

MAB
Man and the Biosphere
The Norwegian National
MAB Committee

A CONFERENCE

on

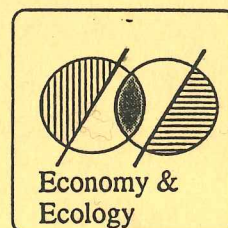
Common property regimes:
law and management of
non-private resources

Nyvågar, Lofoten, Norway
16 - 21 February, 1993

Papers Presented



NLVF
RURAL DEVELOPMENT



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THE E-BOOK PROCEEDINGS HAS 3 VOLUMES

- Volume I contains 21 papers that were presented during the conference
- Volume II contains 8 papers that were presented during the conference and the discussion remarks given by moderators of the 10 sessions of the conference
- Volume III contains the program for the conference, the corrected list of participants. The volume includes one paper that was presented during the conference but came too late to be included in the printed proceedings from 1993, and one that was written afterwards reflecting on the proceedings. It also includes a translation to English of one paper in Volume I that was printed in French.

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PROCEEDINGS
OF
A CONFERENCE ON

COMMON PROPERTY REGIMES:
LAW AND MANAGEMENT
OF
NON-PRIVATE RESOURCES

16-21 FEBRUARY 1993
NYVÅGAR, LOFOTEN
NORWAY

VOLUME I

Compiled
by
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Preface

One of the major environmental challenges confronting humanity today is the development of proper management regimes of our common resources. The Norwegian Man And the Biosphere (MAB) programme focuses on the exploitation and management of common property resources as exemplified by the fisheries based on the resources in the Barents Sea and the Samii pastoral production system of Finnmarksvidda. This is done through multidisciplinary research on the inter-relationships between natural and social systems, both of which interpreted in a wide sense. Before proper management regimes can be developed, improved understanding of both the ecological and the social/political system are needed. Research within the Norwegian MAB-programme is applied in its character; that is, it aims at providing improved knowledge about how to exploit and manage our resources in a sustainable manner.

Central themes within the Norwegian MAB-programme are:

- the state of the relevant common property resources and their carrying capacity, and the application of scientific knowledge in resources management
- indigenous adaptations to resource exploitation and traditional ecological knowledge
- the implications of government regulatory systems and regional policies for the sustainable development of these regions.

The insights gained during this programme will be seen in a comparative manner to insights from other circumpolar regions and countries in the Third World.

The research programme has just started and is planned to go on for approximately four years. As part of and in close cooperation with the research programme of the Norwegian MAB programme, conferences will be organized (partly for a Norwegian audience and partly for an international audience). The conference on "Common property regimes: law and management of non-private resources" we are about to start now, is part of this effort. Both as a scientist working on these issues and as the Chairman of the Norwegian MAB committee and its Board for the research on common property, I am very much looking forward to the presentations and discussions and presentations at this conference. I'm sure all of us will learn a lot.

Nils Chr. Stenseth,
Professor of Biology,
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INTRODUCTION

by

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The theme of the conference is **Law and the management of non-private property**. In particular it concerns the management of the fish in the Barents sea and the range lands in Finnmark.

The fish in the Barents sea is a valuable resource in jeopardy. The range lands of Finnmark is also a valuable resource in jeopardy.

What these two resource have in common is at the very least that neither of them are private.

Around the world one finds non-private resources in jeopardy. And one finds private resource in jeopardy. But somehow public interest in the mismanagement of private resources is not quite as much in fashion as the mismanagement of the non-private.

Private or non-private or public, the concepts we use are not precisely defined. Some discussion of terminology might be in order, but before we look into the concepts we use, perhaps we should look at the problems we are facing. I think that getting some kind of understanding of the dynamic of a problem is necessary before conceptual generalizations will be useful.

I shall not try to give details of the problems faced, only the long distance view of them, as they appeared yesterday. Details were hazy and only the more significant features were visible - or so I hope. The contributions here will give a fresh view with more details.

Problems of Managing Fishing.

In the North East Atlantic and the Barents sea there is a vast resource of fish, an ecosystem where big fish eat small ones and the small ones eat the even smaller life in the sea. Here seals and whales compete with

birds and men to harvest from the abundance, and all are subject to seasonal and long-term changes interacting with stochastic factors of ocean currents and climate to affect the volume and distribution of biomass across species as well as geography.

In the competition for the harvest, man has increased his power tremendously and rapidly during the last few decades. The possibility of depleting the ecosystem far beyond the point of profitable harvesting and possibly into no recovery has become real.

How can we avoid it?

The problem has several dimensions, international as well as national.

The interests of Russia, Norway, Iceland, Greenland and the Faeroes are more or less directly involved. Norway and Russia, and Norway and Denmark (Greenland) are involved in disputes about the border between their extended economic zones (EEZ). In the middle of the Norwegian sea and between Svalbard and Novaja Semlja there are regions not now within any nation's administration. And throughout these various jurisdictions the fish migrate back and forth.

Within each jurisdiction there are problems of legitimacy and justice in the consequences of regulations as well as repercussion throughout the ecosystem of the regulatory policies being chosen.

The problem is to improve our understanding of how the regulations affect simultaneously both the viability of the ecosystem and the qualities of the social system organising the appropriators.

Problems of Range Land Management

Finnmark and Finnmarksvidda is the habitat of the reindeer herders of the Sami people and their herds. Throughout known history there have been long-term swings in the availability of some of the critical resources ensuring the survival of the reindeer during critical times. When the critical resource did not suffice, some of the animals starved, the herds were depleted, and conditions improved.

But both the Sami society and the Norwegian society have changed. Modern society has encroached on the habitat along the margins, modern technology has made it possible to follow the herds more closely, but this also necessitated larger herds to pay for the technology; and new households have added more herds. The overcrowding is visible, at least in the small regions of limited resources which most of the herds depend on during critical periods in the spring.

It may also be visible in the conflicts among herdowners and their anxiety about the future.

Is there nothing the reindeer herders can do to regain control of their future?

The problem has several dimensions. The Sami population is a separate people within the Norwegian state. They enjoy the rights of citizenship like every other citizen. But their status as an aboriginal population also gives them special protection according to the UN covenant on Civil and Political Rights (article 27) and the ILO Convention of 1989, Concerning Indigenous and Tribal Peoples in Independent Countries. The ILO convention indicates that rights of ownership and possession of the land indigenous and tribal peoples traditionally have occupied, ought to be recognised.

The precise content of these rights are so far unresolved, but many of the unresolved problems are tied to the problems of managing range lands. Both Sami and Norwegians acknowledge that Sami culture and national identity to some degree is tied to reindeer herding as an industry. But the implications of this for the management of the rangelands are unclear.

Also, among the Sami there are internal problems tied to the management of the range lands. If access to the range land has to be closed, which relations will the reindeer herders be able to maintain to the Sami population excluded from the reindeer herding industry, and how can the closure be done without jeopardising the Sami culture and identity?

The list of questions could be extended, but our first goal is to understand what is happening and why.

What are the dynamics of these problems?

We know a fair amount of what happens to the resources and how it happens.

People make it happen. People do make their own history.

But here as elsewhere: they have not chosen the conditions under which they make their history. And if it is the conditions which dictates what kind of history people make, we need to ask if it is possible to give the choice of conditions to the fishermen of the Barents sea and the Sami people. Is it possible for them to affect the conditions shaping their choices? In other words: is it possible to shape the institutions governing the resource utilisation on the range lands in Finnmark and in

the Barents sea according to goals expressing the desired path of development for a social system?

The assumption - not to say presumption - of modernity is that it is possible and that science can give the answer of how to do it.

The goal then is to explore which conditions will give not only one reindeer herder, but all reindeer herders conditions where they in common can regulate the allocation of the critical resources of the range lands, and which conditions will give not only one fishing vessel optimal conditions, but allow all fishing vessels to catch their fair share of the harvest with a minimum of effort and without endangering the survival of the ecosystem.

A COMPARATIVE APPROACH

While we know a fair amount of what happens to the ecosystems and why, we know considerably less about which conditions make people behave in a way where resources are used sustainably and even less about how to come from the present conditions to another set of conditions.

To disentangle the various factors affecting resource utilisation, we have chosen a comparative approach.

While the resource systems of Finnmarksvidda and the Barents sea are similar in important ways, the social systems involved in the management of the resources are very different. Of particular importance for the comparison of the situations are that on Finnmarksvidda the resource users are an ethnic group of aboriginal status, and in the Barents sea there are international considerations both in relation to the Law of the Sea, the status of the Svalbard territory and the signatories of the Svalbard treaty, and in relation to the geo-political and industrial interests of Russia.

To increase the scope of comparisons, we have turned to Africa for contrasting cases: to Mali for a look at range land management and relations between traditional and state regulation in a case where aboriginal status is not a salient issue, and to Namibia for a look at the management of fishing rights in a less complex international setting.

But productive comparisons require a standardised theoretical language to describe the various cases. This theoretical language we are beginning to find in the rapidly developing field of theories of property rights regimes.

I will not presume to instruct you in that particular field. But since not all of you are equally informed of what a "property rights regime" is, I would like to repeat some basic concepts.

SYSTEMS OF RIGHTS REGIMES

Property rights come in a wide variety of disguises. Any one particular constellation of rights will be called a property rights regime.

A property rights regime is a complex constellation of rights and duties; privileges and rightslessness; powers and liabilities; and immunities and powerlessness, based on the norms and values of a people and its lawyers.

So far there is no one THEORY of property rights regimes, there are theories. This is not the time to review and evaluate the various theories.

Relying on Eggertsson's (1990) study of "Economic Behaviour and Institutions", we can speak of a "naive" theory of property rights which assumes that property rights will be defined and enforced in a way that will maximise the aggregate wealth of a society.

The "naive" theory may better be thought of as a prescription for how property rights ought to be defined and enforced by the omnipotent and totally good state, than as a description of how reality looks like. It is not hard to find evidence disproving it.

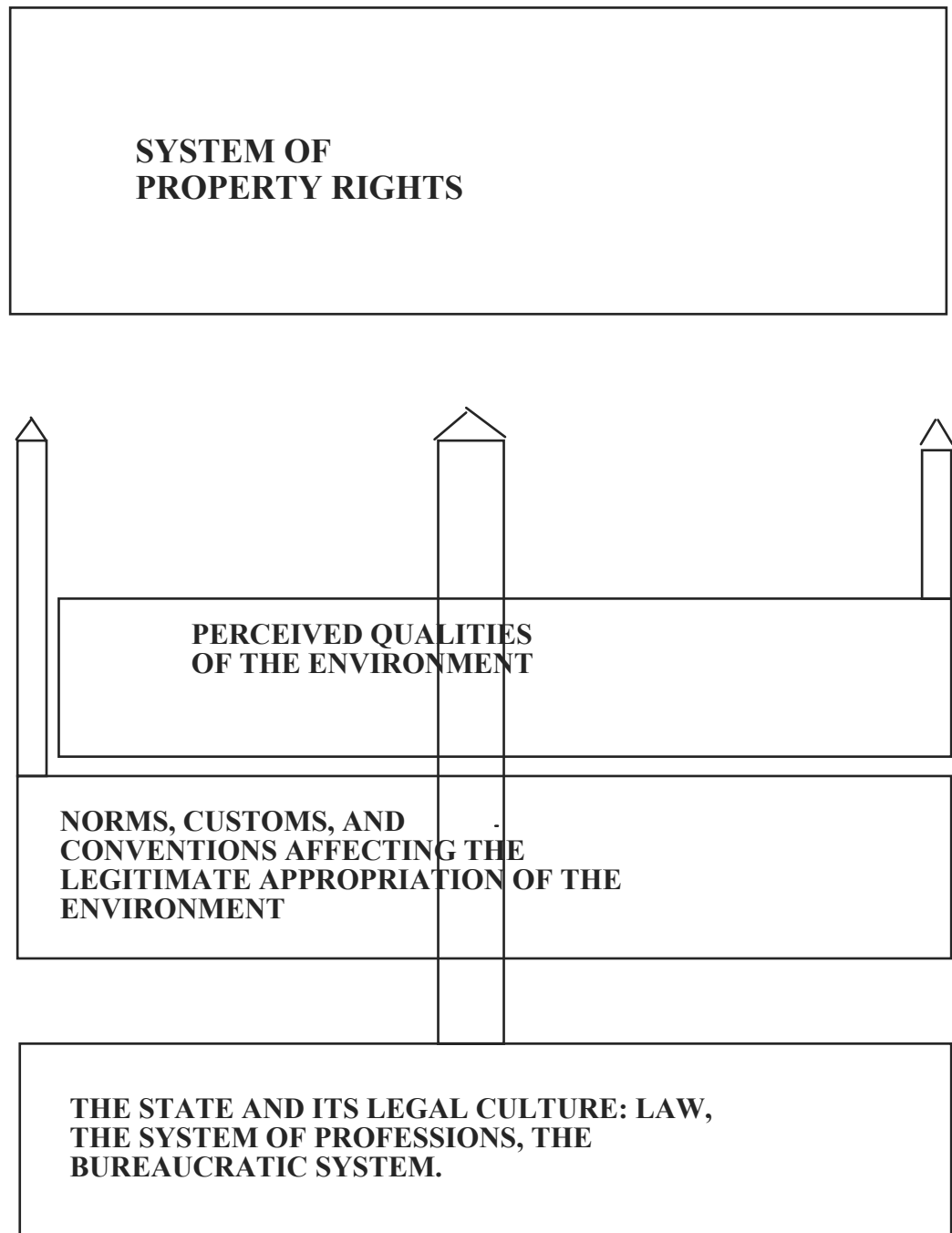
One strain of theory trying to improve on the naive theory have been called the "interest group theory of property rights". It could also have been called political economy. The political clout of occupational organisations or classes will determine changes in the legal system at the margin and thus cumulatively strengthen particular groups at expense of others and without regard to the overall efficiency of the economy.

Another development of the "naive" theory emphasises the nature of transaction costs and how these shape the activity of the state in relation to property rights.

The bottom line of all the theories, though, is that a property rights regime determines who **legitimately** can claim the benefits from which resources. A property rights regime is a real world system of action which affects the distribution of the various goods defined by the society as worthy of attention.

The significant word for a property rights regime is "legitimacy". The degree and source of legitimacy determine the kind of protection given by state and society to any particular holder of a right.

FIGURE 1
FACTORS AFFECTING THE SYSTEM OF PROPERTY
RIGHTS



The foundation of a property rights regime can be divided into three parts.

1) THE CHARACTERISTICS OF A RESOURCE AFFECTING WHO CAN LEGITIMATELY APPROPRIATE WHICH BENEFITS AS PERCEIVED BY THE MEMBERS OF A SOCIETY,

2) THE BELIEFS AND NORMS AMONG THE ACTUAL RESOURCE APPROPRIATORS ABOUT WHO CAN LEGITIMATELY APPROPRIATE WHICH BENEFITS FROM THE RESOURCE, AND

3) NORMS ABOUT JUSTICE AND EQUITY AMONG LEGAL AUTHORITIES AS EXPRESSED IN ACTS AND THE INTERPRETATION OF LAW CONCERNING WHO CAN LEGITIMATELY APPROPRIATE WHICH BENEFIT FROM THE RESOURCE.

One might imagine that a property rights regime was determined by the characteristics of the resource it is supposed to govern. But so far I think the evidence indicates that cultural factors take precedence over environmental factors. The role of the actual characteristics of a resource is more in the role of limiting the variation of regimes. Given such and such characteristics there are some constellations of rights and duties that will not work or will work only very poorly.

The values of a culture can be expressed in a variety of ways. If something is considered to be of great value or to be important for the daily effort to secure a decent living standard, the society will protect it in some way and to some degree. It may be through the norms and regulations promulgated in the everyday encounters or it may be through acts and regulations enacted by a state on behalf of the society and promulgated by a police and court system.

But statutory law also has to be interpreted. Among lawyers and law enforcement officers there also will develop systems of perception as well as norms about appropriate interpretations and suitable reactions to the perceived wrong doers. The legal sub-culture is an important part of the forces shaping an actual property rights regime.

1. CHARACTERISTICS OF RESOURCES

The variety of characteristics of a resource may confuse us. Not many of them are of interest to the management regime. The significant aspects of a resource are its perceived qualities in relation to the goal it is assumed to contribute to fulfil. One important aspect for our concerns here is the degree of divisibility in time and/ or space. The distribution

problems of a society are very different for divisible goods compared to those with important indivisible aspects. If there are noticeable indivisibility's in the utilisation of a resource one has to look for other ways of managing the resource than granting individual physical shares to each user, if the distributional problem is to be solved.

The range lands of many pastoral societies will typically in important ways be indivisible. Optimal use of the range land will usually imply access to seasonal pastures as well as transport corridors between the various pastures. And if there is a stochastic component e.g. in where the rain falls, the pastures must be large enough to exploit this stochastic component. The possibility for dividing the pasture equitably may not exist.

Other important characteristics of a resource are those who are perceived by the members of a society to affect the procedures of appropriation (e.g. max sustainable yield, or externalities in consumption/appropriation etc.).

For renewable resource there exist upper bounds on the volume of extraction from the resource which must be observed if the resource shall maintain its ability to provide benefits in the future.

The process of appropriation and/ or consumption of a resource may create externalities (various types of crowding or queuing phenomena), the nature of which needs to be taken into consideration in the property rights regime in order to maintain the stream of benefits.

While the existence of indivisibility's is important to take into account one should not be blind to the many ways it is possible to divide resources like land. In some legal systems there are different rules for regulating access to different types of resources (arable, trees, water, pastoral land). In other legal systems there are different rules for “fee simple”, “usufruct rights”, “management rights” and the rights of “cestui que trust”.

2. CULTURE AND RESOURCE APPROPRIATION

The culture we are thinking of here are the opinions, attitudes, beliefs, norms, and values within a population of actual resource appropriators about who can legitimately appropriate which benefits from the resource.

If somebody believes he has a right to utilise a resource in a particular way and everybody else of those who come to know about the utilisation concurs, it does not matter what the legal code says or what the “state”

wants. For so long as all people act in good faith the definition of the situation will be the reality of the situation. The problems arise at the point where someone contests the right to any particular resource utilisation, e.g. because it infringes on what this person believes to be his right. If the conflict is solved locally without recourse to the formal legal system we are within the bounds of a traditional management regime. But if it escalates the local resource users have to face the possibility that the state and its representatives may bring a new definition of the situation into the negotiations.

The academic problem now becomes where those who will decide the outcome of the dispute, will find their definition of the situation: their insight into what, accordingly, can be considered a proper resource utilisation, as well as which principles can be invoked to curtail uses incompatible with the principles of justice the definition of the situation implies (e.g. whether the resource is considered common property for the inhabitants of a community or state property).

History shows that the problems which traditional cultures have difficulties handling, are likely to arise in relation to

- exclusion and transfer,
- inheritance,
- exchange of rights, and
- long term interests in use, and
- decisions on joint use of resources.

The problem of exclusion and transfer

The question of inclusion in or exclusion from the group of people allowed access to a resource is fundamental. How is membership in the group acquired and how is it maintained? A particular instance of this problem is inheritance.

Inheritance of rights.

How do societies (pastoral as well as others) handle the question of succession and recruitment. How can a resource user ensure that his or her heirs will be able to enjoy the same quantity and quality of a resource? How is it possible for new households to get access to a resources? The role of inheritance can be tied in to the more general problem of how to secure long term interests in the resource utilisation.

Exchange of rights

Both the problems of membership in a group of appropriators and inheritance are closely related to problems of transferring rights, privileges, powers and immunities (partly or totally) among group members for periods of time or for ever. If transfer is possible, the question is what kinds of restrictions are put on the transaction.

Long term interests in the utilisation.

A property rights regime shapes in powerful ways the time horizon of the actors utilising the resource. The security of tenure (of any kind of rights) and how it is protected forms the possibility for long term investment in a resource.

Decision rules for resource utilisation

Decisions on joint use of a resource require meta-rules about how to decide on joint use. The existence or not of procedures for establishing or changing the meta-rules is an important aspect of a property rights regime.

3. LAW AND LEGAL CULTURE

Within the legal infrastructure and machinery of enforcement of the state, one finds norms about justice and equity expressed in laws and the interpretation of laws concerning who can legitimately appropriate which benefit from the resource.

The legal regulation is expressed in two ways. It is expressed in the form of acts and it is expressed in the judgements in the courts of law where the interpretation of acts and traditions establish a legal tradition, a legal subculture which of course has links to the common culture of the people.

Enforcement of rights.

One problem for holders of claim-rights, privileges, powers and immunities is to defend their rights. Property rights are legitimate if public opinion says so and if some social power - the state or some other central or local institution - recognises the right-holder and is prepared to enforce his, hers or its rights. An important part of a property rights regime is the remedies granted rights holders feeling themselves wronged.

One important distinction in the legal tradition is the division of interests into public and private. Does the violation of a regulation affect only the private interests of a citizen or does it also affect the public interest? In the cases where it is a violation of public interests, the legal tradition will be affected by the system of enforcement since the resources and traditions of this system determine which violations will be investigated and brought to court.

The role of public opinion and the use of cultural means of enforcing rights are important aspects of a property rights regime.

The role of the remainder

An interesting aspect of rights in traditional societies may be described as the problem of the remainder. If different actors control different resources within an ecosystem and their positively described rights are recognised, who controls the remainder (that which is left when everything positively described is accounted for)? The owner of the remainder will be the one to profit from new opportunities as they arise in relation to the resource.

DESCRIBING PROPERTY RIGHTS REGIMES

As a baseline for studying property rights regimes each regime will have to be given a precise and standard description.

A precise description of the property relation

For the group of actors (persons or groups of persons) allowed access to a resource the following points ought to be considered (see Hohfeld 1913, 1917):

- 1) What specific claim-rights does membership entail? and how are they exercised and defended against non-members?
- 2) Which privileges does a claim-rights holder enjoy in regard of the resource? Under which specific conditions can they be enjoyed? And what happens to anyone trying to interfere with the enjoyment?
- 3) Which powers (to create new types of property relations in regard of the resource) do a claim-right holder have? Which are the liabilities of the non-members?
- 4) Which immunities will a claim-rights holder have (legitimate customary and/ or legal protection) in regard of someone trying to usurp his powers? And how are they protected?

A precise description of decision rules

For the rights defining a property relation one needs to know if the source of the rules is tradition or some legitimated decision of a recognised system responsible actor. For any system responsible actor one needs to know the rules governing the decisions on the property rules.

TYPES OF PROPERTY RIGHTS REGIMES

By a natural or environmental resource we shall mean any physically bounded and identifiable entity recognised as a resource by some legitimate social actor.

A property right is a **legitimate** rule of appropriation for some stream of benefits from some resource. This suggests that it may be interesting to distinguish between different streams of benefits from the same physical resource.

Property rights regimes are usually divided into state, common, and private property rights regimes, sometimes with the absence of property rights, the open access regime, added on as a fourth type.

I think one ought to be more specific than this and talk about the property rights regime for a specific stream of benefits from a resource.

A resource specific property rights regime then is all the rules and procedures which determine who can legitimately appropriate any particular stream of benefits from a resource.

The major types of regimes seems to be determined according to number of appropriators on the one hand, and, on the other hand, who may legitimately claim an interest in the distribution of a particular stream of benefits from the resource.

The relevant distinction according to number of appropriators seems to be one individual, a recognised group or all members of a society. By a group resource is meant any resource where more than one independent decision maker, but not all members of a society, can claim legitimate rights to appropriate the particular benefit from the resource.

One may also distinguish between private and non-private resources according to who may legitimately claim an interest in the distribution of any benefit from the resource. By a non-private resource is meant any stream of benefits where legitimate interest in the decisions on the appropriation of it is a matter of interaction among the units of appropriation and other legitimate actors of the society. For a private resource nobody except the units of appropriation can claim legitimate interest in the stream of benefit.

One may argue for the public interest for instance out of the nature and extent of externalities created either by the process of appropriation or by the process of consumption. If such externalities are perceived to be few or of little importance, the legitimate interests in the utilisation are mainly private.

Figure 2**TYPES OF PROPERTY RIGHTS REGIMES**

For any particular resource:

Interests in decisions on use are mainly

Legitimate
unit for
appropriation
is

PRIVATE
(appropriator i.:
few negative
externalities)

NON-PRIVATE
(soc. interests:
many
externalities)

INDIVIDUAL
(the legal
person)

ordinary P

state P

A GROUP OF
INDIVIDUALS
(contractually
defined)

joint P

common P

All members of
SOCIETY
(symbolically
represented by
a monarch or
government)

sovereign P

public P

MODE OF ACTION

Government

regulation

management

Citizen

management

consumption

CONCLUDING REMARKS

The problems encountered in the utilisation of Finnmarksvidda and in the Barents sea have been addressed in two previous conferences (see e.g. Stenseth et al 1991).

Both Finnmarksvidda and the Barents sea belong to a class of resources which in most countries today are considered as common resources. Exactly what this entails varies enormously from situations where the resource for all practical purposes are nobodies property to situations where the resource is managed by a corporation as if it is ordinary private property.

Patterns of resource use tested by history and guarded by tradition will usually be sustainable. Today it is recognised that circumstances (technology, organisations, legal codes, cultural procedures, etc.) may have changed so much that the sustainability of the prevalent pattern of utilisation - whether traditionally enforced or enforced by a state - is an open question.

The problem we want to confront is how to change the regimes of utilisation in a direction approaching a more sustainable pattern of utilisation. To change a pattern of utilisation means changing the structure of property rights to the resources (if property rights are taken in their social science meaning of legitimate appropriation of the culturally necessary means of subsistence).

Before one can start the task of designing modifications to a property rights regime, the existing system of rights, both those recognised in a legal code and enforced by the state, and those recognised in a culture and enforced by traditional means, need to be known in detail. In particular one must know how the various parts of the system act in concert to produce the observed sustainable or unsustainable pattern of utilisation.

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COPING WITH ASYMMETRIES IN THE COMMONS: A CHALLENGE FOR DEVELOPMENT

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I. Background

Economists and policy makers are both interested in better explanations of how participants or external authorities craft rules to counteract the perverse incentives that characterize collective-action problems. Only a theory in which rules are endogenous rather than exogenous can provide the needed explanation. A particularly important collective-action problem is the joint use of a common-pool resource (CPR).² CPRs are natural or man-made resources where: (1) exclusion is difficult and (2) yield is subtractable (Gardner, Ostrom, and Walker, 1990). CPRs share the first attribute with pure public goods; the second attribute, with pure private goods. Millions of CPRs exist in disparate natural settings, ranging in scale from small inshore fisheries, irrigation systems, and pastures to the vast domains of the oceans and the biosphere.

The first attribute—difficulty of exclusion—stems from many factors, including the cost of parceling or fencing the resource and the

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² We distinguish between common-pool *resources* and common-property *regimes*. Common-pool resources exist independent of the particular property rights regime that is used to govern and manage them. The initials CPR as used in this paper always refer to a resource system and not to any particular property rights regime.

cost of designing and enforcing property rights to exclude access to the resource. If exclusion is not accomplished by the design of appropriate institutional arrangements, free-riding related to the maintenance of the CPR can be expected. Provision relates to the activities associated with preference articulation and aggregation and resource mobilization (V. Ostrom, 1991). What rational actor would help to provide the maintenance of a resource system, if *non*-contributors can gain the benefits just as well as contributors?

The second attribute—subtractability—is the key to understanding the dynamics of the "tragedy of the commons" when it occurs. The resource units (for example, acre-feet of water, tons of fish, or bundles of fodder) that one person appropriates from a CPR are not available to others. Unless institutions change the incentives facing them, appropriators take into account only private costs, and not the social cost, of their own harvesting activities. In an open-access commons producing a highly valued flow of resource units, one can expect substantial over-appropriation to dissipate the return (rents) that could be obtained from the CPR by an optimal appropriation strategy.

Empirical evidence from field and experimental settings amply demonstrates that, without effective institutions, CPRs will be underprovided and overused. Substantial controversy exists, however, concerning how to remedy the inefficiencies that result. Many analysts presume that CPR appropriators are trapped in a Hobbesian "state of nature" and cannot themselves reconstitute their rules to counteract the perverse incentives they face. The logical consequence of this view of CPR situations is to recommend that an external authority—"the" government—take over the commons. Only the government, in this view, can successfully impose rule changes so that appropriation outcomes are more efficient. Some of these analysts recommend that the government impose a market. Others recommend that national governments manage CPRs themselves. While the source of new rules is the same, the recommended policy intervention could hardly be more different.³

Recent research has focused on two questions: (1) can appropriators themselves change rules affecting the use of CPRs and (2) do such rules enhance performance in terms of efficiency, equity, or sustainability. Considerable empirical evidence from field and experimental settings supports positive responses to (1) and (2): appropriators frequently do constitute, reconstitute, and enforce their own rules, which do improve the efficiency of the outcomes they achieve. This research is closely related to the more general question of how institutions evolve from a base game (see Calvert, 1992; Knight, forthcoming; Milgrom, North, and Weingast, 1990). The initial research has focused primarily on groups where most of the

³ For an overview of these contradictory policy recommendations see E. Ostrom (1990).

relationships among participants are relatively symmetric. Since it is easier to design rules that assign rights to appropriate and duties to contribute where appropriators are relatively similar, a good scientific strategy is to study symmetric situations first. If appropriators are not able to design rules to counteract perverse free-riding and overuse of CPRs under conditions of symmetry, one could hardly expect them to be able to design rules to counteract these problems under conditions of asymmetry. In settings where CPR appropriators are relatively symmetrical in regard to assets, interests, and the physical situation, and when the problems they face are relatively simple to overcome, appropriators do take "time out" from operation decisions to design rules that improve the joint yield that they can obtain (E. Ostrom, 1990; E. Ostrom, Gardner, and Walker, 1993; Berkes, 1989; Berkes et al., 1989; McCay and Acheson, 1987; Bromley, 1992).

Now that empirical research in field and experimental settings has clearly established that individuals, who are similar to one another in many respects, can, and in many settings, do craft their own rules to increase joint output, more difficult questions can be posed. These tougher questions center on whether individuals, who differ substantially in regard to the amount of their economic or political assets, the amount of information they possess, or their physical relationship to one another, are able to craft rules for themselves that enhance joint output, distribute output equitably, or both. The answer to this question will likely be: "It depends." In other words, we can expect that individuals in some types of asymmetric relationships to one another will be able to cope with these asymmetries by crafting rules that enhance efficiency, equity, or both. Individuals in other types of asymmetric relationships will not get out of the traps they are in. The task is to develop a coherent understanding of the set of conditions that enhance or detract from self-organizing capabilities. Asymmetric relationships are the logical next step in a coherent and cumulative research program (Keohane, McGinnis, and Ostrom, 1993).

This paper focuses on the asymmetry present on most irrigation systems between those who are physically near the source of water (the headenders) and those who are physically distant from it (the tailenders). In Section II of this paper, we describe the problems of free-riding and overuse that are potentially at stake in the governance and management of irrigation systems, particularly in developing countries. In Section III, we introduce a simple irrigation game between headend farmers and tailend farmers. The game illustrates the intricate ties between decisions related to the amount of water to be appropriated by farmers and the decision to invest or not in the upkeep of the irrigation system. We show that increases in asymmetrical power of the headenders over the tailenders can eventually lead to a decision by the tailenders to stop investing in the provision of the system. If the headenders do not need the contributions of the

tailenders to the provision of the system, the game stops there. The headenders maintain the system at whatever level is optimal for the headenders and ignore the interests of the tailenders. In those cases where there is more water than is needed by the headenders, the tailenders free-ride on the contributions of the headenders even though the outcome may be far from the optimal investment that would be made if all benefits and costs were taken into account.

In section IV, we address how those in a situation of suboptimality could shift levels of action to constitute new, mutually beneficial rules. We model this as a bargaining problem between asymmetric parties who meet to discuss a change in the rules they use to govern their repeated interactions. We show that when the contributions of tailenders to the provision of a system are needed by the headenders, there exist mutually beneficial rules allocating rights and duties.

In Section V, we examine empirical evidence derived from a study of irrigation institutions in Nepal that helps us address whether farmers who govern and manage their own systems are able to overcome the perverse, Hobbesian "state of nature irrigation game" of Section III. We show that farmers on self-governing irrigation systems perform better and cope more effectively with potential headend-tailend disparities. We also describe some of the rules that are used in practice to overcome these difficulties. Such rules illustrate the rules individuals constitute for themselves when they have the authority to do so. In the last section of the paper, we discuss the significance of these findings.

II. Free-Riding and Overuse as Typical Irrigation Problems

Prevailing theories of development presume that the obstacles and temptations involved in most collective-action problems in developing countries are substantial enough that those involved will not surmount them. The temptation to free-ride on the provision of key infrastructures, such as irrigation, is viewed as a major deterrent to successful economic development. David Freeman (1990) provides a concise description of this problem in relation to irrigation:

The logic of the individually rational utility seeker may not coincide with the logic of the community. If, for example, farmers individually observe that their leaky and misaligned water course requires improvement, they will not invest in corrective action on individually rational grounds. Assuming a sizable number of farmers, each will calculate as follows. If one farmer invests time, energy, and money required to improve the channel going through his or her own land and other farmers do not make comparable corrective investments in a coordinated fashion, then the payoff in improved water supply and control (the collective good) is negligible.

However, if many farmers undertake the improvement

effort on each of their sections, and one individually rational decision-maker does not do so, she or he will still enjoy a substantial share of the benefit provided by the work of others, at no personal cost. Therefore, the rational, calculating individual will chose to do nothing either way. The collective good will not automatically evolve, even though the individuals in question may possess full and accurate information about the potential benefits of improving the channel and may have the required know-how and resources to do so. (Freeman, 1990, p. 115)

The difficulty of sustaining the maintenance of an irrigation system over the long term, where contributions of labor or fees are obviously costly and benefits are hard to measure and dispersed over time and space, deepens the pessimism over the likelihood of self-organized success. The presumed inability of individuals to undertake their own collective action is used as the foundation for a theory of development that expounds the need for an *external* government to impose and enforce rules on individuals so that collective benefits otherwise not realizable are achieved. Further, where technical knowledge and economies of scale are involved, it is presumed that this external force should be a large, central government. The alternative of creating a special purpose, self-financing, smaller unit of government is not even considered.

A corollary of the proposition that no one will organize to provide collective goods when power is widely dispersed, is that collective action will occur in those settings where someone with substantial assets and power can guarantee themselves returns greater than costs. The resulting level of investment is lower than optimal and those who invest are likely to capture most of the benefits. This further exacerbates the differences between the haves and the have-nots in rural areas of developing countries. Central governments are seen as the agent of change to break the control of powerful individuals in rural areas who underinvest in collective action and obtain a disproportionate share of whatever is generated.

Central governments are frequently viewed as necessary agents to enforce allocation rules as well as to organize the provision and maintenance of irrigation systems. Whatever allocation rules that officials and/or farmers establish for an irrigation system, there is the temptation to cheat by taking more water than authorized, by taking water at an unauthorized time, or by contributing less inputs than required for provision given one's water allocation. For example, rice farmers prefer to keep their rice paddies flooded continuously, since rice is intolerant to drying and highly tolerant to excess water. Extra water keeps weeds under control on those paddy fields that obtain the water, but could be used more efficiently to yield a larger quantity of rice.

The theoretical presumption that an external, central government is necessary to supply and organize forms of collective action, such as providing irrigation works, has been reinforced to a large extent by the colonial experience. During the colonial period in many parts of Asia and to some parts of Africa, large-scale governmental bureaus were established to develop previously unirrigated areas. In many instances, these imperial bureaus had strong enforcement powers at a local level, using a variety of direct and indirect means no longer available to the elected officials of the newly independent governments of the area. Such areas were opened for settlement and oriented toward the production of cash crops for export. The resulting centralization of governmental power over the supply of irrigation water has been continued, in most instances, by the governments that were created as colonial powers left the scene. In much of the developing world, irrigation development "has been highly distorted by the process of state concentration of investments and governance, and the concomitant demise of local rights and initiatives" (Barker et al., 1984, p. 26).

National governments in many parts of the developing world have come to be perceived as the "owner" of all water (and, other natural resources as well) (Sawyer, 1992). National governments often consider themselves to be the only agency that should or could invest in constructing and managing irrigation systems through a central bureaucratic structure. This orientation toward the necessity of central authority is intensified by a second presumption that supplying irrigation is largely a technical problem. Together these lead to a belief that "scarce technical expertise is best located in a powerful state bureaucracy where it can be effectively dispensed" (Barker et al., 1984, p. 26). This predilection toward professional, central control over the supply of irrigation water is reinforced by the inclination of international aid agencies to work directly with the central ministries of the national government to whom aid funds are extended.

In large-scale, centrally constructed systems, not enough attention is paid to the problem of coping with the physical asymmetries between headenders and tailenders. The capacity of headenders to ignore the scarcity that they generate for those lower in the system increases the difficulty of providing irrigation systems over time. Not only is there a "normal" free-riding problem associated with all collective benefits but if the headenders get most of the water, those at the tailend have even less reason to want to contribute to the continual maintenance of their system.

III. An Irrigation "State of Nature" Game

Irrigation CPRs have an asymmetry present between those at the head of the system (headenders) and those at the tail (tailenders). We consider the simplest asymmetric game played between headenders (player 1) and tailenders (player 2) of an irrigation system. Let F

(L_1, L_2) be a separable, concave production function for the provision of water, where L_1 and L_2 are the amounts of labor provided by headenders and tailenders respectively. Since there is narrow time frame during which labor can be usefully provided, one has

$$0 \leq L_1 \leq L \quad (1a)$$

$$0 \leq L_2 \leq L \quad (1b),$$

for some common upper bound L . If F is a symmetric function, then labor is a symmetric factor of production. If F is not a symmetric function, then either the headender or the tailender will have a productive advantage. Whether F is symmetric or asymmetric depends on other factors (such as soil fertility and slope) not modelled here. For simplicity, we assume F is symmetric and takes the form $f(L_1) + f(L_2)$.

All payoffs are in terms of crop units, which are linear in water as measured by F . Player 1, being located in the physically advantageous position, can appropriate a fraction k of these units for his or her own use ($k > 1/2$). When Player 1 appropriates k of the water, this leaves a fraction $1-k$ of the water for Player 2.

The two players pick their labor contribution simultaneously. Their payoff functions, $u_1(L_1, L_2)$, $u_2(L_1, L_2)$ are given by

$$u_1(L_1, L_2) = kF - L_1 \quad (2a)$$

$$u_2(L_1, L_2) = (1-k)F - L_2. \quad (2b)$$

These payoff functions reflect that it is costly for each player to contribute labor. The strategies and payoff functions constitute a game which the headenders and tailenders play each year. This is the Hobbesian state of nature game which has a unique equilibrium.⁴ This equilibrium depends on the distributional asymmetry, k , and the production function, F . Three types of equilibria are important to consider.

Case 1. $L > L_1 > 0, L_2 = 0$

In the first case, only the headenders contribute labor while the tailenders free ride. This happens when k times the marginal product of the first unit of the headender's labor is greater than one, whereas $1-k$ times the marginal product of the first unit of the tailender's labor is less than one. In equation form

This type of equilibrium is frequently encountered in systems where

⁴ For simplicity of exposition, we have modeled this state of nature as a static game that can be repeated many times. One of our graduate students, Myungsuk Lee, has begun to address this question in a more complex manner using dynamic game theoretical models. We appreciate the dedicated help of Myungsuk Lee in undertaking the statistical analysis reported on in Section V.

most traces of community organization have vanished.

Case 2. $L > L_1 > 0, L > L_2 > 0$

In the second case, both headenders and tailenders contribute labor. This happens when k times the marginal product of the last unit of the headender's labor equals one, and $1-k$ times the marginal product of the last unit of the tailender's labor equals one. In equation form

Given $k > 1/2$ and our assumptions on F , we have that $L_1 > L_2$. This is an equilibrium that is often encountered in the field.

Case 3. $L = L_1, L > L_2 > 0$

In the third case, both headenders and tailenders contribute labor, and headenders contribute all the labor they can. This happens when k times the marginal product of the last unit of the headender's labor is greater than one, and $1-k$ times the marginal product of the last unit of the tailender's labor equals one. In equation form

The basic state of nature game can be repeated over many years, in which case the equilibria described is played over and over in a stationary environment. Alternatively, one can think of production function F as being a time average of the productive conditions. Under this interpretation, if there are shocks to production such as floods or storms, then behavior could shift from one regime to another. Under either interpretation, the pattern where headenders contribute more labor and get more water will persist over time.

This type of repeated equilibrium is illustrated by the Thambesi farmer-organized, irrigation system in Nepal where "nature" provides a source of water that is easy to channel and requires little annual maintenance. The headworks of the Thambesi system is a simple brush and stone diversion works that is easily adjusted each year to fit changes in the course of its source (Yoder, 1986, p. 179). Routine maintenance carried out prior to the monsoon rains requires "only four to five hours of work with all the members participating" (Yoder, 1986, p. 180). As a result, it would be feasible for a few farmers to keep this system going. "The members with holdings in the tail cannot force those with land above theirs to deliver water to them equally by not participating in maintenance and other system activities" (Yoder, 1986, p. 179).

Thambesi is one of the few FMIS systems where headenders have clearly established prior rights to water over those of those lower in the system. Farmers at the head of each rotation unit "fill their fields with water first before those further down the secondary are able to

take water" (Yoder, 1986, p. 292). During the pre-monsoon seasons, farmers at the head of the system grow water-intensive rice. Consequently, no one lower in the system can grow an irrigated crop during this season. If the headenders were to grow wheat instead of rice, an area nearly ten times as large could be irrigated during the pre-monsoon season (Yoder, 1986, p. 313).⁵ In this system, measured crop yields are correlated with distance from the headworks and substantial land that could benefit from irrigation depends entirely on rainfall.

Now, returning to our theoretical analysis, let us address what happens if the basic parameters of the state of nature game change. First, suppose that in a Case 2 type of situation, player 1's ability to take water, k , gets closer and closer to one.⁶ This could happen, for example, if the headender were to acquire more and more land and thus be able to put more and more water to beneficial use. It could also happen if the headender were to break the canal banks so as to increase the intake of water coming to the headender's land. Eventually, for a fixed L , an increase in k can drive the system from Case 2 into Case 1, and the tailend will ride completely free.⁷ As we show in the next section, all of the above equilibria have undesirable properties. Production will be less than optimal and the system will be undermaintained. Indeed some of these equilibria can be seriously inefficient. All of these considerations suggest that the players have a stake in leaving the state of nature and attempting to reconstitute their system. If the irrigators involved in the above strategic situations were to craft rules similar to those discussed below, they could measurably improve their systems' performance.

IV. Bargaining Over the Rules of the Game

If farmers' irrigation games are based only on the attributes of a physical world, mutually productive outcomes are likely to occur only when naturally occurring asymmetries are not too great. On some irrigation systems in developing countries, when an irrigation system is operating very inefficiently, irrigators may be able to leave this state of

⁵ Yoder's research also demonstrates that where the farmers own shares of the water system and can sell these shares, the incentive faced by headenders are entirely different. In such a property rights regime, headenders can capture part of the capitalized value of the benefits of allocating more water to those lower in the system. Thus a change in the institutional arrangements related to a physical environment dramatically change the incentives of participants and the efficiency and equity of outcomes.

⁶ If k approaches $1/2$ instead, the equilibrium solution approaches a more equitable solution.

⁷ Even when the tailend is "riding free" it should be noted that the quality and timing of the water made available to the tailend may be quite inferior to that of the headend. Whether the equilibrium enters case 1 depends on boundary considerations.

nature game. If their rights to govern and manage their own system are recognized, or at least not interfered with, farmers can take a "time out" between seasons and attempt to add (or reform) rules that improve the equilibria they obtain in the regular irrigation game. The annual meetings of irrigators to decide on the rules affecting appropriation and provision activities are second-order games that operate to change the structure of the initial state of nature game analyzed above. We model these meetings as bargaining problems. If no agreement is reached in these micro-constitutional bargaining games, the irrigators return to the equilibrium of the state of nature game.

Every bargaining problem consists of a disagreement point and a set of feasible outcomes. The disagreement point, d , is the equilibrium of the state of nature game. Let u_1 denote the net payoff to player 1 from being in the bargaining game; u_2 , the net payoff to player 2.⁸ Then, the vector $u = (u_1, u_2) = d$, where u is a Case 1, 2, or 3 equilibrium. The whole point of bargaining is to agree to and achieve better outcomes than d . To describe all such outcomes, consider the problem:

$$\begin{aligned} &\text{maximize } F(L_1, L_2) - L_1 - L_2 \\ &L_1, L_2 \\ &\text{subject to (1a, 1b).} \end{aligned} \tag{3}$$

If the irrigators solve this problem, then they can maintain the system in an efficient manner each and every period.

To study solutions to (3), consider first the case of an interior solution, with both labor contributions between 0 and L . In equation form,

Compare this solution to the analogous equilibrium of case 2, section III. Since k , $1-k$, are fractions, it follows from diminishing marginal products that the labor contributions given by the optimal solution exceed those given by the interior game equilibrium. Similar arguments follow for the optimal solutions corresponding to the equilibria of case 1 and 3.⁹

Let the amount of production at an optimal solution be F^* , sustained by labor contribution L_1^* and L_2^* . From the above, one has $u_1 + u_2 = F^* - L_1^* - L_2^*$ at an optimal solution. The feasible outcomes that are relevant to the problem at hand therefore are all the vectors u such that $u_1 \geq d_1$, $u_2 \geq d_2$, and $u_1 + u_2 \leq F^* - L_1^* - L_2^*$.

⁸ One can think of these utilities as long run average annual payoffs from the operation of the irrigation system.

⁹ There are cases where optimum and equilibrium coincide. Suppose that the equilibrium labor contribution is L for each player; then this will also be an optimal solution. Again, suppose the optimal labor contribution is 0 for each player; then this will also be an equilibrium solution.

We illustrate these ideas with a simple example. Let $F(L_1, L_2) = 2\text{SQRT}(L_1) + 2\text{SQRT}(L_2)$. Also, set $k = 2/3$. Solving for the equilibrium, one has $d_1 = 8/9$, $d_2 = 5/9$, $F = 2$, $L_1 = 4/9$, $L_2 = 1/9$. Compare this to the optimal solution, where $F = 4$, $L_1 = 1$, $L_2 = 1$, and $u_1 + u_2 = 2$. Many bargaining solutions solve this example via $u_1 = 10.5/9$, $u_2 = 7.5/9$. Players 1 and 2 allocate the same amount of labor, but the headend player still receives more of the water. We see many instances of rules underlying this kind of asymmetric solution in the field. Figure 1a depicts this irrigation bargaining problem. In this figure, $d_1 > d_2$, which reflects the asymmetry between headenders and tailenders in this case.

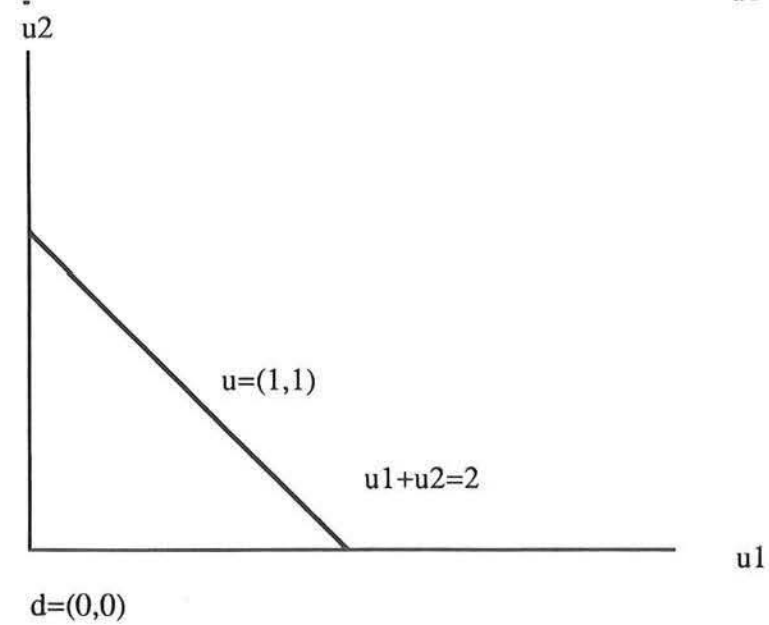
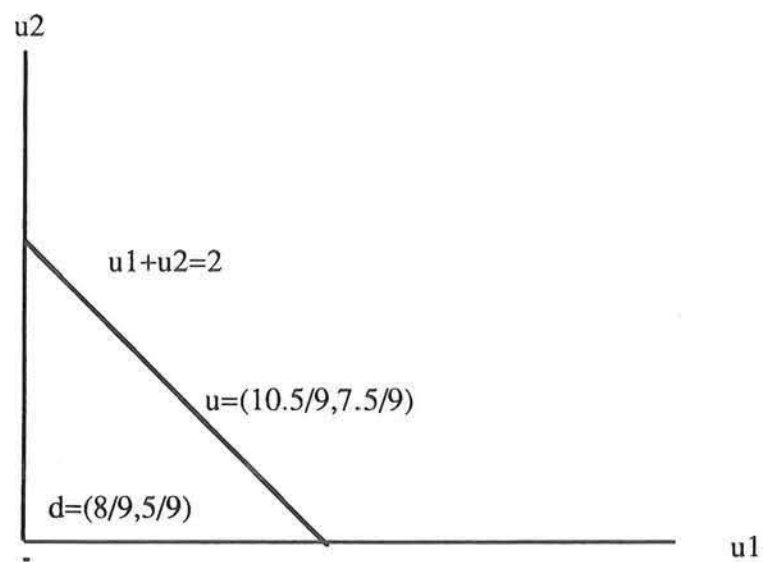
The above example was asymmetric. However, symmetric situations (which typically have symmetric solutions) are also possible. In the above example, set $k = 1/2$. Solving for the equilibrium, one has $d_1 = 3/4$, $d_2 = 3/4$, $F = 2$, $L_1 = 1/4$, $L_2 = 1/4$. Compare this to the optimal solution, where $F = 4$, $L_1 = 1$, $L_2 = 1$, and $u_1 + u_2 = 2$. Many bargaining solutions¹⁰ solve this example via $u_1 = 1$, $u_2 = 1$. Players 1 and 2 allocate the same amount of labor and receive the same amount of water. We see many instances of rules underlying this kind of symmetric solution in the field. Figure 1b depicts this irrigation bargaining problem. In this figure, $d_1 = d_2$, which reflects the symmetry between headenders and tailenders in this case.

