", i.e. future institutional developments in a certain state are to a large extent dependent upon how past developments have been designed and executed (North 1991). Thus efforts to establish standardised "Institutional Preconditions" for sustainable development can easily be-

come mere theoretical constructions. As such, designs that prove feasible in one society may however be completely unworkable in another.

A further reason for the lack of chaos – or the appearance of “social order”, is the fundamental role of culture in people’s life. When faced with mounting risks or incalculable environmental uncertainty, most people seek – and find guidance in their cultural norms and beliefs. These change only slowly and only with succeeding generations. Although new scientific revolutions might change policy formulations, they do not easily alter the fundamental cultural characteristics of a people.

For instance why has the epistemological foundation for biodiversity as a precondition for a robust nature not been adopted as an intrinsic part of North Atlantic coastal fishing cultures – despite more than 10 years of intense advocacy by government? Indeed, the wish to eradicate competing predators such as whales and seals remains deep-rooted within coastal communities. Moreover, during periods of “food scares” due to outbreaks of animal diseases, people tend to revert to the “safety of national beef” no matter what the facts are about the origin and spread of such epidemics.

Within such a perspective, the northern pasture reindeer crisis scenario need not be triggered by human induced global warming processes. It could simply be the result of a rigid state management culture which, despite active participatory rhetoric, paid too little attention to local knowledge of alternative pastures in the face of the serious, but not unfamiliar ice crust (*flein*) situations (Jentoft 1998). Or it could be the long-term unintended consequences of an ill-designed destocking programme that eliminated the small reindeer owners from the pastures whilst allowing the large ones to build up their herds. Or it could even be stem from the unwillingness of sami policy makers to admit that there is a limit to the current extensification of reindeer herding, beyond which the reindeer should be treated as wild game and left to roam wild – even if this is across district and national boundaries.

The potential algae bloom in the Baltic can also be viewed from such an institutional perspective. Most likely it would not be a sudden massive and permanent blue-green algae bloom, but rather a series of early warnings of short-lived local blooms of a toxic phytoplankton probably due to nitrogen eutrofication in the sea combined with unusually weak winds. But early spring blooms, which would leave the sea cleaner than before, and thus would be more of a solution than a problem, would severely harm fish farming in the Baltic. Moreover, the visual impact of algae and the unpleasant odours would have a negative impact on tourism. If recurring annually in large areas, the economic loss to both the aqua-

culture industry and the tourist industry would undoubtedly see the problem of eutrofication rapidly climb the region's political agenda. This issue is thus revealed as a typical "free rider" problem, where profitable though unsustainable agricultural practices, and cheap but primitive urban sewer systems can be seen to have negative externalities for others who depend upon the Baltic as a common property resource. The European Union, together with its Baltic candidate states will therefore be forced to change its agricultural policies and impose stricter runoff and sewage treatment rules, without exceptions. Thus what we have before us is not an uncontrollable escalation of an environmental problem, but rather a case of inappropriate institutions for the compulsion of all relevant actors in the drive for a cleaner Baltic sea.

Finally increased weather variability and the rusty nature of the northern periphery infrastructure can also be viewed through an institutional perspective. The degree of vulnerability to extreme weather or natural catastrophe can in many cases be seen as a social risk rather than an environmental one. Through more rational investment in infrastructure, such as electric grid or communication wires, the post-war "generous reserve" ethos has gradually been eroded. New public management strategies no longer see it as economic to maintain reserve stocks for any unexpected event. Sloppy physical planning has, in many valleys and urbanised areas, allowed house construction to be made on flood prone plains and narrowed river channels, so that flood dampening capacities are reduced. So although extreme weather may become more common as a result of greenhouse gas emissions, the institutionally determined social vulnerability to weather and unexpected natural events has undoubtedly increased faster than the weather variability itself. Such a widening "institutional gap" between a social development process and an environmental processes can easily be corrected by means of new institutional instruments, e.g. penalties paid to customers for reserve-stripped electric grid companies during black-outs, or increasing insurance premiums for flood-prone locations of homes and business.

The dilapidated rural infrastructure scenario also misses some crucial institutional aspects. Rural and northern depopulation coupled with rapid urban growth does not lead to immediate rural breakdown. On the contrary, it usually means increased pressure and overload on the infrastructure in large metropolitan areas. It is here that most of the grid congestion and failures can be expected, whilst upgrading here remains slow because of the physical and organisational complexity of the tasks in hand. It may therefore be here that the most urgent effects are felt, with peripheral areas still enjoying the benefits of the relative overcapacity of public

infrastructure investment from the last decades of the 20th century. Moreover, this process of centralisation within the periphery will secure the maintenance of the main road arteries, harbours and airports. In the coming decades, advances in modern technology will make the transformation from public to private infrastructure in the periphery less painful than before. Except for the very old, private transport be it on road or across snow is a feasible alternative to public transport. In addition, gridless telecommunications and a gridless energy supply system now provide practical alternatives for the most remote areas. In some cases infrastructure that is common to a limited group, i.e. neither public nor private, can become feasible solutions. And as the north was built on seasonality and temporary booms, a further growth of seasonal tourism has no real dramatic effects on either infrastructure or on the social fabric.

2. The Impact of Global Strategies for Sustainable Development

In addition to the analysis of situational and path-dependent institutional development, it is also necessary to take into consideration the weighty international initiatives that have been taken over this issue in recent years. Although cynics may show us that the impact of the UNCED and the Agenda 21 processes has been negligible in a period of massive economic globalisation, the power of repetition should not be underestimated.

An important backdrop to this report is therefore provided by the strategies of sustainable development now being worked out in a number of European countries, by the European Union itself, and by the OECD. All these strategies are being assembled in preparation for the UN Rio+10 summit on sustainable development in 2002. As international pressure increases on individual states to adopt more sustainable development strategies, this will inevitably trickle down to the management of important resource-based production sectors, to international trade in food and forest products and to regional planning and development policies. Moreover, the technical standards agreed upon through the EU –“Cardiff process” will also have important effects. Indeed, this process will be the conduit through which environmental concerns are integrated into important sectors: the transport sector, the energy sector, the agricultural sector, the fisheries sector, the financial sector and the development aid sector that will determine how we do things in the coming decade. Thus the process itself will slowly become institutionalised both within present EU-member states and in the new candidate states.

Sweden has been in the forefront of this effort with its annual reports “Hållbara Sverige” to the Parliament on progress towards an ecologically sustainable development process (Sweden R.S. 2000/01:38). Sweden has also, in 2001, prepared its first set of Sustainable Development Indicators, where 30 indicators are designed to highlight progress in the fields of Ecological Efficiency, Contribution and Equality, Adaptability and Values and resources for the coming generations (Statistics Sweden 2001). These are strong instruments as they annually summarise the progress made across the various sector ministries and levels of national governance, towards sustainable development. Great emphasis is placed on the government’s own work with a number of different policy tools to achieve a more sustainable society. This comprehensive analysis includes a focus on, the redesign of the public sector, the structuring of business and labour markets and fiscal governing tools, the management of natural resources, environmental health planning, regional construction and transport planning, and, research and the international co-operation, all of which are scrutinised in order to transform them into sharper tools in the service of sustainable development. In addition the Swedes have initiated a large “Local investment programme for ecological sustainability,” where central government supports local projects in the areas of waste management, traffic, water and runoff, energy-efficiency, landscape restoration and biodiversity augmentation. A total of 7,2 mrd. SEK is set aside for such programmes for the period 1998-2003.

Denmark has recently prepared a national Strategy Document on sustainable Development (Danish Government 2001), together with a proposed set of indicators with which to measure the success of the strategy (Danish Government 2001). This makes it the most well-designed and comprehensive of all the Nordic strategies. The strategy establishes the priorities and targets for Denmark over a 20-year period, and requires the active participation of all involved, from the Government itself to the business community, municipalities and counties, schools, associations, voluntary organisations and the general population as a whole. During this period the aim is to:

- Continue the development of its welfare society at the same time as it decouples economic growth from its negative environmental impacts.
- Create a safe and healthy environment for everyone, including particularly sensitive groups and ecosystems, and maintain general access to safe and healthy food products.

- Secure a high degree of biological diversity, protecting ecosystems and irreplaceable landscapes.
- Use natural resources more efficiently, use less and recycle more.
- Work towards the creation of a global deal where the decoupling of economic growth from environmental impact in the developed countries is linked to the need for developing countries to observe international agreements and take environmental considerations into account.
- Ensure that environmental considerations are taken into account in all public sectors, especially in Food Production, Forestry, Industry, trade and services, Transport, Energy, Urban and Housing development and in tourism. Such considerations should also be taken into account in all business sectors, and in all other segments of society.
- Ensure that market institutions are designed to support sustainable development.
- Ensure that sustainable development becomes a shared responsibility, that decision-making is democratic and transparent, and that indicators are used to measure progress towards sustainable development.

Finland has recently placed more emphasis on making building construction ecologically sustainable, setting up guidelines to ensure that both public and private construction is sustainable (www.vyh.fi/eng/housbuil/develop/ecoconst). Finland has also previously published a special Government Programme on Sustainable Development. The idea being that sustainability can only to be reached in stages, with a substantial learning component needed at each stage. During such a process, qualitative changes will have to take place in the political realm, in the economy, and in the values and methods of participation. Finland claims to have moved beyond the stage in which the integration of environmental issues and sustainable development initiatives into sectoral policy was often simply more of an objective than a reality, where few people were really familiar with the concept of sustainable development, and where participation was thus rather limited. It is now at a stage where awareness has become action and observation has become participation. The integration of sustainability objectives has been achieved in important policy fields such as Rural Areas, Agro-environment, Forestry, Energy

and Transportation. Various traditional instruments, for example legal rights, legislation and norms, together with emission quotas have also been used in sectoral programmes and plans. Special efforts have thus been made to find new and more flexible instruments, such as taxes, environmental impact assessments, eco-labelling and voluntary agreements to supplement traditional means (Finnish Government 1998).