Several factors in the field can affect the bargaining problem between headenders and tailenders. For instance, the presence of a headworks which makes headend labor more productive than tailend labor will favor headenders over tailenders in the event that negotiations break down ($d_1 > d_2$). Such a production asymmetry reinforces the distributional asymmetry. On the other hand, if there is real mutual dependence, and the productivity of labor of the headenders offsets the distributional advantage of the headenders, then the asymmetries tend to offset one another and the bargains struck are symmetric. In the extreme of a case 1 equilibrium where the headenders only provide labor, one can expect very asymmetric solutions to the bargaining problem.

¹⁰ Indeed, any bargaining solution satisfying efficiency and symmetry must yield this result.

Figure 1 Bargaining over Rules

a) Asymmetric Solution



b) Symmetric Solution

In instances of symmetry, an entire family of rotation rules are used in practice that enable the irrigators to split the water and the labor about evenly. Either of the following two stylized rotation rules suffices to transform the state of nature game into a game that implements a symmetric bargaining solution:

Rotation Rule A. In odd-number years, water goes first to the headender and in even numbered year water goes first to the tailender. Both headenders and tailenders work side-by-side for any days devoted to maintaining the system.¹¹

Rotation Rule B. All water in the system is allocated to the headenders for even days of the seasons and all to the tailenders for the odd days of the season. Headenders maintain the canal for one time period and tailenders maintain the canal for an alternative, but equal, time period.¹²

Both of these rules result in an equal split of the rights of appropriation and the duties of provision.

Rules such as these agreed upon in a "time out" enable the players to leave a state of nature and be assured that desirable equilibria are sustained over time. In the asymmetric case discussed above, the farmers need to craft rules in the micro-constitutional choice game that allocate both water and labor in an unequal but proportional manner. The following stylized rules would accomplish this task for a $2/3, 1/3$ split:

Rotation Rule A'. In years not divisible by 3, water goes first to the headender. In years divisible by 3, water goes first to the tailender. Headenders devote twice as much labor as tailenders on side-by-side workdays devoted to maintaining the system.

Rotation Rule B'. All water in the system is allocated to the headenders for days of the seasons not divisible by 3. All water in the system is allocated to the tailenders for days of the season divisible by 3. Headenders maintain the canal for twice the time period that tailenders do.

Both of these rules in a $2/3, 1/3$ split of the rights to appropriation and the duties of provision.

The rules A (A') and B (B') are stylized in the sense that the rules we find in field settings are rarely this cut-and-dried. For one thing, the rotations involved are often quite a bit more complicated. For another, the rules that relate to routine maintenance normally differ from those related to emergency repairs. Also, the principle of proportionality invoked is often multidimensional. That is, water

¹¹ An example of Rule A is found on the Marpha farmer-organized system in the Mustang District of Nepal where barley is planted in the winter and buckwheat is planted in the summer. Fields devoted to barley were watered from the top of the system to the bottom, while the ordering for buckwheat was reversed so that the tailend fields received water first (Messerschmidt, 1986).

¹² This rule is illustrated by the Yampa Phant system described below.

allocation may be proportional to one variable, while labor provision is proportional to another. The set of variables upon which proportionality is based can include landholding, total labor in the household, labor relative to land held, physical capital, and votes held in a voting system. Although the details of any given irrigation system can appear bewildering, the strategic principles we have identified above—the state-of-nature game and the bargaining game—are recurring regularities in data drawn from the field. It is to these data that we now turn.

V. Empirical Evidence

From the above theoretical analysis, one should expect to observe a wide diversity of outcomes in field setting regarding the level of net benefits achieved and their distribution between the head and tail portions of irrigation systems. Some systems will not be maintained over time and collapse. Others will operate at lower efficiency than feasible and some farmers will gain a disproportionate share of water. Still others will operate at a higher efficiency and net benefits will be more equitably shared. Given the number of variables that affect system performance and its distribution, it is difficult to conduct empirical tests of these kinds of theoretical findings. Until recently, no large-scale data set with the appropriate variables existed that could be used for this purpose. The discovery of a large number of case descriptions of both farmer- and government-operated irrigation systems in one country, Nepal, has led to the development of the Nepal Institutions and Irrigation Systems (NIIS) project. The NIIS database contains information on 127 irrigation systems (see E. Ostrom, Benjamin, and Shivakoti, 1992).

Nepal has an area of about 141,000 square kilometers, slightly larger than England. Its 18 million inhabitants are engaged largely in agriculture. Of the approximately 650,000 hectares of irrigated land, irrigation systems operated by farmers—called Farmer Managed Irrigation Systems (FMIS)—irrigate about 400,000 hectares, 62% (Small, Adriano, and Martin, 1986). The remaining irrigated land is served by a variety of Agency Managed Irrigation Systems (AMIS), many of which have been constructed since 1950 with extensive donor assistance. On some of the AMIS, farmers have organized themselves and do participate in second-level, choice-of-rule games, but they are far more active in devising appropriation and provision rules on FMIS.

Irrigation occurs extensively in the hills (frequently quite steep), in the river-valleys (the terrain is more undulating), and in the flat and more fertile Terai, located in the southern part of the country, which has only been devoted to agriculture since the successful eradication of malaria. In the hills, irrigation systems have several plateaus where it is very easy for farmers on the first plateau to get most of the water to their fields before any water goes on to the second or third plateau.

Thus, one would expect that the problem of physical asymmetries would be easier to deal with in the Terai than in the hills.

In Nepal, FMIS achieve a high average level of agricultural productivity. Of the 127 systems in the NIIS, we have productivity data for 108. The 86 FMIS average 6 metric tons a year per hectare (6 MT/ha); the 22 AMIS, 5 MT/ha, a statistically significant difference ($p = .05$). FMIS tend also to achieve higher crop intensities.¹³ A crop intensity of 100% means that all land in an irrigation system is put to full use for one season, or partial use over multiple seasons amounting to the same output. Similarly, a crop intensity of 200% is full use for two seasons; 300%, full usage of all land for three seasons. Averaged over the three major terrains, FMIS achieve a higher level of crop intensity (247%) than do AMIS (208%). Again, the difference is statistically significant.

The agricultural yields and crop intensities that farmers obtain depends on whether they can be assured of water during the winter and spring seasons when water becomes progressively scarcer. A higher percentage of FMIS in Nepal are able to get adequate water to both the head and the tail of their systems across all three seasons as shown in Table 1. During the spring when water is normally very scarce, about 1 out of 4 FMIS are able to get adequate water to the tail of their systems, while only 1 out of 12 AMIS get adequate water to the tail of their systems. Even in the summer monsoon season, only about half of the AMIS system get adequate water to the tails while almost 90% of the FMIS get water to the tail of their system.

Table 1. Water Adequacy^a by Type of Governance Arrangement and Season

Season of Year	% of FMIS with Adequate Water at the Head	% of FMIS with Adequate Water at the Tail	% of AMIS with Adequate Water at the Head	% of AMIS with Adequate Water at the Tail
Monsoon	97	88	92	46
Winter	48	38	42	13
Spring	35	24	25	8

^aWater adequacy was measured on a four-point scale from adequate to non-existent based on structured coding of field visits and case studies.

¹³ It should be pointed out that FMIS are on average smaller than AMIS, but the size of the system is not significantly related to agricultural productivity when we control for the type of governance and for other physical attributes such as the presence of permanent headworks and at least partial lining (see Lam, Lee and E. Ostrom, 1993).

To begin to address why FMIS systems are more likely than AMIS systems to distribute water more equitably between head and tail, we analyze how physical variables and type of governance structure combine to affect the difference in water availability achieved at the head and the tail of irrigation systems. The difference in water availability is a crude indicator of how well an appropriation process gets water to the tailend of a system. We have estimated the following equation:

Water Availability Difference = f (Headworks, Lining, Terrain, Length, Labor Input, Type of Governance), where

Water Availability Difference is the difference in the score (adequate = 2, limited = 1, scarce or non-existent = 0) achieved at the head of a system minus the score achieved at the tail of a system averaged across three seasons,¹⁴

Headworks is coded 1 if the headworks are permanent and 0 if otherwise,

Lining is coded 1 if the canals are partly or fully lined and 0 otherwise,

Terrain is coded 1 if the system is located in the Terai and 0 otherwise,

Length is the length in meters of the canals of a system,

Labor Input is the number of labor days devoted to regular maintenance per year divided by the number of households served,

Type of Governance is coded 1 if a FMIS and 0 otherwise.

The result of a multiple regression analysis for the 76 irrigation systems for which we have complete data is:

Water Availability Difference = .64** + .34** Headworks -.14 Lining
-.10* Terrain + 0 Length + 0 Labor Input -.32** Type of Governance

F = 5.92, Adjusted R² = .28, ** p < .05, * p < .10.

This analysis illustrates the importance of the physical characteristics of an irrigation system that affect the capacity to distribute the gains from mutual cooperation equitably. The difference in water availability achieved at the head and the tail of these Nepali irrigation systems is significantly and negatively related to being in the Terai. The presence of a permanent headworks—frequently considered as one of the hallmarks of a modern, well-operating,

¹⁴ Thus, a score of zero indicates that for all three seasons, the level of water adequacy was the same in the head and tail sections of the system. A score of .33 indicates that in one season, the head received adequate water and the tail received limited water or that the head received limited water and the tail received scarce water. For the 118 systems for which we have data, the difference score ranges from -.66 to 1.66. The regression presented in the text is based on data for 76 systems for which we had data on all variables in the regression equation.

irrigation system with channel lining—is positively related to a inequality between the water availability achieved at the head and the tail. Farmers have little control over the terrain in which their land is located other than through major location decisions. On the other hand, farmers and irrigation officials have much more control over other physical attributes such as constructing permanent headworks, lining or length (the latter two are not associated with water availability difference in this data set). The difference in water availability is significantly reduced at the tail of an FMIS as compared to that of an AMIS.

Constructing a permanent headworks is related to increased inequality between water availability at the head and at the tail of irrigation systems. Such headworks have frequently been funded by external sources, with farmers not required to repay the cost of this investment. This type of external "aid" substantially reduces the need for mobilizing labor (or other resources) to maintain the system each year. The reduction in the need to mobilize resources annually has been interpreted in project plans as entirely a benefit. When an investment in physical capital reduces annual expenditures of resources so that a net return is achieved, an economic benefit is generated. In developing countries, donors have often attempted to increase the rate of economic development through the construction of extensive infrastructure facilities without requiring that capital investment be paid back by beneficiaries. This has two adverse consequences. First, without a realistic requirement to pay back capital investments, farmers and host government officials are motivated to invest in rent seeking activities and may overestimate previous annual costs in order to obtain external aid (Repetto, 1986). Second, this "aid" can change the pattern of relationships among farmers within a system, reducing the recognition of mutual dependencies and patterns of reciprocity between headenders and tailenders that have long sustained the system. By denying the tailenders an opportunity to invest in the improvement of infrastructure, external assistance may also deny those who are most disadvantaged from being able to assert and defend rights to the flow of benefits (See Ambler, 19xx). We see these consequences clearly in the following AMIS.

The Kamala Irrigation Project, located in the Dhanusha and Siraha Districts of the Terai, illustrates the problem of building sophisticated and expensive capital structures without attention being paid to the design of institutions to bring appropriation and provision decisions into close juxtaposition. Kamala was constructed during the 1970s by the Department of Irrigation (then called Department of Irrigation, Hydrology and Meteorology). It was originally designed to serve 25,000 hectares in a section of the Terai where farmers had practiced rain-fed agriculture but had not previously organized to provide their own irrigation systems. A permanent, concrete headworks and a fully

lined canal were constructed with the financial assistance of the Asian Development Bank. The system was completed during the 1983-84 agricultural year. Since then, no water fees have been imposed or collected. The system has never been able to supply irrigation water to all of the lands within its official service area.¹⁵ The Kamala Project staff is financed from the general revenues of the central government and few funds have been allocated to the continued operation and maintenance of the system. Project personnel spend most of their time operating and maintaining the huge concrete headworks that diverts water from the Kamala River to the main and branch canals and very little time maintaining the rest of the system. Few field canals have been constructed and farmers have broken through the branch canals in order to obtain water.

Neither government nor farmers have undertaken responsibility for operating or maintaining the system below the headworks. The absence of organization at the water use level has generated a high level of conflict and led to an inequitable water distribution pattern. As described by a field research team:

Water allocation is primarily first come, first served. Thus, farmers at the head . . . tend to get all the water they need, while farmers at the tail often receive inadequate and unreliable amounts of water. This situation has often led to conflict between head and tail farmers. Sometimes hundreds of farmers from the area near the middle village of Parshai will take spears and large sticks and go together to the head village of Baramajhia to demand that water be released. At Baramajhia, farmers are often guarding their water with weapons. If water is released, Parshai farmers have had to maintain armed guards to assure that the . . . canal remains open. (Laitos et al., 1986, p. 147)

Even with all of the investment made in physical works, this irrigation system is operating in a "state of nature" in regard to the establishment of rules to allocate water or provision responsibilities. The agricultural yields obtained in this system vary dramatically, depending on water availability but agricultural practices are generally poor. The crop intensity at the head is 180%, compared to 150% at the tail.

In marked contrast to the Kamala Irrigation Project is another AMIS, the Pithuwa Irrigation Project, which is located in the Chitwan District of the Terai. While the Department of Irrigation invested in constructing and lining 16 branch canals, it did not attempt to build a permanent intake structure. The system was designed to serve about 600 hectares, but the farmers have extended the system to serve 1300 hectares of land by rotating the fields devoted to rice during the

¹⁵ This could be due to an overoptimistic estimate of the service area in the first place which happens frequently when a positive benefit-cost ratio is required in the project design phase.

monsoon on an every-other-year basis. The location of many of the larger land-owners near the tail of the system (which is also near to the east-west highway and low cost transportation of produce to markets) is a fortuitous circumstance that counterbalanced the lack of attention by the Government to the design of complementary appropriation and provision rules. The presence of many absentee landowners and sharecropping arrangements did not discourage the self-organization of this system.

While there are many effective FMIS in the Chitwan district, the area served by the Pithuwa system depended on rain-fed agriculture and was not organized prior to canal construction. In the early days of project operation, water distribution was based on a "might is right" principle and there were many conflicts and feuds similar to those that still exist on the Kamala Project (Laitos et al., 1986, p. 126). The origin of the current high level of farmer participation at Pithuwa is interesting as it evolved from organization on one branch at the tail of the system to the organization of the entire system.

. . . one prominent farmer took the initiative to organize the other farmers on Branch 14 into a committee, which formulated rules for water allocation and distribution along Branch 14. With farmer participation in committee activities, conflicts over water sharing along the branch canal decreased in a short time. Other branches started to follow the example set by the farmers of Branch 14. Eventually, all of the branch farmers created branch committees for water allocation and distribution. . . . Once the branch canal committees were working satisfactorily, a federation of the branch canal committees created a general assembly of farmers and a main canal committee. (Laitos et al., 1986, p. 127; it should be noted that Branch 14 is one of three branches at the tail of this system)

From this initial organization, a two-tier system now covers the entire system and governs many aspects related to the operation of the overall system as well as individually crafted rules to operate each of the 16 branches. The main canal committee is responsible for allocating water among the 16 branch canals. During the monsoon season when water is abundant, all branches receive water. Given the crop rotation, half the farmers plant rice, the other half, vegetables, seeds, and fibers. This crop rotation, which is tantamount to a water rotation, is what allows the doubling of the irrigated area. When water is scarce, however, the "committee arranges a rotation system. They then allocate water to the tail outlets first for a set number of days, and then to the head outlets" (Laitos et al., 1986, p. 130). Each branch committee determines its own allocation rules and the rules differ substantially from branch to branch.

In branches 1 and 2, four hours of water per *bigha* (0.66

hectare) are allocated, whereas in branches 3 and 16, two hours per *bigha* are allocated. The time for allocation is based on the nature of the soil, the size of the fields, the volume of water available, and the frequency of watering required for the crop. On some branches, daytime water is allocated for transplantation, and nighttime water is allocated for fields that are transplanted. Each committee has adopted rules that suit their soil, crops, and the availability of water in the branch canal. (Laitos et al., 1986, p. 130)

Given the strength of the branch and system committees, the Department of Irrigation has gradually turned over the maintenance and operation of this system to the farmers. Repairing the intake structure each spring before the monsoon season is a huge task implemented with the assistance of a Government bulldozer and a budget to purchase the fuel for the bulldozer. The responsibility for cleaning the branch canals has been assigned to each branch canal committee using several methods. Some branches "contract out" the cleaning of their canals based on a competitive bidding system whereby the lowest bidder is awarded the contract for a year. The funds to pay for this maintenance are raised by the farmers through an assessment imposed by the farmer's committee based on the size of a farmer's holding. On other branches, the farmers themselves clean the canals and the rules for labor mobilization are determined by that branch.

Agricultural practices on this system are considered to be among the best of the AMIS. This is because farmers have designed and enforced the appropriation and provision rules for this system. The average crop intensity achieved at the tailend of the system (228%) is slightly higher than that at the headend (221%). This is explained by the location of larger farms at the tail of the system. Even though formally this is an AMIS, the farmers in it have nearly the same local authority as in an FMIS.

On FMIS, the diversity of appropriation and provision rules adopted is substantial and closely related to the types of labor requirements needed to keep the systems operational. The owner-operators of the Yampa Phant irrigation system, a very old 40-hectare system located in the hills, for example, do not need to invest in massive resource mobilization during the spring to build or repair their headworks as they and a neighboring system have built a permanent storage structure to retain water from a perennial spring. They are, however, concerned about the daily upkeep of their 12 outlets during the monsoon rains and have devised a labor rotation system during the period of peak labor demand.

During the summer paddy season, maintenance responsibility is rotated among the 12 outlets daily. One laborer per day per outlet is required. After 12 days, responsibility shifts back to the farmers served by the first outlet. Within each field channel served by an

outlet, farmers also rotate the responsibility for main system maintenance. Each farmer takes a turn inspecting the main canal and making necessary repairs. Everyone participates during an emergency. (Laitos et al., 1986, p. 97)

During periods of water abundance, water is available on demand. During the winter season of water scarcity, the upper six outlets receive water for one 24-hour period and the lower six outlets receive water for the next 24-hour period. The farmers of Yampa Phant have thus devised a set of rules that is remarkably like stylized Rule B above. These farmers average 7.75 MT/ha per year. Most farmers at both ends of the system grow three crops every year, so the difference between head and tailend production is negligible.

The farmers of the Kerabari irrigation system, in the Morang District of the Terai, face a different type of resource mobilization problem and have adapted a different set of rules. Constructed by farmers during the 1970s, this FMIS draws water from a stream (the Khadam Khola) which carries a large quantity of sediment from the foothills during the monsoon rains. Even though the main canal built by the farmers is considered by outsiders to be "quite an engineering feat," several attempts by the farmers and by the government to build a permanent intake structure have been washed away (Laitos et al., 1986, p. 217). Thus, despite past government efforts to help the farmers of Kerabari economize on the annual effort required by a temporary headworks, the farmers must continue to deal with floods and washouts. During the spring of 1985, for example, 150 farmers had to work for 15 days to repair the main canal (Laitos et al., 1986, p. 219). There are two branch canals that serve the upper Khadam and lower Khadam farmers. All farmers on this system own their own land and land is relatively equally distributed.

When this FMIS was first organized, there was one committee for both subsystems, but the "lower Khadam farmers felt that the upper Khadam farmers were less active and enthusiastic about system maintenance and operation. They divided the committee into the upper and lower Khadam committees, but agreed to have one common chairman [who owns land in both systems] for both committees" (Laitos et al., 1986, p. 22). When water is abundant, each farmer withdraws whenever desired. During the spring when water is scarce, decisions about cropping patterns are made within the two branch committees and rotation systems are devised that insure that water is adequate for the cropping patterns that have been jointly established.

All households owning less than two bighas (1.32 hectares) of land—about two thirds of the owner-operators—send one laborer for each day of maintenance decided upon by the joint committees. Those owning more than two bighas of land contribute one laborer for each

two bighas owned.¹⁶ The joint committee has mobilized cash from the farmers to line the canal, and has sought external assistance to try to address the headworks issue. At least 90 percent of the fields located in *both* the upper and lower sections is planted during each of the three growing seasons. Farmers have adopted high yield varieties and good agricultural practices and produce about 9.1 MT/ha per year—well above average.

VI. Implications

While asymmetries among participants facing CPR provision and appropriation problems can present substantial barriers to overcoming the disincentives of the "state of nature" game between headend and tailend farmers, these asymmetries are frequently overcome in settings where farmers are made aware of their mutual dependencies and have some assurance that the efforts they make to devise and enforce new appropriation and provision rules will not be undercut by external authorities. Headenders who have a physical advantage over tailenders in appropriating water, may need the resources provided by tailenders when it comes to maintaining the system over time. In a monetized and self-financed system, tailenders are unwilling to contribute their water fees unless they obtain sufficient, reliable water that the increased yield obtained by taking water is greater than the fees assessed on them.¹⁷ In much of the developing world, such relationships are not yet monetized and the most important form of resource mobilization is the labor contributed by tailenders to the maintenance of a system. So long as headenders need the resources mobilized by tailenders (or tailenders

¹⁶ Given that many farmers own much less than one bigha of land, this rule places a heavier burden on small land-owners than on large land-owners. Donald Curtis (1991, p. 76) provides a fascinating account of the change in rules for the Bansbote system on the Sesar River as it evolved from a system originally organized by a Zamindar, a local land-owning tax farmer. Under the Zamindar, each area of this system was required to send a fixed number of laborers whenever the system needed maintenance. When a farmer's committee took charge of the system, they changed the labor mobilization rule to each household sending one laborer (so households owning land in different areas were relieved of their double or triple obligations). Next the small landowners prevailed on the large landowners to provide labor at the rate of one laborer per bigha. "Since in local terms this is still a fairly large unit of land the pressure is now on to have the rules changed again to require labour contributions on the basis of a smaller unit of land. But this move has not yet succeeded" (Curtis, 1991, p. 76).

¹⁷ See Svendsen (1992) where he analyzes the over-time effects of imposing a water fee on users to cover full costs by the National Irrigation Agency of the Philippines that was in turn assigned primarily to that agency rather than the general treasury. One effect is the reduction of the subsidy given by the national government to the irrigation sector. A second major effect is a significant increase in the service areas of government systems and in the equity of water distribution. The evidence from Svendsen's study strongly indicates that the imposition of a user fees improved the situation of the more disadvantaged who could refuse to pay user fees unless they obtained adequate water for their investment.

have other counter-balancing assets), more equitable distribution rules are likely to be devised in the second-order bargaining games over the rules to be used in appropriation and provision problems.

What is striking from an examination of the ways that farmers in Nepal, in the Philippines, in Indonesia, and in other developing countries where they have been effectively allowed to self-organize, is the diversity of rules that result from the tough bargaining that farmers engage in during their annual meetings.¹⁸ As would be expected from our theoretical analysis, not all of these bargaining efforts achieve rules that enhance efficiency and/or equity. But so long as mutual dependencies are clear to all participants, farmers in the developing world demonstrate substantial capabilities to craft rules that lead to higher yields and to a reduction in the asymmetry of results as contrasted to the type of results that occur on systems without such rules such as the Kamala Project described above. Not only do the farmers devise efficiency enhancing rules, they also enforce their own rules as well. Many government agencies have wanted to impose the type of cropping patterns that exist on the Pithuwa and Kerabari systems or the monetary fees that are collected by the Pithuwa farmers but have not been able to do so.

Much of the emphasis in the development literature has been on the importance of physical technology rather than institutions to improve irrigation and agricultural performance. Massive sums have been invested in constructing modern irrigation systems or "improving" farmer operated systems which have frequently failed to generate the predicted returns. There is little question that appropriately designed modern irrigation works can enhance the agricultural yield and efficiency of many farmer-organized systems. But interventions designed by outsiders without any attention to the potentially disruptive nature of changing the mutual dependencies and reciprocal relationships among farmers may cause more harm than good. Aid in the form of grants (or loans that are never paid back by those who directly benefit from them) used to invest in the physical capital of irrigation systems may remove any need by headender to recognize the needs of tailenders for water. In the ensuing state-of-nature battle over water, if no one pays fees or contributes labor to maintain the system, then production is sustained at only a very low level, if at all. Belief in the capability of external agencies to solve CPR problems should be balanced with a recognition that external agencies can sometimes be disruptive. While farmers faced with difficult asymmetric CPR problems will not always solve them, they do reconstitute the structure of many of the state of nature games that have formed the foundation for much of the policy analysis used in the development process during the past two decades. There is much more to learn about the

¹⁸ See Coward (1980), Geertz (1980), Hunt (1989), Korten and Siy (1988), Siy (1982), Tang (1992).

capabilities and limits of all forms of institutional arrangements to cope with diverse problems, but self-governing CPR communities have demonstrated their ability to perform at very high levels of efficiency and equity.

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The Economic Rationale of Communal Resources¹⁹

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Introduction

We are concerned in this paper with the logic of economic organization when several independent producers jointly draw inputs from a natural resource which they share and to which they hold exclusive rights. We use the term communal property to refer to this arrangement and distinguish it from situations where exclusive rights to a resource do not exist and access to the asset is open.

The structure of organization is a chief concern of the economics of institutions which attributes forms of organization not only to economies of scale, but to problems of information and costly enforcement of contracts. In explaining the emergence of property rights and alternative forms of organization, most economists have followed an approach that has been called the naive model.

The naive model explains the structure of institutions and organizations in terms of the demand for these arrangements by rational individuals, who are constrained by information and other transaction costs and seek arrangements that maximize the joint value of their assets. The approach is naive because it does not seek to explain the supply of property rights, which is the domain of social and political organizations.

Our initial discussion is based on versions of the naive model, but we go on to consider the role of social and political organizations in shaping property rights. It is sometimes argued that communal property regimes must deal with categorically different problems of organization than other regimes of exclusive rights. We maintain that all forms of exclusive property rights involve essentially the same measurement and policing problems, and that the appropriate structure of rights depends on technology, physical characteristics of the resources, relative prices, and social and political institutions. In terms of the criterion of wealth maximization, communal property is the optimal arrangement in some situations, but unsuitable under other circumstances. Further, the condition of open access is associated with all forms of exclusive

¹⁹EDITORS NOTE: Footnote numbers were lost in the e-mail transmission of the document. The notes are tentatively reconstructed at the end of the paper.

rights, including individual property, and arises because the marginal benefit of enforcing full control over all attributes of a valuable asset tends to fall short of the marginal cost.

We begin by discussing why one expects to find communal property regimes in some and not in other situations and proceed to look at the variables that push resource regimes in the direction of communal ownership. These issues are examined in terms of the naive model, as social and political institutions are assumed to be exogenous. We then introduce the wealth effect and examine how the struggle over distribution can affect the structure of communal property regimes. The next step is to consider the supply of exclusive property rights. We continue by examining some of the factors that may undermine communal property and finally conclude with a few thoughts about property rights in the Saami rangelands in Finnmark, Norway.

Economic factors and the choice of an exclusive resource regime

Imagine a group of individuals (households or firms) that contemplates the utilization of a contiguous natural resource such as rangeland, a forest, or a fishery. The individuals are capable of collective action (but collective action requires the use of scarce resources); the objective of the group is to maximize the joint value of their resources (the choice is not constrained by individual wealth effects); and the enforcement of property rights is entirely with the group and its members (although exogenous social norms, customs, and conventions affect the cost of enforcement). The users can choose from a large menu of regimes, each characterized by several dimensions.

The number of independent users that share the entire resource or portions of it is a key dimension of a resource regime. At one extreme we have open access, when the community decides not to incur the cost of excluding outsiders. Then there are various regimes of exclusive rights ranging from the sharing of the entire resource by the group (communal property) to individual holdings (individual or private property). In between communal and individual property are intermediate communes which are subgroups of two or more individuals who share property.

Another dimension of regimes is the size of each individual unit and the potential for mergers. For instance, it is conceivable that the individual producers could minimize costs by merging into one firm that would become the sole user of the resource. This dimension was explored by Coase (1937) in his study of the nature of the firm.

Yet another margin concerns the degree of precision and detail that the community decides to give the rules for operating the resource. The costs of explicit rules are balanced against the benefits of limiting potential disputes over uncertain rights. Libecap (1978) uses nineteenth century data from Nevada's richest mining area to test and find support for the thesis that

property rights will be made more precise as resources become more valuable. Finally, we note that the community must determine the extent of the rights to use, earn income from, and transfer or dispose of the resource.

Let us consider more closely the factors that are supposed to push a resource regime in the direction of exclusive rights, which is an issue that has been given considerable attention in the literature. In a pioneering article, Demsetz (1967) explains the introduction of exclusive rights in land among Indian hunters in the eastern part of Canada in terms of the cost and benefits of internalizing externalities from non-exclusive use of the resource. In this case, the driving force of internalization was the opening of a commercial market and a sharp increase in output demand which induced the Indians to divide open hunting regions into smaller hunting territories. Demsetz's approach is employed by Anderson and Hill (1975), who explicitly include the cost of exclusion to explain the evolution of exclusive rights to the utilization of land, water, and cattle on the Great Plains of the American West during the second half of the nineteenth century. Field (1986, 1989) has refined the Demsetz approach on two margins: first, by explicitly considering both the cost of excluding outsiders, exclusion cost, and the cost of controlling the propensity to excessive use when a resource is shared, governance cost, and second, by considering a continuum of communality, ranging from individual ownership through a series of intermediate communes of increasing size to a commune of the whole.

A brief description of the Field model may help us to highlight critical variables that affect the relative efficiency of communal property. In the model, it is assumed that the community will select the arrangement that maximizes the aggregate net returns from a natural resource, such as rangeland. There are two corner solutions, individual property and communal property, and the internal solutions involve sets of intermediate communes of different sizes. The resource consists of units of homogeneous quality; the individual producers are also homogeneous; and their production functions are identical. All inputs other than the natural resource are privately owned. The creation of value is based on three activities:

- A) The transformation of inputs into outputs that is described by a transformation function corresponding to the conventional production function.
- B) The exclusion of intruders by monitoring, fencing, and other means. Successful exclusion is rewarded by greater output at each level of input use, which implies that the transformation function shifts up. The exclusion function can be seen as a production function which depends both on the technology of exclusion and social institutions and organizations.
- C) The policing of insiders to limit excessive utilization when two or more individuals share (a portion of) the resource. We refer to

this activity as governance. The group decides on the level of utilization that maximizes the value of the resource and assigns user rights to each individual. The relationship between inputs and level of control achieved is described by the governance function, and the cost of governance is balanced against the resulting increase in net income.

Various assumptions can be made about the nature of the exclusion and governance functions. In the Field model exclusion costs depend directly on the length of the borders, which are at a maximum when the resource is divided into individual properties and at a minimum when the resource is one property shared by the whole group. Internal governance problems arise when two or more individuals share a property, and governance costs rise directly with the number of joint users on each plot and peak when the resource is one property. If there were no governance costs and exclusion costs, the division of the resource would be determined by the economies of scale in the transformation function. Below we assume that there are constant returns to scale and focus attention on the role of governance and exclusion in determining the degree of exclusivity.

Consider again the complex optimization problem confronting the community of users. Net income depends not only on the allocation of inputs in conventional production (transformation), but also on the use of inputs in exclusion and governance; furthermore, both governance cost and exclusion cost are influenced by the division of the resource into properties. Many small intermediate communes imply relatively low governance costs but high exclusion costs, and few large intermediate commons have relatively large governance costs and low exclusion costs. In sum, the degree of exclusivity depends on a trade-off between governance and exclusion costs, other things equal.

Economic forces supporting communal property regimes.

The higher the exclusion costs relative to governance costs, the more likely will a community that strives to maximize wealth select large communal arrangements. Therefore, in order to understand the economic logic of communal property, we must examine the factors influencing the levels of the cost functions for governance and exclusion.

Exclusion depends on technology, the physical characteristics of the resource, relative prices (including the prices of inputs in the exclusion function and the output price), and on the social institutions that constrain the players. In extreme cases, and given the state of technology, the physical characteristics of a resource can make it prohibitively costly to divide it into exclusive sub-units, which leads to the corner solution of a single communal property. Exclusion costs are also influenced by the size of the area required for individual operations. For instance, in arid or infertile regions the

typical individual may demand a large geographic area for grazing her flocks or need to vary the pastures with the seasons or climatic changes.

When the cost of monitoring or fencing individual properties is high, communal regimes become an attractive alternative, as does the reliance on natural boundaries, when possible. The relative prices of inputs in the exclusion function are an important factor influencing the choice of communal property regimes, for instance in communities where the price of timber and other material for fences is high. Also, an increase in output price creates new incentives for outsiders to intrude and makes it more costly to maintain any level of exclusion. The technology of exclusion is an important determinant of exclusion costs, and primitive exclusion technology increases the relative effectiveness of communal arrangements. When there are important economies of scale in exclusion (particularly in operating a system of individual properties), a small community of users may favor communal property for (some of) its natural resources. Although it is not self-evident, the political integration of a country may bring scale economies in exclusion and increase the attractiveness of individual property.

The interaction between transformation technology and exclusion technology should also be noted. The cost of exclusion depends on what is produced and how it is produced, and the choice of output and production methods is not independent of exclusion (and governance) cost. Furthermore, a change in transformation technology (or a change in relative prices) can affect the choice of regime. For instance, a new transformation technology in agriculture can make the production of fodder on individual plots the optimal alternative and eliminate the dependence on pastures; or new fishing technology may introduce foreign and domestic vessels (and open access) in a fishery that used to be the communal property of coastal fishermen. It is important to realize that a continued upward shift in exclusion costs, with a constant governance function, first pushes a system toward communal ownership but eventually, as the upward drift continues, places the resource in the public domain. In many instances, communal property is the only practical alternative to open access, and because of their proximity the two arrangements are often confused.

Governance costs depend on social institutions, technology, relative prices, and the physical characteristics of the resource and its environment, just as exclusion costs do. Low governance costs for large groups of users encourage communal property. It has been argued, for instance by Runge (1992) and Bromley (1992), that poverty is the cause of communal property because the arrangement is frequently found in poor communities. Runge states that "low levels of income imply that formalized private-property institutions are outside the village-level budget for resource management." And Bromley adds: "In fact, as Runge reminds us, low-valued resources are more likely to be managed under common [communal] property for the

simple reason that there is insufficient economic surplus to support the more expensive private-property regime. I make the same point elsewhere." We prefer different reasoning.

The statement that poor communities cannot afford exclusive rights may apply to the purchase of expensive consumer goods, but not to the choice of property regimes. In fact, poor communities can afford only regimes that maximize the net output from their natural resources, the difference between gross output and costs. The observation that communal property regimes are found relatively frequently in developing countries is to be explained in terms of the available technology in transformation, exclusion and governance, relative prices, and social institutions.

Many low-income communities rely on a mixture of individual and communal rights: for instance, the livestock, farmland, tools, and housing are often the property of individual economic units (households) while grazing land remains communal property. That communal property regimes are found in wealthy communities as well, such as Switzerland with its celebrated Alpine pastures, also undermines the poverty argument.

The wealth effect and communal property regimes

In our discussion so far, we have ignored the individual wealth effects of introducing alternative property rights regimes. Even though it has been assumed that new property rights regimes are only chosen if they increase aggregate wealth (or minimize unavoidable losses), it must be recognized that all changes in property rights involve winners and losers. Therefore, the losers have an incentive to prevent changes that are expected to worsen their (relative) wealth position, unless they are guaranteed compensation, which is often impractical. When side-payments are impractical, the outcome depends on the power of the losers relative to the winners, which is partly determined by the community's political structure.

Consider again the previous case of a community of users choosing a resource regime. The community now confronts a new constraint: each individual has the power to veto all proposals that change the status quo, and no rational (and selfish) individual will agree to a new regime that makes him or her worse off than before. Let us assume that the current situation is one of open access with excess utilization of the resource. The group does not maximize the net economic yield from the resource, but the current yield is sustainable and the resource not in immediate danger of destruction. The group is faced with a dilemma. Their calculations show that a change from open access to communal property (rather than to individual property or intermediate communes) would increase the total wealth of the community, but some individual members could easily lose from the change in regimes. As side payments are ruled out by high transaction costs, the introduction of exclusive rights hinges on the community's ability to

constrain the communal regime in such a way as to make sure that no individual will lose from the change. Roberts (1990), using a straightforward graphic analysis of supply and demand, has analyzed the situation above.

First, it is easy to show that the introduction of a (Pigouvian) tax, for limiting the use of the resource to the efficient level, makes all previous users worse off, unless the revenue from the tax is returned to them. However, the tax revenue does more than cover the consumers' surplus lost by the users, when the price of entry is raised.

As the use of a tax for aligning social marginal costs and benefits is information intensive, a system of marketable coupons is more practical in a world of costly information. With marketable coupons the community would establish the efficient total level of use for the resource and apply some formula to issue coupons to previous users, giving each a share in the total. Again, if the coupons are sold to the users at market price, they are worse off than before, unless the proceeds are returned to them. However, even if the coupons are given for free, the task of assigning shares to previous users in such a way that no one is made worse off becomes a complex task.

Consider two individuals with equal levels of usage in the free-entry equilibrium, but individual A has a greater price elasticity of demand for the resource than individual B. If both receive the same share of coupons when communal property rights are introduced, Roberts (1990) shows that B, because of his low elasticity of demand, is made relatively better off than A. Equal treatment of the two requires that A receive a larger share of the coupons than B. When the price elasticity of demand is similar for all individuals in the group, the allocation of coupons relative to the level of prior usage or relative to some proxy for demand, such as land ownership in the case of private farmers using communal pastures, is likely to guarantee that no one is made worse off and that the relative wealth position of the individuals does not change substantially. Finally, Roberts shows that unrestricted resale of coupons can make some individuals worse off than they were in the open-access equilibrium, particularly if the coupons are sold to outsiders who drive up the price. The trouble does not arise if the allocation of coupons correctly reflects the consumers' surplus lost by each individual, but when that fails some individuals will veto unrestricted resale of coupons, even though unlimited resale maximizes the total wealth of the group.

Several scholars, such as Ostrom (1990), have emphasized that agreements on efficient communal property regimes are reached more easily in a homogeneous than a heterogeneous group. Johnson and Libecap (1982) and Libecap (1989) discuss how heterogeneity among fishermen limits the fisheries regulations that they can agree on. We have discussed how the

wealth effect influences the choice of property rules by a small group of producers, such as the farmers in a rural village.

When resource regimes are selected by an external authority, such as a national government, the interplay of inside and outside interests, and complex procedures for making decisions, can make the story much more complex.

The supply of exclusive property rights

The supply of exclusive property rights We now leave the naive model behind and briefly consider the supply of exclusive rights. For social scientists who employ the rational choice model, the establishment and successful operation of a system of communal property rights by rational, non-altruistic individuals poses several puzzles.

The first puzzle concerns the supply of a mechanism for selecting a system of communal property. The services of individuals who provide this apparatus have the characteristics of a public good and, therefore, are likely to be supplied in inadequate quantity. Second, the choice of constitutional and operational rules for managing the resource regime is likely to involve hard bargaining over the distribution of expected gains, possibly with indeterminate results. Third, individual compliance with rules that restrict use of the resource is also a public good, and free riding may undermine the regime when monitoring is costly.

Before we go further, it is important to note that these collective action problems are not limited to communal property but shared by all attempts to establish exclusive rights. In terms of the rational choice approach, the creation of any system of exclusive rights for a community always requires some curtailment of the propensity to free ride. All changes in property rights have wealth effects which invite bargaining over distribution, and transaction costs always make exclusive rights incomplete and cause a certain amount of waste.

The decision by a group to restrict access to a resource can be represented as a contract among its members, and all contracts are incomplete because of transaction costs, according to contract economics. However, the nature of the open access problems varies from one contractual structure to another.

In the case of individual property, residual rights are exercised by an owner who both has residual control and receives (under ideal conditions) the net residual benefits of her actions, which encourages the owner to make efficient decisions that maximize wealth. However, when the proprietor expands her operations beyond the unitary firm and hires agents, she must deal with incomplete contracts and shirking by the agents, which lowers the joint value of the cooperating assets. In order to limit such losses, the

proprietor usually attempts to realign the incentives of her agents by monitoring and with contractual arrangements which, for instance, link their pay to the fortunes of the firm. The internal problems of the firm (opportunism, shirking, free-riding) mount as the structure becomes more complex and changes from individual proprietorship to a partnership or to a public corporation. In the public corporation it is not clear whether any party, such as the stockholders, directors, managers or the workers, both has residual control and receives the residual income. However, in all these instances various arrangements have evolved for limiting the incentives problems, including competition in the market place.

Communal property arrangements, just as other forms of economic organization, depend on contracts that are structured to limit transaction costs. Recently, the complexities of communal property regimes have been documented and analyzed by various scholars, of whom Ostrom (1990) is a noted example. Why do rational actors supply the institutions of communal property? How do they overcome the collective action problem? In responding to such questions about the supply of property rights (which the naive model does not consider), the theoretical literature has not converged on a single answer, but several approaches to the problem can be discerned. We will briefly consider some of these.

The collective action problem is frequently analyzed in terms of game theory, particularly as a Prisoners' Dilemma where non-cooperation is the dominant strategy. Incentives to cooperate are introduced by considering not a single game but repeated games or supergames. Others claim that the problem of cooperation is best modeled by games, such as the Assurance Game or the Game of Chicken, which are more likely than the Prisoners' Dilemma game to lead to some cooperation, if the game is played only once. In the continuous case, hybrids of games have been suggested. Many studies distinguish between formal rules that are provided by political organizations and informal rules, such as customs and norms, that are not purposefully created but evolve spontaneously.

Many scholars have bypassed the fundamental question of how to reconcile rationality on the part of the individual with rationality on the part of the group, and focus on the role of coercion in overcoming the collective action problem. These social scientists "see in collective dilemmas reasons for the existence of institutions: forms of hierarchy in which sanctions are employed to make self-interested choices consistent with the social good."

Hechter (1990) associates the emergence of coercive organizations in traditional societies with the joint production of private goods in situations where individual behavior is easily visible. These organizations of producers are then used to control free-riding in the supply of public goods. The scholar can also equip his players with internal norms and values that change

the structure of the payoff matrix in their games and introduce cooperation as the dominant strategy. Although not formally stated in terms of game theory, pioneering work along these lines was undertaken in the first half of the century by a number of investigators, such as Evans-Pritchard, who studied traditional societies in Africa. These studies report how customary law and ideology in traditional societies contribute to the maintenance of order. Vengeance groups, collective responsibility, the institution of compensation, exogamy and relations of kinship, the system of beliefs surrounding the institution of witchcraft, and a host of other arrangements have been interpreted as raising the cost of non-compliance and promoting cooperation.

In the naive model of property rights discussed in previous sections, social and political institutions do not enter directly, but affect outcomes by shifting the exclusion and governance functions. One can speculate that certain social structures may be likely to contribute to relatively low governance costs for communal property, while other social institutions may support low exclusion costs for individual property. For instance, it is sometimes argued that the thrust of norms and customary law in many traditional societies is to restrain individualism and lower governance costs, while traditional societies often lack specialized organizations for enforcing individual ownership rights, particularly when ownership rights can be traded.

The demise of communal property regimes

Communal property regimes can give way to either open access or more exclusive (individual) property rights. We now consider in what direction economic growth is likely to push a system of communal property. There is little help to be found in formal economic models, such as the Field model: an increase in either of the two critical variables associated with economic growth, the demand for the resource and population, has uncertain effects on the exclusivity of the resource regime. The reason for this indeterminacy is that each variable affects both the cost of exclusion and the costs of governance in many ways. For instance, an increase in output demand, that is reflected in a higher output price, shifts up the governance cost curve and creates an incentive for smaller communes or individual property. However, an increase in output price can also affect the cost of exclusion by increasing the incentive for encroachment, which means that additional resources are required to achieve the same level of exclusion as before. The cost curve for exclusion shifts up which directs the system in the opposite direction, toward communal property. Furthermore, it is beyond the scope of formal models, to consider directly the impact on exclusivity of the numerous developments that usually accompany economic growth, such as technological change in transformation, governance and exclusion, organizational innovation, changes in the location of industry, the nature of products, and new forms of political and social organization.

Economic growth with increasing population and falling transportation costs may introduce open access by overwhelming the capacity of small appropriator organizations to provide exclusion. Economic growth may also bring integration and restructuring of political units and a greater capacity to manage individual properties. Further, economic growth can contribute to the breakdown of social structures in traditional societies and raise the governance cost of communal property, and with weak social structures the capacity to exclude may also be diminished. There are myriad possibilities and special cases.

The impact of economic growth on communal property arrangements in particular cases has been analyzed informally by several authors. For instance, Ensminger and Rutten (1990) study how economic growth has dismantled a communal system among the Orma, who were nomadic pastoralists in a district of northeastern Kenya. The study shows how economic growth has altered the geographic location of the industry and increased the diversity of interest within the community by introducing a sub-group of sedentary livestock producers who produce for commercial markets and demand different property rights than the nomads. The new heterogeneity has increased the conflict over collective decisions.

Also, with economic growth the role of the appropriator organizations has diminished while the role of the national government has increased, the government seeming to favor commercial producers. The decentralized enforcement of a stateless society has been replaced by third-party specialists.

The Orma story is not solely one of increased demand for the output with a resulting increase in overgrazing and encroachment, but also a story of major changes in the structure of political and social institutions. With the national government now sharing exclusion costs, the local exclusion cost curve shifts down, which increases local demand for exclusive rights and promotes a move away from communal property.

Does the nationalization of rule-making, governance, and exclusion contribute to a more or less efficient utilization of natural resources? There is no definite answer to this question. On the negative side, decision makers in government are often less affected personally than an appropriator organization by decisions that waste resources. They may sacrifice local interests to national or special interests, and their remoteness suggests that they may have less information for making decisions and receive weaker feed-backs about the consequences of their actions than appropriator organizations. Also, as national decision makers often face softer economic constraints than appropriator organizations, they are more likely to indulge in personal preferences that are out of tune with economic reality; for

instance, they may have ideological preferences for individual property or communal property. On the other hand, local users may not be able to resolve satisfactorily their bargaining over the increase in wealth that is expected to flow from changes in property rights, and a powerful outsider could possibly break the deadlock and introduce a new structure that sharply increases the value of the resource.

Conclusions

We have used the criterion of wealth maximization to study the choice of regimes of exclusive rights. On the wealth criterion, optimization requires that costs be minimized. It was argued that communal property is a form of exclusive rights that, in specific circumstances, has absolute advantage in minimizing the aggregate costs of production, governance, and exclusion. We attempted to show how the relative efficiency of communal property depends not only on economic factors but on the nature of social and political institutions.

The choice of regimes of property rights is complicated by the so-called wealth effect and by the problem of collective action. We used the example of a transition from open access to communal property to illustrate why rational agents might place inefficient constraints upon communal property, such as restrictions on the resale of user rights.

We were mostly concerned with the choice of resource regimes by small appropriator organizations, but recognized that national and local governments often have a large role in specifying and enforcing resource regimes. It was also recognized that economic growth is associated with various changes in social institutions and technology, in addition to increases in demand and in population, which makes it impossible to generalize about the impact of economic growth on the viability of communal property. Finally, it must be recognized that the objective function of those who choose the structure of resource regimes may contain other elements than wealth, narrowly defined.

The case of communal grazing pastures of the nomadic Saami reindeer herders of Finnmark in northern Norway is a clear illustration of the difficulties of designing a positive theory of communal property. Prior to the large-scale involvement by the Norwegian state, a simple economic model incorporating transaction costs might have gone far to explain the structure of property rights in the reindeer industry. The Saami took their herds through a sophisticated annual cycle of spring, summer, fall, and winter pastures with the sizes of communes, herds, and appropriator organizations, the Siida organizations, varying systematically over the cycle, much in the spirit of the Field model. Also, Saami society instituted procedures for resolving disputes on the basis of customary law, although the details of the system are apparently not known today. The property

regime appears to have been reasonably efficient. Not a single historical example of overgrazing in the Saami reindeer regions is known, although the Saami have been nomadic herders of domestic reindeer in Finnmark at least since the 1600s.

In the modern system, the Siida organizations are no longer autonomous. Their former authority has been transferred to the national government and its agencies which regulate the industry in detail, determining, for instance, grazing districts, grazing periods, and the maximum number of reindeer that can graze in a district. The authorities can even determine the size of individual flocks. The administrative structure of the industry is rather complex with three levels (industry, district, and subdistrict levels) not counting the Ministry of Agriculture which tops the pyramid. To the extent that the objectives of the top decision makers can be deduced from formal declarations, they are complex and even contradictory. The agreement of 1976 between the Ministry of Agriculture and the National Association of Saami Reindeer Herders lists the following objectives: a) to maximize the production of food from the pastures, without weakening the resource base, b) to guarantee personal incomes in the industry that are comparable with incomes in the other sectors of the economy, c) to guarantee secure employment and traditional residence, d) to guarantee that the reindeer industry develop in such a way that its central role in Saami culture is preserved.

Over time, the Saami have become increasingly sedentary, and motor vehicles, including snow-scooters, have lowered the cost of monitoring large herds over long distances. Also, the incentives in the reindeer industry have been affected by the instruments of government policy. These instruments include various forms of subsidies, and some scholars argue that an increase of about 100% in the size of the reindeer herds in the period since 1976 can be explained in large part as a response to government programs. Crowding in the communal pastures is reflected in the falling weights of the animals and signs of overgrazing. The evidence suggests that the national government has in part replaced the former system of communal property with open access.

Why do national governments introduce open access and place resources in the public domain? We can think of three possible explanations: a) It suits the interest of the decision makers, for some reason, which implies that they are satisfied with the outcome. b) It is an instance of the collective action problem where decisions by rational individuals bring outcomes that no one likes. c) The decision makers either lack data to make better decisions and/or they are using the wrong model of reality to make their decisions. All three explanations are possible, and the answer to the puzzle is essentially an empirical question that we leave to the reader.

Notes

1

Many scholars prefer to use the term common property rather than communal property for exclusive resources that are shared. Other scholars use the term common property to refer to non-exclusive assets with open access, and the "commons problem" is widely understood as implying the waste associated with open access. Much confusion has been caused by two theoretical concepts sharing the same two words, which in this instance suggests that individual rights rather than sharing may be a more productive arrangement. See pp. 249-262 in Eggertsson, Thráinn (1990). *Economic Behavior and Institutions*. Cambridge: Cambridge University Press.