Finland has however realised that sectoral programmes alone will not be enough to resolve environmental problems and their underlying causes such as the growth in energy consumption, the increase in traffic and the overuse of natural resources. International co-operation will require the setting of strategic objectives and priorities for action; so for Finland the next steps must be more comprehensive, having a more strategic outlook, and better operationalising sustainable development on various levels and in different sectors of society. It is as a reflection of this trend towards a more comprehensive outlook on sustainable development, that the Finnish Government is now preparing a new and more comprehensive programme for sustainable development. This programme is based on extensive dialogue between the different sectors of central government as well as on a dialogue with other major groups across Finnish society

Norway prepared its strategy for sustainable development as early as 1997 (Government of Norway 1997). It thus represents a “1st generation” sustainable development strategy, and thus does not reflect the level of closer interconnection found in the more recent Finnish and particularly Danish, strategies. It is also not especially tailored to the issues that will be dominating the 2002 Rio +10 summit in Johannesburg. It does however have an interesting appendix outlining strategic goals for sustainable development and examples of indicators that can be used to measure the achievement of such goals. The 6 key issues in the Norwegian Strategy for sustainable development are as follows:

- Increased international efforts towards implementing sustainable development on a global scale, with special emphasis on the Northern areas and on Developing countries.
- Increased national efforts on protection and sustainable use of biological diversity, with special emphasis on the role of endangered species and of large predators in wild ecosystems and cultural landscapes.
- Increased national and international control of hazardous and toxic chemicals.

- Development of a comprehensive national climate and energy policy based on agreed international climate regimes.
- Improvement in the area of local planning of sustainable development in urban and rural areas, with special emphasis on cultural heritage, outdoor recreational activities, air quality and the improved management of water resources.
- Improvements in the participation of businesses and consumers in the national strategy of sustainable development

The Norwegian government has recently followed up this strategy with a set of more specialised policy documents on strategies for sustainable outdoor recreational activities (Government of Norway 2001) and on Biodiversity – sectoral responsibility and co-ordination (Government of Norway 2001). In particular, the latter document represents an innovation, as it is here that a new management system is announced which, in the period 2001 – 2005, will produce an ecologically sustainable use of biological diversity through the improved integration of legal, institutional and economic policy tools. The basis for this management system is an improved knowledge of biodiversity and a common database for species and mapped ecosystems, which will be shared by all governing levels.

Since 1999, the Government of Norway has also produced an annual environmental report, which takes stock of the environmental status within 8 crucial fields (Government of Norway 2001). Some of these are continuations of the 1997-issues, whilst others represent new and emergent issues:

- Sector-integration of environmental policies and sustainable urban development with emphasis on more sustainable transport solutions.
- Sustainable use and protection of biological diversity, with emphasis on forest resource management, predator policies, wild salmon management and water management by catchment-based methods.
- Increased participation in sustainable outdoor recreational activities.
- Improved maintenance of cultural heritage and cultural landscapes.
- Reduction of eutrophication and oil-pollution.
- Reduction of the environmental impact of hazardous and toxic chemicals.
- Waste reduction and improved recycling.

- Reduced emission of gasses with climatic effects.
- Increased international commitments on sustainable development in the Northern and Arctic Areas.

As with the Swedish annual reports on “Sustainable Sweden”, the Norwegian annual reports on the state of the environment assume considerable political importance, though their shifting emphasis generally depend upon which political party is in power.

Iceland was also very quick in translating the goals of the Rio-conference into practice through general policy formulations. The early goals of sustainable development as conservation of environment and an improved standard of living for mankind were made Icelandic policy as early as 1993, when the government approved a policy formulated on the basis of the Rio resolutions, “Towards sustainable development”. In 1997, the government approved an extensive implementation plan, “Sustainable development in Icelandic society”, which was an attempt to introduce the viewpoint of sustainable development into the main industries and sectors of society. The Ministry for the Environment is in charge of Iceland's efforts towards sustainable development, both in Iceland and in the United Nations committee on sustainable development.

The *Nordic Council of Ministers* has within the international setting that is created by the 2002 Johannesburg meeting, worked out a separate Nordic strategy for a sustainable Nordic Area: “New bearings for the Nordic Countries” (TemaNord 2001:507). This was adopted by the Nordic Council in January 2001 and launched at a “theme-meeting” in the Norwegian Parliament on the 2nd and 3rd of April this year. The strategy has long term goals up to 2020, together with objectives and initiatives for the period 2001-2004 necessary to achieve these long-term goals. An assessment of the initial period will be completed by 2004 and the course of the strategy will then be adjusted. The fundamental aim is to ensure that the Nordic region maintains its role at the forefront of the process of defining sustainable development, especially in the wider European context.

The Nordic Strategy is a response to three fundamental, societal processes of change that challenge and question the current paths of development in the industrialised countries namely, the ongoing economic globalisation of the world, the development of the information society, and the shared consciousness of a bleak future for mankind without the implementation of more sustainable development postures across the socio-economic spectrum. This response is then structured in 5 cross-sectoral issues that together make up the strategy: climatic change, biological diversity, the sea, chemicals, and food safety. In addition, the strategy includes initiatives to strengthen public participation in sustainable devel-

opment, local Agenda 21 activities, knowledge bases, institutional instruments and resource efficiency. The strategy also contains special initiatives related to areas adjacent to that of the Nordic countries.

In the first 4-year period, this strategy will focus on six important sectors in the Nordic countries: Energy, transport, agriculture, business and industry, fisheries, and forestry. A number of related sub-sectors are also included in this first “target-group” of sectors, (e.g. both pasture management/reindeer herding and organic waste management are part of the wider agricultural sector, while coastal resources, hunting and aquaculture are all part of the wider fisheries sector. How the major challenges and the cross sectoral issues will be handled by policy makers and managers in each of the six sectors in the period 2001-2004 thus provides the first serious test of the long term Nordic strategy on sustainable development. Added to this is the fact that a fundamental element in the Nordic approach is the principle of sectoral integration; the idea that environmental considerations and sustainable development can be integrated into all social sectors and developed further in dialogue with these sectors. Moreover, this framework runs parallel to the weighty initiatives contained in the context of the EU’s “Cardiff process.” One of the important issues for the assessment of the Nordic strategy in 2004 will therefore have to be the relative success of the sectoral integration principle. If this does not fulfil its promises, more comprehensive approaches will have to be worked out, similar to the ones announced in the Finnish strategy, and there will have to be complementary or supplementary instruments available for the follow up in the next phase.

Although the individual Nordic countries maintain the principal responsibility for the execution of the strategy, the Nordic Council of Ministers will continue to hold responsibility for the execution of the Nordic Sustainable Development Strategy in areas not covered by the individual countries themselves.

The *European Union* has based its strategy for sustainable development on the 6th environmental action programme: “*Environment 2010: Our Future, Our choice*”. (EU-Commission 2001). The important elements here that govern the ecological sustainability ambitions of the sustainable development strategy are the implementation of already existing environmental legislation, and a deepening of the integration of environmental concerns into other policies through environmental indicators and benchmarking. The action programme will also contribute to more sustainable production and consumption by working with the market and by providing every individual citizen with easily accessible information on the environmental effects of their consumer choices. The environmental action

programme also envisages EU-support for land use planning and management decisions in the EU member states, in the form of best practice advice and support from the Structural funds. The aim here is to avoid the unfortunate fragmentation of the countryside and unmanageable pressures in urban areas and fragile coastal areas. In addition, the action programme selects four priority areas for more focused action during the period 2001 to 2010 (EU COM 2001 31 final):

- To stabilise the atmospheric concentrations of greenhouse gases at a level that will not cause unnatural variations in the earth's climate.
- To protect and restore the functioning of natural systems, stemming the loss of biodiversity across the European Union and globally. To protect soils against erosion and pollution.
- To achieve a level of environmental quality where the levels of man-made contaminants, including different types of radiation, do not give rise to significant potential impacts on, or risk to, human health.
- To ensure a sustainable use of natural resources and management of wastes so that the consumption of renewable resources does not exceed the carrying capacity of the environment. To achieve a de-coupling of resource use from economic growth through significantly improved resource efficiency, dematerialisation of the economy, and waste prevention.

In a recent consultation paper, written in preparation of the *European Union Strategy for Sustainable Development*, the EU Commission followed up on the Environmental action plan and identified the following six challenges to sustainability as being the most important upon which to focus for the period 2001-2010. They are so viewed in light of their severity, their long term nature, and their distinctly European dimension:

The rise in the frequency of severe weather incidents, and the rise in ocean levels if we do not act to avert climatic change. A large part of Europe's populated areas are prone to severe flooding as they are at, or below, sea level.

- The threats to food safety and public health due to antibiotic-resistant strains of bacteria, toxic algae blooms and unknown effects of synthetic substances. The environmental health hazards are warning signs that we are interfering with our environment in unforeseen ways, and

that without long term action such “menaces” to animal and human health can threaten our very survival.

- The increasing pressure on vital natural resources, such as biodiversity, fish stocks, fresh water and waste absorption capacity. In particular the rigidities of the Common Agricultural Policy and the Common Fisheries Policy which are responsible for some of this pressure and the need to broaden the focus of these policies and apply more “agri-environmental” and “mari-environmental” measures to help preserve bio-diversity and ensure the more effective long-term management of wild biological resources.
- The persistent problem of poverty and social exclusion, often accompanied by poor health, low educational attainment and economic and environmental deprivation. Both rapid changes in technology and the enlargement of the European Union to Eastern Europe will increase the severity of this problem during the next decade.
- The ageing population, (low birth rates combined with long life expectancy) will put considerable stress on the fiscal resources to fund pensions, health care services and long term care. This entails less funds for improving the environment and for support to agriculture and fisheries. At the same time however, an increasing number of healthy retirees will use natural resources in alternative ways, something which in itself opens up new avenues for sustainable development.
- The problem of congestion and pollution due to increased mobility and urbanisation, which threatens to undermine the advantages of business networks and fluid labour markets. In particular, transport infrastructure needs to receive greater attention in the planning of territorial development and future land use.