2

Milgrom and Roberts (1992) provide an excellent survey of the modern economics of organization. The studies they examine usually assume that the players are located in a laissez-faire environment. Also, many studies ignore the wealth effects of alternative arrangements when individuals seek to maximize the joint value of their assets.

3

See p. 288 in Milgrom, Paul and Roberts, John (1992). *Economics, Organization and Management*. New Jersey: Prentice Hall.

4

Barzel, Yoram (1989). *Economic Analysis of Property Rights*. Cambridge: Cambridge University Press.

5

Following North (1990) we distinguish between organizations and institutions. Organizations are groups of individuals that play together according to rules that are both internal and external. The external rules, formal and informal, and their enforcement characteristics are referred to as institutions. The definition implies that the set of institutions that a player confronts depends on his location and status in society (a dictator faces another set of institutions than her subjects). The term property rights refers to the power of an agent to control valuable margins of scarce assets. Society presents individuals with various rights and duties and their enforcement, but also individuals themselves privately enforce their rights. Although it is not common practice in the literature, we distinguish between internal (endogenous) and external (exogenous) property rights. External property rights correspond to institutions. Individuals incur transaction costs when they enforce internal property rights to prevent either outright theft or the appropriation of value by partners in exchange. However, from the aggregate or social viewpoint there is no distinction between internal and external property rights, and transaction costs refer to the aggregate cost of operating a regime of property rights. North, Douglass C. (1990). "Institutions, Institutional Change, and Economic Performance." Cambridge: Cambridge University Press.

6

Coase, Ronald H. (1937). "The Nature of the Firm." *Economica* 4 (November):386-405.

7

Libecap, Gary (1978). "Economic Variables and the Development of the Law: The Case of Western Mineral Rights." *Journal of Economic History* 38 (No. 2, June): 399-458.

8

Demsetz, Harold (1967). "Toward a Theory of Property Rights." *American Economic Review* 57 (May, No. 2): 347-359.

9

Anderson, Terry L., and Hill, P.J. (1975). "The Evolution of Property Rights: A Study in the American West." *Journal of Law and Economics* 18 (No.1): 163-179.

10

Field, Barry C. (1986). "Induced Changes in Property Rights Institutions." Research Paper. Amherst: University of Massachusetts, Department of Agriculture.

11

Field, Barry C. (1989). "The Evolution of Property Rights." *Kyklos* 42 (No. 3):319-345.

12

Inputs or outputs appropriated by intruders are given zero value in the model. A formal version of the Field model is found in the 1986 working paper. Firm size is not a choice

variable in the formal model, which implicitly excludes the possibility that individual producers merge into large firms. See footnote 10.

13

Merger is explicitly considered by Lueck (1992), and Caputo and Lueck (1992) in an important extension of the naive model. Lueck (1992) explores the optimal use of a fixed (natural) resource. The choice variables include group size, and three contractual arrangements: a) a fixed payment contract (a firm) where a single party owns the fixed resource and hires effort from the other individuals; b) a communal property contract where the group members supply their own inputs and equally share the fixed output; c) a communal property contract where the members only share access to the fixed resource. Caputo and Lueck (1992) extend the model in Lueck (1992) in various ways and compare private ownership with sharing over three possible margins: a) output derived from the resource; b) access to the resource; c) investment in the resource. Again optimization involves choosing the group size.

14

Lueck, Dean (1992). "Common Property as an Egalitarian Share Contract." Working Paper. Baton Rouge: Department of Economics, Louisiana State University.

15

Caputo, Michael R., and Lueck, Dean (1992). "Common Property: Dynamic Incentives and Contract Choice." Working Paper. Davis: Department of Agricultural Economics, University of California.

16

The allocation of inputs between the three activities is not optimal unless there is equality among the marginal (net) rates of return on inputs used in transformation, exclusion, and governance. For instance, in the mountain pastures of Iceland the typical farmer required a large area for his or her flock of sheep, and the relative price of fences was high. The pastures were managed as communal property. See Eggertsson, Thráinn (1992). "Analyzing Institutional Successes and Failures: A Millennium of Common Mountain Pastures in Iceland." *International Review of Law and Economics* 12: 423-437.

17

Note that instead of using large communal areas to meet variable weather conditions, relatively small individual plots could be instituted along with an active trade in grazing rights between individual owners and users. However, high transaction costs could make the introduction and operation of a market in grazing rights inefficient.

18

See p. 33 in Runge, C. Ford (1992). "Common Property and Collective Action in Economic Development." In Daniel W. Bromley (ed.). *Making the Commons Work. Theory, Practice and Policy*. San Francisco: Institute for Contemporary Studies Press. Note also p. 5 in Bromley's introduction to the volume.

19

The poverty argument for communal rights could be rescued if the introduction of individual rights required large-scale lump investments that bear fruit only in future periods. An isolated community that cannot borrow and is too close to subsistence to save is not able to make such investments. It is an empirical question whether a financial constraint is an important explanation of communal property regimes. Note that implicit in the poverty argument is the notion that communities would do better under individual property rather than communal property, if only the financial constraint were lifted.

20

See Stevenson's (1991) extensive study of the Swiss case. In his econometric investigations, Stevenson compared communal property with individual property in Alpine grazing and found that outcomes of communal regimes were inferior to those in individual regimes. Stevenson gives several theoretical and empirical reasons why his statistical results may not be correct. However, if the results are correct, the Swiss may indeed have ideological attachment to their communal arrangements and enjoy them like consumer goods. Stevenson, Glenn G. (1991). *Common Property Economics. A General Theory of Land Use Applications*. Cambridge: Cambridge University Press.

21

Imagine that the users are restrained by costs and thus prevented from devastating the

resource. The cost constraints could be due to the inelastic supply of a cooperating input, such as water on grazing land or fishing vessels in a fishery. Roberts, Russell D. (1990). "The Tragicomedy of the Commons: Why Communities Rationally Choose "Inefficient" Allocations of Shared Resources." Political Economy Working Paper. St. Louis: Center in Political Economy, Washington University. Roberts (1990), p. 5.

22

Also see Weitzman, Martin L. (1974). "Free Access vs. Private Ownership as Alternative Systems for Managing Private Property." *Journal of Economic Theory* 8 (June): 225-234. Of course, technically these individuals could be compensated for their loss.

23

Ostrom, Elinor (1990). *Governing the Commons. The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

24

Johnson, Ronald N., and Libecap, Gary D. (1982). "Contracting Problems and Regulations: The Case of the Fishery." *American Economic Review* 72, (No. 5): 1005-1022. And Chapter 5, "Contracting in Fisheries," in Libecap, Gary D. (1989). *Contracting for Property Rights*. Cambridge: Cambridge University Press.

25

For an excellent survey of the current state of the theory of collective action, see Sandler, Todd (1992). *Collective Action. Theory and Applications*. Ann Arbor: University of Michigan Press.

26

For an introduction to the theory of implicit and explicit contracts and various applications of the theory, see Werin, Lars, and Wijkander, Hans, eds. (1992): *Contract Economics*. Oxford: Basil Blackwell.

27

Milgrom and Roberts (1992), pp. 314-315. See footnote 2.

28

For a excellent discussion of these issues, see Taylor, Michael (1987). *The Possibility of Cooperation*. Cambridge: Cambridge University Press.

29

The pure game-theoretic approach catches the group before it forms a community and before the individuals are constrained by social institutions, such as norms, conventions and customs, which implies that the members have not developed a common language, religion, set of customs, or network of family and kinship ties. It is an amusing thought to try to visualize these isolated speechless individuals gathered to select a system of property rights and play complex games with each other. However, it must be admitted that the introduction of prior rules begs the question of the origins of cooperation.

30

North (1990). See footnote 5.

31

P. 387 in Bates, Robert H. (1988). "Contra Contractarianism: Some Reflections on the New Institutionalism." *Politics and Society* 16 (No. 2-3): 387-401.

32

Hechter, Michael (1990). "The Emergence of Cooperative Social Institutions." In Hechter, Michael et al., eds. *Social Institutions. Their Emergence, Maintenance and Effect*. Berlin: De Gruyter.

33

Gluckman (1956) has summarized and interpreted some of their findings. Bates (1983) has retold the story in the language of game theory. Bates, Robert H. (1983). "The Preservation of Order in Stateless Societies: A Reinterpretation of Evans-Pritchard's *The Nuer*." Chapter 1 in *Essays on The Political Economy of Rural Africa*. Cambridge: Cambridge University Press. Gluckman, Marx (1956). *Custom and Conflict in Africa*. Oxford: Basil Blackwell.

34

Here we are faced with the fundamental question of whether social and political institutions lead an independent life or merely reflect technologies and economic forces. The answer is, both.

35

The term "appropriator organization" is due to Ostrom, Elinor (1992). "The Rudiments of a Theory of the Origins, Survival, and Performance of Common-Property Institutions." In Bromley, Daniel W., ed. *Making the Commons Work. Theory, Practice and Policy*. San Francisco: Institute of Contemporary Studies Press.

36

The breakdown of communal (or any) property regime need not involve the formal removal of the rules that define the regime, but a weakening of their enforcement. Ensminger, Jean and Rutten, Andrew (1990). "The Political Economy of Changing Property Rights: Dismantling a Kenyan Commons." Working Paper. St. Louis: Center in Political Economy, Washington University.

37

Rainfall is localized in the region and the sedentary households "solve this problem by keeping only small milking herds in the village and hiring herders to take the majority of their stock to remote and highly mobile cattle camps." Ensminger and Rutten (1990), p. 23.

38

In the case of the Orma, at one point decentralized control was successfully maintained with family ownership of wells, and the control of access to water was used to regulate access to grazing. *Ibid.*, p. 3.

39

Consider the vast dissipation of oil reserves in many parts of the American Southwest that results when several independent producers share the same underground oil reservoir. According to Libecap and Wiggins(1985), asymmetric information about the value of each lease prevents independent users from agreeing on jointly operating their reservoir. An outside government could force an agreement and set general rules that require joint operations in all cases. However, positive political theory tells us that decisions by governments are plagued by information and transaction problems, and individually rational behavior by public decision makers can bring irrational outcomes. Libecap and Wiggins (1985) report that the state governments of Texas and Oklahoma failed to design rules that encouraged unitization of oil fields, whereas in Wyoming, where oil fields were mostly on federal land, the federal government designed a structure of property rights that encouraged unitization. Libecap, Gary D., and Wiggins, Steven N.(1985). "The Influence of Private Contractual Failure on Regulation: The Cost of Oil Field Unitization." *Journal of Political Economy* 93 (No. 4): 690-714.

40

The discussion of the Saami case is based on several of the essays contained in Stenseth, Nils Chr., Trandem, Nina, and Kristiansen, Gørill, eds.(1991). *Forvaltning av våre fellesressurser. Finnmarksvidda og Barentshavet i et lokalt og globalt perspektiv*. Oslo: Ad Notam forlag.

41

Sara, Aslak Nils and Kristiansen, Gørill (1991). "Reindriften i Finnmark årssyklus, driftsstrategier og forskningsutfordringer." In Stenseth et al., eds. See footnote 40.

42

Ibid., p. 168. P. 183 in Bjørklund, Ivar (1991). "Samisk reindrift som pastoral tilpassningsform. Noen betraktninger om økonomisk modernisering og kulturell endring på Finnmarksvidda." In Stenseth et al. See footnote 40.

43

See p. 185 in Bjørklund, Ivar (1991) See footnote 42.

44

Kristiansen, Gørill (1991). "Organisasjon og forvaltning i reindriften." P.184 in Stenseth et al. See footnote 40.

45

See Bye, Karstein (1991). "Målsettinger og virkemidler i reindriftspolitikken." P. 175 in Stenseth et al. See footnote 40.

46

P. 186 in Bjørklund (1991). See footnote 42.

47

Lenvik, Dag and Trandem, Nina (1991). "Forvaltning av tamrein i Nord-Norge:status og

Muligheter." And Johansen, Bernt et al. (1991). "Det biologiske ressursgrunlaget for Finnmarksreinen. Both in Stenseth et al. See footnote 40.

48

Open access is both an indirect and direct result of the new law for the industry. As an example of a direct effect, the law has given free access to pastures that by tradition were exclusively owned by specific individuals or groups. There are some similarities between the Norwegian government creating open access in the pastures in Finnmark and the chronic overgrazing on the Navajo Reservation as the result of the policies of the U.S. Interior Department and the Navajo Tribal Council. The policies were intended to preserve the pastoral culture of the Navajo, but in effect they legislated a common property condition for the range and forced many Navajo to leave their traditional employment of sheep raising and accept wage work or welfare. Libecap, Gary D., and Johnson, Ronald N. (1980). "Legislating Commons: The Navajo Tribal Council and the Navajo Range." *Economic Inquiry* 18 (January): 69-86.

Distributional and Political Issues in Modifying Traditional Common-Property Institutions

by

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I. INTRODUCTION.

Throughout the world, indigenous property rights systems are under pressure. Local arrangements for allocating access and use of resource stocks, including inshore fisheries, grazing lands, forests, and animal herds, have historically been a durable means of maintaining the resource and preventing the dissipation of resource rents. Often, these arrangements have been common-property institutions, whereby non group members have been denied access, but group (community) members have been granted usufruct rights to the resource. Although problems of calculating and assigning individual allotments and insuring individual compliance with harvest rules have existed under common-property conditions, so long as the group was reasonably small, homogeneous, and had shared preferences or objectives regarding the resource, serious depletion was not an issue. Long-standing equilibrium conditions emerged.

These conditions and the associated effectiveness of local common-property institutions in preventing open-access losses (Gordon, 1954), unfortunately are under stress. They are vulnerable to rising resource values, new technology, new entry, and new legal codes, drafted elsewhere in the society. Advanced harvest technology and capital equipment have dramatically increased the effects individual extraction can have on the stock. Further, rising resource prices and the depletion of stocks elsewhere have invited entry by non-traditional users, who do not adhere to local harvest rules. This entry, outmigration from traditional societies, and the introduction of other cultures have weakened social cohesion within traditional groups and the effectiveness of common-property arrangements.

Indeed, unlike more formal, impersonal private property rights, traditional institutions, which are based on local information, repeat contracts, and shared preferences, are singularly ill prepared to respond to major new entry pressures. If, instead, new entry is limited and the problem is one of a breakdown of traditional rules, then a solution is the more formal definement of individual property rights within the existing structure. The shares of all current members must

be renegotiated, reduced, and made more flexible if total harvest is not to increase with entry. This negotiation, as described below, however, can involve distributional issues that tax the political framework of traditional institutions. Compliance problems also will increase, if new entrants do not recognize the legitimacy of the traditional commons institution. Moreover, as existing shares are reduced to lessen pressure on the resource, the incentive to cheat increases.

Modifications of traditional institutions can be through the assignment of transferable quotas for fishing or for formal grazing permits for herding. If, however, entry is more significant, then broader public policy intervention is required to define property rights, since traditional arrangements are unlikely to provide a complete framework for addressing open-access problems.²⁰ New rules, however, must recognize existing practices to be effective, but substantial adjustments may be required.

Accordingly, in the face of the potential collapse of or at least, of severe pressure on many of the world's indigenous common-property arrangements, calls have been made for public policy intervention to devise ways to supplement or strengthen local common-property institutions. Adding public policy, however, brings a new set of problems. A new set of actors--politicians, agency officials, other claimants and interest groups--are added to the original users. This creates a new bargaining setting that is more complicated with less clear results for members of traditional groups. Other interests will be weighed in the political process, so that it is no longer predictable that the arrangement will benefit or be consistent with the desires of the original indigenous group.

This paper examines a number of issues with regard to the modification of property rights: First, the incentives to change existing property rights arrangements as new conditions emerge are summarized; second, bargaining issues that are raised due to distributional concerns are highlighted; third, the incentives of politicians, bureaucrats, and new entrants, and the implications for existing resource users are introduced; and fourth, two case studies from U.S. inshore fisheries and Indian grazing practices are presented for insights into how distributional issues have affected political bargaining over open-access problems and how those issues have affected the public policy response.

²⁰Ostrom (1990) provides case studies and analyses of how locally-based institutions can address or be modified to address open-access problems. Johnson and Libecap (1980, 1982) and Libecap and Johnson (1980) indicate the problems encountered in different resource settings when external agencies disregard existing property rights and resource practices.

II. INCENTIVES TO MODIFY PROPERTY INSTITUTIONS.

Property rights are the social institutions that define or delimit the range of privileges granted to individuals to specific assets, such as parcels of land or water, fish, wildlife, and mineral deposits. Although property rights institutions vary from strictly-defined private property rights to common-property arrangements for specified groups, included in all rights structures are the rights to exclude non owners or non members from access, the rights to appropriate the stream of rents from use of and investment in the resource, and rules regarding the transfer of individual property rights. As such, property rights institutions critically affect incentives for decision-making regarding resource use and hence, economic behavior and performance. By allocating decision-making authority, property rights also determine who are the economic actors in a society and define the distribution of wealth.

Property rights institutions exist in order to avoid the losses of open-access conditions, where there are no restrictions on access and use. Under these circumstances, the value of the resource is dissipated through excessive and wasteful use practices. These include too rapid harvest rates because individuals do not take into account the social costs of their harvest decisions. As a result, total output by all parties using the open-access resource exceeds the social wealth-maximizing level. In addition, short time horizons dominate so that the user costs of production are ignored and long-term investment is neglected. Finally, competition for control diverts labor and capital inputs from production to predatory or defensive activities, and the associated uncertainty of control limits the emergence of markets for the exchange and allocation of the resource to higher-valued uses. In the absence of some type of market signals, the resource will not flow smoothly or routinely to new uses as economic conditions change.

Traditional societies with limited resources and production opportunities have understood well the dangers of unregulated access and use of valuable resources. Generally, the very survival of the community has depended upon successfully addressing the open-access problem. Hence, the intricate and sophisticated network of rules that have been assembled over time to manage locally-based natural assets, which include customs or policies regarding who can have access, harvest practices and rates, transferability, and dispute resolution.

These traditional institutions, however, are now under unprecedented pressure. The old equilibriums have been upset and in many cases, new institutional arrangements are required to address the open-access problem. New mechanisms are needed to arrive at a cooperative solution, but the parties that must cooperate are a much broader and more heterogeneous group than before and the distributional issues

involved in assigning access and resource rents are much more difficult.

III. DISTRIBUTIONAL ISSUES IN CONTRACTING FOR PROPERTY RIGHTS.

In general, individuals within a group will negotiate among themselves to modify existing property rights institutions in order to mitigate the losses of the common pool, as soon as there are net benefits of so doing. Forces that drive these adjustments in property rights include declining harvests and income, new competition from others, and production possibilities to which the old arrangement was poorly attuned. But with new entry, no longer can the negotiations for institutional change take place solely within the traditional group. The interests of new entrants, politicians, and bureaucrats must be considered. The bargaining setting is much more complex, and dispute resolution and monitoring compliance with new property rules and harvest rates become more difficult.

These problems compound existing ones about the distribution of the gains and costs from changes in property rights arrangements. While the aggregate gains from reducing open-access problems through the redefinition of property rights are unlikely to be controversial (and empirically, this seems generally to be the case), the allocation of wealth and political power inherent in any adjusted rights structure will be a source of dispute. New property rights arrangements will not only have different production effects, but they will have different distributional implications as well. Some parties will clearly be made worse off, while others may benefit. Some parties will have their traditional harvest practices and the lifestyles associated with them limited, while other parties may be denied access altogether. These distributional effects occur even when there are significant aggregate gains. Distributional negotiations and devising a management and allocation scheme that is politically acceptable becomes the center of the problem in outlining a new property rights arrangement.

In political bargaining over institutional change, the positions taken by individual parties are determined by their expected net gains from the new arrangement with respect to status quo conditions. The benefits of the status quo are a function of current property rights, which define the individual's share of aggregate production, and the productive capacity of the resource. Those who have small shares under existing arrangements or who suffer particularly from the decline in harvests are most likely to expect some benefit from adjustments in property rights arrangements. Others who have adapted well to existing open-access conditions or who have disproportionately large shares will be reticent to make major changes, particularly if there is uncertainty regarding their future shares. Each bargaining party will attempt to

mold the resulting arrangement in ways that maximize his share of the aggregate returns. This maneuvering affects the timing and nature of the property rights that are adopted and the aggregate benefits that are obtained. Accordingly, in modifying common-property practices to address open-access conditions, not only does a new management scheme have to be devised to limit harvests, but a new formula for allocating access and use must be created. This is not only a key problem within the traditional group, but it becomes the key political problem once public policy is brought into supplement traditional arrangements.

The issue, then, becomes one of devising an allocation mechanism to assign the gains and costs from institutional change in acceptable ways, while addressing the open-access problem. Because over harvest, the depletion of the stock, and other conditions associated with open-access require restrictions on future exploitation, some parties will be adversely affected by the institutional change. They may be temporarily or permanently denied access and use or have their traditional use practices dramatically changed. By compensating influential parties that might be harmed in the proposed change, a political consensus for institutional change can emerge. Those share concessions, however, necessarily alter the nature of the property rights under consideration and the size of the aggregate gains that are possible. If influential parties cannot be sufficiently compensated through share adjustments to win their support, otherwise beneficial institutional change may not occur. Even though society is made worse off by the failure to address the new open-access problem, disputes over the distribution of access and resource rents can block a cooperative solution.

In principle, it is possible to imagine a side payment scheme that would compensate those who otherwise would oppose a socially-desirable change in property rights. But empirically, the record suggests that these side payments often will either be incomplete or not forthcoming, delaying collective action. Questions arise as to who should receive payments, who should pay, the size of the compensation, and its form. All of these issues are subject to dispute. These problems, for example, have affected the timing and assignment of individual quotas in fisheries, of grazing permits, of crude oil production quotas, and orange shipment quotas.²¹

Questions arise as to the basis for assigning quotas or other forms of use rights. Two possibilities are to grant them on the basis of prior possession or on the basis of previous production. Prior production as

²¹See, Johnson and Libecap (1982), Johnson and Libecap (1980), Libecap and Johnson (1980), Libecap and Wiggins (1985), Libecap (1989c), and Hoffman and Libecap (1992).

a criteria for shares, however, may involve severe information problems in documentation or verification. Previous possession does not consider new entrants, and fairness issues may arise if the distribution scheme leads to a skewed assignment of property rights.²² A uniform allocation formula is a conventional alternative because it reduces the information problems associated with verifying past production and allows for inclusion of new entrants. It also avoids more complex and politically-risky distributional arrangements and addresses fairness criteria. But uniform allocations disadvantage particularly skilled or successful parties, who may have adapted well to the status quo. These individuals will have reason to oppose adjustments in property rights because they bear more of the costs and receive fewer of the benefits of the new arrangement. Conflict also will arise regarding the means for entry or exchange of property rights, since these practices often will involve outsiders. Finally, strategic bargaining by key parties to increase their share in the new arrangement can block or delay agreement, if unanimity rules are required to institute change.

All things equal, the intensity of political bargaining over distributional issues and the likelihood of successful property rights change will be influenced by i). the size of the aggregate expected gains from institutional change; ii, iii). the number and heterogeneity of the bargaining parties; iv). the skewness of the current and proposed share distribution, and v, information problems. The larger the expected aggregate gains, the more likely politicians can devise shares to make influential parties better off, so that institutional change can proceed. On the other hand, the larger the number of bargaining parties, the greater the number of claims that must be addressed by politicians in assigning or modifying property rights, making institutional change more difficult. Time and precedent are critical factors in determining the number and bargaining power of claimants. Past political agreements regarding property rights define a set of actors or vested interests who can create advantages for future bargaining by molding political institutions to their benefit. Previous agreements also affect bargaining by setting precedents and expectations among competing groups regarding the expected gains from collective action to change property rights. The more heterogeneous are the private bargaining parties, the more difficult is the formation of coalitions and a consensus on the proposed assignment of rights. Further, a very skewed existing rights arrangement leads to pressure in political contracting for a redistribution of wealth. Indeed, those parties without current property rights are motivated to lobby for redistribution even if there are no aggregate benefits from institutional change. Finally,

²²For discussion of fairness issues, see Hoffman and Spitzer (1982, 1985); Fogel (1992).

information problems raise contracting costs by intensifying disputes over how the proposed change will affect individual parties and what share adjustments are necessary for compensation. Failure to agree on such compensating shares may convince those who do comparatively well under the current arrangement, even open-access, that they will be made worse off by the institutional change.

IV. PUBLIC POLICY AND POLITICAL BARGAINING TO CHANGE PROPERTY RIGHTS.

Consideration of the details of political bargaining is necessary for predicting the ultimate impact on traditional users of public policies to respond to open-access problems. Because property rights are politically determined, and especially in appeals beyond the traditional community to public policy, the definition and enforcement of property rights will occur in the political arena. The very existence of an open-access problem indicates that the informal customs and agreements which required little or no state intervention and were sufficient in the past, are now inadequate. However, lobbying politicians and other government officials for new or increased government support for modifying and protecting traditional use practices will activate other interest groups in the political process, as well as involve the additional interests of politicians and bureaucrats. With a broader array of competing interests, greater government intervention in the definition and enforcement of property rights will make bargaining more complex and require concessions from traditional users in the form of redistribution of resource rents to other influential constituents. The bargaining parties include private claimants (traditional users, plus new entrants, environmental groups, and other constituents), politicians (incumbents and aspiring office holders), and bureaucratic officials (who will administer public policy regarding the management of the resource). All have an incentive to devise a management scheme that advances their interests, and these may not be consistent with the interests of traditional users.

Politicians will play an important role in brokering any new arrangement, but they will have a different incentive structure and face a different array of costs and benefits than do the other parties involved in bargaining to change rights arrangements. For one thing, they have short time horizons. Politicians have no particular reason to be concerned about very long-term, sustainable resource uses. The demands they face are immediate, and there are no futures markets in votes. Current practices in the United States regarding the funding of social security and a lack of sustained interest in reducing the federal deficit are examples of an inherent short-term bias in political decisions. Additionally, vote-maximizing politicians must respond to many competing interests to insure reelection or the maintenance of

political power. They have incentives to maintain status quo distributions, and do so by balancing competing demands for resource access and use, so that no group will get all that it wants through public policy.

This suggests that if traditional users are not well-organized and are not politically influential, then the demands of other constituents, perhaps the new entrants, will prevail. Indeed, traditional groups with histories of reaching agreements and maintaining traditional common-property institutions will likely be small, and since income from traditional harvest practices is apt to be low, such groups are generally relatively poor. Education levels and experience in using the political process may be limited. The political influence of competing groups of claimants depends upon their wealth, size, and homogeneity (Stigler, 1971; Peltzman, 1976; Becker, 1983). This suggests that traditional users will not be particularly effective lobbyists in their own behalf in the competition for resource access and use as property rights are being adjusted. In addition, with different political jurisdictions involved, as is a standard case, there will be different and competing politicians, ranging from national politicians (and if more than one country is involved, there will be multiple national politicians with competing interests at stake) to local politicians. All have different constituencies, and will make resource use decisions with their own objectives in mind. Traditional users may have ties to one group of politicians (local), but lack critical ties to national politicians.

Necessarily, agency officials, who administer statutes in devising public policy, also have a short-run bias. They must be responsive to elected officials. Although there is latitude in the devising of administrative rules and perhaps an ability of agency officials to act on their own preferences, agencies cannot stray too far from the desires of the existing electorate (Weingast and Moran, 1983). Indeed, agency decisions regarding the administration of public policy are critically affected by the need to form political alliances with influential constituents for appropriations, staffing, and maintenance of regulatory mandates. Additionally, agency officials are not residual claimants. That is, they do not bear the full costs or benefits of their administrative policies, and hence, have less incentive to devise policies that maximize the rental value of the resource than do actual resource users.

For these reasons, one cannot predict that public policy outcomes will necessarily be in the long-run interest of traditional users, even if legislation or the initiating call for government intervention is made in their behalf. Traditional users become but one of many competing interests at stake. In general, the greater the magnitude of the open-access problem, the more likely there will be a response from

politicians to devise a new property rights arrangement. Once problems have become very severe, interest groups are more likely to form cohesively and effectively to pressure politicians for action. This suggests, however, that a political response to an open-access problem will not occur until late, after much of the damage has been done.

Given the various competing parties and potential for conflict over the allocation of property rights and the prediction that a political response is apt to be delayed, institutional change is likely to be an incremental process with modest adjustments from status quo conditions. The role of time and precedent in influencing the number of vested interests and the expected returns from collective action suggest an historical path dependence for property rights institutions.

These arguments imply that caution is in order regarding the efficacy of public policy intervention to address open-access problems faced by traditional users. The closer that solutions rely on existing practices, the more likely they will advance the welfare of current users and at the same time, protect the resource. The arguments also suggest that within traditional groups and across other competing users, negotiations to modify existing property rights arrangements will raise distributional concerns that will affect the new institutions that are put into place and their effectiveness in mitigating rent dissipation. Some of these issues are illustrated in the following empirical examples from the United States.

IV. U.S. INSHORE FISHERIES.

In some cases, at least, public policy has not been very supportive of traditional (or at least, long standing) use practices. The political influence of other, competing users has been a critical factor. For example, Higgs (1982) describes the vibrant nature of the Pacific Northwest inshore salmon fishery at the turn of the century, when salmon were abundant and could be harvested at low cost due to their anadromous nature. Because salmon returned from the ocean to the streams from which they were spawned to deposit and to fertilize eggs, they could be harvested from fixed sites along streams leading from the Pacific Ocean, using fish wheels and gill nets. A system of private property rights to those sites emerged along major rivers, such as the Columbia, similar to the well-developed property systems used earlier by Indians.

As early as 1892, however, there were concerns about the entry of new fishermen and the impact on the stock of the growing rise in total gear used in the fishery. Declining productivity created intense hostilities among various groups of fishermen, who were identified by the types of equipment that they used. Each group blamed over fishing and its consequences on others and attempted to have the fishing privileges of

their rivals curtailed. Public policy solutions were demanded, and state legislatures were drawn into the fray. Gill netters increasingly were able to secure legislation in Oregon and Washington that placed discriminatory restrictions and taxes on the operators of fish wheels. Ultimately, the low-cost, productive fish wheels were outlawed by the two states. However, removing one group did not solve the open-access problem. Conflicts over access and harvest continued among owners of fish traps in Puget Sound, commercial purse seiners, who relied on vessels, and sports fishermen. New political coalitions of fishermen formed to lobby for restrictions on their competitors. Because of their small numbers and highly visible, large catches, fishermen who used fish traps were especially vulnerable. With the growing political influence of numerous sports fishermen and those commercial fishermen who used vessels, regulations eventually were adopted to forbid fish traps. By the early part of the twentieth century, these historical fishing practices disappeared.

As fishing pressure continued, new regulations were authorized by state legislatures and molded by regulatory agencies to force the interception of salmon in the ocean at much higher costs. Capitalization and labor costs increased as the number of boats and fishermen rose. As the stock of salmon declined from more intensive harvest, a principal regulatory response was to construct costly hatcheries and to shorten the fishing season in an attempt to raise aggregate catch. The progressive shortening of seasons intensified the rush of fishermen to complete their harvest early and added pressure for larger and faster vessels. Moreover, tensions among competing fishing groups continued as each sought to obtain legislation that favored it and posed constraints on its rivals. No long-term satisfactory solution has obtained, despite continued regulatory efforts, and the value of the salmon fishery in the two states has declined.

Similar problems in satisfactorily addressing open-access problems have been encountered elsewhere, and their persistence is not due to some technological imperative or lack of scientific analysis. In examining property rights and regulation in the Texas Gulf Coast shrimp fishery, Johnson and Libecap (1982) describe the actions of fishermen unions in devising locally-based rules for limiting access and harvest. The Gulf Coast Shrimpers' and Oystermen's Association along the Mississippi coast devised rules to restrict entry and harvest. Under union rules, fishermen were permitted to sell only at or above the association's floor price. By setting a minimum price for small, immature shrimp that had to be paid by local packers, which generally exceeded market prices, the rules reduced the quantity of small shrimp demanded by the packers. Accordingly, the higher price required for small shrimp acted to redirect harvest to later in the season and thereby increase the yield of higher-valued larger shrimp. The market price

per pound for larger shrimp set by the union for payment by packers was equal to the market price. Shrimp purchased by packers at less than the mandated price would not be peeled by union peelers. The union also obtained state legislation that recognized its practices and fixed minimum sizes for harvest. The analysis of harvest price data by Johnson and Libecap indicate that the union was successful in delaying harvests in Mississippi and in raising the size of the shrimp caught and marketed there, relative to neighboring Louisiana. Even so, this effort, as well as similar efforts by fishery unions on other U.S. coasts were struck down by the U.S. Justice Department as violations of the Sherman Antitrust Act at the behest of those fishermen who were denied access by local union rules.

In the absence of locally-based arrangements, fishermen in most U.S. inshore fisheries have relied upon public policy with at best, spotty results. Over fishing remains a common characteristic, and catch and incomes have fallen. Neither fishermen nor regulatory agencies have been able to devise very satisfactory harvest rules. Until recently, few quotas arrangements were adopted. To avoid the redistribution problems associated with quota design, fishermen could agree only on across-the-board regulations, such as season closures or equipment restrictions.

Disputes have arisen over the impact of harvest restrictions and on the response of the stock to regulatory practices. Due to differences in skill among fishermen, catch and income have varied sharply. In the design of institutions to reduce open-access losses, each party has been concerned with how the new arrangement will impact its share of total catch. For better fishermen, there has been the hazard that allowable catch and income under any new institutional arrangement would be less than they received under the status quo. These redistribution concerns have existed for a long time and have limited agreement on institutional change until fisheries became severely depleted with all harvests low. At that point more of the bargaining parties have been able to see their welfare improved by controls on catch, and agreement has become more likely. Unfortunately by that time, the costs of the open-access problem have been long standing and the stock seriously depleted.

Among the competing contracting parties have been commercial fishermen of various kinds and sports fishermen. Because of their large numbers as voters, sports fishermen have been politically influential and have succeeded in promoting regulations that have often displaced commercial fishermen and any informal property rights arrangements they may have devised.

Historically, a political consensus has emerged among commercial and

sports fishermen only for regulations that tended to avoid controversial distributional issues, and instead, focused on visible yield-enhancement-hatcheries, season closures, gear restrictions and entry controls on outsiders. Until recent depletion has change bargaining stands, limited access schemes and individual quotas have been a much less popular regulatory approach.²³

Limited access schemes usually involved issuing a restricted number of fishing licenses and allowing entry only to licensees as a means of reducing overall harvest rates and pressure on the stock. With the number of licenses kept small relative to the number of fishermen, who would fish under open-access conditions, and entry restricted to license holders, rents could be increased. If the licenses were considered to be a permanent assignment of access to the fishery and were transferable, they could become a valuable property right. Because of the potential wealth assignment involved, determining who would receive the initial licenses and the procedure by which they would be granted have been important problems to be resolved. Political influence based on numbers, cohesion, and wealth have been more critical determinants of who received licenses than have been other criteria, such as the impact of various fishing groups on fishery rents or past use practices. Because total rents could be increased and redistributed through restrictive licensing, some fishermen therefore could be made better off relative to their position under the status quo. Within the group receiving licenses, however, the problems of designing and enforcing intragroup controls on fishing remained, especially in the absence of local arrangements, which generally have been prohibited by law.

Recently, individual, transferable quotas have become a more common response to this problem, since they restrict entry and limit individual catch. But their long-run acceptance and use still have faced the concerns of fishermen. With transferable quotas, some of the equal access questions that may be politically important have been resolved. For example, markets have developed for the transfer of quotas to allow new fishermen to enter or to allow some of those who were excluded to reenter the fishery.

There has been, however, the problem of the initial assignment of quotas. If the quotas were granted to incumbent fishermen, they would receive a wealth transfer. Politicians have considered imposing taxes on

²³Similarly, Hoffman and Libecap (1992) find that orange growers could not agree on prorationing rules in Florida under citrus marketing orders because of disagreement on the impact on particular growers and shippers. No quota design could be devised that brought agreement. Hence, unlike California, Florida growers have relied instead on across-the-board shipping holidays (season closures) and uniform grade and size restrictions to limit shipments to market.

the value of the license, perhaps to compensate those who were excluded from the fishery. Similarly, if the licenses were sold by the government through price discrimination schemes, the government could extract all of the rents so that fishermen were no better off under regulation. In either case, the adoption of taxes or pricing policies in limited-access schemes could reduce the welfare gain to fishermen from the new program and sharply reduce their enthusiasm for it.

There have been other issues regarding the size of the quota and whether it would vary among fishermen and across the season. Variable quotas to reflect past harvest practices and differences in skill have been considered a means of building support among successful fishermen for regulation. These practices, however, have been found to be uncommon in a variety of empirical studies, where uniform, across-the-board quotas are predominant.²⁴ Uniform quotas would be responsive to equity concerns, which are common political goals.²⁵ They, however, disadvantage more skilled fishermen. Adjusting quotas across seasons and within seasons by regulatory agencies to respond to new estimates of the condition of the stock also could be an important feature of regulation, but it introduces uncertainty for fishermen in calculating the expected gains to them from the adoption of a quota system. Further, uncertainty regarding the size of annual quotas, the duration of quota policies, and the nature of other regulatory actions have added to the difficulties facing fishermen in calculating individual benefits from the new arrangement relative to the status quo. Moreover, uncertain quotas could encourage fishermen to violate their allotments, raising enforcement costs and reducing the effectiveness of the policy in enhancing the growth of the stock and aggregate fishing incomes.

Nevertheless, regulatory officials and politicians have some incentive to adopt temporary quotas. A permanent quota system could sharply reduce the administrative authority of regulators and justification for agency staffing and budgets. Further, permanent quotas limit the ability of politicians to respond to changing political demands for free access to the fishery. With transferable permanent quotas, subsequent exchanges of access rights would be through market transactions and not through political assignments. Finally, there would be political pressures opposing a permanent quota system from fishermen who have their access and harvest opportunities reduced, as well as from input suppliers, ranging from fishing crews to vessel and equipment manufacturers and retailers, who have a stake in a less restrictive

²⁴For example, see the regulatory case discussed by Hoffman and Libecap (1992) regarding orange marketing orders. See also, Johnson and Libecap (1982).

²⁵See Fogel (1992).

regulatory regime.²⁶

This summary indicates some of the bargaining problems encountered in devising regulatory schemes to address open-access problems in fisheries. They have not been easy ones to circumvent. Moreover, public policies and judicial responses to open-access problems often have not considered (or ruled out) locally-devised arrangements. This has reduced the effectiveness of regulation in protecting the resource.

V. GRAZING PRACTICES AND REGULATION ON U.S. INDIAN RESERVATIONS.

American Indians, particularly those in the Southwest, have pastoral economies. Almost all are under stress as the number of herders has increased, and over grazing and deteriorating range quality are common results. This problem, unfortunately, has existed since the 1930s and again, no effective, long-term solution has been devised. There are conflicting goals of maintaining traditional pastoral cultures by granting tribal members access to the land in the face of rapidly increasing populations and of safe guarding the sustainability of the range resource. There seems to be no evidence that these conflicts are being resolved in a satisfactory manner, despite the passage of 60 years.

Grazing practices, the extent of overgrazing, and the quality of range land vary across the reservations (Johnson and Libecap, 1980). Regulatory practices by tribal councils and outside government agencies, such as the Bureau of Indian Affairs, have had mixed effects on the resource stock and on the welfare of tribal members. Political factors, both within the tribes and in government agencies, have played a critical role in formulating regulatory policies regarding property rights and range land use. The experience indicates that one cannot be too sanguine that either tribal governments or the Federal Government can provide property rights arrangements that preserve the resource and advance the well being of tribal members.

In the U.S., the Federal Government holds title to Indian land, and formal use rights, where they exist, are granted to individuals through the Bureau of Indian Affairs (BIA) and local tribal councils. In assigning grazing rights, the BIA has emphasized the equal distribution of tribal land. In the process, it has rejected existing claims of large herders where they have been associated with overgrazing and where their holdings have been deemed unequal. Historically, large herders have established informal control of range land on many southwestern reservations through prior appropriation and continued occupancy.²⁷

²⁶For discussion of individual quota systems and their advantages and costs, see Scott (1989), Libecap (1989b), and Neher, Arnason, and Mollett (1989).

²⁷The notion of occupancy and beneficial use as a means of legitimizing claims is a common practice. It was the basis for U.S. homestead allocations under federal

There are economies of scale in herding, so that large herders have higher per animal returns. Absent an ability to obtain formal property rights to their land, large herders in many cases have engaged in 'limit grazing' to reduce the threat of entry by other herders on their customary lands. Under limit grazing, herders stock beyond the level that would otherwise maximize rents in order to reduce the expected gains from entry.²⁸ Although, this practice of overgrazing is an effective means of defining and enforcing customary grazing areas, it weakens plant stands and makes the range vulnerable to erosion and the introduction of unpalatable species.

Recognizing and enforcing the land claims of large herders to allow them to discontinue overgrazing practices and to encourage them to invest in the long-term quality of the land has not been politically feasible for either tribal councils or the BIA. Large herders have been viewed as better able to bear the costs of imposed stock reductions to improve range quality. More importantly, large herders have controlled a disproportionate amount of reservation land. Recognizing their claims would deny the potential claims of other tribal members, and in any event, federal policy since 1933, has been to emphasize the communal nature of Indian lands. Finally, large land holdings prevent the granting of herding privileges to additional members, and as populations have increased, the demand on popularly-elected tribal councils for herding opportunities has correspondingly risen. Hence, recognizing the land claims of large herders has been inconsistent with other political goals.

Accordingly, in many cases either uncompensated, forced redistributions of land have occurred through BIA policies with an emphasis on an equal distribution of the land (Navajo and Zuni reservations) or the claims of large herders have been tacitly admitted, but no clarification of rights has occurred (Cochiti, Santo Domingo, San Felipe, Sandia, Santa Ana, Taos, Santa Clara, Tesuque, Name, and San Juan reservations). Naturally, uncompensated redistribution has been resisted by herders and has been politically controversial. Unfortunately, while redistribution has brought about a rise in small herds on the Navajo reservation, for example, it has not resulted in range improvement practices. Indeed, with the rise of small herds and the political pressures to facilitate new entry by additional herders, total stocking has increased and property rights have become less, not more confused. Not surprisingly, range land conditions have deteriorated (Libecap and Johnson, 1980).

land policy in the nineteenth century, and remains the basis for land claims by squatters and others with otherwise formal title in Brazil. Failure of title holders to occupy and 'use' their lands makes them vulnerable to entry by others. See, Alston, Libecap, and Schneider (1992).

²⁸The limit grazing model is developed in Johnson and Libecap (1980).

VI. CONCLUDING REMARKS.

As per capita incomes rise around the world, there is greater concern about the rational use and conservation of natural resources. The professed goal is a sustainable interplay between man and the environment. Historically, traditional common-property institutions have been quite successful in small, homogeneous communities in maintaining resource stocks and the community wealth on which they are based. Recently, with rising populations, migration, new entry, and the introduction of new technology, these traditional arrangements have been placed under stress. Policy discussions have emerged regarding institutional changes away from traditional practices to more formal rights assignments to promote more sustainable resource uses. In some cases, pressures have arisen for more formally defining the use rights granted community members, which have previously been informal and vague. Indeed, a common result of rising resource values and greater competition for resource use is a demand for an increase in the specificity of property rights.²⁹ Other pressures have risen to both reduce the number of individuals who can exploit the resource and limit the harvest rates of those who are allowed to continue exploitation. These raise critical distributional issues that affect political support for institutional change. Resolving distributional conflicts over the redefinition of property rights, however, fundamentally changes the nature of the institution that ultimately can result, with implications for its effectiveness for managing the resource stock. Additionally, as traditional users turn (or are turned) to outside politicians and administrative agencies to address resource use problems, new objectives and interests are added. The melding of a broader array of competing political objectives for resource assignment and use may not lead to policies that advance the interests of traditional users or that significantly protect the resource. Accordingly, caution is necessary in calling for public policy intervention, and once a path of regulatory change is taken, the distributional concerns of the various parties involved must be considered, if collective action is to be successful in safeguarding the resource and the traditional societies that depend upon it.

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"Common- and Public property rights regimes to non-private resources. Some legal issues on selfgoverning conservation regimes".

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ABBREVIATIONS

B ...	a beneficiary person
B _a ...	all beneficiaries of other's duty or obligation according to open access regimes
B _e ...	beneficiaries given the right to expropriate
B _n ...	beneficiaries nomen nescio
B _s ...	the sole beneficiary of another's duty or obligation
B ₁ ...	the first-priority fisherman
T ...	persons obliged to tolerate actions by the B's
T _o ...	oil industry obliged to tolerate fishing

1. The problem of public- and common property rights

1.1 Introduction. "The tragedy of the commons" seems to be an accepted and well-known truth (Stenseth, 1991 and further references). However; what is tragic about the commons? In fact arctic cod in Barents Sea has survived for thousands of years without any governmental body managing the stock and keeping it from being overexploited (Jentoft, 1991).

One popular answer (conventional wisdom) to the "tragedy" is the necessity of political control through governmental body (Berge, 1991). Another theory is demolishing public property rights by changing into private rights: Licenses and quotas are made negotiable (Hannesson, 1985). By ignoring these solutions, overexploitation and breakdown of resources is anticipated.

However; is it necessarily so? Is the attainment of sustainable yields by means of distributive plurality decisions possible within the framework of free play of market **without** exclusion of access by turning public- and common property rights into private property rights (Brox, 1988)? How can sustainable management be an inevitable result from atomised market decisions? What are the conditions for fulfilling the goal of making such kind of selfgoverning conservation regimes work?

One solution is to establish permanent trust funds as a mechanism for converting non-renewable resources into renewable. In periods of economic boom and bust the trust fund should be used to restore a self-reliant economy emphasizing conservation of resources, to minimize detrimental effects of such cycles so as to adopt ecologically sound policies (Prets & Robinson, 1989).

Another possibility of achieving sustainable yields by means of free play of market, depends on whether or not society give legal protection to public- and common property rights. If - I anticipate that decisions having environmental consequences is taken out of the regime of governmental, political control -private decisionmakers are obliged to take public property rights into consideration when deciding on environmental issues, a more sustainable society might be a possible result. But then several presuppositions must be fulfilled.

This paper discuss a strategy of sustainable development by allowing public- and common property rights legal protection.

1.2 The further discussion, a short outline. The purpose of this presentation is to elaborate the legal conditions for

directing private market decisions towards sustainable resource management within the framework of public- and common property rights (Chapter 4) or to search whether or not the notion of legal right and its specific items, such as claim, privilege, power and immunity are present in the management regimes of public- and common property rights (Chapter 5). Chapter 3 concerns fisheries conducted in nordic countries in relation to the notion of public- and common property rights. The notion will be explained and distinctions made between those two categories. First (Chapter 2) I shall present some difficulties which the legal regime has to overcome if private decisions shall maintain sustainable management.

At this point of the dissertation I am not making any distinction between public- and common property rights. I am using the notion as a description of a group of (more or less) free access resources. See Chapter 3.1.

2. Some presuppositions

The purpose of this Chapter is to introduce some items whose fulfilment is important for achieving the goal of sustainable management. The construction of the legal regime (Chapter 4) must keep clear of the difficulties mentioned.

2.1 The selfishness of human beings. The selfinterest of human beings is a "free play of market" motive power (Smith, 1793). A new regime of sustainable management must take advantages from the selfishness of human beings. How could society direct selfishness into a sustainable selfgoverning regime? Does legally protected public- and common property rights provide private selfish decisions in achieving sustainable yields?

A minimum condition for having "the market of ecological decisions" work, is to give market-value to the environment (Dahmén, 1970). Destroying the environment shall be expensive! Only decisions which are environmentally indifferent are free from injunction- and liability rules. Before establishing industries, initiate fishing etc. every effort shall be made to secure that the activity (according to the precautionary principle) is acceptable. The executionist himself shall provide for this being effectuated.

2.2 The Coase Theorem. Apparently the free play of market is producing unintended effects. Accordingly the market regime needs adjustment. The purpose of constructing a system of legal rights is to secure optimal market outcomes; that is to establish optimal level of

resource deployment (Coarse, 1960). The optimal outcome of the market will then either be the result of more correct decisions or through creation of framework in which advantageous bargains (between for instance polluter and the public) - within the framework of Chapter 2.4 - can be realized.

The possibility of achieving the goal in Chapter 2.3 depends on whether or not right to resources do have market value.

2.3 Social justice. John Rawls, 1973 are stating: "The social system is to be designed so that the resulting distribution is just however things turn out". A social system which destroy the ecological balance and the basis for human habitation, is not resulting in "just distribution" of resources. A system of sustainable market-regulation must be legitimate. Otherwise a social system would not survive (Dworkin, 1986). Such a society must be avoided.

2.4 Inalienable rights. "Market value" is not the sole answer for achieving sustainable yields. Basic needs (clean soil, air and water) do have an absolute need for legal protection, market value or not. The term inalienable rights is reserved for rights which cannot be renounced because the right-holder cannot be without it (Meyers, 1985). The field of inalienable rights comprises i.a. of res communes omnium (see Chapter 3). This basic needs governed by public- and common property rights regimes, do have a special legal status.

When a right is protected by an inalienability rule, transfers of any sort are prohibited. Nobody is, for instance, allowed to bargain on behalf of humankind concerning destruction of the ozone layer. Even though inalienable rights are not subject to trade and accordingly have no market-value, the possessors are at liberty to assert their rights.

2.5 The free-rider. "The economic man" is an important presupposition for the logic of free-riders in the play of free-markets. The theory of games (von Neumann & Morgenstern, 1947) are pointing out **the wrongheaded** as the winner of the "game of hold out" (Berge, 1991). As the management of sustainable market must be legitimate, such a result is not just and should be avoided.

An issue of utmost importance is how to get rid of "free-riders" (Elster, 1985). By granting public- and common property rights legal protection, the "free-riders" could possibly be eliminated: Nobody is allowed to take the free-ride as every "ride" has obtained its price (Chapter 4). Property- and liability-rules oblige aggressors to keep out and pay damages by transfer of rights.

2.6 The prisoners dilemma (Rapoport & Chammah, 1965). Another treat to selfgoverning, sustainable management regime is the result of "prisoners dilemma". The choice of "economic man" is either to play the role of selfishness or to change the legal system. The logic of the situation is lack of cooperation between the collective traders (Olson, 1974 and Axelrod, 1984). An important issue is therefore how to eliminate cross-pressure situations like the "prisoners dilemma". How could a regime of free play of market avoid such consequences? Is it possible to build in frameworks which inevitably would cut the "Gordian knot"?

2.7 The game of chicken. "A prisoner" - who is "a chicken" - is choosing the legislation alternative (Chapter 2.6). "The dominant prisoner", however, would neglect the warning signals of catastrophe and chose a non-sustainable management-strategy. Because the "chicken-way" is most expensive - by having the highest transaction cost - most possessors of public- and common property rights would possibly chose the road leading to catastrophe.

According to common knowledge, solution of collective action presuppose that distributive decisions are being replaced by collective plurality decisions (Elster, 1985). The answer is to construct a new legal framework so as to build a more sustainable basis for rational private decisions.

2.8 A just and legitime solution. The sustainable management regime is part of the a greater question discussed at all times; how to stabilize social societies by means of human activity. The theory of balanced society is i.a. used for legitimating higher income tax and to remedy public dearth of money (Galbraith, 1969). I am looking at the stabilization problem from a legal point of view; the use of legal framework for limiting human activity.

The legal way is of course, one among many remedies. In a situation of heavy cross-pressure, the problem of legitimating a policy creating a strategy for sustainable development, should not be overlooked. Given the tendency, first noticed by de Tocqueville, 1835, for the modern state to convert political disputes into legal questions, a legal solution to the sustainable development-problem is either unexpected nor impossible.

2.9 Intervention by a decisive government. There is a "cry for" governmental solutions which could deal with "the mess" private lack of cooperation has generated (Berge, 1991). The answer is how to construct a durable legal framework. Is free play of market an outdated selection system? Or is reformation the right answer? Do we already

have the tools within the framework of private law? Is it necessary to replace private exclusive *autonomi* by public *autonomi*?

In this presentation I shall, focus on legal conditions which possibly could bring about sustainable marine management. As this presentation is part of the theoretical contributions and not a description of legal status, I feel free to look behind the *lege lata* questions. Another reason for this is the lack of sharp distinction between considerations *de lege lata* and *de lege ferenda* in this area (Rosas & Brodecki, 1990 p. 2).

3. Public- and common property rights: What is it?

In this Chapter I am presenting the legal status of fisheries rights in west- and east nordic countries. The notion of public- and common property rights differs a lot from country to country and from author to author. Some of the confusion are probably due to the lack of precise ideas.

3.1 Confusion of ideas? Some disagreement between scientists could possibly be written on the account of confusion of ideas (Jentoft, 1991, Stenseth, 1991). When using the notion common rights, do the author think about "free-access resources" or "closed-access resources"? Gordon (1954), Hardin (1968), Munro (1982) and Wetterstein (1990) talks about "common property" but seems to deal with the theoretical problems of public property rights.

3.2 The legal categories. We are dealing with "*Jus ad rem*", that is the right to physical and material objects. Animals are objects and not legal subjects (see however D'Amato & Chopra, 1991). Some of these objects are "*res commercium*" (ordinary trade objects). Others are "*res extra commercium*" (unalienable objects). In this dissertation I focus on the latter. This category is divided into "*res nullius*" (resources of free access which could be occupied) and "*res communes omnium*" (resources of free access which could not be occupied) - Ørebech, 1991.

Both the public- and common property rights is a *res nullius* category. The "*res communes omnium*" however does only comprise public property rights. Among the latter we find "basic public property rights" such as right to air and water. This category I will however not deal with in this presentation.

I am interested in the legal status of *res nullius*, especially the fish resources, the public- as well as the common property rights of fishing. Whether or not the conclusion drawn are appropriate for other kinds of extra-private property rights, is outside my judgement.

3.3 The notion of a right is of course a big theme. My intention is to give a brief explanation of the notion of a right. I agree to Jeremy Waldron (1984 p. 6) when he is stating that the first step to a rigorous understanding of the concept of a right is to notice the ambiguities in the use of phrases like "P has a right to X". First I go into some theories of right (paragraph 1). Secondly I look at the different kinds or aspects of rights (paragraph 2).

1. John Stuart Mill ties the notion of a right to the possessors valid claim on society to protect his right (1987 p. 71): No right without protection ("The Sanction Theory"). Jeremy Bentham (1970 p. 187 ff) is the spokesman for "The Beneficiary Theory" according to which, to have a right, is to be the **beneficiary** of another's duty or obligation whether it is sanctioned or not. By the ideas of Bernhard Windscheid (1906 sec. 37) we are presented to "The Will Theory" (and the close related "The Chose Theory"- H.L.A. Hart's respected theory): It singles out the right-bearer in virtue of the power that he has over the duty in question. When an individual has a duty to do something, there is possibly some other individual who is in a position to control that duty in the sense that his say-so would be sufficient to discharge the first from the requirement. This degree of control makes the latter a right-bearer. Against this Neil MacCormick (1977 p. 192) is introducing "The Interest Theory": The rights are primarily to be conceived in terms of protection of interests of individuals against intrusion. At latest Carl Wellman (1985 p. 95) has given his contribution through "The Dominion Model", which is close to the interest theories: A person has a right when the law gives him exclusive control over another persons duty so that the individual who has the right is a small scale sovereign to whom the duty is owed.

A theory alternative to those previously mentioned, is presented by Alan R. White (1982). This I will call "The Immunity Theory": The rightholder is entitled by something which gives him a sort of ticket of justification and when doing what he is entitled to, he has got immunity from at least certain sorts of criticism.

2. As we have seen; what right is, is debateable. The discussion will take different ways according to the choice of focus. One could look at the rights and duties of one person (the unilateral aspect -), of two persons inter partes (bilaterally - The Hohfeldian perspective, 1964 p. 42) or focussing on a third party constellation, the latter party then having a function of intervention, on either of the both sides (The Wellman perspective, 1985 p. 21). In this dissertation I am mostly focusing on the bilaterally aspect, see Chapter 5.

The notion of a right is a "chameleon-hued word" (Hohfeld, 1964 p. 53). The notion of a right is a complex legal position which has to be grouped into its simple and irreducible elements. What are these elements? Hohfeld identifies a right with (a single) claim, privilege, power, or immunity (the so-called fundamental legal conception). These elements have the following jural correlatives: Duty, no-claim, liability and disability (Hohfeld, 1964 p. 36). According to Hohfeld "the right" is either a claim or a privilege etc. Wellman, 1982, Ch. I & 1984 are suggesting that "right" refers to a complex structure of some or all of these elements. A person holds a "genuine right" if and only if a complex set of norms applies to one in a way giving the person a dominion (1984 p. 213). White holds that right is not an ambiguous term used to cover such notions as liberty, power etc. The notion of a right is as primitive as any of these other notions (claim, power etc.) and cannot be reduced to or made equivalent to any one or any set of it. Nor can it be explained as being a complex or system of these (White, 1984 p. 173).

Do fishery participants possess rights? I do not have to answer that question. Important is, however, to analyse differences between the possession of private fisheries and common or public fisheries as to the fundamental legal conception, see Chapter 5.

3.4 The fisheries of Britain: A public- or common property right? According to Anglo-American legal theory the right of fishing in the high sea, territorial sea, internal waters and tidal, navigable rivers is "public rights". The legal authority of this fishery is the presumed ownership of the soil to the Crown (Attorney General for British Columbia vs. Attorney General for Canada (1914) AC p. 153). This is **free-access fisheries** and identical to the "allmannsrettighet" (not almenningssrettighet) in Scandinavian countries.

"Rights of Common" is the title of private possessory rights which may exist in common with other persons. "Common of piscatory" is a right of fishing in another man's water. It is usually annexed to land or farms and may be claimed by custom, grant or prescription. This fishery is of **limited entry** and is most similar to the Norwegian title "almenningsrett".

A third category; "a free or a several fishery" is not a right of common, but a private property right. The owner of the fishery has an exclusive right of fishing from which the owner of the soil may be excluded. This category is outside my subject and will not be dealt with here.

It seems to me that Gordon, Hardin, Munroe etc. - when talking about

common property rights - are thinking about public property rights. As public- and common property rights to some extent are most similar cases, this is however not any decisive mistake but just a misuse of notions.

Common property rights are linked to geographical areas. One condition for being entitled to such rights is to be inhabitant within this area. The common property rights are however annexed to land or farms and not open to everybody living within the area. This gives - to the contrary of public property rights - a limited access.

When using the expression "public property right" ("allmannsrett") I mean - in this dissertation - an open access resource management regime regardless of private- or public law basis. Even though the latter often are called "general freedom of action" it is - in my vocabulary - still an open access fishery.

Fisheries open to every citizen according to special legislation is in my use of the word, a public property right. Even though a fishery is closed to foreigners, it is -according to my ideas - a public property right. Outside the notion of a public property right is the "reflexive rights".

Common property right ("allmenningsrett") is the name of a partly closed resource management regime. Such fishery is open to every person qualified through habitation or ownership within geographical limited areas. In this area every local citizen has equal right to participate.

I am characterizing closed resource management regime as "private property right" ("eiendomsrett"). It is comprising the possession of land and sea (ownership) as well as the possession of resources originally free, e.g. through negotiable quotas or licenses.

These "labels" do however not give any answer to the question of legal protection.

The tragedy-aspect is obviously more present in the field of public- than in the field of common property rights, see Chapter 4. By this reason public property rights must be distinguished from common property rights. In the continuation I am mainly interested in the public property rights.

Next, I am coming to a more closer description on the conduct of fishing with a special emphasize on norwegian and other nordic countries. I am asked to deal with Norway, Sweden and Finland. As I

would like to make a comparative study on some essential differences between public- and common property rights on the one hand and private property rights on the other, I am also giving a short outline on Icelandic legislation as to the regime of negotiable quotas.

3.5 The nordic fisheries; private-, public- or common property rights? (1) The lege lata situation. Generally speaking the high importance of fisheries in the west-nordic countries (Iceland and Norway) seems to have created more closed entry regimes as to the right of fishing, than in Denmark, Sweden and Finland (which was a part of Sweden until 1917). On the one hand we have the Anglo-Saxon- and Nordic system creating limited entry regimes and on the other hand the Roman law system initiating free access regimes.

As a start-point it is appropriate to say that the law of the sea is the foundation of the national legal regimes. Hugo Grotius, 1609 was the advocate to the regime of "mare liberum". In his opinion foreign fishermen - according to international law - was allowed to fish close to the shores of another state. His study was highly influenced by classical Greek and Roman writers (Churchill & Lowe, 1983 p. 4).

The Anglo-Saxon "mare clausum-regime" was defended by William Welwod (1613) and Joannes Selden (1636). The british Crown neglected mr. Grotius exegesis of international law of the seas. A King writ of 6. may 1609 prohibited foreigners from fishing "upon any of our coasts and seas".

As distinct from Germany, Roman Law was never formally incorporated into common law or into danish-norwegian legal system. (The danish were proud of their independence; as indicated by the inscription on the gateway to Rendsborg, Holstein, Germany (danish town until 1864): "Eidora Terminus Romani Imperii" - (The channel and river) Ejderen, the northern frontier to the Roman Empire).

In the middel age, before the reformation, it is rather small distinctions between the danish, swedish or norwegian legal systems. Concerning the fisheries this is especially distinct as the present swedish west-coast at that time was a part of Norway (Båhuslen) and Denmark (Skåne). It is also told that fishermen from other countries - in the herringfisheries - moved to and from (Ræstad, 1912).

Later on it is assumed that german- and thereby Roman Law -which was adapted through the "reception" (the "Reichskammergericht" of 1495 and "Gemeines Recht") - has got a more dominant position in Sweden and Finland than in Denmark and Norway (Fenger, 1977). Corpus Juris (Codex Justinian, year 529) has on many accounts had

strong effects to the swedish legislation and interpretation in the late middel age (Jägerskiöld, 1963). In Denmark the use of Roman Law at the danish courts was prohibited by the procedure legislation of 1573 and 1636 (Jørgensen, 1974). However this could not prevent Roman legal ideas to mingle with internal danish-norwegian legislation (Fenger, 1977).

Is the assumed differences of public access to the fisheries in the West- and East Nordic states (see Chapter. 3.5.1 and 3.5.2) caused by Roman Law?

When making the outline, one must keep in mind the distinction between public- and private law solutions ("the double-traced system"). At the foundation of nordic countries the Crown was not distinct as to the legal basis of internal regulations; whether it was jurisdiction or ownership. This "mixture" was not fully terminated before the end of the Crowns absolute power (in Norway at the year 1814, Denmark at 1849).

3.5.1 The norwegian regime. The legislation providing every citizen access to fisheries is a foreign rule, probably from Roman Law (Robberstad, 1978 p. 185-186). The question however, is to what extent Roman law has been receipted in danish-norwegian legislation. I think that the picture is a bit complicated. First of all, it is not easy to draw principle lines between Norway, Denmark and Sweden. There are larger differences within Norway than between Norway and Denmark or Sweden (see Chapter 3.5.2). Generally speaking, it is more appropriate to make a distinction between the herring and the cod fisheries (Ørebech, 1986) and between north and south, than to the geographical borderline between the states. In the preceding I am mainly dealing with the cod-fisheries. I am not dealing with the distinction between private- on the one side and public- and common property rights on the other.

As in Great Britain the right to fish did originally belong (a regalia) to the Crown - (Ørebech, 1991 with further references). The sea between Norway, Shetland, Faro Islands, Iceland, Greenland and Spitzbergen was regarded as a norwegian inshore lake (International Court of Justice, 1951 vol. I, Fisheries Case UK vs. Norway). In these Kings streams all kind of trade, transportation and fisheries was prohibited without the Kings allowance (Ørebech, 1986).

The Kings streams diminished through the sixteenth and the seventeenth century. By Kings command of 18 june 1745 and the Cancelli-Promemoria (a memo) of 25 february 1812 (still in force) the territorial sea is stipulated to one maritime mile (sø-mil) from the

outer skerries. Within the zone the coastal state has exclusive right to fish.

Today free-access-fisheries has been strongly limited through a widespread licensing regime. Hardly a fishery of any importance is left out of the licensing regime and thereby becoming a limited entry fisheries (Ørebech, 1982). Whether or not a licensing scheme is transforming fishing from public-and common property rights and to private property rights, is discussed in chapter 4. Whether such a regime is conformable to the common property rights of northern Norway - is not discussed in this dissertation.

3.5.11 The northern Norway. Around 1200 the inhabitants of Hálogaland (Northern Norway) acquired - through a letters patent (a gift) the right to fish (Frostatingslagen XVI, chapter 2). It is discussed whether or not the north-norwegian peasants acquired the ownership or just an easement (Taranger, 1892). In this connection it is however not necessary to come to a conclusion. In one way or another the Háleygium óllum (all the inhabitants of Hálogaland) had the equal right to fish. By means of the "farbann" inhabitants living in the south of Norway was - until 1830 - prohibited from participating in the fisheries in the north (Ørebech, 1986 and 1991).

The fishing right was confirmed by King Christian IV Norwegian Law (1604) and the still valid King Christian V Norwegian Law (1687 - NL 3-12-2). For the northernmost counties Finnmark and Troms the right is established by the king's resolution of 27 May 1775 (still in force). The fishing was until the district fisheries Law of Finnmark (from 1830) an exclusive right to the inhabitants of Finnmarken and Háleygiums. By this Act south-norwegians were allowed to participate in the Barents Sea.

The legal basis constitutes different fishing-rights. The south-norwegians are - after 1830 - granted right to fish through absence of prohibitions. The north-norwegians however still have the right to fish authorized by the Crown and confirmed through legislation. The legal situation constitutes different kind of rights: The northerners' right of fishing are common property rights, while the southerners possess public property rights, or even less; reflexive rights.

The legal consequences are - shortly outlined - that the southern participants (the public property rights) in Norse-and Barents sea fisheries, more easily - through public regulations - could be excluded than those performing fisheries according to common property rights, see Chapter 4.

3.5.12 The southern Norway. In pre-mediaval time the landowners possessed fishinggrounds close to the shore (Robberstad, 1978 og Ørebech, 1991). King Christian V Norwegian Law (1687 - NL 3-13-1 and 5-11-2) confirmed these private property rights. See a lower court decision (Ryfylke -south west Norway) of 29 august 1775 (Ørebech, 1988 p. 132).

The King, who at that time possessed absolute power rejectet however, the court decision. By a "rescript" (statute) of 23. april 1778 concerning the lobster-fisheries and other fisheries, the King nullified the court decision and ordered -with the exception of salmon - open access fisheries.

By this the legal situation in the coastal areas changed from private- to public property rights. From now on private property rights were limited to areas close to the shores. Where a special outer limitations is not proved, the boundary between private and public sea-bed runs through the contour line at the depths of 2 meter at ebb tide. It is assumed that the owner of the soil has an exclusive right to attach fishinggears on shore or at the seabed (Robberstad, 1978).

3.5.2 Iceland. I am dealing with two limitations; the outer against the foreigners and the inner, between private and public- or common property rights. The fisheries around Iceland was originally open to every inhabitant (Ræstad, 1912).

1. In early middelage foreigners were prohobited to fish "in the kings streams", this includes all the seas around Iceland. At the years 1600 fisheries was opened up to foreigners outside the 4 nautical miles limit (Decition by Kings Christian IV of 16 december 1631). By the Crowns plakat (statute) of 13 mai 1682 and later oktroi (license) of 5 may 1721 the 4 nautical miles was claimed as territorial sea. This zone was reduced when Denmark (which Iceland was a part of until 1944) joined the North Sea convention (of 1901) which constituted 3 miles as outer limit of the territorial sea.

In 1952 - after having withdrawn from the convention - Iceland extended the territorial sea to 4 n. miles. The exclusive fisheries zone was further extended in 1958 (12 n. miles), 1972 (50 n. miles) and in 1975 (200 n. miles, the exclusive economic zone, EEZ). The extentions from 1958 on, resultat in "cod-wars" between Iceland and Great Britain and (partly) Germany. Today foreigners is excluded from all fishing-resources within the EEZ.

2. The open acces-fisheries was closed by an interim legislation in 1983 by which quotas was made negotiable. The loss of quota was the same

as to quit fishing. From 1988 this was changed as the transfer of quotas did not necessarily result in cessation. If the vessel from which quotas was transferred had some quotas left, this vessel could still participate. By the Fisheries Administration Act of 13 May 1990, a permanent regime of negotiable quotas was established. Every participating vessel does require license and quotas. As new vessels' entrance is closed, right to participate depends on privately marked acquisitions.

The 1990- (and earlier) legislation has transformed public- and common property rights into negotiable, private property rights. By this, the free entry fisheries has come to an end. The fisheries resources have been privatized.

3. The boundaries between private and public sea is running at the depths of "netlög", that is the line drawn through points at sea where a 20 meshes sealnet "stendr grun"; is standing from sea-bed and to the surface (Jónsbók, 196). At what depths the boundary between private- and public sea runs, has been discussed. Some authors are inclined to believe that the limitations between private and public sea runs at the depths of 6.85 meters (Vidalín, 1849), others at 2.9 meters (Kristjánsson, 1980). The Norwegian author Henry Nærstad, (1938 p. 37) seems to believe that the limit is situated at the depths of 7.52 or 7.31 meter. I am inclined to believe that the exact measure is 2 meter (the Norwegian customary law rule for delimiting private and public seabed) as a sealnet mesh was approx. 10 cm high (Ørebech, 1988 p. 153).

According to the hunting statute of 20 June 1849 a new system of measuring the "netlög" was introduced: The outer limit for private waters was supposed to be 60 "fadmur" (1.8831 m each). The shore at ebb tide is the startpoint for measuring private sea. The new hunting legislation of 21 April 1954 are fixing the outer limit at 115 meter. This makes even more confusion as to the delimitation of private sea and the private property rights.

In private sea the owner has exclusive right to fish all kind of saltwater fish and trout (salmon is protected by legislation of 25 June 1970 section 14). The performance of herring- and sea trout fisheries is however allowed in private sea, and the purse seine could be taken on shore. The private property right is a necessary but not sufficient condition for fisheries participation. In addition there is a need for fisheries license and quotas (according to the legislation of May 1990).

"Almenningur" (common property) is well known in Iceland, but only in lakes, see i.a. legislation of 25 June 1970 section 8. At sea the owner of the soil was a possessor of "fiskhelgi", a area outside "netlög"

(Jonsbók p. 203). Today this special right is no longer in action.

3.5.3 **"The east-nordic regimes"** is assumed to be more identical to the Roman law system than the danish-norwegian: A swedish sosialantropologist are saying that among the Teutons the right to catch sea-animals was open to everybody. The ocean was free for everybody (Hasslöf, 1949 p. 440). This conclusion is the direct oposite of the norwegian system (3.5.1). Does it prove a legal difference between the west-and the east nordic regime?

3.5.31 **Sweden.** The presumed swedish affiliation to the Roman principle of *mare liberum* did however not allow foreigners (a non-inhabitant) to fish in swedish waters. In the fifteenth century Sweden (and Denmark) claimed sovereignty over extensive areas in the Baltic sea (Churchill & Lowe, 1983). The claim was maintained in the seventeenth century and resultet in big controversy in 1636-37 (Grotius, 1687). The swedish claim was however not acknowledged by the society of international law.

Later - according to the swedish statute (forordning) concerning the North Sea Fisheries of 21 july 1774 - the fisheries performance by swedish fishermen was not to take place closer to the coast of Norway and Denmark than a cannon-shot distance from the shore. On the swedish coast however, the width of the territorial sea was stipulated to one maritime mile, that is 1/15 of one degree (The swedish capturing regulations (reglement) of 8 july 1778).

At Båhuslän (at the west coast), fishermen from Denmark and Norway was prevented from participating (the swedish statute -plakat - as to the herringfisheries of 13 october 1666). In this area the principle of national fisheries zone which excluded foreigners, is possibly connected with the prolongation of the validity of rights possessed by the inhabitants under "King Olavs" norwegian legislation even after this originally norwegian, county (1658 and 1660) was incorporated in the kingdom of Sweden (Robberstad, 1971 p. 231).

Later on the exclusive national fisheries zone was - by the Crowns announcement of 5 may 1870, stipulated to one geographical mile.

After having taken possession of Skåne (Roskilde peace-treaty of 26 february 1658), the swedes prohibited the danes from fishing in the swedish sector of Øresund.(Ræstad, 1912, p. 301). This resulted in a danish countermove, the statute (rescript) of 12 may 1696 which prohibited swedish fishermen from fishing in the danish sector, at Sjælland.

According to the swedish Hamnskrå (1450) the fishinggrounds close to the coast belonged to the Crown (Klemming, 1852). Some of these fishinggrounds was obtained by private persons, and achieved thereby the status of private property rights (Ørebech, 1991 p. 69 and 323). In the area outside the archipelago the right of fishing was open to every swedish citizen (Ræstad, 1912). Still the Crown is dedicated certain shores, skerries and small islands ("havstränder ... skär och holmar", see the Kings decree 1950:597). But today all swedish citizens have equal right to fish (with active gear).

The herring-fisheries, however, which was either regular nor local, had a special status as to the fact that all inhabitants in the district of "Viken" (i.a. part of swedish west coast), under the customary law, was allowed to participate (Friis, 1881 p. 101).

If special limitations is not manifest (the 1950-legislation on boundaries towards public sea (no. 595), section 3 and 4) the limitations between private ("enskilt vatten").- and public sea ("allmänt vattenområde") runs in a distance of 300 meter from the shore (the 1950-legislation section 2) or if the contour line at the depths of 3 meter, is far out, the boundary between private- and public sea, runs throught this line measured at the medium tide (section 8).

Public sea areas belongs to the government. In such area every swedish citizen har ecqual right to fish with active gear (the legislation on fisheries rights 1950:596) section 2. Fixed gear do require public license.

The private sea belongs - as to the sea-bed - to the owner of the adjacent soil. The sea however is open to common traffic and in some areas and for certain types of gear, to fisheries. The right to fish is - as a basic principle - dependent on private allowance. The right - in areas open for the public -does however not comprice fixed gears (legislation on fisheries rights 1950:596) section 5 and following.

At the moment a free-access-fisheries regime is conducted, which means that every swedish vessel is likely to paricipate. Swedish citizenship in not required. Those who are entitled to professional fishery license is however granted a minimum price. A bill (a new Fisheries Act which is supposed to replace the Act 1950:596 from July 1. 1993) do constitute a general licensing regime when fishing i Swedish waters. According to the bill (Section 27-29) a fishery license is required to conduct fishing in swedish waters. When fishing outside Sweden the Fisheries Directorate are giving allowance to vessels which then is allowed to participate within Swedish quotas abroad (Draft Fisheries Statutes in action from July 1. 1993, Section 25)

3.5.32 Finland. As in Sweden, Finland is practicing a system of private- ("enskild fiskerätt") and public right of fishing ("allmän fiskerätt"). The public right of fishing is located to the areas of public sea ("allmänt vattenområde"). Act of fisheries of 16 april 1982 section 6 (no. 286/82).

The private right to fish is tied to the ownership of land and sea, see section 5 (Act no. 286/82). The basic right is the "landgrunnsretten" - the right to the ground, see the Act of Soil and Land ("Jordabalken") Chapter 12, section 4 and the Act of Sea Boundaries (no. 31/02). Every possessor of land within the the so called "town" ("byen") - which is the basic unit, - has equal right in using and enjoying the resources within the area. According to the latter, the "byen" is the owner of the sea outside the shore of that "by".

For areas of "enskild vatten" (private sea), the sea is possessed by the owner of the shore in a distance of 500 m outside the contour line at the depths of 2 meter (Act no 31/02 section 2 and 3). In some areas a system of straight baselines is beeing followed.

In the area of private sea, public fisheries performance is allowed only by agreement with the private owner. Through a system of licenses, fishing with handline - within the private sea - is however open to every licensee within a county (Act no. 286/82 section 9 i.f.).

Outside the private sea, we have the public sea. All seas outside areas belonging to the "byene", is public sea ("allmänt vattenområde"). See the Act of Public Sea no. 204/66, section 1. These areas belongs to the state, the seabed as well as the water.

The public sea is open to every Finnish citizen (Act. no. 286/82 section 6). As Finland is not practicing a limited entry fisheries regime, all finnish vessels are allowed to participate. Danish, Icelandic, Norwegian and Swedish citizens are allowed to fish, as recreational- and sport fisheries is concerned (section 6).

All kind of fishing do require payment of fee (Act. no. 286/82 section 88). When paid, the person in question are receiving "a fishingcard". Such card is not a license and the payment do not implement any right of fishing to the person in question. Fishing within the area of Åland do however not require such fee as regards fishermen from Åland.

3.6 The nordic fisheries; private-, public- or common property rights? (2). Some conclutions

I then come to the legal conclutions: Is the right to fish at the sea

private-, public- or common property rights?

1. All nordic countries discussed in this dissertation has sea-areas and fisheries possessed by private. These areas are private property in the same manner as soil is subject to private possession. These are closed entry fisheries and does not initiate the "tragedies of the commons".

2. Iceland has introduced negotiable quotas. By this, national fisheries resources has been commercialized. The right to quota is negotiable documents and may in principle be sold and bought at the exchange. The "tragedies of the commons" and other difficulties mentionned in Chapter 2, is in this situation not present.

3. All countries (in certain areas) have initiated a regime of public property rights. The right to fish is in principle open access fisheries. Finland and Sweden do practice the open regime without any public law limitations. In Norway, the cusk, halibut, herring, lumpfish, red-fish, saith etc. fisheries is open to every norwegian inhabitant. These fisheries are ruled by public property rights.

4. In Norway, the licensing and quota-regulations are in the most important fisheries, closing the public and common right of fishing. I am not dealing with the question whether or not this is conformable to law, i.a. the north-norwegian cod fisheries (north of 62 degrees N). The licensing and quota-regulation regime is giving the entitled owners a type of private property rights even though licenses and quotas as such, is not subject of trade. In practice trade in licenses has taken place for years (Ørebech, 1982).

The north-norwegian cod fisheries (before 1990) and other net, hand- and long-line coastal fisheries has been giving to the "háleygium óllum" (all the inhabitants of Hålogaland - North Norway), by gift and is originally a special right to the inhabitants. This rights were - before the open entry to all norwegians in 1830 (by the District Fisheries Act of Finmark), exclusivly performed. The fishery executed by the inhabitants of Hålogaland is a "common property fishery". The participation made by other norwegians is a public right fishery.

5. In Finland "enskild vatten" (private waters) belonging to "towns" (byene) are common property rights as all possessors of land in these towns has got equal rights to fish. The common property right is however opened up for fishermen from outside "byen" as regards hand-line fisheries, Act of fisheries (no. 286/82 section 9). The latter is performing a public right fishery, the first a common property fishery.

4. Achieving sustainable yields. Legal conditions

In this chapter I look at theoretical legal arguments which mostly appear to have fallacious consequences to the legal protection of public- and common property rights. In chapter 5 I look into the notion of legal right and its specific items, such as claim, privilege, power and immunity (Hohfeld, 1964). To what extent does public- and common property rights give the possessors such legal grounds?

4.1 Lack of legal protection? Legal protection is more than liability and compensation. It is also a question of due process of law, procedural rights, penal law protection, expropriation etc.

As indicated in Chapter 2, one solution to the problem of "free-riders", "the prisoners dilemma" and other problems dealt with in the theory of games, is to acknowledge legal protection to public- and common property rights. Roughly outlined the goal of sustainable management, may be achieved by means of sufficient legal protection to the possessors of public- and common property rights. In casu; does public and common property rights enjoy legal protection against feasible damage caused by multiple use of the sea? The question is whether or not public- and common property rights can be abolished without legal basis and compensation? This comprise internal fisheries conflicts as well as external conflict between fishing and other marine industries.

4.2 Theoretical difficulties. From a traditional point of view a public property right is "no mans right" (Rynning, 1928 og Westerlund, 1988 p. 177). According to Wetterstein, 1990 p. 78. "there exist no rules covering compensation for the infringement of common rights in different countries. The overall picture is that no such compensation is paid. The general opinion is that air, water forest etc. are common property (res communes) and that nobody has individual rights to them ... For this reason fishermen, etc. have often been refused compensation in cases of pollution of the sea". I deny that these sentences are giving a true conclusion as to the question of legal protection.

First of all: I think the theoretical points discussed in the preceding chapters mainly is of "local" scandinavian nature. Even though Wetterstein is giving the world-wide approach, I have not - outside the scandinavian legal area found any sign of similar theoretical difficulties. Some examples:

21 owners of fishing vessels were granted - according to common law - compensation for loss of fishing grounds caused by the petroleum industry (Lake Entrance Fishermen vs. Esso Exploration & Production Australia Inc. - arbitration, Supreme Court of Victoria at Melbourne -

sak nr. 3260/76).

Liability for the petroleum companies has been proved in the case of oilspill catastrophies such as "Exxon Valdez" (arbitration) and "Amoco Cadiz" (Se Lloyds Maritime Law. North American edition Vol. 6, No 9 May 1, 1989 and judgement at District Court of Illinois of 1 november 1988 - MDL Docket No.376) Compensation was given i.a. for restoration of the environment.

A french legal decition (Tribunal de Grande Instance de Bastia (Corsica) between "the fishermen of Bastia" and the industrial company Montedison & Sibit S.P.A - Judgement of 4. juli 1985) recognized the fishermens claim of compencation for loss of fishinggrounds caused by littering of the sea-bed.

Not in any of these cases the thesis of "the detrimental competition argument" (Chapter 4.2.2), "pure economic loss" (Chapter 4.2.3), "loss incurred by third party" (Chapter 4.2.4), "lack of economic value" (Chapter 4.2.5) and "the floodgate argument" (Chapter 4.2.6) has suspended the liability for loss of public- and common property rights.

4.2.1 Does public- and common property rights enjoy private law protection? According to common (nordic) legal wisdom public- and common property rights do not enjoy legal protection. "In the Nordic countries the criterion followed also seems to be that common rights in clear air, water and land are not protected by tort law. This is true even though economic loss can be proved, e.g. when fishermen experience loss of earnings since they are no longer able to fish in polluted waters ... Sometimes fishermen are nonetheless allowed compensation in different jurisdictions by reason of special legislation".(Wetterstein, 1990 p. 78 note 18). In the same direction Westerlund, 1988 p. 177.

These conclutions are - in my opinion - too pessimistic. As documented by Kleineman, 1987 a general customary law development has taken place as to the liability for pure economic loss, in Sweden and elsewhere. As damages striking public- and common property rights partly is a case of pure economic loss, the same tendency can be observed in this field (Ørebech, 1991). Let us look at the arguments given for this not being so.

4.2.2 "The detrimental competition argument". This argument is not void as it is neither distinguishing between fair and unfair interferences nor contribute an explanation of how pure economic loss is to be dealt with in the legal system (Kleineman, 1987 p. 281-82.). The same conclusion can be drawn as to the loss of public- and common

property rights (Ørebech, 1991 p. 85 ff.). This argument can not be decisive.

4.2.3 "Pure economic loss". "Pure economic loss" (non-physical damage) and "violation of physical integrity" (physical damage) is a main distinction in the law of damages. According to traditional knowledge the latter is subject to legal protection for damages, the first category is not. As damages hitting the enjoyment of free access resources is assumed to be outside the category of physical integrity, the public- and common property rights are not subject to compensation (Fleischer, 1983 p. 585).

I disagree (Ørebech, 1991 p. 106) that the distinction between "Pure economic loss" and "violation of physical integrity" is solving any problem as to the question of liability or not. In the same direction, Kleinman, 1987.

4.2.4 "Loss incurred by third party". In these cases the loss depends on an injury or damage suffered by a person other than the party that suffers the economic loss for which he wants to claim damage. According to legal theory compensation is not appropriate for this kind of loss (Fleischer, 1983 p. 586). Another norwegian is however saying that there was 'no acceptable reason that such loss in principle should be exempted from compensation' (Augdahl, 1983 p. 426). This argument can not be decisive.

4.2.5 "Lack of economic value". Compensation can basically be claimed for economic loss. Non-economic damage is protected only when based on special legislation. Such legislation is, with some exemption, not present in the case of loss of public- and common property rights. This is why several authours conclude the way they do (Fleischer, 1983, Westerlund, 1988 and Wetterstein 1990).

However, the crucial point is to decide what is pure economic loss. By what means is the economic value to be evaluated? One point of view is to look at the damages influential on a persons desire to use or obtain money (Scheel, 1893 p. 432). A more popular point of view is to observe whether or not the actual interest has got marketvalue (e.g. Nygaard, 1985). In the first case we are facing an economic value, otherwise not. As public- and common property rights is not subject to business such rights lack marketvalue. These rights are - in this theory - a non economic value, and hence not subject to compensation. As it is impossible to draw a legally valid distinction between economic and non-economic values (Jørgensen, 1966 p. 156). I conclude that it is inappropriate to let such an argument be decisive as to the question of legal protection.

4.2.6 "The floodgate argument". This argument emphasizes the juridical-technical difficulties of delimiting liability for loss of public- and common property rights in cases of mass injuries i.e. single instances of tortious conduct that can cause damage among a large class of plaintiff. By this reason compensation could not be awarded for loss of public- and common property rights (Wetterstein, 1990 p. 79).

The argument is not convincing. Only those who de facto have exploited the resources is subject to legal protection, e.g. compensation. People having fisheries, picking of wild mountain berries etc. as an hypothetical possibility, are not in the status of being subject to public property rights. They are, not at all, possessors of rights (Ørebech, 1991 p. 176).

Any way; the floodgate argument is not decisive as legislation could prescribe all plaintiffs to make joint action e.g. by means of american law institute of class action (Ørebech, 1991 p. 174-175).

4.3 The public property rights: Special conditions for achieving legal protection. Possessors of public property rights are not in general subject to legal protection as several conditions must be fulfilled. In this Chapter I shall briefly outline the main conditions.

4.3.1 The freedom of action. Activity exceeding the common freedom of action is forbidden. This is the concept of unlawfulness (Denmark & Norway "rettsstridighet"). The question of unlawfulness is decided on the basis of customary law or special legislation. A lawful action which detriment public- and common property rights, is not subject to liability of any kind (Ørebech, 1991 p. 196 ff).

4.3.2 A right actively exercised. Public property rights differ from private property rights as possessors of the latter do enjoy legal protection even if the property is not being utilized. The first has to be exercised. Otherwise no legal protection can be claimed. A not exercised public property right could be destroyed without compensation and liability for anyone.

The rights utilization must be firm; it should be carried out with certain stability and intensity (The Norwegian Supreme Court of Justice, Norsk Retstidende 1969 p. 1220 and 1985 p. 247). If so, public- and common property rights do attain legal protection according to norwegian legislation.

5. The notion of a right

Legal protection as carried out in special legislation, is apparently a

result of political influences. Public- and common property rights spokesmen has not - in the same way as private property possessors - succeeded in giving the former legal protection. However, is differences in legal protection based on logical grounds? If not, it is only a matter of time before public- and common property rights do enjoy fully legal protection by the law on compensation for damages. *De lege ferenda* there are strong reasons to believe that public- and common property rights will attain legal protection similar to the private property rights (Wetterstein 1990).

In this Chapter I am - through linguistic analysis - giving a comparative approach to the problem of rights. What is the main factual differences between public and private property rights? My focus is on the **inter partes relationship**. I am looking at the concept of rights as it appears between a favoured person, the one who enjoy beneficium - the beneficiary (B) and an obliged person, the one who has to tolerate somebody's right (T). I am - in this dissertation - **not** dealing with the logical connections between pairs of corresponding types of rights, unilaterally observed, see Hohfeld (1964 p. 36) and Alan R. White (1984 p. 146) who however denies the theory of corresponding freedoms, duties or rights.

In daily use, the word right is used generically to denote any sort of legal advantage. This analysis is based on the Hohfeld approach - that is the question whether or not B practising public- and common property rights, do have "claim", "freedom", ("liberty" or "privilege"), "power" or "immunity". In which way does public- and common property rights differs from private property rights? According to Wellman (1985, p. 54) it is appropriate to consider "claim", "freedom", "power" and "immunity" as subordinate parts and not substantial different (coordinated) types of rights.

When looking up the differences between public- and common property rights on the one side and private property rights on the other, it is appropriate to check the factual and legal autonomy. The idea is that the law giving B exclusive control, over T's duty makes B a small-scale sovereign to whom the duty is owed. (Hart, 1982 p. 183). I am taking a dynamic as well as a static approach, discussing whether or not an owner of public- and common property rights is in the possession of liberty, power, claim or immunity. In what way do public- and common property rights differs from private property rights?

5.1 "Considered rights" versus "reflexive rights". The legal status of rights is basically directed by law-makers rational intention of creating legal protection. Legal "considerations" as submitted by

"substantive and authority reasons" is the basis of legal protection (Peczenik 1983 p. 34-35.) The theory of reflexive rights is making this distinction clear (e.g. Ihering, 1871 p. 339) as the possessor of the latter not justifiably could expect such casual interest to be maintained. People enjoying reflexive rights do not deserve legal protection as such expectations is unintended. When discussing the foundation of legal rights, I take this as a starting point.

Some public- and common property rights are not given direct protection under the law. Accordingly people are unintended enjoying these rights. Is this a sufficient reason for denying legal protection?

This point of view express a very strong positivistic position however not legally correct. I disagree with Jeremy Bentham (1952 p. 334) when he states that a "right is with me the child of law: ... a natural right is a son that never had a father". It is incorrect to consider equal rights as a whole and certain positions under the special legislation. I agree with Luijpen (1973 p. 17) when he states: "Trotz der Stärke des Rechtspositivismus ist die darin vollzogene Identifikation von Recht und Rechtssystem unhaltbar". This is also the position of Jeremy Waldron (1984 p. 4): "I want to argue that this preoccupation with the connection between rights and positive law is a mistake".

Legal rights under the supremacy of common law and customary law are not a product of "political considerations". People are enjoying these rights unintendedly. I do not see that political intention or consideration should be the decisive point as to the legal protection or not. Lots of public- and common property rights are under the supremacy of customary law. The distinction between intended and unintended rights, is not pointing at any substancial difference which could explain lack of legal protection to this class of rights.

5.2 Private and public- property rights? I then come to the comparison between private and public- property rights. Bentham (1843 p. 181) states that "It is by imposing obligations, or by abstaining from imposing them, that rights are established or granted ... How can a **right** of property in land be conferred on me? It is by imposing upon everybody else the obligation of not touching its productions, &c. &c. How can I possess the right of going into all the streets of a city? It is because there exist no obligations which hinders me, and because everybody is bound by an obligation not to hinder me." With this statement in mind one could ask if there is any diffences between public- and private property rights at all?

When looking at the situations of private- and public-property rights there are apparently big differences. B_s (the sole **beneficiary** of

another's duty or obligation) has the competence to change the rights and duties of others which are under the volitional control of one or more human beings (Hohfeld, 1964 p. 50-51). By the "power to alienate" (p. 60) others (the T's) are given the "right of entry" (p. 55). On the other hand; B_a (**beneficiary** of another's duty or obligation according to open access public property rights) has now power to preventing others from fishing. In this case there are no T's. All the others (the B_n - nomen nescio) are B. For this reason there are no market for fishinggrounds.

However; there are no such differences as described between B_s and B_a as the basis for comparison is unequivocal. The point of view is public property rights in common. The correct way of judging ownership would be to look at all the private property rights in common. Taken this point of view it is clear that neither B_a nor the B_s has any power to prohibit other B_a nor B_s from exploiting the resources possessed by others.

The idea is as follows: B_s is the proprietor. On his land he is the possessor of soil, woods, fisheries etc. Then a Mr. expropriator (B_e) is claiming his land. Mr. B_s will suffer a loss according to which he is entitled to compensation. The amount will give him sufficient money to buy another property.

B_a has got a fishing field. He and his predecessors have enjoyed fishing for years. This makes a way of living. Then Mr. B_e arrives and claims the right to use the fishinggrounds for testing pipelines. The field is no longer available for the fishermen. The B_a must look up other fields in the surroundings. As opposed to the proprietor he does not have to buy a new field. However as the new field possibly is poorer than the old one or the travel-distance is longer, Mr. B_a has got a loss.

Mr. B_s will obviously achieve compensation. What circumstances could explain the reason why Mr. B_a are denied compensation? Is any non-fictional reason to be found?

5.3 The liberty (freedom). I am discussing the case of fishery-performance at sea and mastery of fisheries-resources by the use of public- and common property rights. Focus is on fisherman B₁ (the first-priority fisherman) and I am looking at the inter partes relation towards B_n and others, those who has to tolerate fishing e.g. the petroleum industry, (T_o).

1. Free access-fisheries is open to everybody because there are no limiting regulations as to the number of participants. Absence of

restraint is the root idea in liberty (White, 1984 p. 140). Liberty is the negation of a duty to stay off (Hohfeld, 1964 p. 39). Accordingly B_1 is obviously free to fish in relation to B_n . When the fisheries performance has started, B_1 is not only free to fish, he has got the power to deny others from performing fisheries within the same area, the B_n has got the duty to stay off etc.

2. What about the relation to the T_0 's? Could T_0 's "pop up" on every fishing ground and making encroachment upon fisheries? According to norwegian legislation a fisherman is free to proceed fishing in an area as long as the fishery operation is provided. Seismic survey, establishing rigs, platforms and erecting other equipment etc. at the fishingfields could not intervene into the ongoing fisheries performance. The B_n have the liberty to fish and the claim against the T_0 that they stay away from the fields. The B_n 's have the power to claim compensation caused by encroachment against fishermens rights etc.

Otherwise outside the fisheries seasons. Actions inside "the acceptance limit" (tålegrense) is allowed. Some encroachment would need legal authority (in an act of law) and some would qualify as expropriation, (Ørebech, 1991).

Then the question is whether solution differs from the freedom under the issue of private property rights.

5.4 The connection between liberty and claims. When - in the typical private property rights regime - saying that "B has a right (R)", the meaning actually is that B claims every T to restrain from intervention in this right-position (Hohfeld, 1964 p. 39). Or the other way around: B has a liberty to exclusively enjoying this position. Liberty and claim is therefore, coincided: Without claims no liberty and vice versa.

Watching the problem from the other party (the T) one could imagine that the precondition for "B having the R" is that T has the duty to omit interrupting B in R. The duty could also be expressed in the way of rights: Then it is appropriate to say that T has "no mans right" to interrupting B in R. "Duty" and "no mans right" is accordingly coincided, not different categories (White, 1984 p. 146).

Public- and common property rights are liberties. People who enjoy such liberties, could claim others not to intervene into these rights. E.g. is fisheries performance protected against aggression from other fishermen. If fisheries performance has not yet started, fisheries rights

do create liberties but no claims against others (the B_n 's), these others have no duties etc.

5.5 The claim-right. The question is whether or not B has got a claim against B_n of not intervening into B's use of public-and common property rights. In case, the group of fishermen called B_n in Chapter 5.4, is obliged persons called T in the preceeding. Is claim in the case of public- and common property rights similar to the claim as it is in the situation of private property rights?

1. Private property rights are mainly found in the category of "rights in personam" (individual rights inter partes) as private rights is due to negotiations and trade. The public-and common property rights are basically located within the category of "rights in rem" (a right versus everybody). Generally spoken one could say that private property rights are more complex than public- and common property rights. Feinberg, (1966) p. 137 ff. are listing up 8 different claims for the B_s . Some of these we do not recognize in the case of public property rights.

The main question is if public- and common property rights do give access to claims against others. B_a enjoy legal claims according to national legislation. Some of these are really strong as no private decisions as to the succession of ownership of land do liquidate the public- and common property rights (Bengtsson, 1966 p. 15). Legal- and private contractual duties for T in favour of B is clearly giving the latter a claim. These are "real" claims. But what about reflexive rights? Are these claims?

Hohfeld (1964 p. 38) is using the notion of claim in a wide sense: "If, as seems desirable, we should seek a synonym for the term "right" in this limited and proper meaning [the right for the owners to see that others stay off his land], perhaps the word "claim" would prove the best".

The duty of T - according to anglo-american law - to keep out of the land of B is a reflexive consequence from the ownership of the soil. It could be said that this duty belongs to the "protective perimeter" of ownership (Hart, 1982 p. 172) even though neither the duty nor the claim is based upon legislation: "Accordingly ... every offence, crime or civil wrong, is a violation of some right" (p. 169).

In spite of the "loose" connection between a right and special legislation, Bentham, Hart, Waldron (1984 p. 8) and others, do not hesitate to put the "claim-label" on that right. As the public de facto is enjoying a lot of reflexive rights, the question is whether or not the

public- and common property rights do fit in this picture of claim-rights.

2. By comparing "claim" within the regimes of private- and public property rights one is detecting some differences. In the preceeding I am looking at the B_a and B_s 's exclusiv execution when performing the right. Joel Feinberg (1966 p. 139) states that the "duties of respect" are also valid in the case of public- and common property rights. It seems to be some differences.

B_s has "multital legal rights, or claims, that **others**, respectively shall **not** enter on the land" (Hohfeld, 1964 p. 96.). B_a however has no claim towards the other B_a 's what so ever as to "stay out". The explanation is of course, that the public property rights do create a free access regime. The comparison is however not valid (see Chapter 5.1.6).

5.6 The power and the immunity. Do B have power to prevent any B_n perform fishing? Does the sentence "B has a public property right" mean that B has the power to prevent others from perform fishing? The answer depends on the notion of a power (paragraph 1) and the interpretation of "to prevent others from fishing" (paragraph 2).

1. B is actively engaged in fishing. Is he empowered to preventing B_n from fishing? Or the other way around: Do B_n in their fisheries-performances, enjoy immunity against interuption by fishing at a field already in use (by B)?

A person whose "volitional control is paramount" may be said to have the power to effect the particular change of legal relations. (Hohfeld, 1964 p. 51 and White, 1984 p. 153). According to Hart, 1982 p. 194) we need the expression 'legal power' to refer to a range of situations where persons are enabled by the law either to do actions physically affecting other persons or things, or to bring about changes in the legal positions of others or of themselves, or of both themselves and others. Carl Wellman (1978 p. 213) is defining power as the situation in which B are producing - legally accepted - consequences for different groups of T. In such cases B has the power in relation to T. Power to B is coincided with lack of immunity to T and vice versa. Power and immunity is corresponding.

As everybody (the B_a 's) - in the case of public- and common property rights - are entitled to participate, the B's are lacking the power to prohobiting other B's from conducting the fisheries. But when the fisheries performance has started, the fisherman har exclusive right to the fishinggrounds which the purse sein or other fishing gear does

surround, see the Sea fisheries act of 3 june 1983 no. 40 paragraph 16 (Ørebech, 1986 p. 151 ff.). However in comparison with the B's being the owner of private property rights (the B_s) - the B_a 's do enjoy a more uncertain status than the B_s as the power of the latter is manifest without any activity being exercised.

As power is characterized by the opportunity to physically affecting other persons, the public- and common property fishermen do exercise power against others: "The others" volitional decision or participation is unnecessary.

According to Hohfeld (1964 p. 50-51) the factual influence on others legal position does institute power. The B_a 's do typically enjoy factual power which necessarily result in reduced immunity at the other B_a 's. The question then is to what extent the power exercised by possessor of private property rights do exceed the power within the notion of public- and common property rights.

2. In concreto; which power do a performing fisherman (the B_1) owe against potential fishermen (the B_n)? Is the power conducted - in any way - similar to the one performed by conflicting industries; e.g. the petroleum industry? (the T_o)?

B_1 is not in the position of hindering others (B_n 's) fisheries performance. By this reason, fisheries is an unpredictable industry. This is the starting point. One plausible hypothesis then is that it does not make any difference whether it is the fishing- or the petroleum industry which prevent B_1 from fishing.

A comparison between fishing- and petroleum industry encroachment is concluding that the latter is increasingly more concentrated and intense than the first (Ørebech, 1991 p. 183 ff.). Even when abandoned or disused it is not totally required to remove the installations. According to the 1982 Law of the Sea Convention, art. 60 (3) - when deciding on this issue - one should be taken "due regard to fishing". See however the Geneva-convention on the continental shelf (1958) art. 5 (5) which requires a entirely removal. According to norwegian legislation the removal is not claimed. (the Act of petroleum industry of 22 mars 1985 nr. 11 § 30).