The EU-strategy for sustainable development has concentrated on a small number of themes where new insights come from analysing the spillover effects of decisions in different sectoral policies. It is an important observation in the consultation paper that “many of the trends that threaten sustainable development in Europe are the consequences of past choices in production technology, patterns of land use and infrastructure investment, and are difficult to tackle in a short time frame”. Attached to these technologies, land-use patterns and infrastructure, are of course powerful organised interests, willing to do their utmost to influence the development strategies that will actually be implemented by the EU.

The *OECD* has in a similar vein prepared a document entitled “Policies to Enhance Sustainable Development” for its Council meeting in May (OECD 2001). The report concentrates on the risks posed by the irreversible depletion and degradation of a range of important natural and environmental resources, and advises member states to apply a comprehensive set of measures to respond to these risks. The focus of the policy report is on the environment-economy link, both because the stakes in this interface are especially high, and also because less is known about such environmental-social linkages. The main aim of the OECD’s sustainability policy is to remove those inappropriate [economic] incentives that encourage unsustainable resource depletion and environmental degradation. The OECD advises that such measures are undertaken across four broad areas:

- The increased use of the price system to encourage individual agents to take the full costs of environmental degradation into account when making decisions.
- Accelerated reform of governments’ decision-making processes to allow for more integrative approaches to the full range of consequences of their policy choices.
- The increased use of technology policies to help de-couple environmental degradation from economic growth.
- The strengthening of the contribution of the international trade and investment systems to sustainable development world-wide.

In conjunction with the policy report, the OECD has also prepared an elaborate analytical report on sustainable development (OECD 2001). It is one of the most comprehensive documents on the challenges and measurement of sustainable development made since the UNCED meeting in Rio. This document illustrates how all OECD countries can enhance sustainable development by implementing appropriate institutional frameworks such as improved governance, correct market interventions, green taxes and the creation of new “green markets”. The organisation also advises member countries to enhance appropriate technological change by pricing for environmental innovation and strengthening environmental management in industry through promotion of clean technologies. The report starts with an analysis of natural resource management in the context of sustainable development, and then proceeds to deal with a number of cross-cutting issues such as minerals, energy, water, forests, fish and biodiversity. Its conclusions and further work on these issues will have a considerable impact on the practical policies adopted by individual member countries, especially as the OECD has considerable influence

over the Ministries of Finance in member states, and thereby over the incentive structure in the annual budgets (OECD 2001).

The *UN Commission on Sustainable Development* has, over the last decade, worked systematically towards establishing indicators of sustainable development that can be measured and which all member states can agree upon. From an initial list of 134 indicators, a selection of 57 indicators have, as of March 2000, been tested in a number of countries. These range from the “UNDP Human Development Indices” and the “TUCN Well-being Assessments”, through the “Ecological Footprint” measures to the “European System of Environmental Pressure Indices”. The work is difficult because consensus has to be reached in a number of crucial areas before meaningful aggregation of indicators of Sustainable Development can take place. This includes questions of weighting at the international level, standardisation to a common reference, comparability of placement in the cause-effect chain, and achievement of the required transparency in the aggregation process (CSD 9th Session). When these remaining problems have been solved, and probably before the Rio+10 summit in 2002, the Aggregate Indicators of Sustainable Development will start to have a profound impact on the lending practices of the World Bank and the IDA, on the trade regulations of the WTO and on policy making in individual UN-member states.

The accumulated weight of all these initiatives will not be without impact on the practical policy making of the member states of the UN, the OECD, the European Union and the Nordic Council. But judging from the quality of the strategy work and the coherence of the organisations, it will be among the more closely integrated members of the European Union, and its “enlargement candidates” that we will see the most rapid application of these kinds of development strategies into practical policy formation.

Although a pronounced political awareness of sustainable development will not eliminate all unfortunate scenarios, it will nevertheless institutionalise an increased capacity to act on an “early warning” basis enabling regional and/or national authorities to swiftly implement emergency plans to contain environmental disasters. Such capacity will also include monitoring technology, which can detect and counteract environmental deterioration before a situation gets out of hand. Given that environmental uncertainty is a fundamental trait of nature however, surprises will always occur and some of these may bear resemblance to worst case scenarios.

3. The General dilemma of Common Property Resources in Northern Europe

The risk of irreversible depletion and degradation of natural resources is not entirely a new phenomenon. It has played a significant part in the policy calculations of kings and legislatures over the 300 year period that we call the modern epoch. The first “tragedy of the commons” was the depletion of the oak-forests of Denmark and southern Sweden and Norway for the purpose of European naval warfare. Since then forests have in many ways been the lead model for rational and sustainable resource management in the Nordic countries. From the early establishment of Forest Services in the 17th century, the idea of “a balanced logging quantum” has been the guidance for scientific forest management. The annual cutting of timber should be equal to the annual re-growth of trees in the forest. Both too little and too much logging was considered irrational, and claims of unsustainable logging were often the reason for state intervention in the common property forests of the Nordic countries in the period following the introduction of supreme rule in 1660. The ill-fated state of many forest was interpreted as a “tragedy of the commons”, where the only solution was state acquisition of property rights, penalties for illegal logging, and state licences for legal logging. Over the next 200 years the rational planning of forest extraction – and later the purposeful planting of production forests – became the new model for resource management in the Nordic countries. With the state as the main modernising agent, this model was gradually applied to all natural resource based sectors including agriculture, pasture, fishing, aquaculture, game management and hydropower development. The idea of a Maximum Sustainable Yield underlying the individual quota system in fisheries is therefore closely related to that of the “balanced logging quantum” in forestry. This state-driven rationalisation of natural resource management was a common North European tendency, although it was particularly pronounced in the vast areas of the northern parts of the Nordic countries of Finland, Sweden and Norway, and the crucial role of state sectors in all northern resource management remains today one of the hallmarks – and problems – of the mature welfare state.

The older institutions of resource management, based on the collective property rights of coastal villages, *sami sīdas*, and valley villages were to some extent regional mosaics of seemingly vital local economies based on flexible, integrated and ecologically sensitive resource extraction. This is what has often been called the “traditional” Nordic sustainable way of life, although the decay of such “institutions” already began in the 17th century. The private shotgun, the timber entrepreneurs, herring

entrepreneurs, early hydropower entrepreneurs and the recent aquaculture entrepreneurs provide the main challenges to this “balance” way of life, and thus also provided the main reasons why efforts to manage natural resources co-operatively at the regional and local levels became increasingly difficult.

These primordial collective property rights have now, to a large extent, been replaced by state property rights or state guaranteed individual property rights. The consolidated family farms of the 1880s, the “production unit” of modern reindeer herding and the “vessel quota” of the coastal fishermen of the 1990s were all initiated by the state in order to “nationalise and rationalise” the harvesting of natural resources. In many ways the state was a necessary intermediary in the facilitation of the transfer from a collective to a private property natural resources regime.

After more than 300 years of “modernisation” in resource management, the 21st century shows signs of fatigue in areas relating to the early modern institutional arrangements supporting this kind of rationalised resource management structure. The most visible sign is the sector policy inconsistency resulting from spillovers in other areas from policies themselves determined on a sectoral basis. The effects of modern logging on commercial hunting game have been known for a long time, and a number of measures have been applied to optimise the harvesting of both timber and moose. Moreover, the effects of mechanisation in reindeer ranching are now known, in particular, how mechanisation leads to the pecuniary need for larger herds, which then destroy the pasture areas for long periods. Similarly, the calamitous effects of bio-mass fishing in the growing aquaculture industry on wild fish stocks are only now coming to light. In order to address these kinds of fundamental problems in the relationship between the bio-physical world and the social world, a number of new paradigms have been introduced as part of the Rio-declaration on sustainable development. In particular, two of these paradigms challenge the conventional sectoral rationality of most resource management regimes:

- The biodiversity principle – or the fundamental idea that a complex multispecies ecology with a multitude of ecocycles running simultaneously is more robust in relation to external or unexpected shocks than a rationalised, but simplified high yielding monocropping system.
- The ecosystem management approach – or the fundamental idea that it is not sufficient to manage a single resource as a capital stock. It is the whole ecosystem that needs to be man-

aged – and with the human impact as an integral and natural part of ecosystem processes (CBD 1998).

These new paradigms have provided important epistemological foundations for the 10-year process which is now culminating in the Rio+10 summit in South Africa in 2002, and for which most countries and international associations have prepared their "Sustainable Development Strategies".

These paradigms thus provide the epistemological backdrop to this report. Thus the challenges they pose for sectoral policies in the field of natural and area resources through their voluntary or forced implementation in "strategies for Sustainable Development" provides the main theme of this report. This approach then sees the future from a different perspective than that of the scenario approach concerned with unexpected environmental events and the politicians' panic reactions to them. Here the future is shaped more by continuous struggles between ideas, interests and power. In the next section we will briefly look at some crucial resource extraction activities in order to illustrate how this analytical approach can be used to aid the work of European states towards the goal of a more sustainable development.