B_a must tolerate competition and reduction in his fishing rights caused by other fishermen. But we could not draw the conclusion that the B_a 's should tolerate even more, as the case is, when giving access for the petroleum industry to the fishing-grounds. This kind of encroachment is not comparative with the one being a result of petroleum industry.

The fishing industry is conducting relatively small interference compared with the extensive loss caused by the petroleum industry. My conclusion then is that the B_1 's lack of power versus the B_n 's does not give sufficient justification for admitting T_0 's claim of reducing fishing-rights without compensation. Some additional justification must be found. In my opinion such an argument is not easy to find.

The conclusion then is that a fisherman has the power against other fishermen to perform fishing in a way reducing other fishermen's opportunities. This does however not mean that the B_1 's is allowed to reduce other fishermen's rights by exceeding his quota, or by reducing the spawning-capacity, e.g. by catching under-sized fish.

The power, possessed as fisherman, could not be transferred to other groups of conflicting operators at sea. When fisheries performance has started, the fisherman has the priority right to all fisheries resources within the area which the fishing-gear do cover. Then other fishermen do not possess any power to delete or reduce "the first throw".

6. Some main conclusions

What is the most important differences between private- and public property rights? Could these positions explain the lack of legal protection as to the latter?

I have stated that the legal protection of public property rights is directed by legal theory, the thesis of:

- "Loss incurred by third party" (Chapter 4.2.4). "Pure economic loss". (Chapter 4.2.3), "The detrimental competition argument" (Chapter 4.2.2), "The floodgate argument" (Chapter 4.2.6) and "Lack of economic value" (Chapter 4.2.5).

Behind these theories are however some non-fictional legal and factual circumstances. These are:

- The "Nature of free access resources and the relationship between conflicting groups: One should stand some kind of detrimental competition and some negative influence caused by others according to the freedom of action (Chapter 4.3.1).
- The establishment of rights: In contrast to private property rights, the public property rights do require firm, stable and intense utilization (Chapter 4.3.2).

As every participant has equal rights to the utilization of free access resources (jevnlikhetsprinsippet), no one should use his right in a way

deleting or reducing the right of competitors. Fishermen participating within a TAC-fisheries (quota regime) are e.g. liable to bring his fishery to an end when his maximum is met. Otherwise - if quotas is exceeded -the competitors should be free to ask for compensation.

Under the multiple use regime, participants from other industries (than fisheries) are liable to perform their activity in a way not disturbing fisheries above the "limit of acceptance" (tålegrense). If so, it is probably a question of expropriation. The conclusion then is that the interference caused by the petroleum industry normally is exceeding interference caused by fishing industry. One fisherman's lack of power versus other fishermen does not give sufficient justification for admitting e.g. a claim from the petroleum industry of reducing fishing-rights without compensation.

Another conclusion is that legal theory-difficulties as to the legal protection of public property rights, are not pointing at the **condictio sine qua non** for making differences as to the legal protection. In the static situation (when performing fisheries) the authonomy of public property right holders are in many ways as good as the one enjoyed by owners of land. The public property rights initiate power and claims. The immunity is however not as strong as the one possessed by the holder of private property rights.

Within the group of public- and common property rights there are big differences. The fisheries do require heavy investments, a lot more than e.g. traffic. The latter could more easily change direction and area for activity without any extra costs. By this reason, fisheries ought to enjoy stronger legal protection than traffic.

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Human rights and resource management

by

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1. Introduction

1.1 The interrelationship between human rights and resource management.

Until recently, human rights and resource management would generally be perceived as rather separate legal areas. Ideas of human rights were developed at a time when resources were seen as unlimited.

Now the link is more obvious. Degradation of natural resources and the environment threatens the economic base and welfare of millions of people. We see more clearly how the wise management of natural resources, and access to resources, is a condition for the fulfillment of many human rights - today, and even more in the future. The scarcity of natural resources in many parts of the world raises questions of balanced exploitation and fair distribution of these resources.

On the other hand, we often see how respect for human rights of information and participation, political freedom, and democracy in general, is a prerequisite for the wise and balanced management of resources.³¹

This paper looks into some of these interrelationships between human rights and management of natural resources from a legal point of view.

1.2. The concept of human rights

Before going into the discussion, it may be useful to clarify the concept of "human rights". In this paper "human rights" mean the fundamental rights - for individuals or groups - expressed in international instruments in such a way that they have become international law. A "right" for individuals or groups usually means a corresponding obligation for the state to respect or fulfill it in their national law and policy. States that do not respect or fulfill these rights, break

³⁰ The paper was prepared in close cooperation with professor dr. juris Torkel Opsahl, Institute of Public and International Law, who unfortunately was prevented from attending the Conference as the speaker on this subject.

³¹ The massive environmental problems in the former Soviet Union may serve as a reminder of this.

international law.

This is a developing branch of international law, where new aspects of these rights or even "new rights" are recognized through the dynamic process of adopting new binding texts or practices.

The concept of "human rights" is based on the idea that certain human values and interests are of a universal and fundamental nature. As such, they should be respected and fulfilled by all states, and they should form the foundation of national legislation, preferably as constitutional norms. Expressions of this are the Universal Declaration on Human Rights adopted by the UN in 1948, the UN's two Human Rights Covenants of 1966³², and some very important regional instruments such as the European Convention on Human Rights of 1950 - as well as the fact that the most important human rights today usually are included in national constitutions.

Some human rights represent basic limitations on the legislator. Their purpose is to protect the individual against abuse of power by the state (or: the minority against the majority). Other human rights oblige the state to provide services to meet certain human needs and aspirations.

This distinction corresponds roughly to the distinction between the civil and political rights on the one hand, and the economic, social and cultural rights on the other. These two sets of human rights are expressed separately in the two covenants. Without going into too much detail, it should be mentioned that the legal nature and status of the two types of human rights differ somewhat. The civil and political rights are, generally, easier to ensure and enforce through strictly legal means than the economic, social and cultural rights.

Some human rights deal with the participation of the citizen in society. Expressions of this are found both among the civil and political rights, and among the economic, social and cultural rights, and they represent in several respects a link between these two types of rights. It will appear from this paper that rights related to information and participation are particularly relevant in the area of management of natural resources.

Originally, human rights were rights of the individual.

During the latest decades, the concept of human rights has gradually widened - some will say: become less clear, and less operational.

³² International Covenant on Economic, Social and Cultural Rights (CESCR) and International Covenant on Civil and Political Rights (CCPR).

Several international instruments establish rights to be enjoyed by groups - peoples in general, certain minorities etc. The legal status of such "collective rights" or "peoples rights" is not always clear, as we shall see below (2.2). Interesting attempts have been made to describe them more generally as "third generation rights", having in common an element of solidarity: a right to peace, to security, to disarmament, to development, to a healthy environment, etc. In such thinking, the "first and second generation rights" are understood to represent, respectively, the elements of (individual) liberty as is characteristic of traditional civil and political rights, and (social) equality, which has been said to be the typical aim of economic, social and cultural rights.³³

2. A "human right to natural resources"?

Is there a "human right" to natural resources - a right to possess and exploit such resources? Let us first consider if there is such a right as an individual right. The closest we get, is the "right to property".

2.1. The (individual) right to property

The right to property is one of the "classical" human rights - mentioned in the 1789 French Declaration on Human and Citizens' Rights (art. 17 - the last³⁴), in the Fifth Amendment of the US Constitution³⁵, and in later constitutions. In international law, the right to property is expressed in very general terms in the UN Declaration (article 17). It is placed among the civil and political rights:

"(1) Everyone has the right to own property alone as well as in association with others.

(2) No one shall be arbitrarily deprived of his property."

³³ These terms have also been presented as a reflection of the famous human rights slogan liberté, égalité, fraternité. It is perhaps trivial to observe that no revolution, and least of all the French one, has succeeded in making all three concepts operational. On the other hand, historically they need not necessarily appear one after another, as "generations"; the values and interests they represent may, if properly balanced against each other, be harmonized and protected by law simultaneously, as three distinct dimensions of a legal system rather than "generations".

³⁴ "La propriété étant un droit inviolable et sacré, nul ne peut en être privé, si ce n'est lorsque la nécessité publique, légalement constatée, l'exige évidemment, et sous la condition d'une juste et préalable indemnité."

³⁵ "No person shall be...deprived of life, liberty or property without due process of law; nor shall private property be taken for public use without just compensation." The Ten Original Amendments to the US Constitution are called the Bill of Rights. They came into force in December 1791.

The Declaration is, however, not legally binding in the strict sense.

When looking at the two Covenants on human rights, one may search in vain for articles stating the right to private property. One may assume that this issue was too controversial to be adopted by the UN at a time when nearly half the world's population lived in communist-ruled societies where private property to means of production had been formally abolished.

We must turn to regional conventions on human rights to find expressions of a "right to property". The European Convention on Human Rights does not itself include an article on the right to property, but such an article is found in the First Protocol to the Convention, article 1:

"Every natural or legal person is entitled to the peaceful enjoyment of his possessions. No one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general principles of international law.

The preceding provisions shall not, however, in any way impair the right of a State to enforce such laws as it deems necessary to control the use of property in accordance with the general interest or to secure the payment of taxes or other contributions or penalties".

This article has been applied in a number of cases during the last decades³⁶.

It is, however, limited in its real content. The state may expropriate private property for public use. In such a case the right to property implies a duty for the state to pay compensation. The right does not imply any "right" to use or exploit natural resources without limitations. The state may strictly regulate - and even prohibit - the use of (private) natural resources to protect public interests.

In Norway, the "right to property" has found its (indirect) expression in article 105 of our Constitution, which states:

"If the welfare of the State requires that any person shall surrender his movable or immovable property for the

³⁶ In 1982, Sweden became the first country found by the European Court of Human Rights to have violated this article, in the case of *Sporrong & Lönnroth v. Sweden*. The article is discussed in Michael Bogdan: "Äganderätten som folkrättslig skyddad mänsklig rättighet", Raoul Wallenberg Institute Report no. 2, Lund 1986.

public use, he shall receive full compensation from the Treasury."

The use of natural resources is regulated by an extensive legislation in Norway, giving central and local government the authority to restrict the use and exploitation - be it agriculture, forestry, watercourses, mining or fishery. Land use is strictly regulated, and special nature conservation measures may restrict the use even further.

The legal issue is not whether the state may regulate and restrict the private party's use of his resources, but to what extent such regulations and restrictions have to be economically compensated by the state. The main rule in Norwegian law is that regulations and restrictions do not give right to compensation. However, regulations that virtually eliminate any economically valuable use, may in extreme cases be subject to compensation.

So, the right to property, as an individual human right, is not a right to use or exploit the resources of the property freely and without restrictions. The state may regulate strictly the use of natural resources, regardless of whether they are privately or publicly owned. And the economic content of the right to property is defined through the legal principles of compensation in cases of expropriation or - to a very limited extent - regulation on the use.

2.2. The peoples' (and states'?) right to dispose of their natural resources.

In international law, the right to dispose of natural resources has been defined as a "peoples right". This principle is expressed in the two Covenants on Civil and Political rights, and Economic, Social and Cultural rights. Article 1 para 2 of both instruments provides that:

"All peoples may, for their own ends, freely dispose of their natural wealth and resources without prejudice to any obligations arising out of international economic co-operation, based upon the principle of mutual benefit and international law. In no case may a people be deprived of its own means of subsistence."

In talking about "peoples", these articles differ from the other articles of the two Covenants, which mainly deal with individual rights. They are directly linked to the principle of peoples' right to self-determination, expressed in article 1 para 1 of the two Covenants.

It appears that these issues came up during the preparations of the two covenants much as a reflection of the process of decolonization.

Whether this principle of peoples' self-determination should be included in the Covenants on human rights was highly controversial, and was adopted by the UN only with a small majority. As an argument to include it, it was claimed that the right of peoples to self-determination is an indispensable condition for the full enjoyment of the human rights treated in the Covenants.³⁷

There is, in the two Covenants, no reference to the right of States in this respect. However, states permanent sovereignty over their natural resources is a basic principle in international law. How does the right of "peoples" to natural resources relate to this right of states?

In cases of clear identification between state and people, this dichotomy does not represent any problem. The principle of state sovereignty over natural resources, and peoples' right to dispose of "their" natural resources become *de facto* and *de jure* identical. In this situation, the substantive content is that other states cannot exploit the resources without the explicit or implicit consent of the state.

The peoples' right approach becomes more complex (and less clear in law) when applied to minorities. Is the real content of the Covenants art. 1 para 2 an exclusive right for minorities to exploit the natural resources of their land - if necessary against the will of the majority - the state? In other words: is the state sovereignty over natural resources subject to limitations in the form of consent of the population directly concerned?

This is a controversial issue. The problem has been central in discussions on the legal situation - in particular the right to land - of indigenous peoples and other minorities. One seek in vain for rules governing the matter in customary international law or general human rights conventions.

Generally speaking, the historically founded claims of indigenous peoples must carry more weight than any claims made by other minorities, in particular colonizers or other immigrant groups ("new minorities"). But in the absence of specific treaty regulation³⁸, the domestic law will determine the issues arising.

The issue is connected to the discussion of article 27 in the UN

³⁷ See Johan Nordenfelt: "Human rights - what they are and what they are not" in Nordic Journal of International Law, 1987:1. Nordenfeldt is generally very critical to widening the concept of human rights through "collective" or "peoples'" rights.

³⁸ One example of this may be the Swedish-Norwegian conventions on Reindeer Pastures for Migrant Samii.

Covenant on Civil and Political Rights:

“In those States in which ethnic, religious or linguistic minorities exist, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and practise their own religion, or to use their own language.”

An important question is whether this article implies a right for minorities not only to enjoy their culture *strictu sensu*, but also a right to the material conditions for this culture, such as the natural resources on which the culture and lifestyle are based. This has been a much discussed issue in relation to the Saami population and culture in Norway.³⁹

There are different views on this issue. The text of the article, as well as the *travaux préparatoires*, do not exclude a wide interpretation. But neither do they provide a clear legal basis for such an interpretation. The arguments are strong, however, in favour of giving the article 27 importance as a source of law also for the protection of natural resources, insofar as the existence and availability of these resources are a prerequisite for cultural survival of indigenous peoples.⁴⁰

The ILO Convention of 1989 Concerning Indigenous and Tribal peoples in Independent countries treats the complex land issue more directly. Its article 14 states:

“1. The rights of ownership and possession of the peoples concerned over the lands which they traditionally occupy shall be recognized. In addition, measures shall be taken in appropriate cases to safeguard the right of the peoples concerned to use lands not exclusively occupied by them, but to which they have traditionally had access for their subsistence and traditional activities. Particular attention shall be paid to the situation of nomadic peoples and shifting cultivators in this respect.

2. Governments shall take steps as necessary to identify the

³⁹ See in particular NOU 1984:18 “Om samenes rettsstilling” og Ot.prp. nr. 33 (1986-87) Om lov om Sametinget og andre samiske rettsforhold (sameloven) - which formed the basis for the new Norwegian legislation concerning the Samii rights.

⁴⁰ The question was briefly discussed by Norway’s Supreme Court in plenary in the “Alta-case”, but no conclusion was drawn, see Norsk Retstidende (Rt.) 1982 p. 241

lands which the peoples concerned traditionally occupy, and to guarantee effective protection of their rights of ownership and possession..."

These questions are part of a wider issue, which is in some sense "the other side of the same coin", namely:

3. The protection of natural resources - a general State obligation?

As already indicated, protection and conservation of natural resources may in many respects be as important, from a human rights point of view, as the right to dispose of the resources. An adequate natural resource base is crucial for economic development and human welfare - and hence also for the enjoyment of many human rights. There are several elements in international law in this context.

3.1. Protection against "deprivation."

The two Covenants from 1966 in their common Art. 1, para 2, do not only express the right of peoples to dispose of the resources. They also stress the protection aspect, stating that: "In no case may a people be deprived of its own means of subsistence".

This is particularly relevant to minorities' and indigenous peoples' rights (and closely connected to the above mentioned issue related to article 27 of the CCPR). One practical aspect of the right to land and other natural resources for these groups is their right to oppose the destruction of their livelihood.

There are many international instruments dealing with this issue. The most recent is the 1989 ILO Convention on Indigenous and Tribal peoples in Sovereign States. As mentioned above, article 14 of this convention deals with the right of indigenous peoples to own and occupy the land. It does not generally recognize indigenous peoples' exclusive right to use the land in case the land is being used also by others. But it clearly implies a duty for the State to protect land resources on which indigenous people depend. This is also expressed in the first para of article 15 (to which I shall revert briefly).

3.2. Common resources and transfrontier problems.

The States' sovereign right to exploit its natural resources has other important limitations in international law.

It follows from international customary law that states must respect the interest of other states when several states share common natural resources such as an inland waterway or living resources in the sea.

According to the same principles - usually referred to as the principles of "good neighbourliness" and "due diligence" - a state can not use its resources in such a way that it damages resources of other states. This has become particularly relevant in relation to transfrontier environmental problems.

This principle was expressed in the famous Principle 21 of the Declaration of the 1972 Stockholm Conference on the Human Environment, which states the following:

"States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction"⁴¹.

This principle is also expressed in several international Conventions, among them the UN Convention on the Law of the Sea (UNCLOS). It was repeated in the Rio Declaration, and in the conventions on climate and biodiversity which were signed in Rio.

3.3. Has the state a general obligation to protect the environment and natural resources?

Has the State, according to international law, a general obligation to protect natural resources and the environment - regardless of transfrontier effects? There is - surprisingly - no clear answer to this crucial question.

There are several general expressions of such state obligations in declarations and recommendations from international organisations and conferences. Important examples are the Stockholm Declaration from 1972 and the World Charter for Nature adopted by the UN General Assembly in 1982.

There are also numerous conventions and treaties laying down specific obligations for states in the area of nature conservation. For example, UNCLOS states in its article 192:

"States have the obligation to protect and preserve the marine environment."

⁴¹UN declarations and recommendations of this type are often referred to as "soft law". They are not legally binding in the strict sense of international law. But the commitments they lay down, often gradually develop from political declarations to legal obligations, working their way into international conventions and national legislation, or becoming customary law.

This obligation also applies to the marine environment within national jurisdiction⁴².

However, international law generally does not oblige the states to protect their own environment and natural resources. They have "the sovereign right to exploit their own resources pursuant to their own policies". If no international treaty covers the matter, a state may degrade its own natural resources and environment without violating international law.

One of the crucial issues in future discussions of international environmental law is the possible conflict between this right for the states to exploit the resources freely, and the need for restrictions and safeguard measures in order to protect the atmosphere, the world's biodiversity and the global biosphere in general. The international discussion on the protection of tropical rain forests is a case in point. (Unfortunately, this seems to have turned into much of a North-South conflict area.)

3.4. The concept of "sustainable development".

The issue of protection and conservation of natural resources has got a new dimension by the introduction of the concept of "sustainable development". This is the central concept and idea in the Brundtland report. Since the report was presented in 1987, the idea and objective of "sustainable development" has gained widespread political support.

The concept is unclear in many respects and is interpreted in very different ways. The basic idea, however, is simple. Sustainable development is defined by the Brundtland commission as: "A development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

It contains both the concept of needs to be met today and in the future - in particular the basic needs for the poor part of the world -, and the concept of limitations: we must manage the natural resources and the environment in such a way that sufficient is left to our children and grandchildren.

It presents us with a double moral challenge: solidarity with the poor people of today's world, and solidarity with the next generation. "Intergenerational equity" is one legal expression of the idea behind

⁴² Other parts of UNCLOS could also be mentioned in this regard. For example, article 61, para 2 states: "The coastal State, taking into account the best scientific evidence available to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation..."

"sustainable development".

Through the objective of sustainable development, resource management and human rights merge. It represents an interesting development from the Human rights covenants of 1966. In these, to use and exploit the natural resources is seen as a peoples' right in itself. In the perspective of sustainable development, the emphasis is not so much on the right to exploit resources, but rather on the obligation to exploit resources sensibly - as a means of meeting basic needs for all people. And it introduces an important time perspective: Proper management of our natural resources today is a condition for the fulfillment of basic human rights in the future.

A "sustainable development" is the combination of economic development and environmental protection. From a human rights point of view it includes both the economic, social and cultural rights - the "right to development" in a broad sense - and the "right" for present and future generations to protection of the natural resource base.

3.5. "The Right to Development". Also a "Right to Environment"?

In 1986 the UN General Assembly adopted the Declaration on the Right to Development.⁴³ The idea of such a right was first advanced by a Senegalese jurist in 1972, and was strongly supported by the developing countries. But the Declaration is of a very general nature, and many questions remain open as to the real content of this right - as well as its legal status and implications. It is an important example of the "third generation" of human rights mentioned earlier in this paper, and as such also controversial both legally and politically.⁴⁴

With growing environmental problems worldwide, it has been much discussed how the law can be developed further to contribute to a more effective protection of nature and the environment. Many lawyers have argued in favour of developing a "right to a healthy environment" as a fundamental human right.

Already in Stockholm in 1972 such a view was present. Principle 1 of the Stockholm Declaration states:

"Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality

⁴³ G.A. Res.41/120, adopted by a vote of 146 to one (the United States) with six abstentions.

⁴⁴ The first Global Consultation on the Right to Development as a Human Right was held in Geneva in January 1990, see R.L. Barsh: "The Right to Development as a Human Right: Results of the Global Consultation", in Human Rights Quarterly, vol.13, no. 3, August 1991.

that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations."

During the two decades that have passed, many lawyers and institutions have discussed this idea further.

The fact that a good and healthy environment is a condition for the fulfillment of already recognized human rights, especially in the social field, also contributes to the process of giving environmental conditions legal relevance.

More than 50 states around the world have - in different ways - made reference to environmental protection in their constitution - as a basic objective and obligation for the state or a "right" for its citizens.

Hence, many important trends now contribute to strengthening the legal status of environmental protection in international law. However, there is still no general recognition of an enforceable "right to environment" - neither as an individual nor as a collective right.⁴⁵

It would be unrealistic not to acknowledge the complexities involved in this issue. It is not simple to grant legal status to such very broad - and in many ways relative - concepts and goals as sustainable development and environmental protection. The notion of human rights is not necessarily the best starting point for meeting the legal challenges in the field of resource management and environmental protection. For example, its antropocentric character overlooks nature's intrinsic value, and it provides little guidance when the interests of the present and future generations have to be weighed against each other. It may, in some respect, be more relevant to define the human responsibilities and obligations towards nature, and towards our grandchildren - as was also underlined in principle 1 of the Stockholm declaration.

3.6. The Rio Conference

These issues were discussed at the UN Conference on Environment and Development in Rio de Janeiro in June last year. In general, however, the Conference did not contribute much to clarify or strengthen the legal status of sustainable development and environmental protection in a human rights perspective.

The objective of sustainable development got broad political support at the Rio Conference. But the conference did not contribute to clarifying

⁴⁵ See discussion in Dina Shelton: "The Right to Environment" in "The future of Human Rights in a changing world", Essays in Honour of Torkel Opsahl, Oslo 1991.

the meaning and implications of the concept. Neither did it break much new ground in national and international law concerning management of natural resources.

The important new conventions on climate change and protection of biodiversity provide a basis for major new steps in international cooperation, but rest mainly on conventional international law.

The Rio Conference refused the idea of a "human right to environmental protection" - both as an individual or a collective right. In spite of the efforts during the preparatory process, any reference to such a right was deleted from the Rio documents. The Rio Conference was not even willing to repeat the formulations of Principle 1 of the Stockholm Conference. The corresponding Principle 1 of the Rio Declaration on Environment and Development was formulated as follows:

"Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature."

The general obligations of states concerning protection of natural resources and the environment are indeed quite weak in the Rio Declaration - in fact weaker than the Stockholm Declaration. The basic problems of developing countries dominates the document. Hence, the "right to development" is repeated in Principle 3:

"The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations."

This leads to the question of

4. Human rights as a condition for the proper management of natural resources

Instead of pursuing the idea of developing a "right to environment" or a "right to sustainable development" as a material human right, it may be more fruitful to look into some of the procedural rights as a means for securing proper management of natural resources: decision-making processes, participation and information.

In the broadest sense, this is a question of the political system in general, democracy, and right to information. Expressions of this are found in the Universal Declaration on Human Rights, articles 19 (freedom of opinion and expression), 20 (freedom of peaceful assembly and association) and 21 (the right to take part in the

government of the country), as well as the corresponding articles 19, 22 and 25 in CCPR, and art.8 in the CESC (right to form trade unions).

The public's right to information and participation is essential. If this right is sufficiently clarified and acknowledged, it may be an important key to basic changes in decision making, and to promoting sustainable development and a good management of natural resources. It has a basis in some of the human rights which have already been accepted, and it can be made sufficiently precise and practicable to be legally enforceable in most countries.

The right to participate in decision-making concerning natural resources is not least important for minorities and indigenous people. It is a crucial point in the ILO Convention on indigenous peoples of 1989. In general, such peoples shall be consulted in all matters concerning their situation and the implementation of the convention (arts. 6, 7). Articles 15 and 16 are particularly relevant to issues related to management of land and other natural resources. Article 15 states:

“1. The rights of the peoples concerned to the natural resources pertaining to their lands shall be specially safeguarded. These rights include the right of these peoples to participate in the use, management and conservation of these resources.

2. In cases in which the State retains the ownership of mineral or sub-surface resources or rights to other resources pertaining to lands, governments shall establish or maintain procedures through which they shall consult these peoples, with a view to ascertaining whether and to what degree their interests would be prejudiced, before undertaking or permitting any program for the exploration or exploitation of such resources pertaining to their lands. The peoples concerned shall wherever possible participate in the benefits of such activities, and shall receive fair compensation for any damage which they may sustain as a result of such activities.”

If relocation of people is found necessary as an exceptional measure, it shall take place only with their free and informed consent.

It may be fair to say that the right to information and participation is a "compromise" solution between the full acceptance of minorities exclusive rights over the natural resources of their traditional territory, and the principle of state sovereignty.

Recently, the right to information has become an important issue also in relation to environmental protection. While the "right to environment" in a material sense may be problematic, procedural rights in this area are more easily accepted and applied, in particular:

- the right to be informed about the environmental situation in the area, and the environmental consequences of new projects (i.a. environmental impact statements)
- the right to participate in decision-making processes,
- the right to legal and administrative remedies against decisions in this area.

On this issue, the Rio Declaration on Environment and Development took a step forward. Its Principle 10 states:

"Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided."

5. Trends in Norwegian Law: The new Art. 110 b of the Constitution

On May 25, 1992 the Norwegian Parliament, the Stortinget, adopted a new section in our written Constitution dealing with the protection of the environment (§ (Article) 110 b).

It appears from its provisions that this Article shall secure an environment which does not endanger health, and a nature where diversity and ecology are preserved. The management of natural resources must be far-sighted and balanced. To this end, there shall be a right to information about the state of the environment.

The principles expressed in § 110 b are formulated in terms of "rights" for individuals combined with a directive to state authorities to issue more detailed provisions about the implementation of these principles.

The history of this constitutional amendment⁴⁶ shows that Parliament neither intended to adopt a general subjective right nor a mere programmatic declaration. It can thus be argued that it will have legal implications apart from those set out in implementing legislation, i.a. for the interpretation and application of other rules of law, and for the exercise of executive and administrative discretion.⁴⁷

6. Should we pursue further the concept of human rights as a means for balanced (sustainable) resource management?

The dynamic concept of human rights has created a temptation to mobilize its persuasive force for many and widely different causes. The question that increasingly needs to be posed, is whether it is a good policy to pursue this concept further into new fields, or to newly discovered problems. The question has many implications and should be discussed at the Nyvågar Conference. We suggest only a few points: As the recent constitutional amendment in Norway illustrates (and many other texts referred to above), individual and subjective rights in the traditional sense of claims which entails corresponding obligations for the state and society, may have only a limited role to play as regards resource management.

At the same time, everybody is aware that the exploitation and management of resources pose problems which cannot be solved at the national level. Thus, there is a strong need for more international law. More procedural rights for individuals, such as a right to information, will be useful. But instead of more substantive rights for individuals and groups, what is necessary seem rather to be more responsibilities and duties - and not only for individuals, but also for "legal persons" such as companies and other collectivities, as well as for the state.

⁴⁶ See in particular Innst. S. nr. 163 (1991-92) with references, and the debate in Parliament, S. tid. pp. 3735-3743, and earlier Inge Lorange Backer: "Grunnlovfesting av miljørettslige prinsipper", Institutt for offentlig retts skriftserie nr. 6/1990.

⁴⁷ See Inge Lorange Backer in Knophs Oversikt over Norges Rett, 10th ed., 1993. It is, for instance, arguable that this new provision will weaken the claim of individuals to compensation for restrictions on the use of property when these are imposed by environmental legislation, i.e., it strengthens the "Polluter Pays Principle". Some Supreme Court decisions had, however, already drawn similar conclusions, e.g. Rt. p. 1279 and 1987 p. 80., see also Backer: "Grunnloven og miljøet", Juristkontakt no. 7, 1991, and Carl August Fleischer: "Miljø- og ressursforvaltning. Grunnleggende forutsetninger", 1991.

"THE LEGAL STATUS OF RIGHTS TO THE RESOURCES OF FINNMARK".

by

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I. Some remarks about the topic of my paper.

The headline of my paper can be interpreted in different ways. Thus it is necessary to define more precisely the subject for my discussion.

Most of Finnmark can be defined as outfields (woodlands and mountains). In my opinion it is necessary to have the whole county, and not only Finnmarksvidda, in mind when you are talking about the rights to common resources in this part of Norway. (Further about this problem, see the paper from professor Gudmund Sandvik.)

Another problem to be considered is the phrase "rights to the resources". Throughout the centuries the inhabitants of Finnmark have worked as fishermen, combined farmers and herdsman, and reindeer-herders without particular reasons to try to find out what kind of rights they had to the resources they used. During the last decades, however, the question of ownership to land, water and other resources in Finnmark has emerged. The traditional view has been that the State has the rights of ownership. In opposition to this view some representatives for the Saami people have asserted that they are the owners in areas they traditionally have been using for their living for several hundred years.

The arguments for the two different views on this matter can shortly be summed up like this:

According to the main legal theory in times past it was not possible to obtain ownership to land by nomadic use. According to the theory one could only acquire ownership right to unowned land by living on it and using it in some specific ways, for instance cultivating land (the specification theory). Both the Danish and the Swedish King declared that land not taken into specific use was this land. The specification theory was stressed by the Norwegian Government in its proposal to our Parliament in 1848 (Ot.prp. 21/1848). It is reason to believe that the theory is a part of the basis for the opinion that the State was the owner of land and water in Finnmark. The administration was built on that view.

According to Order in Council from May 27, 1775 the State began to

parcel out lots for private ownership. It was said that by this order in Council, private ownership to land was introduced in Finnmark.

This point of view has more or less clearly been layed down by the administration and in legislation since then, and also earlier than 1775. It can be found in some court rulings too. The State will now assert that the people in Finnmark have adapted this view in practice and that the State's ownership to land and water is based on what Norwegian courts will call "festnet bruk", or use and opinion for such a long period that it can not be altered.

The Saami people on the other side, assert that they have the rights of ownership, to land and water in Finnmark. According to their view there are several arguments for this opinion.

The Saami people were the first to use these areas. They used the resources for their living without any interference from the State or anyone else. They had no reason to think about the term "right of ownership". The resources were shared between separated reindeer herding groups ("siidaer"). Inside the group several resources were used in common, but some were separated for individual use. The Saamis will assert that none of them have transfered their rights to the State in any form of contract and the area has not been expropriated from them. The use of land and water was a necessity for their living and culture and thus in their opinion the resources were theirs.

Considering the legal situation of the rights of ownership to land in Finnmark one will encounter another complicating factor. It could be said that the state of law is different for the southern part of Finnmark (Finnmarksvidda) and the rest of the county. Up to 1751 Finnmarksvidda stood under Swedish jurisdiction and this fact could have an impact on the legal status to-day. In this area the impact of Swedish rights in similar areas in Sweden could be of interest. The Saamis could point to views in the judgement of the Swedish Supreme Court in 1981 (The Taxed Mountain Case, *Nytt juridiskt arkiv* 1981 p. 1) and to historical investigations of Kaisa Korpiaakko about Finnish rights concerning Lapp areas of Torne and Kemi in the northernmost parts of Sweden and Finland.

An argument in addition is that in this part of Finnmark the Saami people were the predominant part of the people using the resources.

The Danish-Norwegian administration had the jurisdiction of the rest of Finnmark (den "privative sonen"). This fact could have impact on the legal status here. In this area the people were more mixed with Norwegians, Finns (kvener) and Saamis. The variety of resources

utilized were larger.

The legal situation for Finnmark as a whole is different from the rest of the country because of historical reasons, and the fact that only 4% of the county is transferred to private ownership.

In addition to the arguments mentioned above, Norway has some obligations towards the Saami people according to International Law. These obligations are founded on The United Nations 1966 Human Rights Covenant on Civil and Political Rights for minorities and the ILO convention. Norway has, unlike Sweden, ratified the ILO convention.

In 1980 the Government set up a Saami Rights Commission. One part of the Commission's task is to give an opinion on the question: who has the right of ownership to land and water in Finnmark. The Commission has not yet given their conclusion concerning the ownership question. Thus the following discussion about rights to the resources of Finnmark will be based on the traditional opinion of the State as owner of land and water in Finnmark.

II. The local administration of the State's right to land and water in Finnmark.

The rights of ownership are delegated to The Local Office for administration and selling land in Finnmark (Jordsalgskontoret). This office is placed in Vadsø. The legal basis for the administration is The Act of March 12, 1965 concerning unregistered land belonging to the State in Finnmark. According to this act land can be sold or rented to private persons, municipalities and companies. Land which in the opinion of the authorities, is needed as grazing land for reindeer, can not be sold. The same is the situation concerning land used for moving reindeer on traditional migration paths between the coast and the inland.

The Parliament has also stated in the Act that Land which, according to the view of the administration, ought to be in ownership of the State for the sake of forestry, mining industry, fishing activities, outdoor life and nature conservation should not be sold.

In pursuance to the Act of March 12, 1965 the King is given the authority to lay down more detailed regulations concerning use of resources in Finnmark. Such regulations were laid down July 15, 1966. I will later return to some of these regulations.

III. The right to reindeerherding in Finnmark.

1. The right to reindeer herding in Norway is regulated in the

Reindeer Farming Act of June 9, 1978 (here abbreviated RFA). Norway is, according to section 2, divided into six reindeer herding areas (reinbeiteområder). These areas are situated in the counties Finnmark, Troms, Nordland, Nord-Trøndelag and Sør-Trøndelag/Hedmark. Reindeer herding inside these areas can not legally be done by other than Norwegian citizens of Saami descent. Reindeer herding outside these areas can be done by Norwegian citizens, but only according to special concession from the King (§ 5).

Finnmark is divided in two reindeer herding areas which cover practically 100% of the county.

On a national scale the reindeer herding is a small industry. The total industry counts less than 700 management units. Only approximately 2500 persons have reindeer-herding as a main or subsidiary trade. The number of domesticated reindeers was about 220 000 by April 1, 1991.

Even though reindeer-herding is a small industry in national scale, it is of great importance for the Saami people both economically and culturally. The industry has always been looked upon as a specific Saami-industry. Finnmark is the main area of this industry.

The rights of the reindeer-herding Saamis to utilize outlying fields have been recognized from ancient times. This was supported by the Lapp council, which is an appendix to the border treaty between Sweden-Finland and Denmark-Norway of 1751. Along with the progress of the Norwegianization policy at the end of the 19th century into the 20th, the theory emerged that the use for reindeer-herding purpose was only a tolerate use.

According to this understanding, the legal basis for reindeer-herding was the law, as it was at any time, given by the Parliament. This view was stated by the Department of Agriculture in 1976 (see Ot.prp. nr. 9 for 1976-77 p. 42 and p. 47). The Norwegian Reindeer-Herding Saami Association was of another opinion. They pointed out that reindeer-herding have been exercised in the area for centuries and had established a legal basis for reindeer-herding that was independent of the law given by the Parliament. The Agricultural Committee in the Parliament would not decide what was right or wrong of these two views (see Innst. O. nr. 98 for 1976-77 pp. 3 and 5). The question is now under discussion in the Saami Rights Commission. If the final conclusion should be that the right to reindeer-herding was established already before the border-treaty of 1751, the existing law concerning reindeer-herding of 1978 is regulating the extent and contents of the right and is not establishing the basis for the right.

2. The organizing and management of the reindeer-herding

industry is regulated in the act of 1978. Specific for this industry is that the reindeer-owners themselves are given great influence and responsibility over the administration. The Ministry of Agriculture appoints a "Reindrifstyre". This is the central administration of reindeer-herding. To this board persons who are active in reindeer-herding will be appointed. Finnmark is divided into two reindeer-herding areas (reindrifsområder). A board is to be appointed to administer each area. Some of the members of the board have to be active reindeer-herding persons.

Each of the reindeer-herding areas is divided into several reindeer-herding districts with their own boards consisting of reindeer owners. The district board can represent the owners and the district as legal persons in lawsuits.

This organization gives the reindeer-herding industry itself administrative boards on national, regional and local level. The industry has in practice the majority in all these boards, even if the election procedures of members to the boards are varying.

The right to reindeer-herding inside a "reinbeiteområde" is, as mentioned, depending on your descent. According to section 3 in RFA only a Norwegian citizen of Saami descent is allowed herding. It is a condition that his parents or grandparents have had reindeer-herding as the main trade.

The basic unit for reindeer-herding is called a management (improvement) unit. This term was introduced in the Act of Reindeer-Farming of 1978. In principle a management unit is owned and managed by one responsible owner (§ 4). The management unit could include reindeers belonging to the owners spouse, their descendents, brothers and sisters and their children. A condition is that the actual person is of Saami descent and not a responsible owner of an other management unit.

Reindeer belonging to several persons or families exercising reindeer-herding in common could be accepted as a management unit on condition of consent from the board of the reindeer-herding area.

A reindeer-owner is not allowed to move his unit from one district to another without consent from the board of the reindeer-herding area.

An existing management unit can normally not be divided. Sale and inheritance of the unit is regulated by the law. An undivided unit can be transferred to the spouse of the owner without approval. This is also the situation concerning transferring or inheriting the undivided unit

from parents or grandparents. Any other form of transferring or establishing management units cannot be done without approval.

The right to herd reindeer include the right to use available resources and put up necessary constructions for the trade (§ 9), e.g. right to take materials from the forest for fuelwood and to erect necessary works like fences and turf-huts and make equipments. The right to reindeer-herding include also right to hunt and fish in the lakes and rivers.

The reindeer-herding industry is legally protected against encroachments. If rangeland is taken for other purpose like roads, power lines, mining and so on, the reindeer owners, often represented by the board of their district, can demand compensation for lost rangeland and for disadvantages for the industry.

The reindeer farming industry in Finnmark has large problems to day. The situation is particularly difficult in the core areas of Finnmarksvidda. Too many reindeer have caused an overexploitation of the grazing resources, which have caused low productivity and unsatisfactory economic development. These factors cause conflicts and social unrest. It seems to be difficult for the reindeer-herding industry to solve these problems themselves. This is the reason why the Government in a new white paper to the Parliament (St. meld.nr. 28 for 1991-92) has given an analysis of the situation and has proposed some remedial actions.

IV. Rights to resources in the underground and to waterpower in Finnmark.

Minerals with a specific weight lower than 5 belongs to the owner of the ground. In regulations laid down by the Ministry of Agriculture the rights to underground resources in Finnmark are not following the ground when the State sells it to private owners.

Minerals with specific weight higher than 5 is free for everyone to search for. If something is found, the finder needs official permission to start exploration of the resource. The owner of the ground has the right to a sort of fee maximised to 6000,- pr. year. Even if the State has sold the ground in Finnmark, the owner's right to this fee according to the Act of June 30, 1972 (§ 42) is reserved for the State.

The right to waterpower belongs as a main rule to the owner of the ground, The Watercourse Act of March 15, 1940 (§ 1). If the State have sold the ground in Finnmark, the right to waterpower is reserved according to the Regulations of July 15, 1966 (§ 3).

V. The right to materials from the forest.

Professor Gudmund Sandvik has in his paper a survey of the historical development concerning rights to wood.

The Order in Council of May 27, 1775 founded the legal basis for selling ground in Finnmark to private persons. The right to the conifer forest on the ground did not follow the ground to the new owner (§ 5). From 1820 a clause could be taken into the deeds that gave the new owner the priority to take wood necessary for his household on the property he had acquired.

According to the Act of 1965 the forest will always follow the ground to the buyer and new owner.

Because of the different practices the State has followed during the history there are different categories of forest in Finnmark. The greatest part of the forest is however on ground belonging to the State.

The question is then what usufruct rights the local inhabitants have to take materials from the wood. In the 1965 Act on selling ground in Finnmark it is said in § 4 that county people have the right to have pointed out birch necessary for fuelwood enough for their households.

It is a question under discussion whether the local inhabitants have a more extensive right to wood than stipulated by the Act of 1965. The answer is depending on what is to be found in court rulings, administrative practice and the opinion of the inhabitants and the State. The Saami Rights Commission is discussing this problem at the moment. Their opinion is not yet official.

VI. The right to use outfields as grazing land for domestic animals and as a place to gather winterfodder.

It was earlier a necessity for everyone who had domestic animals to use the outfields as grazing land in summertime. Also the winterfodder has to be found there.

Before the Order in Council of 1775 there was no regulation for this use of the outfields in Finnmark. The resolution altered nothing in this practice.

In 1863 the Parliament enacted a Law on selling ground in Finnmark. According to this Act and the following regulations, it was an assumption that the owner of domestic animals did not have the right to use outfields for pasture unless there was basis in the contract for it. In 1902 the State was given a stronger right to regulate rights to pasturing given in contract from that time on. And in 1955 a new clause was taken into new contracts. The State was given right to terminate the

grazing right giving notice one year in advance.

In the Resolution of 1965 the right of grazing in the outfield established in new contracts was weakened even more (§ 7).

According to this historical background there could be up to five groups of rights to use the outfields as grazing land for domestic animals (Sverre Tønnesen: Retten til jorden i Finnmark (1972) s. 264-267).

There could of course be some owners of husbandry who had obtained a more extensive grazing right than the right based in his contract. Such a conclusion can only be reached by concrete judgement of use and court rulings.

Whether there exists a general rule of grazing rights more extensive than that following from the contracts is now under discussion in the Saami Rights Commission. The only body that can give a definitive answer to this question is the Supreme court of Justice or the Parliament.

VII. The rights to the resources in the Zone next to the seashore.

The general rule in Norway is that an owner of ground bordering the sea, is also the owner of a part of the ground out into the sea. The border for his property out in the sea will differ a bit depending of the deepness and the slope of the seaground.

The owner of the seashore has the right to build out into the sea. Another important right is to come to and from his land undisturbed in boat. The seashore owners rights include several other possibilities for dispositions, but the right to shooting or hunting is free for everyone. The right to fish is also free for everyone except for fishing salmon with some types of fishing tackle.

These general rules are also laid down in Finnmark, but there are still two question who can be discussed. The first one is the fact that some of the homesteads do not have borders out to the sea. There could be a small corridor between the sea and the ground bought from the State. The conclusion depends on what is written in the contract when the homestead was sold.

The other question is the legal situation for all the seashore not sold from the State. The State claims to have the same rights here as owners of ground elsewhere in Norway. The answer to this is not quite certain. The inhabitants have used the resources on the shore with few or

without any restrictions. The rights for people in general on seashore formally owned by the State are under discussion in the Saami Rights Commission.

VIII. The right to inland fish, to hunt and to pick berries.

1. Fishing, picking berries, mainly cloud berries and hunting wild animals and ptarmigans was earlier an important part of the daily bread-winning for a great part of the inhabitants in Finnmark. This was the situation for the reindeer herding Saami people and for the inhabitants living alongside the rivers and the fjords (see the paper from Gudmund Sandvik p. 6).

This situation has changed during the last decades. Change from a subsistence economy to money economy, more leisure time and better communications have resulted in a use of the mentioned resources as an important part of the leisure time activity both for the inhabitants of Finnmark and for tourists from other parts of the country and abroad. For the reindeer-herding industry all these leisure time activities often mean disturbances and difficulties and can cause confrontations concerning regulation and use of the outfields in Finnmark.

2. The right to fish salmon in the rivers of Alta, Tana and Neiden is different from the rest of the rivers and lakes in Finnmark. In Alta river owners and users of ground who are living on their property, have the right to fish salmon from June 24 and the rest of the season. Up to June 24 the right to fish is free for all the inhabitants of the municipality.

In Tana river the right to fish salmon belongs to owners of properties not longer from the river than 2 kilometres. In addition it is a condition that the owner grow at least 2000 kilo hay. The right belonging to this group is limited to net fishing.

A much debated question is whether all inhabitants of the valley Tana have the right to fish salmon by rod or not. The State has asserted to be the owner of this right. The question is under discussion in the Sami Rights Commission, but a definitive answer can only be given by the Supreme Court or the Parliament by legislation.

In the river Neiden the right to fish both salmon and other sorts of fish belongs to Neiden Fishing Community (Neiden Fiskefelleskap). The conditions for membership in this community are almost similar to the conditions for fishing salmon in Alta and Tana. The conditions of agricultural activity are however not so clearly formulated.

3. Fishing of salmon and other sorts of fish in the rest of the rivers

and lakes in Finnmark is regulated in the Act of Salmon- and Inlandfish of May 15, 1992.

The main rule in Norway is that the owner of the ground bordering rivers and lakes is the owner of the right to fish, section 16 in the Act of May 1992. Many of the private properties bought from the State in Finnmark are however not bordering the rivers because the State has held back a small corridor of ground between the private property and the rivers (see "Innstilling om lov og forskrifter om statens umatrikulerte grunn i Finnmark fylke" (1962) p. 17.) In these cases and everywhere else the State is, as owner of the shores of the rivers and lakes, the owner of the fishing right.

The right to fish with fishing rod in rivers and lakes belonging to the State is free for Norwegian residents. Fishing with all types of fishing tackle is free for residents of the county of Finnmark. All the same, there are some regulations about how many fishing nets each resident can use in some specific lakes.

Foreigners are allowed to fish with fishing rods within a distance of main roads of 5 kilometres. The right to fish both salmon, and other fish, in rivers is often rented to organisations.

4. The right to hunt is regulated in the Act of small and big game hunting of May 29, 1981. The general rule in Norway is that the owner of the ground has the sole rights to hunt on his own ground, section 27.

The right to hunt on ground belonging to the State is regulated in section 31. The right to small game hunting is allowed for all residents of Norway.

5. Reindeer herding Saami's right to fish and hunt is regulated in the Reindeer Farming Act of June 9, 1978.

In connection with legally executed reindeer herding the Sami are allowed to fish and hunt on the same conditions as the residents in the district they are passing with their deer.

6. The right to pick berries is free except for picking cloud berries. Picking this sort of berries is regulated in the Act of March 12, 1965, section 5a. The right to pick cloud berries is as a main rule reserved for residents of the county of Finnmark. The only exception is berries you are eating on the spot.

LEGAL RIGHTS REGARDING RANGELANDS IN NORWAY - WITH EMPHASIS ON PLURALITY USERS-SITUATIONS

by

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I. Some introductory remarks

Definitions are usually boring, but, nevertheless, I feel that it is necessary to say a few words on some of the main concepts of this seminar and some of the basic concepts I use myself.

The central word in the title of my theme is rangeland, which is not found in my legal dictionaries, nor in the Oxford Concise Dictionary. I shall use the word in a somewhat loose sense, corresponding to the Norwegian word *utmark*,⁴⁹ i.e. land outside towns and built up-areas not being cultivated farm land. Positively designated, rangeland will in my vocabulary include forests, natural grazing land as well as barren mountain areas and glaciers.

In this sense, rangeland is very often utilized by a number of persons - as I shall explain in a moment. But this fact does not - seen through my lawyer's glasses - justify the use of the term *non-private resources* as the organizers of this seminar have done in the preparatory documents. I shall, therefore, adhere to conventional legal terminology, which will be commented upon to the extent necessary later on.

Clearly, the law is not static. In order to have the full picture it is necessary to know quite a lot of the historical development of the legal rules, and also whether there today are winds of change and in which directions these winds might be blowing. With the given limits, I have, however, to restrict myself to a general overview of the present legal situation in Norway. My presentation will be general also in the sense that I shall not say anything on the problems related to Finnmark. In that respect I refer to what Torgeir Austenå has explained to us.

II. The rangelands: ways of exploitation and possible user conflicts

As indicated, rangelands may be of interest to various groups of users. In order to get a better understanding of the possible conflicts

⁴⁸Thor Falkanger, b. 1934, professor of law. Law Faculty, University of Oslo, since 1970.

⁴⁹ The term *utmark* is defined in the Act on Outdoor Life of 28th June 1957 No. 16 Sect. 1.

and the legal machinery for avoiding or solving such conflicts it may be useful to enumerate the benefits which may be derived from rangelands.

This may be done by listing the resources as follows:

- (1) forests
- (2) grazing land for cattle and sheep
- (3) fish and game
- (4) peat (for heating purposes, etc.)
- (5) nuts, berries, flowers
- (6) minerals
- (7) water
 - for consumption
 - as a source of power
- (8) building ground
 - for an expanding town, etc.
 - for recreational huts

(9) last, but not least, the use of the rangelands for recreational purposes as well as the importance of the rangelands in a wider, environmental, ecological sense should be stressed.

It is apparent that there are a number of possibilities of conflict between various groups of users. Using waterfalls for production of electricity may reduce or eliminate fishing, or the development of a waterfall may be considered as disastrous from an ecological point of view, etc. The possibilities of conflicts exist also when the use of the land is on one hand only, which the last example clearly shows.

However, in the present context we shall focus on situations where more than one person or group of persons rightfully are utilizing rangelands for various purposes. It is natural to distinguish between what might be named internal rules and on the other hand external rules belonging to the sphere of administrative law.

III. *The internal rules*

The internal rules belong basically to the private law regime.

The starting point is that one person is considered as the owner of a land area, and as such he has the exclusive rights of disposition - legally and factually. His position as owner is negatively delimited, i.e. he is omnipotent unless there are specific grounds for delimiting his powers.⁵⁰

Even when disregarding public law - to which we soon shall pay attention - there are, however, important practical exceptions to the main rule of owner supremacy.

1. *Joint ownership*

First of all it should be noted that the owner may have a co-owner. Joint ownership regarding rangelands is a very old institution in our country, and even to-day considerable areas are subject hereto -

⁵⁰ For a more detailed explanation of the concept of ownership, see *Falkanger, Tingsrettslige arbeider* (Real Property Studies), 3rd ed 1990 pp. 20 *et seq.*

usually in the form that the joint property so to speak belongs to certain farms. The joint property follows the farms and can be sold only in conjunction with the farm.

In particular, with a great number of joint-owners there are conflict of interest-possibilities as regards many aspects. Two pieces of legislation are of particular importance.

The act on joint ownership of 1965⁵¹ defines the rights and duties of the joint-owners. Some of its stipulation should merit a short mentioning.

Regarding the physical use of the land, the act is conservative: Each of the joint owners is entitled to use the land in the customary, traditional manner. But it is added in Sect. 3 that it may also be used for other purposes "which are compatible with the time and the circumstances".

Within this framework, each owner is entitled to use the land, e.g. for cattle grazing, but only to an extent corresponding with his part in the joint ownership.

The expenses involved in the preservation of the property shall be divided between the owners, basically according to their ownership interests.⁵² It is apparent that with many owners it may be advantageous to have some kind of organisation, preferably with a board or a steering committee which has the powers to take decisions on behalf of all the owners. The act is, however, somewhat restrictive in these respects. Majority decisions are subject to rather extensive protection of the minority, and there is no obligation to have formal bodies.⁵³ It is up to the owners - or rather the majority of the owners - to decide whether there should be a board and whether there should be formal rules on owner-meetings, voting procedures, election of officers, etc.⁵⁴ It should be added that some acts of a more specific nature also have rules on majority decisions.⁵⁵ As an example the Farming Act of 1955 may be mentioned. This act gives greater powers to the majority regarding questions of farming and forestry, than the 1965 act does, but the minority has a right of recourse to the agricultural authorities.

If an owner does not fulfill his obligations in respect of contributions to the up-keep of the jointly owned property, exceeds his rights to use the property, etc., the co-owners cannot easily get rid of him - in particular where we assume that there in principle is an insoluble connection between the farms and the jointly owned

⁵¹ Act on Joint Ownership of 18th June 1965 No. 6. Further on this act, see *Falkanger op. cit.* pp. 71-124.

⁵² See Sect. 9, compared with Sect. 8.

⁵³ See Sects. 4 and 5.

⁵⁴ See Sects. 6 and 7.

⁵⁵ See in particular Farming Act of 18th March 1955 No. 2 Chapter IX, and further Game Act of 29th May 1981 No. 38 Sect. 29.

rangeland.⁵⁶ Of course, injunctions and damages may be demanded. There is, however, one remedy of a general nature, viz. the right to demand reallocation of land in accordance with the act on reallocation of land of 1979.⁵⁷ If such a demand is accepted, the jointly owned land will be distributed so that each piece of land will have one owner only.

2. Land owned by one individual owner

The powers of an owner - regardless of whether there is one or more owners of the same land area - are delimited in various respects. Some of them shall be mentioned:

a. The rights to minerals, with specific gravity 5 or higher, do not belong to the owner of the ground. Norwegian law adhere to the principle that the finder has the right to exploit mineral resources, and for this purpose he may use the necessary land areas - against a compensation to the owner.⁵⁸

b. Of great importance are the rights which in Norwegian are called *allemannsrettigheter* - i.e. rights belonging to literally everyone, and which I shall name *all men's rights*. These rights, dating from times immemorable, include a number of different types of use of property belonging to others - e.g. the right to walk over and stay on foreign property, to camp and bathe there, and to pick wild berries and nuts.⁵⁹

However, in most instances these rights enjoy a weak protection. The owner may decide and is entitled to use the land for a purpose which is not compatible with the exercise of the all men's rights. If he e.g. cultivates an area or build a house thereupon, then the rights of the public cease. Only in exceptional circumstances is a person, now deprived of his former use, entitled to compensation. But up to the moment when the owner changes his use of the area, the public in general may enjoy the indicated rights, and an attempt on the part of the owner to restrict the exercise of these rights is illegal. To some extent the conflicts between the owners and the public are solved or at least diminished by decisions or statements by particular administrative bodies (Norw. "friluftsnemnder", i.e. "outdoor life-councils").

In a longer perspective it should be noted that there is a tendency to extend the all men's rights - typically it is a broadly held view that the possibilities of fishing and hunting for the public should be increased. This is one element in the to-day's emphasis on recreational activities and "back to nature"-attitude. At the same time there are indications that the protection given the all men's rights are being

⁵⁶See Joint Ownership Act Sects. 13 (2) and 15 (5).

⁵⁷ Act on Redistribution of Land of 21st December 1979 No. 77.

⁵⁸ See Act on Mineral Resources of 30th of June 1972 No. 70.

⁵⁹The rights are to some extent codified in Act on Outdoor Life, see note 2. For an overview, see *Falkanger, Eierrådighet og samfunnskontroll* (Ownership and State Control), 3rd ed. 1986, pp.172-178.

strengthened - in particular when the rights are of importance for making a living.⁶⁰

c. Finally it should for, the sake of completeness, be added that an owner is entitled to create encumbrances on his land of such a nature that they remain as such also when the property has passed to another owner. The encumbrances may vary widely: leases, mortgages, rights of preemption, restrictive covenants, easements, etc. Obviously, the relationship between the owner and the holder of a limited right over the property may give rise to difficulties. Such difficulties have primarily to be solved by construction of the promise, etc., creating the right (the encumbrance). In addition there are a number of acts defining the rights and obligations of the parties, e.g. as between owner (mortgagor) and mortgagee.⁶¹ In most instances these acts are of a supplementary nature, meaning that they come into play only when no regulation - or sufficiently clear regulation - can be obtained by construing the promise or contract whereby the encumbrance was created. But in some instances an act may be of a peremptory character, e.g. setting a maximum time limit for the lease of fishing rights in a river.⁶²

3. State owned land

The state may have acquired land through an ordinary sales contract, through expropriation, etc. In such cases the relationship between the state as owner and on the other hand: persons with specific rights and the public with their all men's rights, is in principle the same as when the owner is a private person.

But the majority of state owned land is not acquired in this manner. Roughly one third of the total area of Norway is state owned, and the dominant part hereof has been state owned for hundreds of years. One simple way of explaining this is that when Norway was populated, the state considered itself as owner of the areas which were not intensively used by the farmers.

These areas have a particular status, inasmuch as the farmers in the vicinity - and to some extent also other residents - have rights over the lands. The particular status appears from the name given to such areas, viz. Norw.: *statsalmenning*, which may - with considerable hesitation - be translated by *state owned common*. In a number of cases the ownership to the common has been transferred to the farmers in a defined district, and thus we have a second category of commons, which may be called *district* or *farmer owned commons*. For the

⁶⁰ See e.g. Supreme Court decision in Rt. 1985 pp. 247 *et seq.*

⁶¹ Act on Mortgages and Other Charges of 8th February 1980 No.2. See as further examples Act on Easements of 29th November 1968, Act on Leases of 30th May 1975 No. 20, Game Act (see note 8) and Act on Salmon and Inland Fishery of 15th May 1992 No. 47.

⁶² Act on Salmon and Inland Fishery (note 14) Sect. 19.

present purpose it is sufficient to say a few words on the state owned commons.⁶³

The typical legal pattern is as follows:

(1) The farmers have certain rights in the state owned common.
 (2) These rights are enjoyed by the farmers in the vicinity of each state owned common. The geographical delimitation depends upon usage and tradition.

(3) In order to have rights in the common, the farm must have a certain size.

(4) The rights in the common may vary from instance to instance. The actual contents depend upon usage. One important limitation should be noted: The rights may be exercised only to meet the requirements of the individual farm - e.g. a right regarding wood or timber is limited to what can reasonably be used on the farm for purposes compatible with farming as woodfuel, building material, etc.

(5) The typical rights in the common concern:

- (a) wood
- (b) grazing
- (c) fishing
- (d) hunting

(6) When the farmers have exercised their rights the state, as owner, may utilize the property, which is of importance in two respects:

First, if e.g. the forest yield exceeds the quantities which the farmers are entitled to, the state will profit in respect of the excess.

And, secondly, if it is possible to utilize the land in a manner not contrary to the farmers' rights (as defined through usage), the state may do so. Thus the benefits derived from leasing plots for buildings fall to the state,⁶⁴ and, to give one more example, the state may develop waterfalls for production of electricity without compensation to the farmers.⁶⁵

(7) Fishing and hunting rights have, however, gradually to some extent been transferred upon the public in general. Now the general rule is that hunting and fishing in state owned commons is possible for anyone being domiciled in Norway - against certain payments, which may be differentiated so that people living in the vicinity of the common have to pay less. The fees paid shall cover certain expenses, and the

⁶³ The rules on commons have gradually been codified. On state owned commons, see Mountain Act of 6th June 1975 No. 31 and Act on Forestry in State Owned Commons of 19th June 1992 No. 60; for district owned commons, see Act of 19th June 1992 No. 59. These acts together with the preparatory documents ("travaux préparatoires") give a good knowledge of the present situation.

⁶⁴ See however Mountain Act (note 16) Sect. 12 (3): Half the income from leases for huts and hotels goes to the "mountain chest", from which expenses relating to the common are covered, see Sect. 11.

⁶⁵ See in particular Supreme Court decision in Rt. 1963 pp. 1263 *et seq.*

excess, if any, shall be used for the economic development of the district surrounding the common.⁶⁶

The administration of the state owned commons is divided:

The ownership aspects are dealt with by a special state body: the State Forest Administration.

As regards the questions actually concerning the forest, there is a cooperation between this body and the Common's Council. This Council is elected by the farmers who have rights in the forest.⁶⁷

For the other types of use there is a so called Mountain Council, elected by the municipal council.⁶⁸

IV. Rules controlling the use of rangelands

In modern society there has been an increasing tendency on the part of state to regulate or control the use of real property.⁶⁹ Accordingly one does not get a full picture by focusing on the traditional private law rules as I so far have done. However, these state control rules are so many that it is impossible even to give an outline. I have to limit myself to some remarks related to protection of the all men's rights or in a somewhat wider perspective: the protection of outdoor recreational activities, which to a large extent are based upon the rules on all men's rights.

This I shall do by giving some examples:

(1) There are rather rigid rules on building, be it houses for permanent residence or huts for vacation purposes.⁷⁰

(2) Building roads⁷¹ and developing waterfalls⁷² are subject to state approval.

(3) The forest legislation takes into account the recreational values connected with the forests, with the objective that forests may serve both commercial and non-commercial (ideal) interests.⁷³

(4) There is, it seems, an evergrowing legislation - and stricter enforcement - in respect of pollution and environmental protection.⁷⁴ Generally, this is beneficial for recreational activities, but sometimes restrictive: In order to preserve nature, the freedom is curbed.⁷⁵

⁶⁶ See Mountain Act (note 16) Chapters XI and XII.

⁶⁷ See Act on Forestry in State Owned Commons (note 16) Sect. 1 on cooperation and Chapter 3 on election of the Council.

⁶⁸ See Mountain Act (note 16) Chapter III.

⁶⁹ See e.g. *Falkanger, Eierrådighet* etc. (note 12) pp. 20 *et seq.*

⁷⁰ See Planning and Building Act of 14th June 1985 No. 77, in particular Sect. 20-4.

⁷¹ Primarily regulated by the Planning and Building Act (see previous note).

⁷² See Act on Regulation of Rivers of 14th December 1917 No. 17.

⁷³ See Forestry Act of 21st May 1965 Sect. 1 and in particular Sects. 17 a and 17 b.

⁷⁴ See Pollution Act of 13th March 1981 No. 6.

⁷⁵ See e.g. Nature Protection Act of 19th June 1970 No. 63 and Salmon and Inland Fishery Act (note 14) Sect. 1 compared with Chapter III.

V. *Some concluding remarks*

The time has come to sum up:

The rangelands in Norway are to a considerable degree used by more than one person.

This is true regarding privately owned property - in particular when it is jointly owned, which frequently is the case. But even if there is one owner only, the land will in practice be used by others as well, due to specially created rights over the property (encumbrances, seen from the owner's point of view), and due to the all men's rights founded on general law.

The pattern is notably difficult in respect of state owned commons: There are a great number of farmers as users - and in addition the general public by virtue of the all men's right. Otherwise put: We have the possible conflicts between the owner and three groups of users: The farmers, the public, and those to whom the state has conferred rights in its capacity as owner.

The rights and obligations of the users - being owners or others - are to some extent defined by contract, but in important respects directly by written or customary law. Nowadays there is in addition a framework, consisting of a number of administrative law rules. Thus, the final solution of conflicts between the many users of rangelands will depend upon the combined effects of traditional private law and modern administrative law. This synthesis may create problems, because we are at the interface of two basically different regimes of law:

On the one hand, we have the traditional private law regime, which is court focused: If the parties are not able to solve the problems themselves, then the issues are decided by the ordinary courts - with the traditional possibility of appeal to a higher court.

In administrative law the conflict solving mechanism is different. An administrative body, being responsible for a particular act, does not negotiate with the citizens to an comparable extent; administrative law is characterized by the issuance of decrees and granting permissions. And furthermore, the person not satisfied with a decision will make a complaint to the administrative body one step higher in the hierarchy. But above all, administrative decision-making has - usually - a wider objective than that of the courts. The primary task of the courts is to solve conflicts between individuals; the administrative bodies have in most cases to take wider social aspects into consideration.

But also administrative decision-making is in the end subject to court control, however, with the important reservation that a number of discretionary decisions (Norw. "skjønnsmessige avgjørelser") cannot be challenged by the courts.

Previous regulations of the use of non-private resources in Finnmark.

by

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1. Three remarks on terminology and a major one on models:

1.1. Finnmark or Finnmarksvidda ?

In Norwegian language, *Finnmark* means the whole county, while *Finnmarksvidda* means the plateau east and south of the fjords.

In 1991, The Norwegian MAB Committee published *Forvaltning av våre fellesressurser. Finnmarksvidda og Barentshavet i et lokalt og globalt perspektiv*. Here, when writing about Finnmarksvidda (title, p. 161, partly even p. 165 sqq), the whole of Finnmark is meant, down to the coast-line and out on the great islands. This is surprising.

The reason seems to be that (by law) practically the whole county of Finnmark is used for reindeer herding, because the reindeer needs green grass as early as possible in the spring or summer season. This grass is found at shore level. The reindeer will inevitably first

approach the shore on its transhumance from the winter pastures. Later in the summer season the reindeer grazes on the grassy hillsides and the plateaus in the coastal region and on the islands. So, it must be stressed that the reindeer fattens itself in the coastal region during the summer season, that it has to move to the inland plateau in the autumn because of deep snow in the coastal regions in winter, and that it subsists on the lichen on the plateau during the winter season (p. 189 sq.).

Finnmarksvidda in our discussion must be used when we mean the plateau. The only name for the whole county - of which its reindeer husbandry depends - is *Finnmark*.

1.2. Non-private / Common resources in the same book refers mainly to reindeer pastures. But in spring and early summer some of the reindeer pastures were also pastures for cattle or where cattle fodder for the coming winter began to grow.

Consequently, "non-private resources" such as pastures must include cattle pastures and harvesting land for winter fodder.

Further, such a broad notion as "non-private resources" must include vital resources for the human beings. Earlier, the really vital resource was wood. Other resources were fish (from the sea, rivers and lakes), game, birds (ptarmigan) and berries (cloud berries). They were rich, at times abundant.

1.3. Samis in the book mentioned seem to mean only Sami reindeer herders.

Samis often speak of themselves as "a people in four countries". Anyhow, most of the Samis in this world live in the country of Norway, especially in the northernmost counties of Finnmark and Troms. The reason is evident: The coastal region of what is now Northern Norway has always offered *fish* in the fjords, rivers and lakes, *sea animals*, *game* and *birds* along the shores and in the mountains, *grass* and *moss* for reindeer and cattle, *wood* for many human needs.. One consequence is that in our days only between 10 and 15 % of the Samis in Norway are reindeer herders, others are fishermen and peasants, or they have gone into secondary and tertiary occupations like any other inhabitants. In comparison, in Sweden and Finland, only Samis who were reindeer herders, hunters and salmon catchers had the status of "lappar". Samis who established themselves as peasants were not "lappar" any more, but "Swedes", "Finns" or "Kvens". This seems to be the reason why today, Samis in Sweden and Finland in general are reindeer herders. A few Samis in Sweden and Finland are hunters and fishermen along rivers and lakes. Other ethnic Samis have been assimilated.

In Norway, reindeer husbandry is by law generally reserved for Samis from Sami husbandry families (this is not the case in Finland). So for the sake of clarity, *Sami reindeer herders* should be our

terminology when that is meant.

1.4. "The tragedy of the commons".

Social scientists may object that the preceding remarks are "noises" in the theoretical **model** and therefore irrelevant to our discussion. But I have understood that the Norwegian MAB program and this discussion aim at bringing about changes in **reality**. My remarks may seem far from the laboratory purity of the model. But I hope that they are relevant to the discussion.

From what I have read (*op.cit.*, pp. 18, 22 sqq, 72 sqq, 96 sqq - and even *Research Programme*, August 1992, pp.5, 12).and heard about the discussion of the "tragedy of the commons", I must infer that Mr Hardin has been ignorant of what "commons" really were in Europe, the British islands included.

On the European continent (Denmark included), as well as in England, in Sweden and in Norway the "common" with forest and grazing land surrounded the village or the community. The use of those surroundings was "common" to the inhabitants of the village or the community. In feudal terminology on the continent the local inhabitants had a *right* to use the common, as part of their *dominium indirectum* or *d. utile* to their holdings (*mansi*). The lord in his mansion house had a right (*dominium directum*) to the village (with its fields) and the common. As the European states developed since the 11th century, the kings claimed and obtained a superior right (*dominium eminens*) in the ground of the state. In England and Scotland since the 17th century, the Parliament gave statutes to the lords so that they could "enclose" commons and even villages and put sheep there. *That* was a tragedy of the commons, but a British one, and for the inhabitants of the villages. On the continent the commons (as the German "Landgemeinden", the Danish "Almindinger" or "Overdrev") were cultivated and allotted when the land reforms started at the end of the 18th century. In Norway, commons ("allmenninger") are still a reality in most parts of the country. The legal construction is that the state owns the commons, and that a well defined group of farmers in the municipality has a legal right to use them in different ways. Therefore, the legal language distinguishes between "allmenningsrett" in the commons and "allmannsrett" (literally "right of all citizens", "everybody's right", for instance to pick berries and to trespass, even on cultivated fields when covered by snow; see Ørebech, *op. cit.*, p. 137 sqq). Our legislation and jurisdiction concerning commons is still developing. It may prove important to Finnmark.

What may be a difficulty to understand about commons - and perhaps confusing to social scientists - is that the rights to the commons do not fit in the modern terminology of property rights. Until the land reforms since the end of the 18th century land property rights formed a sort of pyramide over each parcel of ground (Marc Bloch, *La société*

féodale, "The feudal society", is useful reading for sociologists). The *one* and private proprietor, equipped with *the human right* to property from John Locke and the French revolution, is a recent phenomenon - though the proprietor's sovereign right to use his propriety freely tend to be considerably curtailed in our epoch.

Anyhow, the use of commons in Europe was never open and free to *everybody*.

A model of commons that implies free access for everybody - resulting in "The tragedy of the commons" - is nonsense, harmful to discussion and intersubjectivity. Therefore, I disagree with Mr. Berge, when he (*op. cit.*, p. 72) writes that "we" (! ?) will not change the name of the model.

2. Non -private / Common resources in Finnmark and previous regulations.

2.1. Wood.

As mentioned, there are some woods in Finnmark. Birch (and willow, "vier", *salix*) is fairly usual in the inland, in valleys and wet areas. Pine is found in Alta, in some areas in Porsanger, in Karasjok and in the Pasvik area.

Wood was a vital resource for all people in Finnmark, until the age of coal, petrol, electricity and modern communications, that is until 1880 - 1960. Wood was necessary for heating and cooking and as raw material for many sorts of equipment. The coast is rather bare, and here turf, heather, willow and driftwood from Siberia filled some of the needs of the local population.

The very first known regulation concerns the use of the pine forest in Alta. In 1693, the fogd (sheriff and judge) of Finnmark declared that the "Commons of His Majesty in Alta " should only be used by the population of Alta and to a certain degree by the population of Western Finnmark farther out. Fishermen from the counties of Nordland and Troms were forbidden to cut timber in Alta, and the merchant company had to ask the county administration for permission to cut timber for its buildings.

This regulation was confirmed by rescripts in 1753 and royal resolution in 1775, and extended to all Finnmark, while the use of birch was reserved for the local populations. As a whole these regulations are still in force. An embargo on "export" of pine timber from Finnmark since the end of the 17th century was extended to an embargo for the whole of Northern Norway by an ordinance of 1752. The embargo was definitely cancelled as late as in 1925. The regulation of timber cutting in Karasjok began in 1776. Here pine was cut by the local population (Samis) in winter, floated down the river Tana to the Tana fjord and used especially for houses and for boats in the western part of Eastern Finnmark. The Varanger region seems to have got their

timber from the (until 1826 Norwegian-Russian) Sami sii'das of Neiden and Pasvik.

The copper mine of Kåfjord in Alta 1826 - 1880's was the most important industrial enterprise in Northern Norway during the 19th century. But the enterprise was not allowed to make charcoal from the Alta forest to melt the ore into copper. Coal had to be imported from England.

In 1863 two laws included Finnmark in the wood protection policy in Norway. The income of state ground sold to privates should be put in a fund and used to pay for the forest administration of Finnmark.

What about the Sami reindeer herders ? They were supposed to conform to the same rules as other inhabitants. But of course it was usually impossible for them to ask for permission to cut wood, so the general rule has been that they are entitled to use dry wood freely and to cut fresh wood (pine and birch) for their specific needs for different equipments. In the 1860s reindeer herders were forbidden to pass through pine forests with their herds in winter, because pine sprouts tend to become brittle in frost.

2.2. Fish.

Since the 1680's until 1830 the inhabitants of the fishing stations ("fiskevær") along the coast had the exclusive right to the nearby fishing grounds. Fishermen from southern regions had to fish elsewhere. The reason was that merchant companies were under the obligation to supply the inhabitants of the station and the surrounding regions with necessary goods on long term credit, mostly paid in dried cod ("stockfisch"), salted salmon and cloud berries in barrels. Casual fishing in the fjords was free. The Sami reindeer herders themselves fished in the fjords during the summer season, but for the coming winter they exchanged dried reindeer meat against dried cod fished in the fjords during the preceding winter. Sea fish was a normal part of the diet of the Sami reindeer herders.

Since 1830 until the first World War fishing in the fjords and on the coast was gradually liberalized. Since the 1930's regulations here has become common, and especially since the end of the 1980's. It is a very complicated subject.

The salmon has been the main basis for Sami settlement along the rivers in Finnmark, especially along the great rivers of Tana and Alta. The county governor decided in 1763 that the salmon in the river of Alta should be reserved for the local community, a principle that was extended to the river of Tana by the royal resolution of 1775. This is still Norwegian law.

For the other rivers the salmon fishing was free - the general principle in Norwegian law, that salmon fishing belongs to the individual owner of the riverside, was not introduced in Finnmark. Since about 1900 the

state has usually rented the salmon fishing in the small rivers to local salmon fishing associations, who usually demand small fees from local fishers and greater fees from external salmon fishers. The income is used for supervision and development.

Finnmark has a lot of lakes, rich in trout, char ("røyr", *salvelinus alpinus*) and whitefish. Regulations here have only recently been introduced for "southern Norwegians" and foreigners. Sami reindeer herders took what they needed of inland fish during the winter season.

2.3. Pastures and winter fodder

The oldest regulation which I know about took place in 1595 between the Sami reindeer herders of Varanger on the one side and the inhabitants of Vadsø and two nearby communities on the other side. The two parties agreed that the reindeer herders should not pass over the pastures near the coastal communities later than the end of May. The agreement was confirmed by the county governor ("lensherre") and it was referred to in 1622 in court proceedings (*Tingbok*).

Such an agreement reflects the opposite interests of reindeer herders and cattle owners.

From the end of the 17th century and onwards this situation is well known. There were also - though less frequent - the opposite interests of the reindeer herders from the inland and the reindeer herders on the coast, both Samis, about grass in summer and lichen in the winter. I have not seen any real regulations, but there has certainly been customs as to where the reindeer herds were supposed to be. The ting protocols contain admonitions from the fogd (sheriff and judge) that the inland reindeer herders should not infringe on the pastures and range lands of the coastal population. I have noticed one interesting proposal in the 1820's from the county governor ("amtman"), that the reindeer should leave the coast region at the same time as cattle owners sent their sheep to the mountain pastures. The idea was presented to him by a most respected mountain reindeer herder.

Since the 1760's and the royal resolution of 1775 the authorities allotted homesteads practically free of charge and (of course) without ethnic discriminations. The homesteads were generally used for a combination of activities, especially fishing in the fjords and along the coast, one or two cows and some sheep, hunting, salmon fishing in rivers, picking of cloud berries. Generally, the "agriculture" in Finnmark was cattle breeding for the use of the family, not cultivation of the soil for cereals, potatoes and hay. Because of the very long winter season winter fodder for the cattle was a vital necessity. It had to be collected on the hillsides, on bogs and on the clearings of former dwelling-places, dried into hay and stacked, to be transported home when snow came. But the winter fodder was scarce, so in spring the cattle needed the first green grass along the shore as badly as the

reindeer. And in the autumn, the reindeer much preferred the hay in the stacks to the brown and wilting grass on the ground. Fencing in was impossible, especially as the homesteads were composed of a site for the dwelling house and a great number of "hay fields", not seldom far away. It is easy to understand why interests clashed and more so as the numbers of both homesteads and of reindeers grew.

Problems became acute after 1852. Until 1852 the reindeer herders from Finnmark could have their herds on the extensive lichen fields in Finland in winter. But in 1852 Russia closed the frontier and denied access to the grand duchy of Finland to reindeer from Finnmark. Norway followed suit by denying access to the fjords to reindeer and fishermen from Finland in the summer season. The lichen fields in Finnmark now became the minimum factor in the reindeer husbandry. In order to protect the lichen, it was vital that no reindeer should be allowed to remain on the plateau during the summer season. The government (by its commissioners) and the reindeer herders agreed that every herd had to move to the coastal region in summer. Accordingly, the clash of interests between reindeer herders and cattle owners intensified.

When the Storting in 1863 decided that homesteads should no more be allotted freely, but sold, it put as the first paragraph of the law that "the ground of the state" should not be sold when it was in different forms of collective use, notably as grazing land for reindeer and for cattle and as moving routes for reindeer between the coast and the inland (and as ground for cod drying along the coastline). This was a "major clause", the parliamentary committee said, and it is still the leading principle in today's law. The Storting followed suit few years later, by ordering commissions to round out or regroup the numerous lots of "hay fields" belonging to the homesteads.

It is safe to say that nevertheless this problem was not really solved. But compared to the 19th century the problem has taken new forms.

Earlier the reindeer was more tame. Female reindeers were milked and castrated bucks were used for transport. Herds were smaller and had to be guarded against beasts of prey, at least in winter. With the modern techniques there is more distance between herders and the reindeer and apparently less control of the herd. Nowadays, meat production for the market is the important aspect of reindeer husbandry. It is not a quite new aspect.

Modern agriculture in Finnmark is still chiefly cattle breeding and milk production, but now with few units, each with many cows. The modern and high productive cow is only able to bait on flat and cultivated fields (so-called "culture range lands", "kulturbeiter"). Grass for ensilage and hay is grown on deep-cultivated fields. Baiting in the hillsides and on the mountain is now only for sheep and perhaps for some young cattle.

To an outsider from Southern Norway it seems as if most of the conflicts between reindeer herders and modern farmers now may be solved by fences around the relatively small areas which need protection, especially in spring or early summer - namely fields cultivated for ensilage, hay and baiting.

2.4. Inland fish, ptarmigans and cloud berries.

These resources were parts of the diet of the local population and to varying degrees. also sold to local merchants, for "export" to towns south of Finnmark.

In relation to the small population these resources were rich, at times abundant. The local communities had their traditional resource areas, and it was considered bad manners to trespass into neighbouring areas.

Since the 1960's this has changed. Modern communications (good roads, cars, scooters, airplanes), leisure and refrigerators have opened the inland to the coastal population and to tourists from southern Norway and abroad. Some regulations have come, mainly to be the benefit of inhabitants of Finnmark (for instance to collect everywhere as much cloud berries as possible or wanted - and in defined areas to catch trout with three nets for each person).

2.4. Commons in Finnmark ?

The legal institution of "common" has not been introduced by formal law in Finnmark. But the civil servants and the sentral authorities have to a considerable extent adapted rules from the southern Norwegian commons for Finnmark, which since the end of the 17th century has been called "the King's (State's) land". Even such an expression as "The King's commons (Almindinger)" was frequently used until about 1850. Since then it has not been in official use.

The southern Norwegian institute of "commons" is related to farms since the 17th century, as accessories. The institute of "common" will need several changes if it - eventually - shall be introduced in Finnmark.

3. Salient features in previous regulations of resources

3.1. Wood.

The pine forest in Alta was declared "His Majesty's Common and Land" by the county sheriff in 1693, most probably in order to preserve Finnmark for the Crown by reserving a vital resource for the local population of Alta and Western Finnmark, thus applying rules about commons in the King's Norwegian Law of 1687. This principle was later extended to all pine forests in Finnmark. Birch has mainly been reserved for local communities. Duties for the pointing out of trees have generally been charged, generally also for the "root value"

of pine trees. The income has been used locally for the very small forest administration.

Even if the population of Finnmark has grown considerably, it has not been necessary to make the regulations more rigorous after ca 1900, because of coal, petrol and electricity and because of timber "import" to Finnmark if necessary, as for the reconstruction after the war.

It is fair to say that regulations has contributed to preserve the woods in Finnmark.

3.2. Fish.

Since the 1830's the principle of "free fishing" was gradually put into effect, by laws. From the 1850's Finnmark has been the main "fishing-county" in Norway.

The fisheries in the fjords and along the coast attracted farmer-fishermen from Southern Norway. They settled in the coastal region. The immigration from south is probably the main reason why the population of Finnmark increased from 0.9 % (7 700) of Norway's population in 1801 to 1.5 % (32 800) in 1900 and to 2 % (80 000) in 1975.

Whaling with modern technology (from Southern Norway) started in the Varangerfjord in the 1870's. The modern whaling seems to have reduced or even extinguished most of the former whale populations within a generation. Commercial losses were probably the main reason why the whaling company then retired from Finnmark, not the uproar of the fishermen (Mehamn 1902) or state regulations (1904). The fishermen stuck to a very old belief, that the whales sent the *lodde* and the cod to the coast and to the fjords. Indeed, fish catches around 1900 were poor. But the real reasons may have been over-fishing along the coast and in the fjords with huge nets and the new trawlers, seal-invasions and - very probably - periodic oceanographic changes.

Anyhow, since about 1900 there has been continuous conflicts between different groups of fishermen - from the fjords, from the coast, from the towns and from Southern Norway - and state authorities about where to fish, what to fish, what quantities of fish and with what technology. I leave details to more informed participants. But to me, the main point is that fish is a continually renewable resource.

3.3. Reindeer pastures.

From qualified observers I have been informed that today's main problem is found in the narrow and comparatively small regions in Western Finnmark where the reindeers stay for a month or two when in the autumn they are on their way to the lichen fields in the interior of Finnmark. This is a vital region and a vital period for the reindeers,

simply because of mating and reproduction. It is said that the region now has deteriorated to a sort of desert, which in some areas will need up to 20 years for regeneration.

Such a problem has not occurred earlier, at least not on the same scale, and there are no precedents of official regulations. The nearest problem seem to have been the scarcity of lichen fields after the closure of the Norwegian-Finnish border in 1852, with the following restrictions on the use of the Finnmark plateau in summer as a solution.

The current problem has some aspects not earlier known:

- the very high number of reindeers
- absence of informal rules and cooperation between reindeer herders.

- absence of necessary official rules

As to solutions concerning reduction of the number of reindeers there are no precedents.

As to solutions concening informal rules and cooperation between reindeer herders, I am confident that they will follow

if

the authorities (the Storting, the Government, the Reindeer herding authority in Alta, the Sameting and the local authorities) use their legitimacy and stick to a leading principle since the Middle Ages, namely to give and to enforce necessary **rules for the use of natural ressources in commons**. I do not believe in self-government for the reindeer-herders.

Actually, the Ministry of Agriculture has taken the initiative, with the statement of problems and possible reforms in a publication to the Storting, February 1992: "A sustainable reindeer husbandry" (*En bærekraftig reindrift. Stortingsmelding nr. 28, 1991-92*).

NATIONAL GOVERNMENTS, LOCAL GOVERNMENTS, PASTURE GOVERNANCE AND MANAGEMENT IN MALI

by

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A. Introduction

This paper analyzes the changing structure of political and legal relationships that channel interactions, in the Soninké country of northwestern Mali, among pasture users, local government leaders, and national government technicians and administrators. The paper concentrates on a single village, Yaguinébanda, located in a prime pastoral zone some 100 km south of the Mauretanian border.

The essay examines whether new governance arrangements inaugurated with the Third Republic in May 1992, after the fall of Moussa Traoré's twenty-year-long military dictatorship in March 1991, can be expected to better the prospects for more effective, efficient and equitable pasture governance and management in Yaguinébanda.

The foci of this analysis are those actors listed in the first paragraph, plus municipal and national assembly representatives elected since the beginning of the Third Republic, and the migrants from Yaguinébanda. The last, like Soninke everywhere in northwestern Mali, have left their rural villages to find work in France, elsewhere in Africa, and in numerous countries the world around. Migrant remittances affect the terms and conditions of life in Yaguinébanda.

Pasture users mentioned in the first paragraph form three distinct groups:

- sedentary Soninké stock owners resident in Yaguinébanda;

- Fulbe and Moor transhumant pastoralists who winter their herds on village lands after spending the summer rainy season in the Gana salt pastures of southern Mauretania; and
- Fulbe and Moor transhumants who move their herds north and well south of Yaguinébanda to take advantage of the seasonal availability of forage and water.

Strategies and behavior of these various categories of actors are examined in the context of the institutional arrangements prevailing in 1990 at the end of the Traoré regime.

Soninké migrants can be expected to continue to play a crucial role in the evolving political situation in Yélimané *Cercle* because they fund acquisition of livestock by family members who remain at home. Migrants' contributions also finance construction of public good and common property infrastructure facilities within their home villages. Finally, migrants can and do mobilize funds to engage lawyers to defend village interests. Yaguinébanda migrants conform to this pattern.

The analysis draws on several sources, notably short-term field work undertaken in Yaguinébanda during the fall of 1990; subsequent interviews with knowledgeable Maliens and Malien officials; a national workshop organized in Mali on results of 1990-91 research on public service provision, natural resource governance and management, and land tenure issues; official documents, especially the constitution of the Third Republic (approved January 1992) and the peace treaty signed with dissident Malien Twareg groups (April 1992); and results of an investigation of governance issues in Mali at national and local levels conducted during the summer of 1992.

The paper consists of six more sections:

- a description of the Yaguinébanda pastoral production system at the end of the Traoré dictatorship, emphasizing the **attributes of renewable natural resources as economic goods** and the **attributes of communities**, and the incentives these attributes create for behavior by various classes of actors;
- an analysis of **attributes of key legal relationships -the working rules** - linking pasture users with pasture governors and managers and the incentives they create for various actors;
- **interactions** which follow when actors pursue strategies to achieve their preferences given the incentive structures within which they operate, and efficiency and equity **outcomes** of those interactions;
- a review of possible new opportunities for self-governance and self-management of common pool resources by users which may be consolidated under the Third Republic;
- prognostication about impacts of these changes on pasture governance and management activities in Yaguinébanda and in other pastoral areas of Mali; and
- conclusions.

B. Yaguinébanda Pastoral Production System Circa 1990: Attributes of Resources and Communities⁷⁶

Yaguinébanda, with a resident population of some 1,500, encompasses an enormous geographic area: 240 km². At present, forage supply poses few problems so long as dry season pastures do not burn. Local cattle, while totaling in excess of 1,100, and 3,000 head of small ruminants (sheep and goats), are still too few in number to overgraze village pastures. Transhumant herders, who formerly frequented the village as well as other communities in the general area, now move rapidly through the zone to more southerly sources of forage when the rainy season ends and surface water sources on the high marches of the Mauretanian Sahel evaporate.

This section examines, in succession, the attributes of the Yaguinébanda pastoral resources (forage and water) and the attributes of the three ethnic groups that exploit those resources. Attributes of the working rules governing access to those resources and their exploitation are addressed in the following section.

1. Attributes of Pastoral Resources

Pastoral resources in Yaguinébanda comprise the two basic building blocks of a pastoral production system: forage and water. Each is assessed here in terms of the ease with which it is subject to exclusion and the character of consumption of the resource: joint and non-rivalrous or separable and potentially rivalrous. Both forage and water turn out to be common pool resources (exclusion problematic, consumption separable).

Forage Resources

Forage takes two forms: grasses and tree browse. Grasses occur throughout most of the village territory, starting on the range of hills that form the eastern limit of that territory, and extending some 20 km to its western boundary. The north-south axis averages roughly 12 km. Of this 240 km², better than three-quarters is open rolling pasture land, on which annual (and some perennial) grasses sprout at the beginning of each rainy season. These grasses provide nourishing forage during the rainy season, and even when dessicated early in the dry season, supply the bulk cellulose ruminants need to survive. From an economic perspective, these vast pastures have the characteristics of a common pool resource. It is difficult to control access to them, and

⁷⁶This and the next section draw heavily on Chapter IV, "Yaguinébanda, Yélimané Cercle: Pasture Land Management in a Sahelian Agropastoral Community," in "Decentralization, Governance, and Management of Renewable Natural Resources: Local Options in the Republic of Mali," Hadiza Djibo, Chéibane Coulibaly, Paul Marko and Jamie Thomson, Vol. III of Studies on Decentralization in the Sahel (OECD Contract No. 90/52, prepared for the Club du Sahel); Burlington, VT.: ARD, Inc., October 1991.

each user (stock owner) makes separable, and potentially rivalrous, use of the resource. Village borders are not fenced, so both neighboring and transhumant herds can penetrate village lands when they will.

Tree browse takes the form of leaves that can be harvested from the scrub brush and small trees, often of the genus *Acacia*, that grow intermittently throughout the village territory. Goats particularly favor browse, but sheep and cows will consume green leaves in the dry season. This often requires that stockherders climb small trees to lop leafy branches for their animals. As with grasses, it is difficult to exclude potential users from access to browse resources, and consumption is separable. Thus browse as well as grasses has the attributes of a common pool resource.

Water Resources

Water resources are likewise common pool resources. They take two forms. Temporary ponds provide highly accessible water sources from early in the rainy season through February of the following year. Use of these sources is essentially costless, since stockholders have only to drive their herds to the ponds and the animals water themselves.

Sub-surface aquifers provide the second type of water resource. When the water table is high early in the dry season, shallow, hand-dug wells and short-life bailing solves the stock-watering problem. Anyone who wants can dig a small well in the dry bed of a seasonal watercourse. However, water tables drop as the dry season advances. By early March, ground water can be tapped only by a variety of mechanized and hand-operating pumping systems through boreholes and wide bore wells.

Wells are all sited within or near the Yaguinébanda residential center, which is located just west of the range of hills on the village's eastern border. The wells are more easily subject to exclusion than ponds because, being located close to the village, they are subject to costless surveillance by villagers going about their daily routines. No effort however has been made to discourage users. Consumption of water drawn from the wells is separable.

Towards the end of the dry season, after surface waters have dried up, groundwater takes on the attributes of a rivalrous good. This reflects, not a present limitation in overall supplies in the aquifers but rather technical constraints on extraction. The domestic water requirements of Yaguinébanda households are met first. Then herds are watered. However, the combination of several diesel pumps and widebore wells does not suffice to meet stock needs. Widebore wells can accommodate only so many buckets at a time, so a natural rationing process occurs.

2. *Attributes of Communities*

Three different user groups exploit pasture resources in Yaguinébanda:

- sedentary, agro-pastoral Soninké;
- transhumant Fulbe and Moor herding families who spend the dry season on village lands; and
- transhumant Fulbe and Moor who merely pass through the village, spending only a few days in local pastures in the spring and fall as they move north and south.

Of the 55 extended families resident in the village, most own some livestock, most farm sorghum, and many produce maize and vegetables in bottomland plots. Almost all receive some remittances from family members who have migrated to the four corners of the world.

The village is divided in two quarters, each usually headed by the oldest member of the founding family. The village chief is also the oldest member of the founding family (the Tourés). The chief's sons actually manage day-to-day public affairs in the community. In addition to collecting taxes and solving disputes that quarter heads cannot solve, the village chief serves as the link between the population and the administration. These traditional structures of local governance appear to handle the bulk of problems and issues of concern to residents.

Seven development and political committees were established by various technical departments, projects, and the Democratic Union of the Malian People (UDPM), the single party of the Traoré regime:

- the Herders Committee (established 1984);
- the Bush Fire Control Committee (established 1986);
- the village brigade for plant protection;
- the commission to link women to the FAO Project; and
- the "democratic organizations," namely,
 - °the local UDPM Committee,
 - °the local committee of the National Youth Unions of Mali,
 - and
 - °the local committee of the National Women's Unions of Mali.

The age group system exists but is not as structured as among the Bambara, in part because of Yaguinébanda's very strong tradition of migration.

Money that village migrants send home from foreign countries strongly affects the social and economic life of the community and strongly influences the behavior and strategies of various actors. The same holds true of the other villages in the cercle.

In the simplest terms, this cash underwrites a high degree of village autonomy, in both economic and political terms. Community residents are not dependent on outside help to initiate activities of local interest. They are also capable of co-financing investments with

outside agencies, whether governmental, foreign assistance or private voluntary in nature. Yaguinébanda residents have benefitted from infrastructure investments - primarily tubewells - financed by foreign assistance. But they have used migrant remittances - that is, their own money - to improve those wells and to construct a village domestic water supply system organized around eight public fountains.⁷⁷ They have also been able to rely on migrant remittances to finance livestock purchases during the 1980s, when foreign assistance funded wells expanded the dry season water supply and made it possible for the first time to maintain large herds in the village year round. This has allowed villagers to maintain independence from state- and bank-supplied lines of credit.

Local people share with other Soninke communities a willingness to pool their resources to hire lawyers to challenge administrative abuses of power. They will also appeal to politicians if that seems a way to get recourse. Soninke are renowned in Mali for their willingness to contest administrative decisions. Indeed, *cercle*-level administrators and technicians in Yélimané readily volunteer that "...the Soninke 'don't let themselves be pushed around.'⁷⁸ Authorities try their best to respect formal rules and principles of fairness in their dealings with local people. This behavior was something of an anomaly under the Traoré regime. Yélimané officials explained it by referring to their own career self interest in avoiding administrative and legal sanctions for abuses of power.

C. The Working Rules of Pasture Governance and Management in the Context of Institutional Arrangements Circa 1990

The working rules of pasture management arise from two sources and reflect a relatively positive relationship between officials and technicians of the Project for the Development of Livestock Raising in the Western Sahel (PRODESO) and the Malien Conservation (Waters and Forests) Service. Once PRODESO began developing water resources in Yaguinébanda (late-1970s early 1980s) Yaguinébanda residents seized the opportunity to invest in livestock as a potentially lucrative source of income. From that point on, surface and ground water, pasture grasses and tree browse gained value, justifying locals' efforts to manage them.

Working rules governing these resources, first water, then pasture resources, are sketched out in the remainder of this subsection.

⁷⁷These water supply improvements cost in 1990 roughly 24,000,000 FCFA, or nearly \$100,000 at a \$1 = 250 exchange rate. "Decentralization, Governance and Management...", p. 31.

⁷⁸"Decentralization, Governance and Management...", p. 32.

Surface Waters

Surface waters are available in Yaguinébanda from early in the wet season (June) until the following February. Formerly herders used them as they saw fit. Since PRODESO has initiated upgrades in water supply infrastructure, the amount of livestock exploiting village resources has increased dramatically. This poses two problems: crop damage during the growing season and over-grazing in the early dry season of pastures closest to the longest-lasting surface ponds.

To deal with these issues as well as with others (pastoral input supply, marketing, etc.) PRODESO invited local stockowners to create a Herders Committee. This unit, organized in 1984, serves both as a local mutual attached to the herders' cooperative based in Yélimané, and as a herder governance unit within the village. Committee members, working with PRODESO technicians, developed a pasture rotation system that reduced crop damage and prolonged availability of forage in the neighborhood of surface water.

Yaguinébanda surface water sources occur in three areas: in the chain of hills that forms of the eastern border of village lands; a small pond south of the settlement; and a larger one north of the settlement. Herds are moved into the hills during the growing season, far from crops and in an area where forage and water are abundant. At the beginning of the dry season, when hill water sources dry up, herders water their animals at the small pond south of town and exploit adjacent pastures. When that pond dries, they move to the northern pond, which lasts for another one-to-two months. By the end of February, all animals must be watered from village wells.

Ground Waters

Hand-dug wells are controlled by those who create them but water is generally abundant during the summer when the water table is high enough to make such wells feasible. Thus few issues of access arise. Tubewells and largebore wells are treated as common property resources subject to minimum regulation, formulated in four operational rules:

- first come, first served - whoever is willing to queue can have water so long as the supply lasts; once at the well head, an individual can draw as much water as s/he needs, e.g., to water a herd of livestock;

- stock may not be watered within a 2.5-meter radius of wells, tubewells and cistern-wells;

- users may not employ certain wells for washing clothes or dishes; and

- villagers are required to finance recurrent costs of operating the diesel pumps installed on some wells, and the costs of repairs when hand pumps break down.

Enforcement of these rules is the prerogative of the Bush Fire Control

Committee, but no details are available on monitoring patterns, sanctions or dispute resolution procedures.

Grass Forage

Working rules of the rotational grazing system governing use of grass forage have already been described. One additional rule constitutes a significant improvement in pasture management strategies. Before PRODESO actions expanded stock raising opportunities in Yaguinébanda, bush fires annually ravaged a large proportion of village pastures. In 1986, PRODESO convinced local people that forage resources upon which their future potential economic success was based were uselessly going up in smoke each year, and probably being degraded over the long run.

The proposed remedy was to construct a fire break along the eastern edge of the flat pastures, at the base of the chain of hills. The working rule stipulates that individuals of working age and able to work must participate at the beginning of each dry season - when crop harvesting activities are in full swing - in constructing a 12-km-long firebreak. Shirkers can be fined 2,500 FCFA for each unexcused absence.

Tree Browse

Shortly after its formation the Herders Committee decided a ban on cutting live wood within the village jurisdiction.

D. Actors' Interactions Concerning Pasture Resources

1. Rotational Pasture Management System: Grass and Surface Water

This system works relatively well. Three members of the Herder Committee patrol three sectors of village pasture lands, informing both local and localized transhumant herders of regulations being applied at any point in the pasture management system. Compliance is reported by the Committee head to be adequate, with the occasional exception of a transhumant herder merely traversing village lands and resting his animals for several days in the process. One local herder did contradict this, asserting he takes his animals when and where he wants.

At present, Yaguinébanda still has a surplus of grass pastures resources. Overgrazing is not a problem. Equity is served since those who want grass for their animals can get it. Furthermore, efficiency has been improved by the rotational grazing system because the distance animals have to move between water sources and pastures is minimized by the rotational system.

2. Pasture Fire Protection System

Since the system was established in 1986, villagers claim they have respected their commitment. Technicians with the Waters and Forests Service in Yélimané confirm that Yaguinébanda sets the standard for surrounding communities. Residents annually invest 1,000 person-days of collective unpaid work to re-open their firebreaks. If a bush fire does occur they mobilize to combat it. Other communities have refused to create firebreaks, but do mobilize en masse to fight wild fires.

In Yaguinébanda work on firebreaks is supervised by one of the chief's subordinates and by age grade leaders. Together they keep track of who appears for work and check on absentees to determine whether they have legitimate excuses. Fined absences are extremely rare.

Bush fires have diminished substantially since the fire control system was instituted. It is difficult to judge the efficiency of this system in the short run, since reduced stress on animals is purchased by collective investment of 1,000 days annually devoted to opening the firebreak. However, the long-term impact is likely to be positive and appreciable. Preserving pasture productivity preserves opportunities to expand stock raising activities within the community. Since most village household own livestock, inequities occasioned by the collective labor mobilization system are probably minimal.

3. Browse Management System

Stock-owning villagers want to preserve tree cover on village lands. Trees provide shade and a microclimate at their base favorable to grass production. If trees are removed, grasses soon disappear as well. Informants reported that cases of proven rule violations were rare. This should be interpreted as meaning that it is difficult for Herder Committee members to shadow each herder, which makes it difficult to get proof of violations. Herders are tempted to lop limbs particularly in the late dry season when green forage is otherwise non-existent. Visual evidence indicates some, but not devastating cutting continues to occur.

4. Well Management and Maintenance System

Villagers report good compliance with the simple rules governing exploitation of well water. Visual observation in Yaguinébanda indicated that wells, including those with pumps installed, were functioning properly, as was the public water supply system villagers had installed at their own expense. Presumably villagers as a group find themselves better off for maintaining these common property investments.

E. Third Republic and Possible New Opportunities for Self-Governance and -Management Concerning Pasture Resources

Critical changes in institutional arrangements from the Traoré dictatorship to the Third Republic may give renewed value to national commitments to decentralize, strengthen the judicial branch, and enhance recourse for citizens in terms both of resolving local disputes and confronting abuses of power by government and military officials. This section begins with a brief review of institutional arrangements under the Traoré regime and their consequences; it then describes formal innovations provided for under the new constitution and the "national pact," or treaty with Twareg rebels who fought a guerrilla war for autonomy from 1989 to 1992 but eventually agreed to a cease fire in return for guarantees of greater regional autonomy.

1. *Overview of Traoré Regime*

In its last years the Traoré government operated a monocentric political system, characterized by a captive legislature, a single political party, a frequently intimidated and corrupt national judicial system. The Traoré regime merely continued the fundamental institutional assumptions of the French colonial and first civilian independence regime under president Modibo Keita, that is:

common people are incapable of governing their own affairs because they lack "training;"

since common people are incapable, efforts at governance and management they initiate independently without prior approval by government authorities are at least wasteful and probably dangerous;

tutelary authority must be exercised by the government to prevent common people from making mistakes (acting outside the nationally-established development plan) and to protect them from traditional elites (notably the dethroned canton chiefs);

government must be responsible for common people "from cradle to grave."