It is a common misunderstanding that when natural resources are part of shared "commons", access to their use is open to all, and there is little incentive for individuals to conserve and use them in a responsible way, thus producing overexploitation (EU- SEC (2001) 517). This idea of an inevitable "tragedy of the commons" (Hardin 1968), has been the prime mover behind a number of policies aiming at privatisation of the rights to natural resource exploitation. During the last three decades "anti-tragedy measures" such as individual fishing quotas, tradable dairy milk quotas, marketable licences for aquaculture localities, and fodder quotas for salmon farms, have all been introduced as "final solutions" to the problems of overexploitation of finite resources and oversupply of finite markets. More often than not however, such solutions have merely created new problems, which themselves often take at least a decade to rectify. The reason for this lies in the logic of this kind of incentive system itself. Most schemes relating to individual semi-property rights created by states through the means of quota systems tend to be "sticky"; once they are created and handed out they are difficult to remove. They represent assets and can be used as collateral for credit to be used for investment in more efficient technology. Even when the resource itself is run down and the quota is virtually empty, individuals will protest violently if attempts are made to nullify such assets. Therefore organised interests are forced by

their members to continue the quota systems, even if this reduces their membership size and thus their political clout.

In most cases of natural resource management, the fundamental problems relating to the most common “anti-tragedy-measures” are therefore now becoming visible:

- Rigidities build up as one-species or one-product quotas invite harvesters and cultivators to invest in increasingly more specialised technology. Faced with resource or market failure, the lack of flexibility and the inability to switch to other species or lines of production leads to economic problems and the threat of bankruptcy. Over investment leads to over-capacity, the only solution being to reduce the numbers of resource users.
- The inability of quota systems to accommodate resource risks, tends to strengthen the processes of selling out/buying up quotas, thereby producing a primary accumulation of property rights to natural resources in fewer hands, and the exclusion of increasing numbers of erstwhile resource users.
- This “closure” of a number of previously open resource uses, marginalises an increasing proportion of the coastal and rural population and effectively bars them from undertaking a flexible and mixed use of local resources.

A closer analysis of the nature of shared “commons” or Common Property Resources, shows that this kind of privatisation is not the only solution, and certainly not the final solution. Such resources are complex because they share the characteristics both of “public goods”, i.e. it is costly to develop institutions that exclude potential beneficiaries, whilst the characteristics of “private goods” are such that the resource units harvested by one individual are not available to others (Ostrom 1994). This mixed character of common property resources makes the task of crafting institutions to run them very demanding. Analysis of thousands of common property institutions around the world also shows that most of these are very complex, but they are, at the same time quite flexible and adaptive to changing resource fluctuations, to human demographics, and to market variations. Thus no institutional blueprint can itself provide for a “final solution”, institutions have to give the appropriate incentives in a given situation, but at the same time they must be robust in allowing the appropriators or cultivators to adapt the operating rules according to changes in exogenous conditions such as climate, technologies and markets. From this perspective the “sticky” character of individual property

rights to quotas and licences will increasingly come to represent a significant problem for Nordic institutional designers. Through well-researched examples taken from the areas of marine fishing, aquaculture, reindeer and sheep pasturing, game hunting and wild salmon, this report illustrates in some detail the complex character of these institutional challenges.

4. The Northern Fisheries – few species and large fluctuations in the light of a revised CFP

There are a number of particular ecological characteristics that make northern fisheries different from those in the Mediterranean or the southern European fisheries area. Whilst Spanish or Greek Mediterranean fishermen can fish freely on some 20 to 30 species with only modest fluctuations, northern fishermen have to rely on 4 to 5 commercial species with substantial fluctuations. The further towards the North Pole one moves, the fewer harvestable species are available, and the larger the fluctuations in these species become, due to changes in sea-temperature, salinity, natural predation or catch pressure. The species that experiences the most extreme levels of fluctuation is that of the northern capelin, which can vary from almost nil to enormous quantities over short periods of time. This also makes inter-species relations rather complex and volatile, where for instance cod as a predator have to be able to switch between capelin and herring as well as cannibalising their own fry, and in addition they have to compete with seals, whales and commercial fishermen for their prey.

Such ecological interactions tend to aggravate the fluctuations, deepening the financial troughs and thus tempting industrial fishermen to overinvest at the financial peaks. In practice it remains impossible to model the multispecies environment of the North Atlantic, with only a rather rudimentary model existing for some 2 or 3 species. This also means that much of the rationale behind the various quota systems, and the implementation of a maximum sustainable yield (MSY) for key species, has proved impossible to establish. Even the OECD doubts whether major fish stocks will ever “return to levels consistent with their single species maximum sustainable yield” (OECD 2001). Nevertheless, the hope for the North Atlantic is that when the ICES recommends a total allowable catch “within safe biological limits”, it is because it is possible to “rebuild” a stock to yield a stable sustainable yield sometime in the future. More often than not however, marine scientists are taken by surprise, due to the nature of the negotiation and consultation institutions, or because Fisheries – Ministers as a rule overshoot the ICES recommended TAC resulting in industrial fishermen overfishing the inflated quotas and discarding unregistered amounts of young fish (Aasjord 2000). Nature itself

does not of course behave predictably, as a good spawning stock can produce a miserable spawning, and a good year-class of fry can have a high mortality rate due to a lack of food.

After almost 10 years of strong cod stocks in the North Atlantic and Barents Sea areas, the TAC system and the individual quota system could be seen to have almost passed the test. But in 2000 and 2001 a new cod crisis emerged, with low quotas and fears of new waves of exclusion from coastal fisheries in the North Atlantic. The reason for this crisis remains however a subject of controversy. According to the “stock-capital logic” it was due to an excessive TAC of 900.000 tons in 1997, if some cod had been saved then, there would have been more for all concerned now. Another explanation is that after 9 years of the tight quota regime, fishermen have learned how to “beat the system” and thus how to have substantial amounts of cod in excess of their species-specific quota, often registered as haddock for instance. Thus they themselves manage to achieve a degree of flexibility that the quota system does not allow them. However, the yearly-negotiated modifications to the quota based regulation system of the North Atlantic makes this system increasingly less transparent and ever more bewildering. Thus a large proportion of fishermen, with or without intention the intention to do so, end up as rule violators – or “fishing criminals”.

There have been attempts to define part of major northern fish-stocks as “local” that is to say, to define it as “Coastal Cod”. This would decrease the distance between those who make the rules and those who have to live by them, and thus increase the legitimacy of the regime. Apart from a limited number of designated “sami fishing zones” in northern Norway, coastal sub-stocks of major commercial species have been impossible to establish, due to opposition from those involved in the international quota negotiations. Thus coastal regulatory regimes based more upon “user collectives” have not been tried in the North Atlantic environment since the Lofoten Regional Commons was replaced by an individual quota system in 1989, (Holm, Rånes and Hersoug 1998, 2000).

Moreover, it does not help the legitimacy of fishing regulations that a number of international treaties and agreements relating to living marine resources have not yet come into force due to non-ratification by a large number of important fishing nations. This is the case both with the “Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas,” and the “Agreement for the Implementation of the Provisions of the Convention relating to the Conservation and Management of Straddling Fish Stocks

and Highly Migratory Fish Stocks” which forms an integral part of the FAO Code of Conduct for Responsible Fisheries.

In sum, the low legitimacy of regulations, the lack of much needed flexibility, the regulation overload and the costly monitoring and sanctioning system are all likely to ensure that the present northern fisheries institutions become obsolete in the course of the next decade. Indeed the Færoes have already abandoned the quota system for most marine species, and have introduced a system based on easily monitored “days at sea” which can be adjusted at short notice according to updated stock assessments. According to some observers, the future institutions for marine governance in the north Atlantic will be more influenced by interest groups outside the fisheries community itself, such as large retail chains and powerful environmentalists’ organisations. Thus the resource management processes will become both more transparent and more political at the same time (Jentoft & Mikalsen 2001).

The more southerly waters of the North Sea and the Baltic have more species and more stable levels of natural fluctuations and thus could produce a more stable fishing environment for fishermen if they were allowed to switch freely between species. Major fish stocks in these areas are now however outside safe biological limits, mainly because they are too heavily exploited and have low quantities of mature fish. Output from the “common EU Pond” is somewhat stable, but at a very low level, and the catch is mainly that of young fish. The available fishing capacity of the Community Fleets far exceeds that required to harvest fish in a sustainable manner, and if current trends continue, many important stocks will soon collapse completely. The grim prospects for these areas were recently presented in a Green Paper on the future of the Common Fisheries Policy, in EU (COM (2001) 135 final).

EU technical measures and regulations have been extremely difficult to implement in the Mediterranean. Century old traditions and institutions, such as the *Prud'hommies* in France and the *Confradias* in Spain, still play a significant role in most fisheries dependent regions. These have, to a large extent, prevented the introduction of individual fishing quotas in the Mediterranean, and have thus enabled fishermen to continue their traditional flexibility, enabling them to switch from declining species to expanding species almost at will. They have also maintained some local decision-making powers enabling them to swiftly open and close fishing areas for designated periods according to the availability and condition of the fish.

Although this system has a very limited entry point through its fraternity-based organisation of fishermen and its novice-based recruitment

system, it has no active exclusion mechanism, and thus seems to be able to maintain a relatively large and stable population of fishermen on a relatively small resource base.