Three negative consequences of this system stand out:

since citizen initiative was generally unwelcome, it generally languished;

the national government never controlled the financial or human resources to honor its commitment to citizens to provide cradle to grave services; and

corruption grew apace once officials at most levels realized they could exercise very wide determining powers to define, in practice, what the working rules were in their jurisdictions. Many succumbed to the temptation and profited thereby.

2. Formal Institutional Changes under the Third Republic

This subsection describes significant changes in formal institutional arrangements prescribed by the Third Republic constitution.⁷⁹ It also notes some of the special institutional provisions for the "northern regions" (read Twareg pastoral zones of northern Mali, collectively, the "Azawad") of the *Pacte National*. The next section turns to the question of the extent to which these institutional innovations may encourage greater efficiency and equity in RNGM. The present section deals first with decentralization issues, and then with changes in organization of the judicial system.

Decentralization and Local Organization

The constitution of the new Third Republic authorizes creation of governmental jurisdictions that will parallel the former administrative jurisdictions down to the *arrondissement* level. While this may be done subsequently through a basic law, the new constitution currently makes no provision for recognizing as formal governments the existing grass roots administrative units such as villages, quarters, "nomadic" groups and tribes. Nor does the new constitution encourage citizens, local groups or formal/informal units (e.g., villages, groups of villages) to constitute new jurisdictions to deal with specific natural resource governance and management problems.

Lack of such a constitutional facility at the disposition of citizens and local leaders amounts to a powerful brake on local initiative to build institutions that reflect the ground-level realities of natural resources distribution and use patterns. There is sentiment among national-level decision-makers to redraw geographic boundaries of the *arrondissements* to "more accurately reflect local historical and social solidarity patterns,"⁸⁰ but this has not yet been approved.

The most significant formal changes propounded by the new constitution concerning decentralization are:

Title XI (Articles 97. and 98), providing for organization of "local" collectivities, i.e., regional, *cercle*, *arrondissement* or county level units, and urban jurisdictions; and

Title XII (Arts. 99-105), establishing a High Council of Local Governments to function at the national level.

Contents of these two Titles are discussed in sequence.

⁷⁹The constitution of the Third Republic was approved and implemented January 12, 1992.

⁸⁰Gellar, "III. Decentralization in Mali," p. 10, in "Democratic Governance in Mali: A Strategic Assessment," prepared by Richard Vengroff, Sheldon Gellar, Benoit Ngom and Tessa Bakary; Washington, D.C.: Associates in Rural Development, Inc. in association with Management Systems International, October 1992 [draft]. This section draws at various points on this document.

Title XI provides for the creation of autonomous local governments for both urban and rural areas. Those of interest here are rural governments. These units, at the regional, *cercle* and *arrondissement* levels, are to have councils, selected by a system of indirect election, and authority to govern themselves (*s'administrer*) within terms established by a basic law. They are expected to have authority to legislate rules and limited taxation authority to mobilize resources to address issues of local interest as well as spend funds allocated to them by over-lapping governments.

Below the *arrondissement* level, villages are to have councils as well, whose members are to be directly elected by persons aged 18 and over. The councillors will select both a village chief and a representative to the *arrondissement*-level assembly. The *arrondissement* councillors, chosen by indirect suffrage, will likewise select a president and a representative to the *cercle*-level council. The same process will be repeated

at that level to constitute the regional government. Council presidents at the *arrondissement*, *cercle* and regional levels will be assisted in their tasks by the technicians and administrators posted in the jurisdiction by central government agencies.

The electoral system is expected to strengthen power of local traditional leaders. Elections at all these levels will be contested by multiple parties, which can be expected to increase politicians' responsiveness to the interests of village council leaders⁸¹

The proposed system of local governance incorporates certain serious weaknesses when viewed from the perspective of NRG. Failure to recognize villages and other local communities as formal governmental units, rather than merely as electoral jurisdictions and administrative units, represents a lost opportunity to capitalize on existing potential for self-government concerning NRG.⁸² Many of these units have continued to function as de facto local governments, whatever the character of overlapping regimes. Failure to recognize them as potentially key actors in NRG, and to transfer formally to them the powers necessary to govern as well as manage resources, amounts to underutilization of existing institutional capital. The consequence is to make local initiative hostage to the approval and support that must be provided by overlapping regimes, whether administrative or elective.

Title XII of the new constitution provides for creation of a High

⁸¹[Sheldon Gellar], "III. Decentralization in Mali," p. 10.

⁸²Recognizing local communities as legitimate centers of governance that require *and should have* appropriate rule-making, -application and -enforcement powers, taxing and dispute resolution authority if they are to function as effective governments, was strongly supported in the recommendations of the Seminar Workshop on Land Tenure and Decentralization Issues, Bamako, 28 November 1991, pp. 4-5.

Council of Local Governments (HCLG). Members of this body are to represent the interests of sub-national jurisdictions from which they stem in matters of environmental protection and social welfare. Constitutional rules preclude an individual from holding concurrently the post of national deputy and HCLG councillor.

Rules implementing Title XI and organizing the details of local government are expected to be promulgated in early in 1993.⁸³

The National Pact

The national pact is a peace treaty signed April 11, 1992 with Twareg rebels⁸⁴ who had conducted a three-year war of resistance in the northern parts of the Sixth and Seventh Regions and throughout the new Eighth Region. It spells out in more detail than the new Constitution the character and organization of local governance envisioned for the northern parts of Mali. In particular, it provides for direct election of councillors at the *arrondissement*, *cercle* and regional levels. It provides also for creation of an inter-regional government. Membership in this council would be voluntary on the part of eligible regions (Sixth, Seventh and Eighth). It is to be governed by a small assembly selected by indirect suffrage from the member regional councils.

Judicial Reforms

A recent evaluation of the Third Republic judicial system sums up changes in that institution in a single paragraph:

The Malien judicial system has been set-up with regard to a recent political experience marked by a justice system subordinated to political power and discredited in the eyes of the people. With regard to that fact, the Malian Constituent Assembly decided to protect the legal system from the control of political authorities. Thus a separation of power has been worked out. Henceforth, the judiciary is considered an autonomous power and not as a subordinate authority.⁸⁵

It is not of course clear when and to what extent these reforms will be implemented, and if they are, how effective they will be in providing citizens leverage to challenge governmental decisions at local as well as national levels. Nonetheless, it is promising that the Malian Constituent

⁸³Gellar, "III. Decentralization in Mali," p. 10.

⁸⁴The *Mouvements et Fronts Unifiés de l'Azawad* (MFUA); *L'Eclair Quotidien*, 14 April 1992, p. 4 (reprint of text of the *Pacte National*).

⁸⁵(Bernard NGom [President, Association of African Jurists], "IV. Mali's Judicial System," p. 3, in "Democratic Governance in Mali: A Strategic Assessment," prepared by Richard Vengroff, Sheldon Gellar, Benoit Ngom and Tessy Bakary; Washington, D.C.: Associates in Rural Development, Inc. in association with Management Systems International, October 1992 [draft].

Assembly of August 1991 invested considerable effort in buttressing judicial autonomy.

F. Prognostication about Impacts of Institutional Changes on Efficiency and Equity of Pasture Governance and Management

This section begins with general comments on the nature of administrative relationships with the population in Mali since independence. Then it addresses specific issues concerning the potential impact of constitutional changes on pasture management in Yaguinébanda and in other pastoral regions.

1. Administrative Traditions in Post-Independence Mali

Problematic aspects of institutional changes intended to encourage decentralization revolve around the distinction between devolution and deconcentration. For much of the past century, the geographic area now known as Mali was ruled by a succession of highly centralized governments under the colonial, independent civilian and independent military regimes.

Since before independence in 1960, national government administrators and technicians have been raised and socialized in this centralized system of governance. Administrators have been trained to command *leurs administrés*. Their reactions in most situations are keyed to implementing top-down directives. This clashes with the formal political commitment of the new regime, which envisages considerably more participation by Maliens as citizens in the country's governance. Resistance is to be expected from many of those in the national administration and technical services accustomed since independence to operating by commanding subjects accorded few if any prerogatives of citizens.

Despite the traditional *dirigiste* approach to many development problems prefaced on the pernicious assumption that those with diplomas somehow immediately become omnicompetent, whereas those without have nothing to contribute but their unthinking labor, some technicians have evolved a much more collaborative approach to the resolution of development problems. The *Compagnie Malienne de Textiles* [CMDT] has played a lead role in this process, the proof being that CMDT peasants have, since March 1991, persistently demanded a greater role in economic and political affairs.

Other examples of collaborative approaches to resolution of development problems, particularly those involved with NRG, are documented in several chapters of a study of renewable natural resources governance and management carried out in Mali in 1990.⁸⁶

⁸⁶In addition to Chapter VI on a CMDT village in southern Mali, see also Chapters III, IV, V, and VIII in "Decentralization, Governance, and Management of

2. Impacts of New Constitutional Changes on Yaguinébanda Pasture Governance and Management Practices

Two obvious points must be made before speculating about impacts of constitutional changes:

Yaguinébanda residents, like other Soninké in Yélimané Cercle, have long demanded that administrators and technicians recognize their prerogatives as citizens and have, as a result of consistent posture and migrant remittances, have already benefitted from a collaborative approach to development in their relationships with PRODES, the Waters and Forests Service, and the Livestock Service;

the speed and extent of implementation of constitutional changes remains highly problematic.

Assuming accuracy of these observations, it seems fair to conclude that, in Yaguinébanda, changes in residents' behavior in the area of NRGGM are not likely to be earth-shaking. On the other hand, it is easy to imagine that clearly recognition of local NRGGM prerogatives and a consequent reduction in the transactions costs of obtaining authoritative rules on governance and management of pastoral resources could stimulate an incremental process of improvement in the existing system.

If the changes promoting local governance capacity envisaged by some articles of the new constitution are introduced, several other innovations become possible. Yaguinébanda stock owners like their peers in other Yélimané communities have long sought better transportation and marketing infrastructure facilities for the animals they produce. Soninké, unlike Twareg, Fulbe and Moor pastoralists, appear to produce livestock primarily as an investment (they engage in ranching - meat production for profit - rather than in dairy-farming for subsistence, with meat and milk product marketing as secondary activities, as do the latter three groups).

Soninké could be expected to respond to greater market demand by exploiting further the underutilized pasture resources they possess (at least in average to good years). Thus if better - cheaper, more rapid and reliable - transportation facilities were developed in Mali's northwestern Region I because burdens illegally imposed on private and public entrepreneurship under the former autocratic regime are sharply reduced under a new, more democratic and more open political system, stock-raising activity can be expected to expand.

At some point, particularly in bad drought years, such developments will pose range management problems. Who has rights

Renewable Natural Resources: Local Options in the Republic of Mali," Hadiza Djibo, Chéibane Coulibaly, Paul Marko and Jamie Thomson, Vol. III of Studies on Decentralization in the Sahel (OECD Contract No. 90/52, prepared for the Club du Sahel); Burlington, VT.: ARD, Inc., October 1991.

to maintain what size core herds on village lands, in order to restart ranching activity when climatic conditions improve? This may raise interesting questions of relative prerogatives of Yaguinébanda residents versus transhumant pastoral families who now winter their stock on village lands. Solutions along lines already developed - importing food supplements - can be envisaged, but who is responsible for implementing them, and who has the right to be included?

3. Implications of Constitutional Changes for Other Pastoral Areas and Groups

If the Malien national government implements decentralization provisions of the Third Republic Constitution and National Pact with due deliberateness over the next three to five years, two outcomes, similar to those predicted for Yaguinébanda, can be foreseen.

First, when demands exceed supply of pastoral resources, local communities in the Sixth, Seventh and Eighth Regions can be expected to invest more effort in delimiting their resources and in excluding non-authorized users. Concurrently they may seek ways to increase the drought-resilience of their production systems by investments in tapping new water sources, in enhancing perennial grass resources, and possibly in developing more rapid destocking arrangements.

Greater local autonomy and authority, plus a new set of citizen-dependent supra-local institutions whose officials have stronger incentives to respond to the interests of their electors than to those of officials in overlapping regimes, may open the door for further institutional innovations. These will likely involve local initiatives to structure pastoral enterprises in ways that draw more fully on herders' indigenous knowledge of what is and is not feasible. Institutional innovations might also involve coordinating pastoral strategies in jurisdictions above the grass-roots community level, again to improve infrastructure and to enhance the capacity to exploit underutilized resources.

The second consequence to be foreseen is greater "ethnic" conflict. Units of different ethnic groups as well as units within the same ethnic group may begin jockeying for advantage. Methods by which such conflicts can be resolved, and the costs of resolution, will greatly influence the capacity of Malian pastoral peoples to maintain a degree of economic autonomy and some capacity to defend new political prerogatives. If repeated armed skirmishes, or prolonged open warfare result among pastoral groups using resources in the northern regions, odds are that the central government will attempt to re-impose a fiat form of order. If conflicts can be resolved by peaceable means, on terms that litigants will accept and support, then productivity and living standards in the pastoral sector may gradually improve.

G. Conclusions

This paper has used a single pastoral community, Yaguinébanda, situated in northwestern Mali to illustrate the natural resource elements and attributes of those resources, of the community and of rule systems to highlight incentives that influence stockowners' behavior. Most of the analysis focused on the nature of the pastoral enterprise in Yaguinébanda during the last years of the autocratic Traoré regime.

In the aftermath of the downfall of that regime, Malians have developed a new constitution. Key provisions indicate a renewed commitment to transferring authority over NRGM to local communities. Should these commitments be honored, pastoral communities in both the northwest and northern (Azawad) regions will have new opportunities to use institutional innovations to strengthen their production systems. They also face new dangers linked to greater local autonomy and authorization for more autonomous local initiatives. The outcomes are problematic in this latter case. The quality and reliability of dispute resolution mechanisms will play a key role in the success or failure of the new system.

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THE LEGAL STATUS OF RIGHTS TO THE RESOURCES IN THE BARENTS SEA

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1. Introduction

The Barents Sea has long supported one of the world's major commercial fisheries. Overall in the last few years the total catch has been of the order of 1-1.5 million tonnes a year, compared with peak catches in the mid and late 1970s of about 4-4.5 million tonnes a year. At that time the catch was about 6 or 7 per cent of the total world marine fish catch (even though the Barents Sea occupies only about 0.3 per cent of the area of the world's seas and oceans): now the catch represents only about 1.5-2 per cent of the world total. The decline in catches reflects both natural fluctuations in fish stocks and over-fishing. This paper will focus on the rights to the fish resources in the Barents Sea at the international level and the legal aspects of their management. The emphasis will be on demonstrating that the fish stocks to a large extent are international - common - resources. I will also demonstrate that fisheries management in this region is affected by some particular problems: disputed maritime areas, special management regimes for some living resources and non-fisheries issues, such as national security and pollution. These problems must also be taken into account when devising management arrangements and measures.

2. General legal framework

The general legal framework establishing rights to the living resources and management responsibilities in the Barents Sea is set out in the 1982 Law of the Sea Convention (LOS Convention). Although this Convention is not in force, its general principles on coastal states' rights regarding fisheries management are assumed to reflect customary international law, which is legally binding for all states.

In the 1960s and early 1970s, international fisheries management in the Barents Sea was undertaken by the regional North-East Atlantic Fisheries Commission (NEAFC). Art. 56 (1) of the LOS Convention establishes, however, the coastal state's sovereign rights for the purpose of 'exploring and exploiting, conserving and managing' the living resources in the 200-mile exclusive economic zone. The first point to note is thus that the two coastal states of the Barents Sea, Norway and Russia, have exclusive jurisdiction over the living resources in their 200-mile zones. Since the LOS Convention merely establishes vague conservation duties, Norway and Russia are relatively free to decide

which conservation measures to be implemented. No fishing rights for third states in the 200-mile zones in the Barents Sea can be founded upon the LOS Convention and the two coastal states may decide to what extent third states shall be given access.

Secondly, the most important fish stocks in the Barents Sea are shared between the two coastal states. Shared - or common - fish stocks necessitate co-operation between the owner states. Such co-operation is also an obligation under the LOS Convention art. 63. This means that fisheries management in the Barents Sea is still an international problem, but it is now a bilateral rather than a regional problem.

Thirdly, management is undertaken by the two coastal states, not by regional entities such as the Norwegian county of Finnmark or by national fisheries organizations. States may have other aims than merely serving regions or fishermen, for example protecting national security.

Fourthly, the principle of balance has been essential. It seems obvious that balance is applied when exchanging quotas. But this principle is also relevant for the introduction of other conservation measures, such as increasing mesh sizes in trawl or establishing areas closed for fishing, because such measures have effects upon the fishing opportunities between the two states. The need for balance may complicate the adoption of agreed conservation measures and thus make management less effective. There may also be a balance between the two states, but an imbalance at the national level, in the sense that certain fishermen may be more obstructed by the measures than others. This demonstrates the need for an integration of fisheries policy at the international and the national level.

How to establish efficient management of the shared stocks is the most important challenge facing fisheries management in the Barents Sea. Neither the LOS Convention nor the 1975 or 1976 bilateral treaties between Norway and Russia establish precise rules and regulations for management of these stocks. A pertinent question is to what extent these treaties should be further developed by establishing more precise management goals, defining the content of balance, facilitating balance through transfer payments, establish co-operation in enforcement etc. There is reason to examine whether any methods applied in the management of other international commons may also be applied in the management of fisheries in the Barents Sea. Another question is how national and local interests should be integrated. Should for example North Norway be delegated more extensive management responsibilities?

3. Disputed areas

Norway and Russia have not agreed upon the delimitation between their 200-mile exclusive economic zones. The so-called 'Grey Zone Agreement' was, however, entered into by the two states in 1978. This agreement provides an interim arrangement for fisheries in the part of the disputed area lying within 200-miles of the mainland. This agreement has worked well for the area it applies to. There is, however, no such arrangement for the disputed areas further north between the Norwegian Svalbard archipelago and the Russian Novaja Zemlja and Frans Josef Land. This creates problems regarding reporting of fishing activities and enforcement in these areas.

The legal regime in the 200-mile zone around the Svalbard archipelago is disputed. Norway claims that the 1920 Svalbard Treaty does not apply in this zone, whereas Russia contends that the Treaty prevents Norway from establishing measures in the Svalbard 200-mile zone on a unilateral basis. Other states (except for Finland which supports Norway's position) have either claimed that the Treaty applies in the Svalbard 200-mile zone or have reserved their position. The main effect for fisheries of the Treaty applying in the Svalbard 200-mile zone would be a prohibition against Norway adopting discriminatory regulations (cf. the Svalbard Treaty art. 3). This dispute has meant that Norway has been careful in introducing conservation measures, there has been violations of regulations by foreign vessels and Norway has been reluctant to arrest violating vessels. Fisheries management in this zone has been under reasonable control, but further violations may make a more strict management and enforcement necessary.

There is still a remaining pocket of high seas outside the 200-mile zones in the Barents Sea, where uncontrolled fishing by third states has recently occurred. General international law provides that coastal states have jurisdiction in the 200-mile zones, whereas the flag states have exclusive jurisdiction on the high seas. This means that conservation measures on the high seas, to be effective, would have to be agreed upon by all states fishing in such an area. There is some basis in the LOS Convention art. 116 for claiming that coastal states have regulatory control over fish stocks straddling between a 200-mile zone and the high seas, but this question is controversial. Norway has tried to gain control by bilateral arrangements with the relevant states, but more firm arrangements may be needed in the future. It remains to be seen whether such arrangements will be adopted on a global, regional or bilateral level.

4. Other management regimes

Most fish stocks are managed bilaterally between Norway and Russia. There are, however, also examples of marine living resources managed on a regional or a global level. Article 66 of the LOS Convention

contains special regulations on anadromous species, the most important such species in the North Atlantic being salmon. The state in whose rivers anadromous species spawn is primarily responsible for the management of these stocks. In general, fishing for such species is prohibited beyond the 200-mile zone. Salmon in the Barents Sea is managed through the regional 1982 Convention for the Conservation of Salmon in the North Atlantic Ocean. The management of salmon does not seem to create international problems in the Barents Sea.

The LOS Convention art. 65 allows coastal states to limit or prohibit the exploitation of marine mammals. States are to co-operate in the conservation of marine mammals. Whales are managed through the global International Whaling Commission (IWC). In 1982 the IWC adopted a prohibition on all commercial whaling. Japan, Korea, Peru, Norway and Russia filed objections and the decision was thus not binding for them. However, these states later stated that they would cease whaling and from 1989 there has been no commercial whaling.

Marine mammals eat a considerable amount of fish and compete with fish for food. The ban on whaling makes multi-species management in the Barents Sea difficult. Since the minke whale stock is at a sufficient high level, Norway has decided to start commercial whaling from 1993. Catch of marine mammals may, however, be met by import restrictions from other states, especially the USA, and by actions by environmental organizations.

5. Non-fisheries issues

Several non-fisheries issues have an impact on fisheries management. The Kola Peninsula bordering on the Barents Sea contains the largest naval base in the world and harbours the most important of Russia's four fleets. This has meant that security issues has played a major role in co-operation between Norway and the former USSR. This has especially affected co-operation in enforcement. With the disappearance of the cold war, co-operation between Norway and Russia should be easier, but security aspects will still be taken into account by the two states.

The Barents Sea may contain considerable quantities of oil and gas. These prospects may also influence fisheries management. There is for example reason to assume that Norway can accept non-discrimination in the Svalbard zone for fisheries purposes, but not for oil and gas exploitation. But since there is a connection between the legal regime in the 200-mile zone and the continental shelf, Norway may not readily accept non-discrimination in the 200-mile zone. The result may thus be that oil and gas interests prevent effective fisheries management in the Svalbard zone.

There has been reports of Russian dumping of nuclear waste in the

Barents Sea. If fish in this area become contaminated - or if the consumers get such an impression -, this may have disastrous effects on fish exports. Consequently there is a link between effective management of pollution and fisheries management.

Another example of the connection between fisheries management and export is the recent agreement on the European Economic Area (EEA). The European Community got increased quotas in the Barents Sea in exchange for better market access to the European Community.

6. Conclusions

The 200-mile system has made it easier to adopt adequate management measures in the Barents Sea. Before the introduction of the new ocean regime, all states fishing in this area had to agree in the regional fisheries organization, the NEAFC, on which conservation measures to implement, while management is now left to the two coastal states, Norway and Russia (except for whales and salmon). But because of the shared stocks, the fish in the Barents Sea is still an international common resource.

Fisheries management in the Barents Sea is primarily a question of the effectiveness of the bilateral co-operation between Norway and Russia. This co-operation may be developed by establishing binding agreements on management aims, the content of balance, enforcement etc. Experiences in the management of other international commons should be examined. There may also be a better integration between national and local management needs, possibly by delegating more management responsibilities to a local level.

The effectiveness of the management arrangements will, however, be influenced, first, by questions related to the disputed areas in the Barents Sea: the unsolved delimitation of the 200-mile zones, the 200-mile zone around Svalbard and the remaining area of high seas in the Barents Sea. Secondly, non-fisheries issues, such as security, oil exploitation on the continental shelves, pollution and export conditions will also limit the number of options available. Finally, problems with the management of marine mammals may make multi-species management less effective.

DRAFT VERSION

- ready for comments, not citations

THE EFFECTIVENESS OF INTERNATIONAL REGIMES: THE BARENTS SEA FISHERIES CASE

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This paper will assess the effectiveness of the Barents Sea fisheries regime. We are particularly interested in identifying features of the institutional setup of the regime which might have contributed to its effectiveness - or lack thereof. The core of the Barents Sea fisheries regime is formed by its specification of rights, rules, and recognized practices for making collective decisions. Prior to 1977 the areas in question were international beyond the thin belt of territorial waters and most of the fishery resources were subject to international management in the North East Atlantic Fisheries Commission (NEAFC). The introduction of 200 mile exclusive economic zones (EEZ) by Norway and the Soviet Union restricted considerably the membership of the regime. Based in a bilateral Fishery Agreement, a Mixed Norwegian-Soviet Fisheries Commission has been operative since 1976, making authoritative decisions on total catch and quota allocations. As we shall return to, this is fully in line with the 1982 Law of the Sea Convention, signed but not ratified by both countries⁸⁷.

The paper is an early draft of a chapter in an edited volume

⁸⁷ Article 63 states that shared fish stocks shall be managed cooperatively, and that coastal states "...shall seek, either directly or through appropriate subregional or regional organizations, to agree upon the measures necessary to co-ordinate and ensure the conservation and development of such stocks..."

comparing several international regimes in terms of institutional design and effectiveness. The comparative research design of the multinational project which forms the base of this volume is described in some detail in Levy, Osherenko and Young (1991). First we will briefly review the methodology for evaluating regime effectiveness used in the paper. Section two describes the history and the important elements of the regime while the third seeks to identify the problem addressed by the regime through a discussion of basic principles of fisheries management. In section 4 we offer the substantive analysis of the Barents Sea fisheries management regime.

1. How to assess effectiveness

The concept of regime effectiveness is elusive indeed. Clearly, there is an element of *causation* present, or a statement that the regime has had an impact. As regimes are social institutions, this requires a demonstration that the regime has contributed to a change in relevant human *behaviour* among members or non-members. We shall return to this problem below. Second, there is in the effectiveness concept an element of *evaluation*: this regime impact is assessed according to some standard. The question is *what standard*, and this question can be split in two: what kind of behavioural change would qualify as relevant to the standard; and *how much* behavioural change should be required for us to judge the regime as effective? Usually, it is easier to agree on the former than the latter. For both questions, one may be inclined to refer to *goals* expressed in the regime itself, by actors who took part in its negotiation or even those subject to the regime. Goal attainment, however, is an unreliable indicator of effectiveness. Frequently, goals expressed in e.g. preambles of agreements are too vague or comprehensive to offer much guidance; the negotiations may well have harboured hidden agendas not expressed in the agreement itself or by its negotiators; and different actors may have had quite different reasons to support it. In this paper, therefore, we apply the wider concept of problem solving as a key to the evaluation of regime effectiveness: *does the regime contribute to the solution of the problem it was designed to address?* Note that this concept does not remove the difficulties of specifying contents and sources for the relevant standards - it simply acknowledges the fact that formal goal attainment is insufficient and urges the analyst to proceed with a broader and more indepth assessment of the socially defined purpose of the regime. Our procedure (Levy, Osherenko and Young, 1991:18) is to discuss the goals stated in the constitutive agreements or by members of the regime; but also views expressed by members of the scientific community concerned with the issue at the time. Where these sources diverge, our formal description of the problem will reflect not only the former. If the social assessment of the problem is changing over time, we will seek to incorporate these changes in our evaluative standard.

This will allow us to make judgements on the adaptability of the regime towards a changing environment.

One might intervene that such a procedure is likely to produce arbitrary results in the sense that two analysts might nail down different definitions of the problem and subsequently reach different conclusions about effectiveness. This is a weak intervention because such disagreement is neither unavoidable nor problematic. The important thing is to combine theoretical validity with explicitness: to have a well-grounded basis for evaluation out in the open in order to see the boundaries of the claims made in the conclusion.

Summing it up, in this paper we address regime effectiveness along two dimensions: problem solving and behavioural impact. These two dimensions are closely connected: a necessary but not sufficient condition for solving problems is the capacity to *affect the behaviour* of those actors who are relevant to the problem. The fundamental test is whether this behavioural change contributes to the *solution of the problem* for which it was organized. This problem must be specified indepth in each given case. In our context, this is done by delineating the fundamental problems of fisheries management in section 388, propped up by the regime goals stated in section 2. As noted above, however, statements about effectiveness harbour *causal claims*: we must show that it is the regime, rather than some other factor, which has been brought about the behavioural change. Therefore we must constantly be sensitive to the question of what would have happened were it not for the regime. Some actors might have tried to grapple with the problem on their own; and some of the issues covered by the regime might have been addressed jointly in an *ad hoc* manner rather than the regularized one ensured by the regime. Therefore, in order to say that the regime was effective in producing this change one must show that it would have been difficult to bring it about, at least to the same extent, in the absence of the regime. This is counterfactual analysis, and there are definite ways such arguments should be structured (Fearon, 1991). The key methodological requirements are *explicitness* about the counterfactual argument that are made, and *reasonableness* of theoretical models and empirical information used, i.e. one should not use other behavioural models or other, selectively chosen, pieces of information in the counterfactual analysis than in the causal analysis⁸⁹.

⁸⁸As we shall see in section 2, this implies that other goals addressed by the regime, such as the development of friendly relations between Norway and the Soviet Union, is shoved into the background. As noted above, the important thing is that this choice is made explicit.

⁸⁹The latter requirement Fearon terms co-tenability.

2. The bilateral regime

The purpose of this section is to identify key components of the regime in order to subsequently trace their impact on the problem in order to pinpoint which of these seem to contribute especially much to its effectiveness.

Soviet-Norwegian cooperation in fisheries started in the early 1920s, with a number of concessional treaties providing Norwegian companies with practically exclusive hunting rights in Russian territorial waters. These agreements were quite similar to the ones acquired by Japanese firms in the Bering Sea some years later (Stokke, 1990:5) and reflected the inability of the Soviet Union to exploit her resource wealth in the northern regions. These concessions promoted the development of friendly relations between Norway and the young Soviet state. In the following decades, a series of intergovernmental agreements were negotiated regarding trade and navigation (1925), the regulation of sealing (1957), procedures for handling claims in connection with damages to fishing gear (1959, still in effect), and reciprocal access in each other's fisheries zones between 6 and 12 miles (1962).

Three bilateral agreements between the Soviet Union⁹⁰ and Norway form the basis of the current regime⁹¹. The cornerstone is the 1975 *Cooperation in fisheries agreement*. Stressing the need for conservation, rational utilization and the building of good neighbourly relations, this agreement establishes a Mixed Soviet-Norwegian Fisheries Commission⁹² to meet annually and make consensual recommendations on total quotas of the three shared stocks, cod, haddock and capelin. The commission moreover makes recommendations about the distribution of quotas between the parties, the share to be allocated to third countries, as well as operational restrictions regarding the geographical distribution of catches, mesh size and minimum size regulations, closed periods etc. Also, the commission is instrumental in coordinating scientific research between institutions in the two countries. More recently, it has overseen and even stimulated the emergence of cooperative relations in areas such as industrial cooperation between fishing and processing units in the two countries and the exchange of knowledge on catching and selection technologies. To the Norwegians, the agreement was instrumental in obtaining Soviet acceptance of her establishment of trawl free zones beyond 12 nautical miles, which was seen as a first step towards extending coastal state jurisdiction in accordance with the evolving Law

⁹⁰Today, of course, its legal successor Russia.

⁹¹According to the former Soviet Union, and now Russia, in addition to these three agreements the 1920 Svalbard Treaty is a part of the Barents Sea regime. This, however, is denied by Norway who claims that the limitations on her exercise of sovereignty laid down in that Treaty does not extend beyond the territorial waters of the archipelago. See below.

⁹²Now Russian-Norwegian Commission.

of the Sea (Flöistad, 1991:38). The second key document is the 1976 *Agreement on mutual fisheries relations*, which in practice expands the geographic area of cooperation to fit the subsequent Norwegian 200 mile EEZ declaration. Within agreed-upon quotas and subject to coastal state rules and notification and licencing procedures, this agreement permits fishing in the EEZ of the other. The third key Agreement in the bilateral fisheries regime is the 1978 *Grey zone agreement*. Its main function is to produce a system of enforcement in a disputed area of the Barents Sea⁹³. Without an agreement, the exercise of jurisdiction in disputed waters can easily lead to incidents between the contenders because if not opposed, it may strengthen the legal basis of sovereignty claims. Therefore, the provisions of this agreement tries to minimize its legal relevance to the national sovereignty claims. First, the Agreement, which requires annual renewal, provides for separate systems of licensing and enforcement in the Grey Zone⁹⁴. Both parties license national and third party vessels in the zone, and enforcement is done by the government that has issued the licence. Second, the geographic extension of the Grey Zone is much wider than the disputed area. This is done in order to reduce the identification of one with the other and hence, between the disputed area and the non-exclusive enforcement practice agreed to⁹⁵.

As can be seen, management authority rests with the individual coastal states: formally it is a minimalist *harmonization regime* in that the mixed commission is endowed with recommendatory powers only. While these recommendations are more or less automatically adopted by the national governments, the *activities* within the regime can still be summed up as annual meetings of the commissioners aiming to draw up an annual bilateral agreement, or protocol, regarding the conduct of fisheries in the Barents Sea. This agreement must be adopted, implemented and subsequently enforced by the respective national authorities. Hence, formally the regulations are not constitutive parts of the regime. This is to a large extent a reflection of Norway's long-standing skepticism to bilateral arrangements with the Soviet Union in the far North, based in two worries: a practical-political concern not to end up as a weak party to a strong agreement; and a legal-political concern not to add to Soviet sovereignty claims in the disputed part of the Barents Sea by explicitly accepting Soviet or even joint institutions

⁹³This disputed area is defined by the Norwegian claim that the maritime delimitation line should follow the line of equidistance to the two coasts of the two states, and the Soviet/Russian insistence that it should follow a sector line. Negotiations have been on and off since 1974 without producing a solution.

⁹⁴Or "adjacent area" which is its formal name,

⁹⁵This point is especially stressed by the Norwegian side, however. In Soviet terminology the Grey Zone has often been referred to as the Zone of Joint Management in the Barents Sea, sometimes even implying that the arrangement has some validity for the petroleum area as well.

producing authoritative decisions pertaining to it.

By implication, rather than constitutive parts of the regime, the production of *regulations* is an important *target* of the regime and as we shall see, one of the purposes of this investigation is to find out the impact the bilateral regime has had on this type of activity.

This fisheries regime is *nested* in a set of wider regimes, organizations and inter-state relations. At the most general level, both the coastal state privilege and the obligation to set up cooperative institutions to conduct rational management of shared stocks are specified in the 1982 *United Nations Law of the Sea Convention*. While yet not in force, these features are generally seen to have entered into the body of international customary law. Coordinated knowledge production is nested in the broader work within the International Council for the Exploration of the Sea (ICES), a multilateral institution which has served as a coordinating vehicle on Atlantic marine research since the turn of the century⁹⁶. As stressed by Fløistad (1991), Norwegian-Soviet relations in the fisheries sector has also been nested in a wider framework of international relations in the region, which have changed much the past decade from a conflict-embedded low in the early 1980s over the era of Soviet *perestroika* and East-West thaw to the present largely optimistic and cautiously cooperative situation⁹⁷.

Fisheries management in the EEZ around *Svalbard* is worthy of special mention. The dispute is rooted in a long-standing ambition on the part of the former Soviet Union to obtain a privileged status among the signatories to the 1920 Svalbard Treaty. This Treaty gives sovereignty over Svalbard to Norway with some specified limitations⁹⁸. Norway argues that there is nothing in it to suggest that Norway does not have unilateral management authority on Svalbard, only an obligation not to discriminate against foreigners in certain areas; and furthermore, that this obligation is limited to the onshore areas and territorial waters and does not concern the EEZ. The Soviet Union never recognized Norway's right to establish unilaterally a management zone around Svalbard and most other signatory states too have filed their reservations. This is why Norway has implemented only a non-discriminatory fisheries protection zone although she claims an EEZ. Because of the link in international law between the exercise of accepted management authority and the development of jurisdiction, Soviet and later Russian fishermen have been prohibited by their home

⁹⁶For a discussion of the role of ICES as a provider of scientific advice in the fisheries management process, see Fløistad (1990).

⁹⁷For a broad presentation of the emerging cooperation in the Barents region, with an emphasis on Russo-Norwegian relations, see Stokke et al. (1992).

⁹⁸Norway is obliged to keep Svalbard demilitarized, give nationals of any of the signatory states equal access to specified economic activity, and refrain from collecting higher taxes than required to cover the costs of administering the archipelago.

authorities to report their catches in the Svalbard zone to Norwegian Coast Guard vessels. Nor do they sign inspection papers. This has made every Soviet and Russian trawler inspected in the zone a formal lawbreaker and they receive due warnings from the Coast Guard. While the Soviets formally opposed Norwegian unilateral regulations they usually acted in accordance with them. Nothing was done to interfere with or obstruct the actual work of Norwegian inspectors in the Svalbard zone and this has been matched by the *low posture* of Norwegian authorities to violations in the Svalbard zone. Foreign vessels found guilty of violating Norwegian rules are given warnings but are not fined or arrested, as might have happened in the Norwegian EEZ⁹⁹. While both parties stick to their principles and seek to avoid actions that may weaken their claims, in practice they behave in a cooperative manner.

In conclusion, while varying in their specificity, the three agreement texts specifying the Barents Sea fisheries regime as well as statements by actors who participated in their negotiations seem to suggest that the regime aims at balancing the interests of resource utilization, conservation and general foreign policy relations between Norway and the Soviet Union. In this paper we will not pay much attention to the latter goal. There is definitely evidence to suggest that the regime has promoted friendly relations by offering a stable forum for cooperative problem-solving in an area of strategic tension between East and West, but we do not pursue this hypothesis. Even with this simplification, however, we are strengthened in our belief that formal goal attainment is likely to be insufficient for specifying operational standards for effectiveness. Neither the agreements nor statements of actors negotiating them can inform us on *what kind of balance* shall be struck between the sometimes conflicting goals of utilization and conservation. In accordance with the procedure outlined above, section 3 proceeds with a more indepth assessment of the nature of the problem addressed by this regime.

3. The nature of the problem

The purpose of this section is to arrive at *criteria* for evaluation of the effectiveness of an international fisheries management regime. We should be able to pinpoint not only the *operational variables* that must be specified in order to judge the regime effective or ineffective, but also their *required (minimum) value*. These variables may refer to conditions in the natural or social environment, such as the health of

⁹⁹The risk of this approach is obvious. Weak enforcement may have the effect of diluting both the rules and the claims to authority behind them (Hoel, 1989). When Spanish trawlers in the late 1980s openly mocked warnings issued by the Coast Guard, pressure rose to step up reactions. However, the issue was solved by diplomatic means.

the fish stocks, or to human behaviour. Accordingly, this section will show why fisheries management is necessary, and what issues have to be addressed in formulating and implementing fisheries management policies.

3.1. What is fisheries management?

It will prove useful in the discussion to outline the general fundamentals of fisheries management and to demonstrate the difficulties of producing successful management. The discussion will abstract from many biological and economic complexities; the purpose is to state and elaborate the goals and problems of fisheries management in the most general sense. Two points should be noted explicitly. First, fisheries management is necessary because of the lack of individual ownership or control of the fish resource. If all individuals have open access to stocks, their incentives may cause a race for the fish which can cause inefficiencies and waste in the current period, and which can lead to stock depletions in the future. Second, however, while the amount of fish taken in any period can have effects on stock sizes in the future, there are many other determinants of stock size. The science of estimating current stock size and predicting the effects of certain catch levels on future stock size is still in its infancy. While scientific advice is a fundamental and extremely useful part of good fisheries management, decisions will always have to be made with varying degrees of uncertainty and consensus about the impact of fishing.

At the most basic level, the goal of fisheries management is to allow for proper use of the fish stock(s) over time. The key phrases of this definition are "proper use" and "over time". Proper use has to do with how much and what types of products are produced, who produces them, and how the gains from production are distributed. The over time element derives from the renewable nature of fish stocks. The amount of catch in any period can affect the amounts that will be available for harvest in the future. Therefore the decision to produce a certain amount in a given period should be made taking into account the needs of the future as well as the needs of the present. As will be seen below, this is the crux of evaluating the effectiveness of fisheries regimes. It will be useful to discuss the two aspects of fisheries management separately in more detail.

3.2. The conservation problem

Consider first the "over time" problem concentrating only on the size of catch at any one time. The problems of how the catch will be used and by whom and its inter-relation with the "over time" problem will be discussed below. The issues, all of which are related, that must be faced when addressing the problem of proper use through time include:

1. the inherent variability of the resource and the difficulty of

obtaining knowledge concerning the population dynamics of the resources; and 2. the necessity of determining a trade-off ratio between catch today and catch in the future. Later we shall emphasize the problem of implementing and enforcing a program to ensure that catch is kept to the agreed upon level.

3.2.1. Science and uncertainty

In a world of certainty, an inter-temporal use problem is greatly simplified. If you know how an increase in catch will affect future catch potential, there is a concrete basis from which to determine if it is wise to increase landings. More to the point, if the exact amount and timing of increased stock productivity that will result from a reduction in catch are known, people have a basis for determining if the gains are worth the current self-determined deprivations. See the discussion below.

However, in the real world of fisheries management things are not so clear cut. There can be large fluctuations in stock size which may be independent of current catch levels. Further, the cost of obtaining and evaluating data to determine the current and likely future status of the stock, with or without changes in the catch levels, is high and the accuracy of the estimates and forecasts is less than perfect. Therefore the cost of increasing current catch levels and the benefits of current harvest reductions, both in terms of future stock potential, are difficult to ascertain. In short, the actors must make decisions with varying degrees of uncertainty about the results of their actions.

3.2.2. Catch today vs. catch in the future

For purposes here, the proper use through time question can be most usefully discussed in the context of fish stocks that have been heavily exploited such that stock size and catch levels are relatively low. Frequently management is not seriously considered until the stocks are in trouble. The argument from industry is "Why manage if there is no problem?" In this situation the conservation problem is to rebuild the stock. But what do we mean by rebuild? By how much should the stock size be increased and at what rate should the rebuilding take place? Significant reductions in current fishing will tend to increase stock size rapidly but present consumers and industries will suffer. Smaller reductions for longer periods of time can potentially achieve the same ultimate stock size. The benefits of full stock productivity will be postponed, but the annual effect on producers will be less.

The choice of which rebuilding program to use will depend upon society's preference for consumption and employment now or in the future. To anticipate some of the discussion to follow, it is useful to note that consumers and workers may have different preferences in this regard. This is especially true of fisheries in developed countries. For consumers to go without a certain type of fish for several years when it

is a relatively small part of the diet may be of little concern; moreover, usually imports can fill the void. However, for workers to be unable to harvest that same fish, especially if it accounts for a significant part of total income and if opportunities to harvest other species or for other employment are small, it can be a very important.

Because of the tendency for unregulated fleets to overharvest fish stocks, the conservation problem exists even when stocks are not currently overfished. The problem is to ensure that current catches do not become so high in the present that future use is jeopardized. Here again what society deems as the proper catch level in the present will depend upon its intertemporal preferences.

3.3. The utilization and distribution problem

The discussion thus far has focused on the "over time" or conservation side of this. But in order to understand real world fisheries management, it is necessary to understand the many aspects of proper use and how the concept can be made operational. Even with a specified catch level for a given year, it is still necessary to determine how it is to be taken and by whom and what final products will be produced. This is partly an economic efficiency problem, because all else equal, it makes sense to harvest the allotted catch as inexpensively as possible and to use it to produce that combination of final products which has the highest value. There is an extensive economic literature on how management programs can be developed to address this issue. For example, see Anderson (1986).

The political reality, however, is that proper use is most often viewed as a distribution problem. For example, should the harvest be taken by offshore trawlers or a inshore fleet made up of smaller less mobile vessels? The answer to this question is of obvious importance to members of the respective segments of the industry. The problem can have another dimension if one area of the country or one type of gear has few alternative employment alternatives or if, as in the case of Norway, there are regional development goals which can be more easily achieved if subsectors are given preferential access to annual allowable catches.

In theory the most desirable allocation should be chosen according to societies' preferences and notions of fairness and equity. In reality, however, it is often determined by the relative bargaining power of the various interest groups in the fisheries management decision process. A complete analysis of such bargaining is beyond the scope of the present discussion. However, it will be useful to discuss one aspect which has particular relevance to the evaluation of the effectiveness of fisheries management regimes.

3.3.1. Distribution as barrier to conservation

For purposes of discussion the "over time" and the "proper use"

issues have been discussed independently. However they are very much related and therefore the two aspects of fisheries management are often determined simultaneously. Because they are interrelated, the range of bargaining over distribution can sometimes extend to conservation issues. One explanation is that different regulation schemes, even if designed to achieve the same catch level, will probably have different distributional implications. For instance, a closed season may affect various parts of the fleet differently depending on their ability to fish in the open season. If the fish are generally located further off shore during the open season, smaller less seaworthy boats may be disadvantaged.

Various interest groups will therefore tend to favor particular types of regulation measures which give them a bigger share of the catch. If given the choice between two programs, one which has a better chance of achieving conservation goals and one which will give them a bigger share of current catch, they may prefer and bargain for the latter. Therefore given the bargaining strengths of the various groups, the negotiated regulation program may not be capable of adequately dealing with conservation issues. We shall return to this point when discussing the mesh size regulations in the Barents Sea.

The scientific uncertainty discussed above can also lead to this type of behavior even when interest group bargaining is not an issue, and it will make it even more prevalent when it is. Individuals, groups, regional development authorities which have concrete current needs or goals (pay the boat mortgage, improve employment) may not be convinced that the stocks are in such bad shape as scientists say they are or that proposed cut-backs will have any bearing on future stock productivity.

A final reason why distribution and conservation issues become mixed is that the bargainers may agree to sidestep conservation issues to increase the possibility of agreement¹⁰⁰. If all interest groups have similar bargaining powers, scientific advice to lower catch may be ignored. Low recommended catch levels, and increase in catch for one group must result in a decrease in the catch of another. These bargaining conflicts can be, and often are, reduced by agreeing to an allowable catch that is larger than recommended.

3.4. Implementing and enforcing fishery management programs

Until now the discussion has been somewhat abstract. Conservation is proper use through time. Intertemporal use judgements must be made based on time preferences and uncertain relationships between harvest today and stock size tomorrow. It is a large step from this formulation of the fisheries management problem to setting up a program which can make it operational in the real world. A brief

¹⁰⁰See, for instance, Underdal (1980).

discussion of the issues which must be faced and the steps which must be taken in order to do follows. Note that while the focus of a management agency has been compartmentalized for ease of description, many if not all of the issues are interrelated.

A prerequisite for a management agency is a scientific unit to perform the necessary data collection and analysis to determine stock conditions and critical parameters of the population dynamics of the relevant stocks. While this will involve a certain amount of basic scientific work, it will also be necessary to have the ability to provide assessments and answer questions concerning the likely effects of various harvest levels and particular regulation techniques used to achieve them¹⁰¹.

It is also necessary to have a *procedure* for selecting the desired levels of harvest in any period of time. This issue has been described in some detail above, but one should not underestimate the difficulty of coming up with an organization and a process to interpret and balance the biological and social issues in order to produce specific recommendations for total allowable catches.

It is also necessary to come up with a system of *regulations* which, given the existing industry structure and the agency's enforcement capability, will cause the catch of the fishing fleet to remain within the desired amount. While this may appear to be a easy problem, especially given the simplistic coverage of fisheries biology provided here, the opposite is often true. A simple aggregate quota program which shuts down the fishery when the quota is taken will seldom suffice. There may be other issues such as protection of spawning grounds, discards of small size fish, by-catch of other species and other such problems which will not be addressed by a total quota. A quota may also induce a race for fish which can lead to larger fleets and/or bigger vessels than necessary, and unsafe or wasteful fishing practices. Depending on the circumstances these problems may be usefully addressed using closed areas, closed seasons, mesh restrictions, or individual transferable quotas. For more detail on the specifics of setting up regulation programs, see Anderson (1986).

However, determining which set of regulations will do the desired job and getting them implemented is only a first step. It is also necessary to institute a *program surveillance and reporting* system to ensure that the participants actually comply. The participants must feel that there is a reasonable chance that deviant behavior will be detected and that the punishment will outweigh any potential benefits of cheating. Accurate record keeping is important not only for ensuring

¹⁰¹In recent times pollution and habitat destruction have made the implementation of fisheries management regimes even more difficult. The predictive accuracy of existing population dynamics models will decrease to the extent that these influences change the underlying parameters. This will necessitate more and broader based research programs and regulation programs.

compliance, but also as a critical part of the fish stock monitoring and research program. Falsified data can make the problem of estimating stock size and potential effects of various regulations programs even more difficult.

3.4.1. International regimes: additional difficulties

Although it is never easy to achieve the goals of fisheries management, however defined, it is often even more difficult when more than one country or political entity is involved¹⁰². For one thing there will probably be a larger number of interests between which the access to the resource must be divided. More important there may be a lower acceptance of others as credible claimants and this may affect the intransigence of the actors. For example, while fishermen from Finnmark may agree that residents of southern Norway have a right to fish off their coasts, they may view Russian fishermen with a jaundiced eye and may dismiss claims from third party states out of hand. The possibilities of legitimate bargaining with these groups and the possibility of reaching agreement will vary inversely with the perception of validity of the groups' claims. This problem can be compounded if the nations have different preferences about the value of fish today versus fish tomorrow and about what is a fair and equitable distribution of fish within and between countries.

In addition it is often far more difficult to obtain compliance in an international regime. In most cases this is because individual states reserve the right to enforce any rules against their own citizens. If one nation is skeptical of the desire or ability of another to enforce regulations against its citizens, that nation may be reluctant to enforce the same regulations against its own citizens. Similarly if industry participants think that the rules are not being effectively enforced in other countries, they will be less likely to comply themselves.

Another difficulty has to do with the problems of performing and utilizing scientific research. It is usually the case that for science to be credible, there must be input from all parties involved. Even in the most open circumstances this can be difficult; the research organizations may be located great distances from each other, they may use different approaches or techniques and may have different types of research vessels, access to compatible computers, etc. In other instances the scientists of one country may, or may be perceived to, knowingly produce false or misleading results which support that nation's bargaining position. Either way, the scientific basis for management is eroded.

3.5. Conclusion: effectiveness of fisheries management regimes

We have seen in this section that the conditions of fisheries

¹⁰²The problems of interjurisdictional management between adjacent waters of the states in the US are very similar to the case under discussion in this paper.

management are first, lack of individual ownership of the resource implying externalities of costs and individual incentives to take more than collectively rational; and second, uncertainty and often dissensus about the consequences of given levels of fishing. The *conservation problem* implied by these conditions is posed by the need to make trade-offs between current and future use. The *distribution problem* amounts to finding and legitimising ways to divide current catch between potential users within or between states. In the previous paragraphs we have tried to show that these basic fisheries management problems appear at two levels: the *outcome* level, expressed in the biological status of stocks or in various socio-economic indicators related to the distribution and utilization of resources; and the *behavioural* level, related to the basic tasks of organizing and implementing fisheries management problems.