The institutional situation in the main area of the EU Common Fisheries Policy (CFP) is quite the opposite. Here TAC (total allowable catches) and associated national quotas have been thoroughly introduced and the quota logic has penetrated the thinking both in the management, and in the production side of fishing industry. Quotas are supplemented with technical measures such as mesh sizes, closed areas and closed seasons, though attempts to combine such measures with measures to control fishing effort have been largely unsuccessful. Moreover, TACs are difficult to monitor, as many species of fish are taken simultaneously in mixed or multispecies catches. TAC's are also set considerably higher than scientific advice alone would recommend, thus the CFP has been unsuccessful in controlling overfishing, discards and illegal or "black" landings. This is particularly so in the Baltic and in the North Sea, including the Nordic parts of these waters, the EU itself does not consider the current situation to be sustainable, and a major institutional overhaul is thus deemed necessary. The initial proposals for a revised CFP for the next 10 years therefore recognise the need to do something fundamental with the basic institutions of fisheries management:

- The implementation of more multi-annual and ecosystem-oriented management, more in accordance with the "precautionary principle".
- The adoption of stronger technical measures to protect juvenile fish and to reduce discards including pilot projects for measures not applied until now – such as discard bans
- The development of a system to track the progress of the CFP towards sustainable development, and to measure the performance of the management schemes and policies against stated objectives by using social, environmental and economic indicators.
- The strengthening of the 6-12 mile coastal zone regime as a zone reserved for small scale coastal fisheries, to put less pressure on spawning and nursery localities and to protect the traditional fishing activities of coastal communities, thus helping to maintain their economic and social fabric (COM (2001) 135 final).

These are drastic measures that will reduce the role of the yearly TAC's in the annual negotiations between fishing nations. It will thus weaken the institutional negotiation set-up where the fishing industry has had a dominant role, and thus contributing to inflated TACs. How more multi-annual management plans with multi-annual strategies for a number of stocks will be generated and implemented however remains as yet unclear from the preliminary documents. But if these are to be compatible with the "precautionary principle", a need will arise for broad public and political debates over how "precautionary" we want to be – or need to be (Aasjord 2000).

Thus there is a convergence between the institutional developments in the CFP areas and those in the northern Atlantic areas. In the decade from 2002 to 2012 the overriding institutional challenge in both areas will be how to craft institutions that allow open and transparent political debate on resource risks and management of marine ecosystems.

5. Mountain pastures for reindeer, meat-sheep and milk-goats – the deep impact of the modernity trap

The other major Nordic "shared commons" is the vast area of mountains and forests, to be found predominantly in the northern areas of Finland, Sweden, and Norway, as well as in Iceland. Unlike the situation pertaining in the Nordic marine areas, large parts of these areas retain the legal label of primordial "*almend*" (a 1000 year old traditional "commons" in the germanistic legal tradition). Due to different histories however, there are important legal and institutional differences between mountains and forests across the Nordic countries, in many cases even between landscapes within the same country. In terms of contemporary "commons law", southern Norway and northern Norway appear to be two different countries. Whilst with regard to fundamental property rights, institutions based in different property histories, such as for example the Swedish landscapes of Skåne and Lappland, also emerge as distinctly different. In addition, there are a number of slow processes taking place in three Nordic countries in particular relating to the constitutional question of Sami aboriginal rights to land and water in the states that they inhabit. Moreover, it is expected that such issues will increasingly display the characteristics of a "commons", i.e. they will include rights to access, to harvest common goods, to exclude external users, and the right to manage the resources of the area, but not the right to sell out the common property.

Across these large terrestrial areas the institutional challenge in the coming decade will remain closely connected to the impact of more global strategies for sustainable development. The problems that the mountain,

valley, and forest communities experience today are thus intimately tied to the recent processes of modernisation, in particular those of the extraction based industries located in these areas. In a short scenario focusing 10 to 15 years ahead, the environmental impacts of the particular paths of modernisation of these industries are of far greater importance than the climatic changes caused by global CO₂ emissions. As with the northern Fisheries, the fundamental modernisation process of the resource based industries here has been one of over-investment, over-exploitation, resource deterioration, closure and exclusion of numerous farmers, forest workers and reindeer herders – with ecosystem consequences such as mountain over-grazing, valley reforestation and decay of productive cultural landscapes. These were modernisation models borrowed from the same industrial heritage as the Common Agricultural Policy and Common Fisheries Policy of the European Union, and which the European Union now sees an urgent need to revise. The institutional challenge is thus to get the incentive structures right, so that further modernisation “aid” does not lead to further resource deterioration and new waves of exclusion.

Nordic reindeer herding in Finnmark has perhaps been hit most severely by modernisation developments in animal husbandry. A 50 year long process of rationalisation has seen the extensification and ranchification of reindeer herding, driven – or made possible – by the mechanisation of both winter and summer herding operations. A further rationalisation of the sami reindeer industry into specialised meat production combined with the increased demand for capital investments in mechanisation, has resulted in a need for larger herds per economic unit. This, together with state support for increased meat production, has resulted in overgrazing of crucial winter pastures and keystone migrating corridors. Thus, as with other “shared commons” questions, the modern solution to overgrazing is enclosure (fencing) and the exclusion of large numbers of reindeer owners and reindeer herders from this old core activity in the protection and maintenance of Sami culture and identity.

Despite the transformation of the reindeer industry over the last 50 years, the basic biological properties of reindeer husbandry remained unchanged. Northern mountain pastures are not rich and the need for reindeer pasture area is higher than for any other animal production – approximately 36 km² per ton of reindeer meat. Moreover, given that the reindeer have to be able to survive the harsh arctic winter without additional fodder, little scientific breeding for increased meat weight has been undertaken. Thus mating has been allowed to remain “natural,” and the flock and escape tendencies of individual reindeer have, for the most part, been maintained. Although the reindeer owner is therefore forced to let

the shifting – and ecologically uncertain nature of the all-year round outdoor pastures decide his herd size and slaughter weight of animals – some crucial elements of business rationalisation have however found their way into the reindeer industry. Among the 12 crucial operations seen as a part of reindeer herding, the yearly spring/fall migrations and the slaughter-strategies in particular have been affected by modernisation. Strictly speaking however it is difficult to describe an optimally adapted traditional reindeer herding system; from its entrepreneurial innovation as a form of long distance nomadic pastoralism in the 15th century, reindeer herding has always had to accommodate non-ecological external disturbances, most of them more disruptive than the presence of predators. The demarcation and enforcement of exact boundaries between Norway (Denmark), Sweden, Finland and Russia started as early as 1751 and was basically completed in 1852. The establishment of national boundaries was eventually followed by the closure of these boundaries to long distance reindeer pastoralism. This resulted in modified migration routes and in a less efficient utilisation of the area than that contained in its the full ecological potential (Mysterrud and Mysterrud 1995). Not only did the utilisation of available pasture become sub-optimal under this constrained regime, but also the predator avoidance strategies previously employed during critical stages in the yearly cycle (“calving time”) were hampered by this early enforcement of national boundaries. Thus predator eradication became a necessary strategy for the Sami reindeer herders at about the same time as the national boundaries were closed and bounty was first introduced as part of a new state development strategy. After 250 years of predator eradication, this is now interpreted as part of the “traditional” Sami reindeer herding strategy to reduce calf mortality and increase reproduction rates. In retrospect however, it can be seen that it was the emergence of virtually predator-free areas in the post-war Nordic north that allowed the recent large scale extensification and “ranchification” to become synonymous with “traditional” intensive Sami reindeer herding

In their natural state, wild reindeer employ a number of strategies for defense against predators, and through thousands of years of evolution they are naturally selected for efficiency in employing such evasive strategies:

- Flock formation and flock behaviour.
- Seasonal migrations.
- The use of natural “refuges” – or protection areas (Mysterud and Mysterud 1995).

In open landscapes such as the mountain pastures of Scandinavia, the native mountain reindeer naturally form flocks as defence groups with both males and females, whilst the forest reindeer have a tendency to hide individually in forest areas. The long seasonal migrations should be seen as not only a way to continuously reach fresh pastures, but also as a way to maintain a safe distance from predators, who are seasonally confined to their pens during birth and the weaning of cubs. For experienced reindeer, the use of natural predator free “refuges” during mating and calving is also of great importance. The herded reindeer of the Sami are often a mixture of mountain reindeer and forest reindeer and it is now the owners’ and herders’ day to day herding strategies, within the constraints of an institutionalised system of pasture rights, that decides the success or failure of the reindeer “unit of operation”.

These strategies have to be flexible and adaptive, as the winter and spring weather decides the quality of the winter and spring pastures, and thus the overall condition of the reindeer themselves. Strong animals give rise to strong calves who can profit from the natural group defence of the flock, whilst weak animals give weak calves who often freeze to death before being taken by predators. The complex choices regarding snow-depths, pasture nutritional value and predator risks of the winter pasture are therefore crucial for the level of economic returns from the flock. The prevailing culture was to follow the “natural” mechanisms of the reindeer as closely as possible, and to allow the natural death of weak animals during adverse snow conditions, and to allow for natural wastage through disease, or to actively weed out obviously weak animals (*galdring*). It is usually the case that no supplementary feeding or veterinary treatment is given to weak or sick animals. The Sami herder usually also allows the reindeer as an opportunist grazer to follow the nutritious budding vegetation after the receding snow line, and also allows “natural selection” within the herd during mating. New methods of selecting animals for slaughter, emergency feeding, and the use of truck transport to distant pastures, have however altered the demographic structure of a number of herds, usually with the aim of increasing the slaughterweight of the animals and the total meat production from the herd over a set time period. Such “rational” production plans are often made with selection for slaughter as one of the most important tools in making the reindeer enterprise more profitable. The effects of such policies on predator-resistance for instance are however as yet unknown, as little research has been done on such issues. It is undoubtedly the case however that, if not properly conceived, such economically motivated selection strategies can make the herd more predator prone, and can induce more frequent predating than in

is natural (Mysterud and Mysterud 1995). The design of modern management strategies for increased production made by state extension workers is still done mostly with reference to a predator-free environment, thus these strategies have no provision for the effects of increasing degrees of predation. Despite opposition from older Sami herd owners, “calf slaughtering” and the “restructuring of reindeer herds” are advocated as profitable herd management techniques. Whereas natural predation is generally regarded as having a positive effect on flock behaviour and on the behavioural adaptation of the reindeer to their ecosystem, as is human selection for maximum meat production, the combination of the two on a reindeer herd can be disastrous. Even if the selection by slaughter does not alter the genetic composition of the reindeer herd, any human alteration of the demographic composition of the herd that makes it more prone to predators can have grave consequences for the individual herd owner.

We are thus faced with a situation where a continued modernising trend of rationalisation in the reindeer industry is on a collision course with trends relating to the protection of endangered species, and with late modern policies of actively reintroducing extinct species of predators, increasing the biological diversity in order to strengthen the overall resilience of the total ecosystem. As such, reindeer herders increasingly find themselves snared in a “modernity trap” from which there seems to be no way out. The overriding question thus emerges whether it is now possible to attempt to reverse the course of “modernisation” in the reindeer industry in the face of ongoing technological developments and under the present state incentive systems or whether simply reverting to illegal shooting of the protected predators is the only remaining solution. It may however be the case that more advanced solutions utilising the most recent findings in the ecological sciences and evolutionary biology do however exist.

In the first instance the challenge is to get the incentives right in order to produce a more sustainable – or agro-environmental – system of reindeer husbandry. More intensive herding, utilisation of more of the reindeer (milk/cheese, skins, horns), lower degrees of mechanisation and smaller herds will allow more sami to remain in contact with the “herder culture”. This requires not only a dramatic change in the design of the support institutions, but also a change in the whole agricultural support and negotiating system surrounding the reindeer industry. Nevertheless, vested interests remain strong, with such organised interests built upon the industry model, the potential for conflict within the sami communities remains high. It is therefore not self-evident that a transfer of authority over reindeer pasture resources to the Sami Parliaments of the Nordic countries will eliminate such conflicts. A transfer to a more sustainable process of

reindeer herding will therefore most probably come about as a result of fundamental changes in the incentive structures laid down by general agricultural policy across the Nordic countries – which itself will follow from the next WTO negotiation rounds.

The challenges facing sheep and goat husbandry are related to those of reindeer herding, but they also illustrate other aspects of the problems of the sustainability of natural resource based industries. In the few places in the Nordic countries where mountain sheep husbandry is still active, it is under increasing pressure from growing predator populations. Sheep farming in mountainous regions in the Nordic countries has been promoted since 1730 when the first public bounty systems and state predator eradication programmes began. This early modern notion of “ecological simplification” basically functioned, for the past 200 years, as the official approach to an “enhanced nature” where agricultural development and surplus generation could take place. The Nordic states’ promotion of the economic utilisation of the vast mountain and forest pasture resources thus had as a precondition a predator-free environment in which the efficiency of animal husbandry could be pursued unconstrained.

Now all of the major Nordic predators, the Bear, Wolf, Lynx, Wolverine, Eagle and Fox have increased dramatically in both numbers and territorial coverage over the last 30 years. This is, as in the reindeer districts, partly due to new endangered species regulations and the abolishment of bounty incentives and predator eradication programmes during the 1970s. It is however also partly due to ecosystem processes triggered by other modernisation processes in agriculture, such as, for example, the halt in mixed grazing of farm animals in nearby valley and forest pastures. This has resulted in a slow, but discernable reforestation of vast areas of Nordic valleys and hills, which in turn has led to dramatically increased populations of wild herbivores in the young brush and virgin forests. This has not only benefited a growing group of leisure hunters of Nordic Moose, Stag and roe-deer, but also a slowly growing predator population. As true opportunists, these predators will always take the most plentiful and most easily available prey, which is now clumsy sheep adapted to what used to be a predator-free environment.

In addition, the modernisation of sheep-farming itself has added difficulties to the herding operations. In specialising in meat production, sheep are now thoroughbred to be meaty, though they are often lacking in flock instincts. Thus grazing is made more efficient and the meat output from the short summer grazing season is maximised. Moreover, the sheep are no longer herded in the vicinity of the summer farmhouse and kept in a night pen, but are left alone for the entire summer in large quantities in

vast mountain tracts. This extensification of sheep farming has left both the individual sheep and the sheep population of a certain landscape more vulnerable to the increasing predator populations. Thus the state-induced modernisation of sheep-farming and the state driven modernisation of our “social construction of nature” as resilient through complexity, have collided and left the Nordic sheep farmer once again snared in a vicious modernity trap (Sandberg 1999). Nordic sheep-owners have not however sought to use their interest organisations to ask for financial and research support or to adapt their operations to the new and more complex type of managed “wilderness” with a higher degree of biological diversity. Had they done so, such projects may have entailed genetic research into more mobile breeds of sheep with improved flock instincts, increased support for more intensive and directional herding, and support for special night folds in the pastures. Instead they have concentrated on demands for increased compensation for lost sheep, and for the eradication of predators in “sheep-areas”, thus making a “simplified” ecosystem a prerequisite for modern sheep farming.

Milk goat husbandry on the other hand has avoided most of the problems of sheep farming, although it has also been rationalised into large cooperative goat stations, servicing hundreds of goats. The difference from sheep-farming comes with the daily milking and overnight physical protection of the goats and the kids. The milk goat success story shows that sustainable animal husbandry can survive and modernise even in ecologies with increasing biological diversity. Simplification of ecosystems is thus not a necessary prerequisite for modern animal husbandry.

Nordic agriculture and animal husbandry carries most of the workload of maintaining the Nordic cultural landscape. Contrary to ecological processes in most of southern Europe and indeed in most developing countries, the Nordic countries are not experiencing deforestation. Indeed, massive reforestation during the late modern age is now threatening the biodiversity of a 2500 year old cultural landscape (Edwardsen 2000). This is an ecological process that works slowly, but is costly to reverse. The state cannot easily reshape the landscape that generations of farmers have created. The development of agriculture and animal husbandry in a fashion that leads to a form of rural depopulation, and that produces a homogeneous wilderness is therefore not a sustainable way of managing landscape resources. Urban users of the landscape resources of the shared “commons” thus often share common interests with the resource dependent dwellers of the Nordic mountain valleys and forest communities. Both groups maintain an objective interest in keeping the rural periphery populated. With increased leisure time, and increased purchasing power, there

remains some degree of willingness to pay for not only harvestable goods from mountains and forests, but also for the recreational, suspense and experience “goods” now available from this same wilderness. As we shall see, this list also includes hunting and fishing, where the meat value is minimal in relation to the value of the experience. As mentioned above, modern forestry has managed to balance the production of timber and the production of moose-hunting within its forests, often with improved economic results for the forest company or the forest owner. Moreover, mountain valley communities and other rural communities should be empowered to manage their own wilderness resources in order to supplement income from a more sustainable agriculture and animal husbandry.

Nevertheless, the crucial institutions needed to oversee rural-rural and rural-urban co-operation seems to be lacking. The institutional challenge for management of the vast mountain and forest areas of the Nordic countries is therefore to integrate the incentives of the agricultural, animal husbandry and forest sectors with those of the environmental sector, including landscape, wildlife and fish resources. This is the idea behind some of the designs for a new support regime for a multi-functional agriculture, which does not increase overproduction, but still keeps the rural areas of the Nordic countries populated. The next decade will be dominated by the struggle between farmers’ interest organisations, hunters’ interest organisations and environmentalists over the exact design of these new institutions.

6. Game hunting and inland fishing; urban public rights or local enterprise

Another area, which will in future put both national, Nordic and European Sustainable Development strategies to the test, is that of wild game and freshwater fisheries resource management. The current institutional setup dates back to the early modern period, and its “social construction” of nature project. The arrival of the individually owned shotgun liberated the hunter from the territorial constraints and social surveillance risks of fixed traps, pits and nets. By 1720 however, serious concern for diminishing game resources was reported in most Nordic countries, and a gradual breakdown of local harvesting control thus had to be replaced by public, or state policies for improved harvest of game. This was, together with the parallel “logging debate”, the base for the first batch of “sustainable development policies” in the Nordic countries. As far back as 1730, we find that an important rationale for new state policies on “eradication of worthless vermin and predators” was also the concern for the productivity of so-called, “beneficial game”, not only the concern for grazing domestic ani-

mals. In the Nordic countries the most prominent game were the ptarmigan, the roe deer, the stag-deer, the wild reindeer and the moose. It was at that time strongly believed that a reduction in predation would automatically yield higher productivity in the population of “useful” game. These ideas were propagated by early forestry developers and later supported by the first generations of field biologists. Such ideas therefore quickly entered into the “Nordic Mindset,” and still form much of the epistemological basis for ecological thinking in most Nordic rural communities and in the hunting communities and hunting associations. It was, and still is, strongly believed that by the scientifically based enhancement of nature, humans could not only improve the conditions of domesticated animals, but also could rationally manage relations with a hitherto un-tamed nature in order to produce substantial benefits for themselves. Similar thoughts can of course be found the world over, especially where a distinct frontier situation has been in existence for a considerable period, producing or demanding a “frontier ideology”. Thus the situation, and the bounty system were quite similar in the 18th century Nordic countries to that pertaining to 19th century USA.

The ptarmigan was the first game animal that behaved differently from these early modern theories of human enhancement. Towards the end of the 19th century it was widely believed that ptarmigans benefited greatly from the successful predator eradication programmes, though scientific advances in the 20th century suggest that its fluctuations were unrelated to the decreasing stocks of predators, and probably had more to do with weather conditions in early summer, the availability of insects, and fluctuations in the stocks of small rodents as the favourite prey of predator birds. This obviously suggests a much more complex set of relationships than that of the pure predator/prey relationship initially envisaged. Similar complex relationships were also found in high-yielding inland lakes stocked by arctic char and trout.

Larger herbivorous game, such as moose, deer, roe-deer and wild reindeer have seen a dramatic growth in most Nordic countries during the last 100 years, both in terms of absolute numbers and, apart from wild reindeer, also in the extension of their living areas. This could be due to the eradication of predators, but it could also be because of the abandonment of mixed livestock pastures on hillsides and valley slopes to vegetation re-growth. This ongoing process has thus gradually provided a niche for wild herbivores. As all four of the major species have increased in number, and none seems to have grown at the expense of the others, there must be some common cause for their growth. There are however several

hypotheses explaining this growth, though most of them originally developed from single-species studies:

- *The reversed predator/prey-hypothesis*: The most popular hypothesis is still that the successful eradication of predators should take most of the credit for current plentiful levels of herbivorous game. Thus it is the reduced predation on wild herbivores that explains the growth in all species.
- *The Reforestation hypothesis*: Another hypothesis is that dramatic changes in animal husbandry and forestry, and the recent depopulation of rural areas, together with climatic changes, has led to a reforestation of highly productive areas and an advance of the tree-line. This has been beneficial for wild herbivores and has increased the availability of fodder dramatically. In consequence, their numbers have risen and the expansion of the areas in which they can be found have proceeded apace, particularly over the last 50 years.
- *The Scientific-management-hypothesis*: A third hypothesis is that the human management of wild game has become more scientifically based and more professional in its operation. Thus poaching is eliminated and hunting is strictly managed with detailed quotas for each area, specifying the age and sex of the animals that can be harvested. Usually this means altering the demographic characteristics by shooting calves and young males during the autumn hunting season; allowing as many productive females as possible on to the limited winter feeding areas. As with the case of sheep ranching, the maximisation of summer grazing animals relative to winter animals gives a high “sustainable harvestable yield” (Mysterud and Mysterud 1995).

Modern evolutionary biology has not managed to conduct a strategic test of these alternative hypothesis, though the empirical facts remain that in around 100 years, the harvest of herbivorous game in the Nordic countries has increased more than ten times. In Norway alone, the 5-year-yields of wild herbivores have increased from a few thousand animals to 60.000 roe-deer, 40.000 moose, 10.000 reindeer and 6.000 stag/deer. Such figures are illustrative of a total change in the environment in Norwegian rural areas, from that of an open landscape teeming with cattle, horses, sheep and goats on summer pastures, to that of a reforested landscape

teeming with wild herbivores on all year pasture, and with growing predator populations lurking in the thicket.

This points to where the real challenges are to the management of Common Property resources in the Nordic countries, and thereby also to the fundamental challenges to Nordic strategies for the sustainable development of area resources. One is the epistemological disagreement, both within science and in the echelons of Nordic nature management over what are deemed to be the best explanations for current developments in Nordic vegetation and wildlife. Another challenge is the limited knowledge of the ecological processes initiated by the fundamental social and economic processes of urbanisation, rural depopulation and the individualisation of hunting and fishing. And as pointed out above, a third challenge is to predict the ecological effects of new operational practices resulting from a more “multi-functional” support system for agriculture, forestry and animal husbandry.

These challenges are made all the more serious by institutional “lag”, where the fundamental property rights related to the new concepts of biodiversity and ecological resilience are still largely unspecified at levels below the state, and the rights and duties related to maintaining or increasing biodiversity are not allocated. A number of European states have experienced high levels of conflict in a number of areas where predator reconstruction has taken place. This is the case both in Germany, Austria and Italy where wolves are returning, in Switzerland where lynx were reintroduced, and in Northern Scandinavia where bears, wolves, wolverine and lynx have largely been restored. Similar conflicts have also been experienced in the USA, where wolves were reintroduced into the greater ecosystem of national parks bordering on important livestock areas. One of the reasons why such conflicts occur is that ecological resilience has tended to be regarded as a public property as well as a public duty – and thus the prerogative and responsibility of the nation state. It does not therefore pose a challenge in terms of policy formulations in national strategy documents, the problems starts when practical biodiversity is to be made a common property for a limited group of heterogeneous users, e.g. nature watchers, urban environmentalists, hikers, livestock owners, loggers and hunters. To work out ways of governing a landscape resource with the aim of maximising complexity and interconnectedness is far more difficult than to manage a single stock of herbivores in a simplified predator-free environment for the greatest possible annual harvest. The more complex the common property resource is, the more credible commitments from a more heterogeneous group of users are needed. This requires both epistemological agreement, and delegation of authority and responsi-

bility, and usually also of property rights as well, at least to the level where commitments and managerial decisions are made. In addition, it requires restraint from central government in order that local institutions can learn by their own mistakes in relation to political, social and ecological processes. In the Nordic countries, with their centralised governing and corporate structures, and where the state is also an important land-owner in itself, this kind of devolution has been difficult to implement. Instead, compensation to sheep farmers for predator kills from a central environment agency has thus far proved to have been the easy way out. Thus, conflict dampening strategies have been applied more often than attempts to solve the fundamental institutional challenge arising from the newly constructed “Right to a diverse Nature” and the practical challenges posed by the management of a more complex nature.

In all of the Nordic countries, patterns of use of landscape resources by hunters and fresh water fishermen has changed dramatically over the last 30 years. Some of these changes were caused by ecological changes initiated by dramatic ongoing change in agricultural and animal husbandry practices, as we have seen above. For example the spread of moose in the Nordic countries has resulted in new moose-hunting activities, which have not been undertaken in living memory. New conservationist ideologies have also changed the ecological preconditions for nature use; large areas are now protected as national parks or nature reserves with varying restrictions on access and harvesting. Moreover, the protection of endangered species has resulted in new kinds of hunting activities, and in the licensed trophy hunting of large predators. This is, in the Nordic context at least, a crucial re-invention of the Viking-age and of the medieval hunt for the highly priced skins of predators (*klovare*), and is thus the opposite of the “bounty-hunt” philosophy of the eradication programmes of the 18th century. Predators are, from a hunter’s perspective, not only classed as vermin, and viewed as a competitor, but also now as a resource that itself needs to be “managed”.

Indeed almost all types of nature “leisure use” have changed, including those harvest-motivated uses such as berry- and mushroom picking, and the more experience-motivated activities such as hiking and climbing. The three important processes here are the individualisation, the urbanisation and the globalisation of all leisure use (Bauman 2001). In brief, the development has been from one of a local and community based use-pattern, with local control over local landscape resources, towards an urbanised use-pattern where user rights are independent of home address or travel distance to and from the resource itself. Leisure use has also become more specialised, the modern Nordic urban nature user is thus rather

different from the traditional Nordic rural “multi-user” of the local and often commonly owned landscape resources. In the valley or in the village, ecological knowledge, harvest control, and management and maintenance duties were exchanged, executed and allocated in informal and frequent gatherings. Hunting, fishing and berry-picking was usually combined with agricultural or forestry activities, sometimes also with maintenance and enhancement of landscape resources and fishing in both rivers and lakes.

For the urban individual nature user, the hunting, fishing or climbing activities are usually not an important part of their annual income, although they can form an important part of their annual expenses. It is often the case however that individual identity, or “image” is closely tied to one specialised form of nature usage, in the Nordic context you *are* a moose-hunter, a grouse hunter with dog, or a fly fisherman – or you are a hiker, or a mountain climber. As such, you are an informed member of the appropriate association, have all the right equipment and organise your life, your spouse, your vacations and your car to maximise this particular form of nature usage. The modern nature user pays a licence to the state and/or user fees to the “owners” of the landscape resources and assumes that the management and maintenance of the resource is taken care of by professional and dedicated people. As such, she is not a “member” of a user-community with obligations towards the landscape resources as a commons, but a “customer” who pays to be free from management and maintenance obligations. Through her association, she gets all the specialised ecological information and training she needs, and can, via their website, be constantly updated on the current hunting and fishing prospects – and corresponding prices in the various localities. Provided that all this functions reasonably well, and with regular increases in licence fees it is expected that it should, the Nordic urban nature user is becoming more and more self-sufficient. Consequently there is a decreasing need for the visiting hunter or fisherman to contact local villagers to ask about the prospects in the different parts of valley or mountains. Information that the teenager in the municipal information office would not know in any case!

This brings us to the deepest institutional challenge facing Nordic nature use and sustainable development, the challenge of credible commitment. The modern Nordic urban individual nature user is satisfied as long as everything functions, and is apparently willing to pay considerable amounts into both state coffers and the local economy for the prized harvest or the thrilling experience. In many ways the quality of the “product” in most hunting and fishing localities in the Nordic countries, is bolstered by the solid level of “social capital” constructed over generations of local

natural resource use. This capital has been actively utilised in ground-owners cooperatives, river-owners cooperatives, local hunting and fishing associations, mountain councils and a host of voluntary associations at the local level. With the accelerating rate of rural depopulation in all the Nordic countries however, and an increasing specialisation in agriculture, forestry and animal husbandry, this capital is now slowly being eroded. Many rural associations and co-operative enterprises in the Nordic countries are therefore experiencing problems with the recruitment of officers to undertake management and maintenance work. Young people have moved away from the social control of the valley, whilst “urbanised values” are gradually seeping into rural areas. Indeed many people in such rural communities want to be able to become customers themselves, and thus to be able to buy their freedom from further duties and obligations. We are thus left with the deepest question surrounding the structures of the modern age of institutional maintenance, namely – who is going to do it? (op.cit.)

To answer these institutional challenges, three different categories of models have been tested across the Nordic countries. They each have their own advantages and disadvantages, and no one model seems better suited to managing sustainable development than the other. Viewed together however they illustrate the complex dilemmas and choices that have to be made by the Nordic countries in the next decade (Sandberg & al 2000).

First we find in most Nordic countries an *interest-based management* of landscape resources, which is under considerable stress. In this “industrial-age model” the strong groups of organised interests in agriculture, forestry, reindeer husbandry, hunting and fishing, hiking, climbing and nature conservation play a decisive role. They also, in most Nordic countries, correspond to an “office” in central, provincial or local government, and together they form a segmented system for the utilisation of “their” landscape resources. Within such agglomerations of “interests,” meeting places, state subsidies and arrangements for consultation are all highly institutionalised, in many ways organised interests play the role of co-managers of “their” part of the landscape resource. Moreover, the sector based legal structures support this model, in most Nordic countries agriculture, forestry, reindeer husbandry, hunting and fishing have their own laws which often take precedence over more general environmental legislation. To a great extent, the educational background of the bureaucrats and the full time officers of these “segments” are similar, thus they often share similar epistemological models of how ecological processes work and what a desirable ecology should look like. At present, such insti-

tutional relationships provide the most powerful and the most entrenched institutions for landscape resource management in the Nordic countries.

The inherent weaknesses of this model are now however gradually becoming more visible. As knowledge of ecosystem interconnectedness increases, the segmented management model will increasingly appear uncoordinated and unnecessarily fragmented to large groups of nature users, and thus will probably experience a significant decrease in legitimacy outside the ranks of its own members. Every time that forestry development harms the prospects for moose hunting, or the overstocking of certain mountain pastures destroys a good grouse habitat – or field manure pollutes an important salmon river, the pressure for improved co-ordination will increase, whilst at the same time meeting resistance from the various sector managers. The current resistance across Nordic agricultural segments to the WTO inspired ideas of a “multi-functional agriculture” can also be explained in these terms – other considerations for agriculture than the production of food would make the work inside the segmented model more complex and thus increasingly difficult to handle. Moreover, in the leisure-use segments of landscape resource management fragmentation is already noticeable, the management of hunting and hiking in national parks can be poorly co-ordinated, thus creating conflicts between different user categories.

The question is thus whether an integrated management of landscape resources is possible in the coming decades, whether it shall continue to be interest based, or will alternative models come to be seen as more suitable?

One such alternative approach has long centred on the *demand for rights-based management* of all landscape resources. Such rights can be property rights of various strengths, from public property rights vested in the state, via common property rights for a group of stake-holders, to private property rights. Territorial rights moreover usually provide a solid base for the integrated management of all ecosystem resources in a certain landscape. Ground-owners are usually interested in maintaining a good balance between the harvest and maintenance of the different kinds of resources. Indeed the empirical evidence suggests that this is so as a number of rights-based management schemes have shown results, both where the state manages its own ground through a state company, and where a “common’s” property rights regime is given recognition and the right to manage resources, as was case for *allmend* in Sweden and Southern Norway. In all of the Nordic countries we find such demands in relation to relationships between the local level and the state. In addition demands are also made by the Sami population of northern Finland, northern Sweden

and northern Norway for indigenous property rights to landscape resources (land and water) in the traditional Sami areas. A number of these claims remain unresolved in spite of lengthy constitutional processes, in Norway, the sami claims in Finnmark have now been considered for 20 years. Moreover, legal processes over resource rights tend to drag on interminably, for instance it took more than 100 years to acknowledge the “common” character of state-owned land in Northern Norway.

Thus the complicated property history of the Nordic countries and the legal dominance of the questions of “who has the property right?”, hampers the implementation of a more rights-based model. Although a number of analyses point to the greater efficiency, lower transaction costs and higher legitimacy of a purposely designed property rights regime with built-in incentives for commitment, contribution and efficient resource management, this seems difficult to implement in the Nordic countries. Indeed, even if rights-based regimes become increasingly popular in the coming decades, perhaps as part of the ongoing attempt to trim public spending, they will not meet all of the challenges outlined above. A right-based regime will, in most cases, improve the co-ordination and integration of the management of the different ecological elements of the landscapes, but it will also, in most cases at least, produce a new type of fragmentation, namely, the distinction between those who have user rights, and duties, and those who do not. If the base for common property regimes is to be located at the municipal level in the Nordic countries, many of the “circles of users” will become highly exclusive, and a large number of traditional regional users will be excluded or feel discriminated if confronted with a steep price differentiation between “home-users” and “outsiders”. The solution here may thus be to use two or more municipalities as the base for rights-based regimes, designing “regional commons” that contain both urban and rural populations, and crucially that better correspond to the patterns of commuting and the specialised nature use of the modern Nordic inhabitant.

Finally, there remains a significant level of interest in the devolution of *politically based management* of landscape resources. This takes as its point of departure the fact that resource management in the Nordic countries is already political, that is to say, it is the national legislatures who decide upon the relative use of the landscape resources, through laws, institutional arrangements and budgets. As such, they decide what the national landscape will look. Moreover, this line of arguments continues, Parliaments are not well suited to “political ecology”, as they are too far removed from the actual scene, they are too slow and inflexible, and they are usually forced to leave too much of the practical policy-making to the

“experts”. Thus the regional or municipal levels retain sufficient knowledge of the local ecologies to match that of the experts, and can balance the use of landscape resources for agriculture, forestry, hunting, fishing, conservation and leisure use at the same time as maximising biodiversity and accommodating the costs of the precautionary principle. This kind of balancing, together with the distribution of goods and chores among the electorate, is the true nature of politics. Local, or regional political assemblies are therefore thought to be the institutions best suited to govern the ecosystem resources of their own landscapes for the optimal long term benefit of both its harvesting users and its leisure users.

If sustainable strategies are to have legitimacy beyond government corridors, more emphasis will have to be placed on local and regional political bodies, even in the Nordic countries. This will however require that Nordic regions and municipalities acquire ever more ecological expertise, which can be independent of the strong interest groups in their landscapes. In some Nordic countries, national database-systems and nature information systems are being constructed (e.g. AREALIS) which will aid the municipalities when they take over more of the practical work related to the management of landscape resources.

Across all the Nordic countries however, constitutional problems connected to these ambitions for widespread devolution remain. Such problems are tied to the property rights regimes, which governs much of the landscape use. Both the private property rights of the farmstead and the public rights of access to the Nordic mountain landscapes (*allmannarätten*) are guaranteed by the state. The only property rights, which exist independently of state patronage, the common property rights, are however not dependent on the municipalities either. To complicate matters further, in many parts of the Nordic countries where powers were balanced by kings holding ground in common with the peasants, the state also holds property rights in such commons. Thus, politically based management at the municipal level can easily be curtailed by legal action, and most harvesting businesses and leisure activities will still have to obtain their legal trading base and licensing authority from the state. So unless some of these basic property rights relationships between the Nordic state and its municipalities are redefined, the role of the municipality may well remain that of a toothless planning authority with regard to the management of its landscape resources. Therefore it is necessary to take on board the ambitions of those who propound “devolution” to the municipal level endorsing the politically based management of landscape resources, and the demands for a more rights-based management within the same context.

7. The institutional challenges to strategies for sustainable development – the limited scope of sector integration and the potential for ecological modernisation

The present mode of implementing the strategies for sustainable development within both the Nordic area and the European Union are based on the principle of sector integration. Following the idea of the EU Cardiff-process, all major sectors in society shall strive towards integrating the objectives of the sustainable development strategies into their operations. The first generation of such strategies centred on plans for the transport, agricultural, forestry, industry, energy, and fisheries sectors.

The new generation of sustainable development strategies however seems rather eager to depart from this sector integration principle. Although the Cardiff process has not yet been concluded, there now seems to be a push towards including more complex development problems within strategic policies such as for example “Climatic change and clean energy”, “Public health and food safety”, “Managing natural resources” (EU 517, 2001), or “Responding to Climatic Change”, “Managing Natural Resources” (OECD 2001). The Nordic Sustainable Development strategy has retained the most sector-integrative approach, but even here cross-cutting issues have become more prominent: i.e. “Biological diversity, Genetic Resources – Natural and Cultural Environments”, “The Sea”, “Chemicals”, “Food safety” (Nord 2001). These types of sustainability challenge cannot easily be met by means of the sector-integration approach, the question is therefore whether this has a limited scope for achieving a measure of sustainable development. If this approach should continue to be used to attack some of the more complex sustainability issues, it would require an increased level of consultation and co-ordination between state agencies and their experts that would incur transaction costs that remain incompatible with the political goals of renewal and the trimming of the public sector.

As we have seen in this report, as far as the “Management of natural resources” is concerned, a number of institutional challenges to the Common Property resources regime in the Nordic countries can be related to the troubled relationship between the state and the local communities themselves. For centuries, they have quarrelled over who shall control the riches of the Nordic mountains, forests, coasts and seas. One way of solving the sector-integration dilemma is for the state to adopt the strategy of devolution offered by representatives of the regional and municipal levels, entailing a decentralisation and delegation of resource management to

lower levels, which would not only increase the ability to attack complex development problems in a more efficient way, but it would also entail the considerable “spill-over” bonus of increased levels of democratisation, transparency and legitimacy to a policy area that badly needs them .

Due to the increased understanding with both the general public and the media of the complexity of ecosystems, most Nordic countries will, over the course of the next decade, probably be forced to delegate more of the policy-making duties related to natural resource management to elected political bodies at the regional and municipal levels. As we have seen, there is pressure from coastal and rural communities to assume a greater local role in the management of coastal fish resources, coastal localities for aquaculture, forest resources, pasture resources, game resources/biodiversity resources and river and lake fish resources. A devolution of this kind of management can solve some of the overload problems currently plaguing the Nordic states, and thus could contribute to the “Ecological modernisation” of the Nordic countries in the sense that greater sustainability can be achieved by technical and procedural innovation (Hajer 1996).

But as we have seen, there are also dangers involved in this way of meeting the institutional challenges posed by resource management. In particular in this regard we can point to increasing levels of globalisation which make the resource users more mobile and less committed, rural depopulation and the concomitant decay of local associations, the erosion of local social capital, and the plethora of unsettled property rights disputes between the state, local communities, and indigenous groups.

This suggests that how we organise the management of natural resources in the future is not only a question of implementing a strategy for sustainable development, but also a wider institutional question of how we organise the relationship between the state and its citizens.

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