This leads us to an operational definition of the specific problem addressed by the Barents Sea fisheries regime. In our analysis, such a judgement will be based on an inspection of five clusters of variables, two of which are related to the natural and social environment and three to regime member behaviour¹⁰³. These five clusters of variables are the health of the *fish stocks*; the health of the *industries* feeding on them; the *scientific* investigations conducted to clarify the intertemporal and current trade-offs between various exploitation patterns; and the *regulation and enforcement* activities.

It now remains only to decide where to *place the threshold of effectiveness*, i.e. identify the value on each of these variables that would suffice for an affirmative answer to the effectiveness question. Clearly, this is a matter of both *direction* and *degree*. The former is quite straightforward. Unless we can conclude that the regime has contributed to some level of *relative improvement* on these five variables, we would not be inclined to judge it an effective regime. Note, however, that this does not necessarily mean that the stock situation must continuously improve or that fishermen must get richer or scientists more consensual every day - only that without the regime, the situation would have been worse. The question about the *degree* of impact is more difficult, even on a strictly theoretical level. A minimalist approach would judge *any* relative improvement on these variables as sufficient evidence to warrant a conclusion that the regime has been effective. A far more ambitious criterion might require that the regime has produced *optimal improvements* on these variables, i.e. has caused as much improvement as can possibly be accomplished,

¹⁰³Strictly speaking, the regime we discuss is an inter-*national* one, implying that only states are directly subject to it and hence, that only state activities are relevant for the assessment of behavioural effectiveness. This is also the locus of our analytical emphasis. However, as the role of the state is to ramify or induce relevant behaviour of sub-state actors, the adequacy of state behaviour can only be measured by its success in affecting the behaviour of its subjects.

given the state of knowledge (Underdal, 1992:231). It goes without saying that such optima are hard to operationalize and even harder to reach. Not surprisingly, our solution lies somewhere in between these extremes, although considerably closer to the former than the latter. For each variable we offer explicit reasons for whatever threshold we indicate, allowing preciseness to vary. In general, the *how much is enough* question is the one that is most difficult to answer, and in this paper we have addressed it only to a moderate extent.

3.5.1. Health of the fish stocks

In the final version of this paper, changes in the status of the stocks will be measured by conventional biological indicators, i.e. spawning stock biomass and recruitment. Due to certain problems with that data, this version offers a reasonably close proxy in the scientific catch recommendations offered by ICES¹⁰⁴. While the internalization of socio-economic conditions precludes strong conclusions about effectiveness based on biological criteria alone, we would not expect an effective regime to coexist with sharp declines or even depletion of the stocks in question. As noted above, however, in an effectiveness perspective the relevant comparison is not the past but the situation that would have occurred in the absence of the regime. We have already touched upon and will return to the methodological problems emanating from this.

3.5.2. Health of the industries

Similar comments are in order for this variable, which is measured here by changes over time in catches, employment and profitability. While we must be cautious in our impact assessments, we do not expect effective regimes coexisting with great declines on these indicators.

3.5.3. Scientific activities

As the major task of scientific investigations in fisheries management is to clarify and make available to managers the intertemporal and social trade-offs that are involved in given management programmes, we will focus on three aspects of the scientific activities stimulated by the regime. First, we focus on the *effort* invested in science, with an admittedly crude presupposition that more resources made available to fisheries research is an indication that the need for these clarifications is taken seriously by managers. Second, we will discuss the extent to which science is subject to pressure from political or industrial interests, which, if unchecked, might be assumed to have some relevance for the contents of the scientific advice. In general, we assume that the more core scientific investigations are insulated from political or industry interest, the greater the ability of science to

¹⁰⁴See section 4.2 and 4.3.

produce results that represent well the current state of knowledge about trade-offs in time or space. Third, we investigate the way the regime has affected the *imputation* of scientific knowledge into the management process, especially the extent and timing of their inclusion. Generally, we believe that the conservation problem can be more easily solved when the scientific knowledge about uncertainties and believed causalities are introduced early rather than late in the management process. As above, the crucial question is whether we can trace any causal impact from the regime to changes on these indicators.

3.5.4. Regulations

The fact noted above that the regulations are officially conducted individually by the parties does not imply that the Commission is insignificant to the regulative activity. Since both parties tend to automatically implement the decisions in their domestic legislation, it functions as a very efficient harmonizer of policies. The first thing that must be said about the regime, therefore, is that it facilitates the elaboration of certain *minimum standards* for regulation in the entire ecosystem.

The questions are first, whether these standards are improving in terms of how well they balance the intertemporal and social use conflicts given current knowledge; and second, whether this coordination of selection measures could have been done equally well on an *ad hoc* basis without the regime. These two questions will be tackled by investigating five aspects of the regulations produced by the regime members. i) First we will scrutinize the way the regulations are developed by focusing the *organizational insulation* of the management decisions from industry interest. *A priori*, we expect that more independence is better than less in terms of assuring intertemporal balance. ii) Then we will evaluate the *quota regulations* produced by the actors by comparing them with the scientific recommendations produced by ICES. Though well aware of the limitations of such a measure, we assume that the smaller the difference between recommendations and agreed quotas, the better the regulators have fared in terms of withstanding pressure from, presumably, short-sighted industry interests. The theme of whether the regime enables managers to produce regulations which permit a more rational fishing pattern is followed up in the three subsequent measures, which focus on the *geographic* scope of iii) *fishing rights* and iv) *gear restrictions*; as well as on v) the *functional* scope of the *quota regulations*, i.e. whether or not they shall apply to all types of vessels. For reasons indicated above and elaborated below, we will count it as improvements when regulations are extended geographically and functionally.

3.5.5. Enforcement

Just like the formal production of regulations, their enforcement is conducted by the states themselves within their respective areas of

jurisdiction. We shall use four indicators of enforcement intensity: i) the extent to which reporting procedures allow *cross-checking* based on independent sources; ii) the number of *inspections*; iii) the rate of *violations revealed*; and iv) *reported overfishing*, i.e. the extent to which aggregate reported landings exceed the total allowable catch.

None of these indicators is wholly satisfactory. Regarding cross-checking, we should specify in addition the extent to which it is actually conducted as well as the organizational links between harvesting industry and processing industry - because this affects the degree of independence of these reports. The number of inspection tells us little about their thoroughness or what kind of violations that are targeted. Moreover, it would be a more precise measure of inspection intensity if we could adjust for changes in the number of fishing vessels operating in the area. While we do not have the precise numbers, the tendency in both countries is towards fewer vessels operating in the Barents Sea. This is partly because Barents Sea groundfish catches have been on the decline throughout the 1980s. For the USSR and Russia, this has spurred a gradual shift of harvesting capacity from the Northeast Atlantic to the Far East. Hence, inspection frequency, defined as inspections per vessel operating in the area, is probably *higher* than the number of inspections given below. On the face of it, the third and fourth indicators are the least persuasive: surely, one might object, the violation rate or aggregate overfishing says more about the fishermen than about the enforcement system? Our reason for using it is the assumption that fishermen's inclination to violate rules is quite stable at given levels of enforcement. Hence, changes in behaviour, as measured by overfishing or violation per inspection, can be assumed to reflect changes in the *incentive structure* surrounding him¹⁰⁵, i.e. the entire enforcement system ranging from appeals to solidarity over monitoring intrusiveness to the harshness of administrative sanctions imposed in the case of violation. While none of the indicators are impeccable, their combination is likely to shed light on the phenomenon under discussion.

4. The effectiveness of the Barents Sea Fisheries Regime

In this section we will present the evidence identified above as relevant for a judgement about the effectiveness of a fisheries management regime.

4.1. Status of stocks and industries

At its most basic level the conservation problem is to ensure that current catches do not become so high as to jeopardize harvest potential in the future. As noted, while in the final version of this paper we will use two commonly accepted biological indicators to assess conservation effectiveness, spawning stock biomass (SSB) and recruitment, at this

¹⁰⁵Needless to say, this assumption is problematic on several grounds, one of them being that various fishermen might have widely different risk aversions.

stage we settle with a proxy, i.e. ICES recommendations of total catches.

Though the ichthyofauna of the Barents sea comprises more than 120 species, the community is dominated by a few species which form the basis of an interrelated ecological complex of Barents and Norwegian seas (Zilanov, 1990:6): Arctic cod, haddock, capelin, herring, saithe, redfish and seals. Figure 1 a and b portrays the stock developments of two categories of Barents and Norwegian Sea species: those managed cooperatively by Norway and Russia and the two exclusively Norwegian stocks saithe and redfish.

Figure 1.a. Health of the shared Barents Sea stocks measured by ICES recommendations. (Source: ICES Coop. Res. Report).

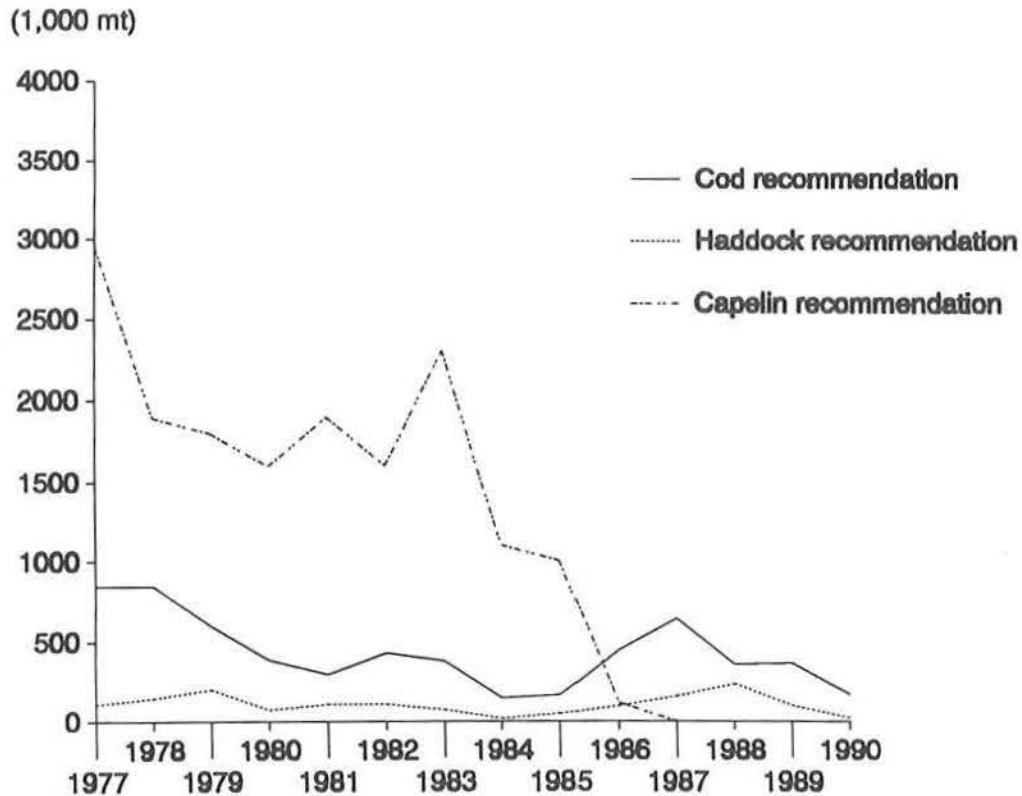
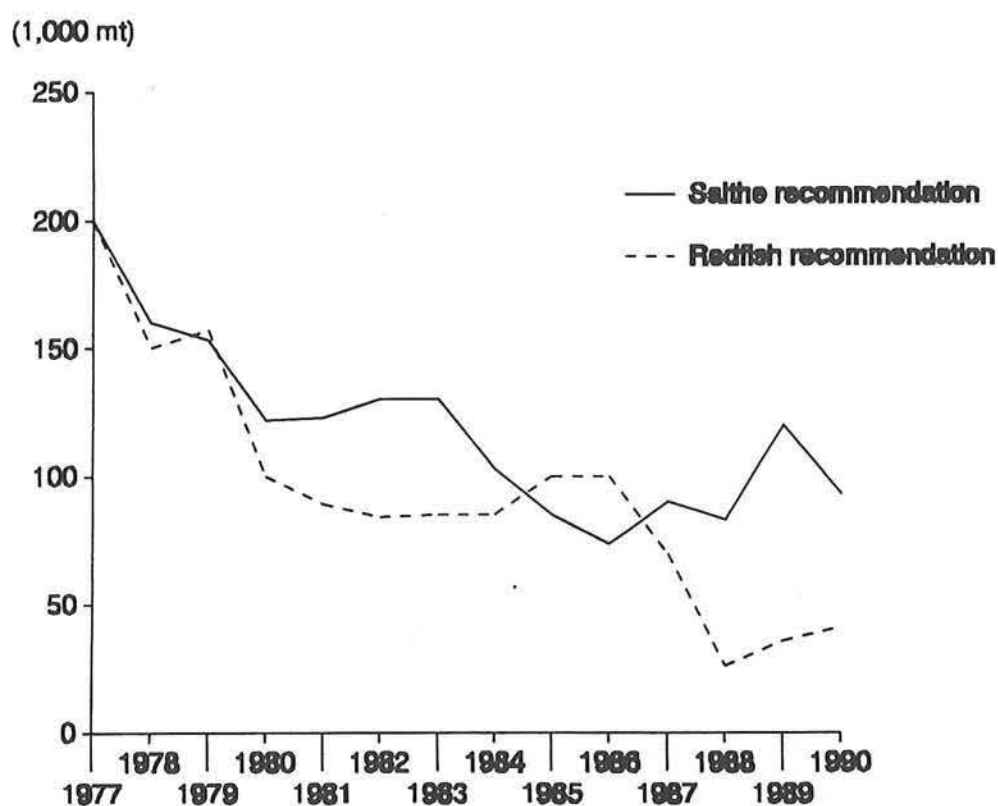


Figure 1.b. Health of the exclusive Norwegian Barents Sea stocks as measured by ICES catch recommendations. (Source: ICES)

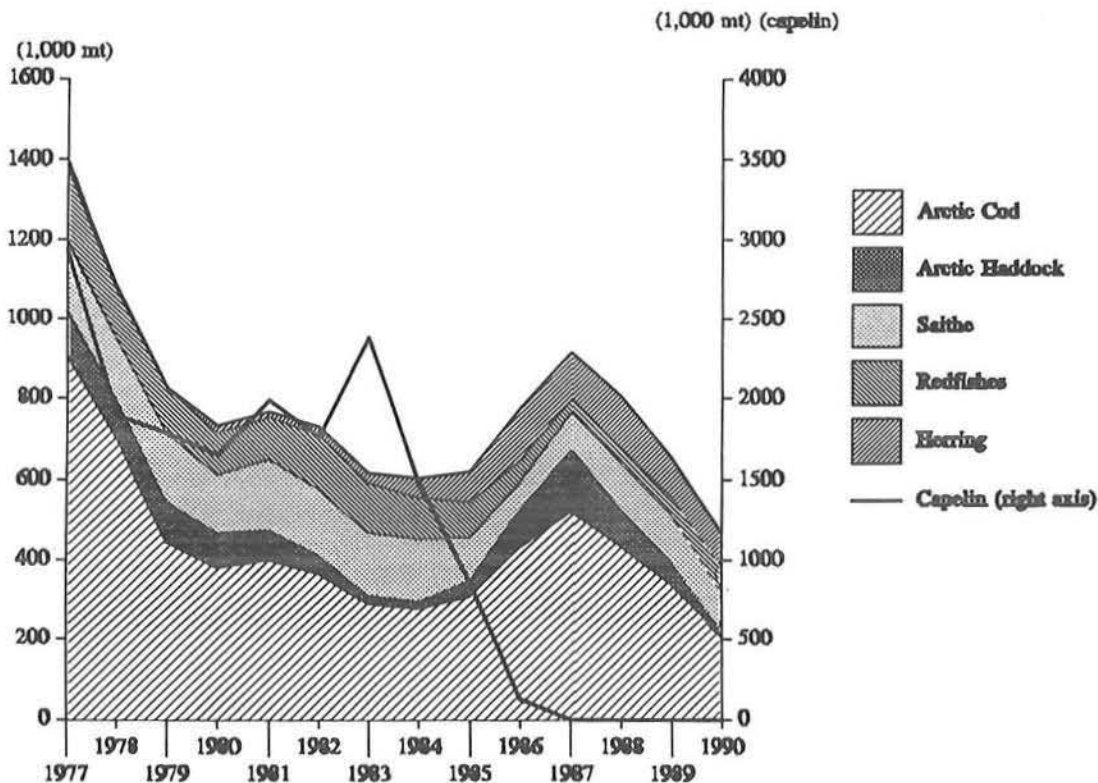


We see from the figures that the major commercial species are in much poorer condition today than before the introduction of the present regime. After the terrible blows of the 1980s, however, the situation for all the stocks seems to be on the rise.

Moving from the health of the fish stocks to the health of the fishing industry, the key indicators give an equally dismal picture. Admittedly, the regime, by fulfilling the requirements defined in the evolving international Law of the Sea, was highly successful in phasing out third countries. By the turn of the decade, the third country share is roughly 5%, the majority of which is part of mutual access agreements with the European Community. However, fishermen are not fed by percentages. Before 1977, the fluctuations of major species often occurred in antiphase so that the over-all catches remained stable. From then on,

however, the decline of stocks and catches have been wide and unequivocal. The volume of Barents Sea catches in 1990 was only a ninth of the 1977 level¹⁰⁶. Figure 2 shows the commercial catch of the most significant Barents Sea species in the period under investigation.

Figure 2. Commercial catches in the Barents Sea ecosystem. (Source: ICES Coop. Research Report).



Source: ICES Cooperative Research Report

Simultaneously, and partly by implication, *employment* in the fishing industry is dwindling¹⁰⁷. In 1981, there were 13,600 fishermen in the three northernmost Norwegian counties and 8,400 were engaged in the processing industry. In 1990, the figures are 11,100 and 5,000 respectively, a reduction of 27%¹⁰⁸. In the cod fisheries, the *earning*

¹⁰⁶This figure refers to catches of Arctic cod and haddock, capelin, Norwegian spring-spawning herring, redfish, saithe and Greenland halibut, data for which is compiled from *Cooperative Research Report*, several volumes.

¹⁰⁷Needless to say, this process is quite complex including not only changes in technology or settlement patterns but also in such factors as export market development and the size of government subsidies.

¹⁰⁸*Norwegian Fishery Statistics*, 1982, 1989-90. The figures for fishermen refers to

capacity per man-year rose by 40% from 1980 to 1985, but then declined by 45% from 1986 to 1990¹⁰⁹. For USSR and Russia, a similar development has happened.

Thus, both the biological and the socio-economic indicators seem to suggest that the regime has been less than successful. There are other things to consider, however. First, as noted, the observed deterioration of the fish stocks may be explained better by processes beyond the scope of the regime. This seems to be substantiated by the fact brought out in figure 1 that there are *scarce differences* between the shared stocks which are directly affected by the international regime and those that are not. The latter include the Norwegian exclusive stocks of saithe, redfish, and, since its return with a new migration pattern in 1988, spring-spawning herring.

One *rival explanation* is change in water temperature. The Barents Sea experiences a relatively cold period between 1965 and 1984, and this is likely to have affected the fish stocks (Zilanov, 1990:17). Moreover, activities in other sectors of the economy have probably contributed to the problems. For instance, offshore geophysical surveys performed by both Soviet and Norwegian scientists the past 15 years are believed to disturb the growth of fish and other marine organisms, especially in their early stages. Although it is poorly mapped and the causalities are far from clear, one should also mention the imports into the Barents basin of airborne as well as marine pollutants.

Let us stress the limits of the claim made here and simultaneously dismiss charges of apologism. These rival explanations are not put forward as *excuses* for what may appear as a shattering management failure. Rather, the claim is two-fold. First, given our definition of effectiveness as positive contribution to the solution of the problem addressed by it, the Barents Sea regime might still be judged effective if it can be plausibly shown that without the regime, the ecological and economic situation would well have been *even worse*. Indeed, as part of the on-going evaluation of international agreements made by the former Soviet Union, the Russian Committee of Fisheries has concluded that the activities of the mixed commission are highly effective¹¹⁰ and that the bulk of the agreements should be prolonged for at least twenty years. Second, and more important to our argument, the uncertainty and imprecision of our knowledge about the relative impact on fish stocks of natural fluctuation and anthropogenic activity makes it difficult indeed to substantiate either the would-have-been-

those with fisheries as sole or main employment. It should be pointed out that a number of fishermen from southern counties take part in the Barents Sea fisheries as well. The over-all reductions in the three northernmost counties, however, are roughly comparable with those in Norway as a whole (24% reduction).

¹⁰⁹*Fishery Statistics 1989-90*, table 56. The depreciation rules changed in 1980 and 1986, hence the division of the period.

¹¹⁰No precise definition of effectiveness was offered, however.

worse or the couldn't-possibly hypothesis. For the two variables related to conditions in the natural and socio-economic environment, therefore, *the causal leap between the regime and the outcome indicator is too long* to make strong statements about impact, at least with only one case. It is highly difficult to give a plausible counterfactual account of what would have happened in the absence of the regime. Note that this problem is a consequence of our definition of effectiveness as *contribution* to the solution of the social problem at hand and not as downright solution. Another side of this is that introducing these rival hypotheses into the argument is a two-edged sword. If we can mobilize them to take parts of the blame for stock reductions, we must also control for them in cases where the environmental indicators show positive trends. As we shall see, the problem of excessively long causal leaps is less severe for the behavioural indicators of effectiveness which are assessed in the following three paragraphs.

4.2. Knowledge production

Both Norway and USSR/Russia have proud traditions in the marine research area. Their activities in this area can be evaluated along a number of dimensions. We decided in section three to narrow in on developments in effort, institutional insulation and position in the management process, which were all believed to contribute to the solution of the conservation and distribution problems. For all of them, we will try to demonstrate the relevance of the regime to the change recorded.

4.2.1. Effort

In order to have a basis for the stipulation of management measures, knowledge about stock size and population dynamics must be produced and made accessible by the regulators. There are two main ways to create this basis (Sahrhage, 1989). One is to rely on the catch and effort data from fishermen and make stock assessment thereof. The second way, and increasingly important as quantitative catch restrictions rendered reports less reliable, is fisheries-independent data collected by scientists themselves. Most fisheries management systems employ a combination of the two, and this goes for the Barents Sea regime as well. All three actor groups are involved here: the scientists naturally have a lead role and have to organize themselves in order to collect independent data as well as make use of the information from fishermen. Their work, however, requires a material and political basis. This is supplied partly by the authorities providing funding as well as setting up and enforcing adequate reporting procedures; and partly by the fishermen by the extent to which they abide with these reporting procedures.

The cooperative stock assessment in the Barents Sea involves primarily the Norwegian Marine Research Institute (MRI) and the

Polar Research Institute on Fishery and Oceanography (PINRO) in Murmansk. The cooperation dates back to the 1950s and has grown steadily in scope and intensity. Each spring the administration as well as researchers from the two institutes meet to draw up the plan for the joint research programme the following year. The results of national as well as the joint surveys are discussed in special meetings between scientists from the respective research vessels. Ever since 1983 special research symposia have been held between PINRO and the MRI.

In the USSR/Russia, budgets for fisheries science were cut in the 1980s, partly due to reduced incomes from the fisheries. The economic reforms brought severe financial constraints on institutions relying on state funds and in the late 1980s, the departmental institutions PINRO and VNIRO closed down several hydrobiological laboratories (Matishov, 1989:18). As we shall see below, since 1988 the financial situation for PINRO has deteriorated dramatically.

Figure 3. Assessing the stock development. The Norwegian Marine Research Institute profile in the Barents Sea.

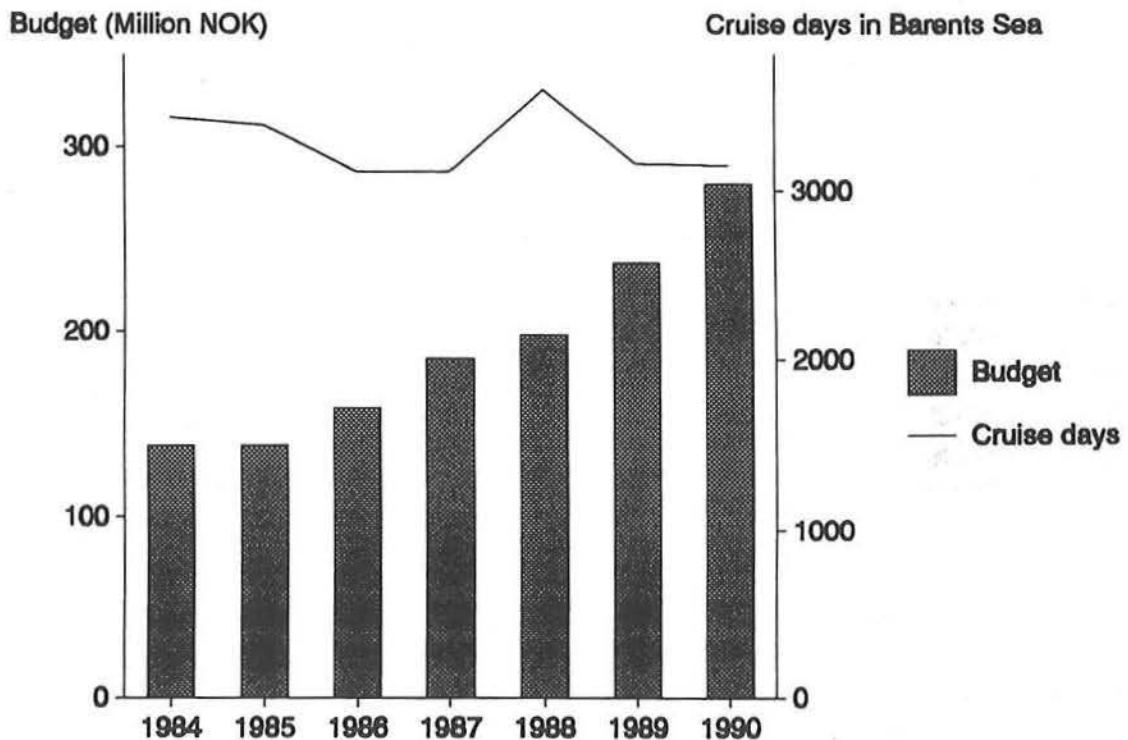


Figure 3 shows the developments regarding the Norwegian MRI's financial basis and stock monitoring and assessment efforts in the Barents Sea, measured by number of cruises¹¹¹. Obviously, the MRI has had far more stable surroundings the past years than has PINRO.

4.2.2. Institutional insulation

In general, fisheries science organizations are often under pressure from industry challenging its legitimacy if advocated measures are too strict. In some cases this pressure comes from the managers as well, pressed by the same industry through the corporative system or by politicians concerned with regional employment or similar worthy goals. Thus, a certain degree of insulation of knowledge production from the pressure of political expediency is an important condition for the realization of long-term conservation goals.

Traditionally, both the Soviet Union and Norway have financed and administratively subordinated scientific activities through the fisheries bureaucracies¹¹². This departmental science on both sides has been heavily criticized for selling out conservation concerns for short-term interests of the fishermen. In Norway this criticism was put forward in the mid-1980s by primarily environmental organizations such as the Foundation for the Protection of Nature or Greenpeace. In the USSR, it was voiced by representatives of the independent Kola Science Center which complained that their input to the management process was not taken seriously. The models applied in Barents Sea management, they added, were too short, as recommendations did not take stock interrelationships into consideration (Matishov, 1990:10-12). One might intervene that it is not quite clear that this is due to the fact that the scientific organizations are organized within the departmental structure. While it is well known that predation from other fish species and marine mammals are conspicuous factors in the decline of the commercial stocks, the multi-species approach is both extremely costly and relatively new¹¹³.

By the turn of the decade, changes occurred in both countries, albeit to differing extents. In 1988, the Marine Research Institute was made formally independent from the Norwegian fisheries administration. At that time, the Ministry had reduced its share of the budgets from 95% in the late 1970s to roughly 75%, where it seems to have levelled off. The bulk of the remainder is extracted from free-standing research

¹¹¹The figure is based in materials published in the Institute's Annual Reports for the years 1984-1990.

¹¹²In the Soviet Union, the Ministry of Fisheries was the only financial source until 1989; in Norway, the Marine Research Institute got between 75-95% from the Ministry of Fisheries. Administratively, the MRI was a part of the Fisheries Agency which sorts, with a certain autonomy, under the Ministry.

¹¹³Except, historians would point out, that such considerations were prominent in the opposition among fishermen against whaling at the turn of the century.

councils. Simultaneously, in the Soviet Union, the financial responsibility for PINRO was gradually shifted from the Ministry to the industry association, Sevryba¹¹⁴. While tight institutional links between science, Ministry and industry was certainly nothing new, the change nevertheless implied a shift of emphasis towards more practical, supportive fish-finding tasks. The operations of the fishery scientists have always depended on the needs of the ministry and the industry. Today the dependence is shifting from the former to the latter, especially in Russia.

4.2.3. Integration in decision-making

It is not enough that knowledge about the stock situation is produced. It must also be imputed into the regulation process. As section 4.3.1 below will show, this is very much the case in the Barents Sea management, and it is highly likely that the way the scientific cooperation is nested in the wider ICES framework has been instrumental in this respect. Since the early 1970s, the Advisory Committee on Fishery Management (ACFM) within ICES has produced collaborative scientific advice on quantitative as well as operational measures to the managers of exclusive and shared stocks in the Northeast Atlantic. In the Barents Sea regime, both PINRO and VNIRO¹¹⁵ on the Soviet/Russian side and the MRI on the Norwegian are stable participants in management process, both in the preparatory phase and by representation in the respective delegations to Commission meetings.

4.2.4. The role of the regime in affecting this change

For a scientific cooperation to be mutually beneficial and capable of producing credible results, compatible equipment and comparable data are essential. The more advanced acoustic equipment on the Norwegian vessels and the difference in the trawl sampling equipment between Norway and the Soviet Union have been problems in this respect. This is why *inter-calibration* of methods and equipment has been a stable item on the joint programmes and also on the scientific symposia throughout the 1980s (Hoel, 1993).

The data produced by the joint research programmes form the basis for the reports of ICES Working Groups on various Arctic stocks, all of which are dominated by scientists from Norway and USSR/Russia. These reports are scrutinized by ACFM, which implies a certain peer review of the working group report and also means that the information on stock conditions and the scientific advice is made publicly available to any interested party. Still, the peer review rarely affects the recommendations proposed by the working group. It is

¹¹⁴See below.

¹¹⁵The statistical department of the Fisheries Ministry.

indicative of this that ICES often finds it expedient to make allowance for political feasibility when stipulating recommendations on total catches. The most explicit expression of this is found in the report on the Arctic cod stock situation in 1980. Stating that on biological grounds, both the exploitation rate and the fishing pattern should be drastically changed, it went on to note that "...It is realized, however, that these measures will have serious implications for the fishing industries which are dependent on this stock. ACFM therefore feels unable to give any specific recommendation on the TAC for 1981..."¹¹⁶. The reluctance of ICES to take controversial stands is demonstrated also in the USSR-Norwegian mesh size debate to be dealt with below. ICES repeatedly advocated larger mesh size in the Barents Sea cod fishery in the late 1970s and early 1980s. After the issue was politicized, however, by the Soviet refusal to accept an enlargement in 1982¹¹⁷, ICES did not stress the issue again.

In conclusion, the regime places the scientific organizations in the midst of the decision-making process, and it is highly likely that this position has enhanced their ability to extract funding from state authorities and hence finance sustained efforts. Moreover, as part of the regular preparation, the Mixed Commission has encouraged the development of quite intense and stable cooperative links between PINRO and MRI, especially the joint stock assessment programme. Partly because these scientific organizations have had their strengths in different areas, and partly because of the intercalibration efforts, this cooperation has probably enhanced their capacity to produce policy-relevant knowledge. Importantly, however, a large portion of this cooperation *would have been likely even without* the bilateral regime, because independently of it, ICES serves the function of bringing scientists together for those kinds of tasks. We have also seen that neither the regime nor its linkage to activities within ICES do much to change the fact that fisheries science is only moderately insulated from the interests of industry and fisheries bureaucracy. In Russia, the dependence is shifting rapidly from the latter to the former.

4.3. Regulation and rule production

In section 3, we pinpointed five indicators of change on this variable relevant for our assessment of regime effectiveness: organizational insulation, heedfulness of scientific advice, geographic scope of fishing rights and selection requirements, and finally, functional scope of the quantitative restrictions.

¹¹⁶*Cooperative Research Report of the ICES Advisory Committee on Fishery Management 1980*, No 102:222.

¹¹⁷Supported, incidentally, by a PINRO report attacking the scientific basis for it (Enclosure No 4 in the Protocol of the Mixed Norwegian-Soviet Fisheries Commission, November 1982).

4.3.1. Porosity of the management process to industry interest

Just like in the science section, a key question is whether fisheries managers involved in the international process have enough independence from the fishing industry to go against their demands whenever these may threaten long-term conservation goals. Let us first look at the organizational aspect of this relationship.

In USSR/Russia, the administrative integration has been very high in the fishing industry, with the Ministry of Fisheries¹¹⁸ towering as the principal orchestrator over five regional fisheries combines, one of which is *Sevryba* (North fish) in Murmansk. This is a highly complex organization, embodying not only harvesting fleets¹¹⁹, transport vessels¹²⁰ and processing plants, but also, since 1988, PINRO conducting scientific investigations, partly in cooperation with the Norwegian MRI. PINRO was always one of the two Soviet representative organizations in the ICES Working Groups on Arctic species; and even before its inclusion into *Sevryba* it was dependent upon its fish-finding research component, *Sevrybpromrazvedka*, i.e. for vessels¹²¹. Prior to the dissolution of the Soviet Union, the quota issuance could be described in the following manner. *Sevryba* is a stable participant in the preparations for Commission meetings and is always represented in the delegation. Quotas and other restrictions agreed to at the Mixed Commission meeting was scrutinized by an Industry Council of the Basin which summarized the needs of the fishermen in the region. This information was channelled to the Department of Resources of the Ministry which prepared monthly, quarterly, annual, as well 5-year *plans* and a corresponding fishing fleet deployment scheme for each basin. These schemes were quite detailed in specifying fishing areas and seasons, number and types of vessels and their technical characteristics as well as the types, sizes and amount of gear. They also included programmes for fisheries research. In accordance with these schemes, a special department of the Ministry, *Glavrybvod*, issued licences and quotas to foreign fishermen while its regional branch *Sevrybvod* distributed licences and production plans for the regional combines. The Director Meeting of *Sevryba*¹²² then allocated quotas to the various member fleets as well as to a number of fisheries cooperatives (*kolkhozes*). These quotas were seen more as production plans than production ceilings.

¹¹⁸Now the Fisheries Committee which, after a brief period under the Ministry of the Environment, is again a free-standing entity.

¹¹⁹The biggest of which are *Tralflot* and *Murmanrybprom*.

¹²⁰Organized in *Sevrybkholodflot*, the former leader of which, Vladimir Korelskij, is now Fisheries Minister.

¹²¹Pers. comm. Georgy Luka, former Director of PINRO.

¹²²Previously, the Director of *Sevryba*. After a reorganization in 1990, the Director Meeting is composed of the leaders of the 16 member organizations of *Sevryba* (Davidsen, 1992:85).

In conclusion, the fishing industry was organizationally involved in the whole fisheries management process: the production of scientific knowledge (PINRO links to Sevryba), the international negotiations (membership in the delegations), the preparation for domestic regulations and supervision of production plans (Industry Council of the Basin).

In Norway as well there is a high degree of *porosity* between the industry and the regulative process. Before negotiations with other states, there is a consultation phase with affected organizations and administrative bodies. This takes place through the *Working Committee for Fisheries* under the Ocean Law and Ocean Boundary Commission. The former is headed by a representative of the Fisheries Ministry and attended by representatives of the Foreign Ministry, the Fisheries Agency, the Marine Research Institute, Norway's Fisherman Association, the Seamen's Union and the Processing Industry National Association. Discussions in this group starts out from the ICES/ACFM results and recommendations. The bargaining strategy is discussed and this forms the basis for the delegation's instructions, which are finalized by the Fisheries Minister. If special circumstances indicate so, he will consult with the rest of the Government. After the Commission meeting, transformation of its recommendations into Norwegian regulations starts in the *Regulation Council*, an advisory body to the Fisheries Agency. The core of the preparatory working committee is retained¹²³. An environmental NGO has tried to become included in this corporative structure, but has so far been denied access¹²⁴. The Council shall, based on ICES recommendations and the negotiations outcome produce advice on the allocation of the quota on various vessel and gear types: group and vessel quotas, operational regulations, total quotas for exclusive Norwegian stocks. The advice of the Fisheries Agency and the Regulation Committee forms the basis for the final formulation of the regulative system for each fishery, normally made by the Fisheries Ministry¹²⁵. Some operational legislation is delegated to the Fisheries Agency.

¹²³The international bargaining being over, the Foreign Ministry no longer take part; instead the Natural Management Agency is included along with a number of invited observers.

¹²⁴The composition of the Regulative Committee is amendable by the Fisheries Ministry in accordance with the Saltwater Fisheries Act.

¹²⁵When the restrictions are very strict or controversial, they are sometimes given by the Government in a Royal Decree. In 1990, the quantitative regulations for Norwegian spring-spawning herring, North Sea herring and saithe to the North of 62N was set by Royal Decree.

We see that although the form is different, in both coastal states the *fisheries industry are strong participants* in the corporative system preparing the international negotiations and producing national regulations. The regime *does little* to add to or detract from the influence of the industry in the management process.

4.3.2. Quantitative regulations: in line with science?

This high degree of industry participation in the decision-making process can lead one to expect short-term gains to triumph over the long-term conservation and rational utilization objectives stated in the regime. A quite crude indicator of this, somewhat insufficient because political managers may view the trade-off evaluation between present and future use differently from the scientists, is the extent to which the managers deviate from the scientific recommendations in their quantitative regulations.

Figure 4.a. ACFM recommendations and Mixed Commission decisions on total quotas for shared stocks in the Barents Sea. (ICES)

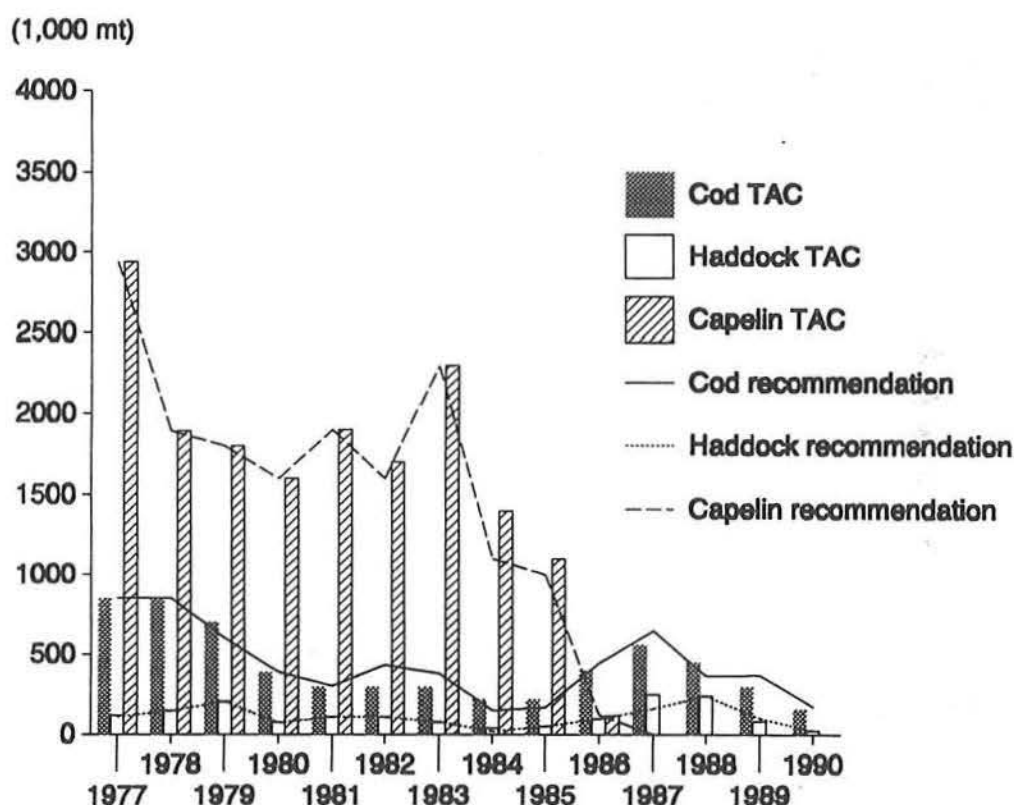
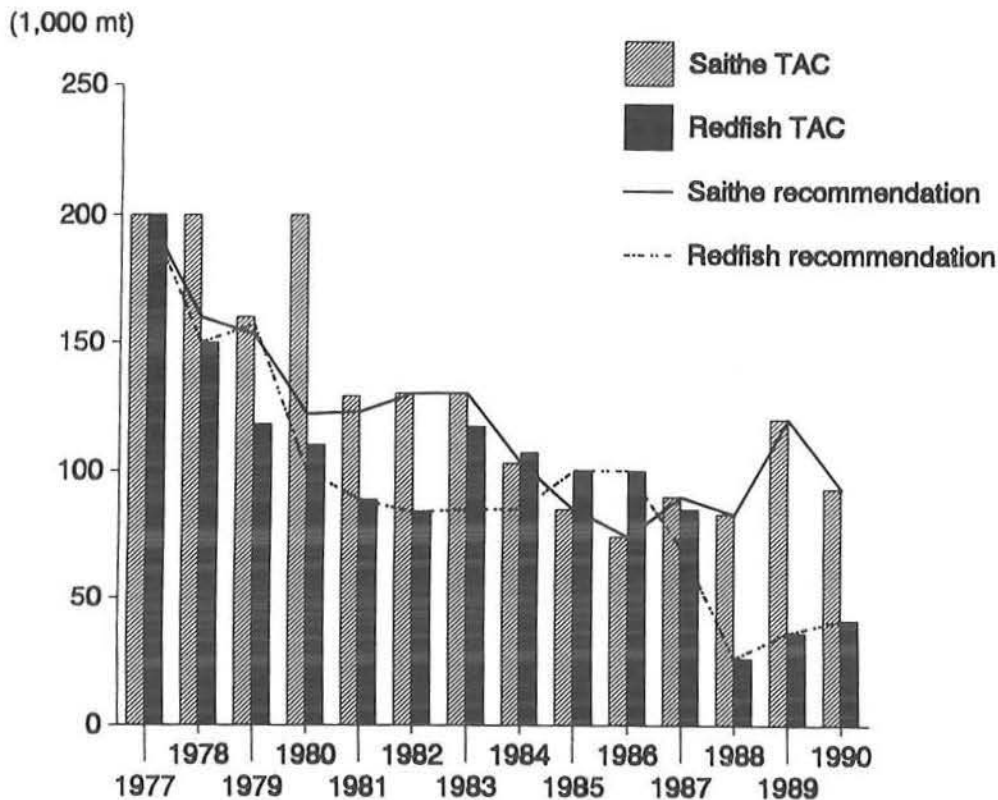


Figure 4.b. ACFM recommendations and Mixed Commission decisions on total quotas for exclusive stocks in the Barents Sea.



them, ICES had made dramatic dives in their recommendations as compared with the preceding year, so these deviances are not surprising. Indeed, while the regulators did not follow the scientists all the way they nevertheless cut the quota considerably from the preceding year. Interestingly, moreover, in the subsequent two years they narrowed and then *removed the gap* to the scientific advice although the latter continued to be very painful to the fishing industry: the 1986 capelin quota was less than a tenth of the quota two years earlier. The capelin case is still less impressive than the cod case. In 1985 the industry had been unable to take the capelin quota and there was wide appreciation that more problems lay ahead. For cod, the relative integrity of the regulators is demonstrated by the fact that they narrowed and then removed the gap to the scientific advice despite the fact that fishermen had been able to overfish the preceding year's quota

by as much as 26% and 40% respectively¹²⁶. Indeed, when the scientists promised fair weather in 1986, the parties nevertheless agreed to a *lower* quota than recommended by ICES. *In conclusion*, it seems that the coastal states have been reasonably good at absorbing bad news from the scientists and transforming them into stricter regulations.

As shown in the figures, moreover, there appears to be *scarce systematic difference* between the stock subject to international negotiations and the exclusively Norwegian stocks, such as saithe, redfish and spring-spawning herring. Saithe is a particularly good case because unlike redfish, it is largely taken by Norwegian fishermen who can be expected to exert pressure on the regulators through the channels sketched above. We see that since 1981 the regulators have been extremely loyal to the ups and downs of scientific recommendations. On the other hand, the quotas for 1980 and 1981 show the step-wise *shock absorption capacity* of the regulators to be neither better nor worse than for shared stocks.

This may be somewhat surprising, both because the shared stocks are economically more significant and because it is often hypothesized that it is harder for international management bodies than for national ones to produce ecologically sound management since intractable distributional questions cannot be solved by command as in domestic systems. Hence the tendency in international commissions to get around this problem by enlarging the total quota (Underdal, 1980). However, in the Barents Sea fisheries regime, the initial division of the shared stocks is *not* subject to negotiation at Commission meetings. Even before the formal bilateral fisheries agreement was signed in 1975, the parties had reached an understanding on an equal sharing of the Arcto-Norwegian cod and haddock for 1976, and this *fixed key* was confirmed two years later (Engesæter, 1992:8). Unlike more mature sharing arrangements, such as those with the European Community based on stable or adjustable zonal attachment, the Barents Sea solution reflected partly historical fishing but predominantly a political need among the participants to agree on the issue. Zonal attachment was problematic to assess since the EEZ delimitation is still a matter of dispute. Only in 1979 was the capelin division set, and the 60/40 solution in favour of Norway was a result of both historical catches and more scientific input on stock abundance and migration (Engesæter, 1992:8). This fixation means that the quota negotiations are not beset with distributional questions and this may be why they have been able to avoid inflation of quotas.

The setting of low TACs on the shared stocks is arguably far more demanding at the domestic political scenes. Therefore, if anything, figures 4 portrays the regime as being *reasonably successful* in terms of stimulating the coastal states to set quantitative regulations in only

¹²⁶See figure 5 in paragraph 4.4.2.

moderate excess of ICES recommendations. It is probable that one of the reasons for this is the fact that the quota division is not subject to negotiations within the regime.

4.3.3. Reciprocal fishing

An interesting aspect of the regulations pertaining to the Barents Sea is that each year, the two parties license one another's vessels for fishing in their respective EEZs. This is relevant both for the exclusive and the shared stocks. Each year the USSR/Russia has been allowed to take roughly half of their groundfish quotas in the Norwegian EEZ. Although this arrangement means more competition for the Norwegians, especially the coastal fishermen with limited operational range, it is widely recognized as rational since the fish is larger in this part of the ecosystem and hence, it takes fewer individuals to fill the quota. Indeed, this was one of the major goals of the negotiators. When presenting the Reciprocal Fisheries Agreement to the Norwegian parliament, the Foreign Minister noted that regarding Northeastern cod, "...optimal exploitation of the stocks requires that a rational division is found between catches of juvenile fish in the northern and eastern Barents Sea and those of fertile and spawning fish in the future Norwegian economic zone."¹²⁷

This practice is also important because it has provided the legal basis for a mutually beneficial *quota exchange* throughout the 1980s, in which Norway has received primarily cod, shrimp and scallop in exchange for larger quantities of redfish, blue whiting and sometimes herring¹²⁸. Given the differences between the two states in terms of fleet structure and reliance on groundfish, this trading of fishing rights has cushioned the transition to the new coastal state regime and enabled a better utilization of both existing capital and the fisheries resources.

Three points indicate that this regular, large-scale reciprocal fishing would have been difficult to maintain on an *ad hoc* basis, i.e. without a regime in place (Fløistad, 1991:41). First, as groundfish became scarcer during the 1980s, the presence of a large number of Soviet trawlers right outside the territorial waters would probably have raised protests among Norwegian coastal fishermen. With the regime in place, this was part of a regulated and reciprocal practice, and the amount the Soviets could take was fixed. Second, as noted, the Reciprocal Fisheries Agreement is very detailed in its specification of rights, rules and procedures, especially as compared with the cornerstone 1975 Agreement. This indicates that the parties regarded the substance to be potentially problematic and in need of unequivocal ramifications. As

¹²⁷Stortingsproposisjon nr. 74 (1976-77). Om samtykke til ratifikasjon av en avtale mellom Regjeringen i Kongeriket Norge og Regjeringen i Unionen av Sovjetiske Sosialistiske Republikker om gjensidige fiskeriforbindelser, p. 1. Our translation.

¹²⁸For a detailed study of this quota exchange, see Stokke and Hoel (1991).

EEZs were quite new at the time and they clearly benefited the coastal states, it is not surprising that Norway was cautious about the kind of practices it would agree to during the formative years. Third, although this was never a part of the official rationale for that specific agreement, the Norwegian Foreign Minister later stated in the Barents Sea context that as a result of increasing activity in the northern areas "...we must be both mentally and practically prepared for new episodes to occur..." and that it was "...important to have developed procedures and methods designed to prevent new episodes from leading to conflicts."¹²⁹

4.3.4. Restrictions on fishing patterns: geographic scope

The geographic scope of regulations are decisive both for their impact and the likelihood that they will be enforced. Absent of a certain policy harmonization between the parties sharing a resource, the stock impact of costly restraint on the part of one coastal state can easily be destroyed by the behaviour of the other. It matters little if juveniles are spared in the first leg of their annual migration if they are crushed in the second. The interactive dynamics of this, as noted, is that unless one party is reasonably sure that the other will do the same he will likely be reluctant to introduce or enforce gear restrictions in order to let the young ones go. Migration patterns makes the average size of cod and haddock taken off the coast of Norway larger than that taken in the Russian part of the Barents Sea. This renders conservation distributive. Norway prefers to see the stocks protected by large mesh size requirements because targeting large individuals is the best way to combine low fishing mortality and high total quotas, which is good for the fishing communities in the north. However, large mesh size requirements is believed to be felt most heavily by the Soviet side, due to the smaller mean size of groundfish in that zone. The official argument, however, is that mesh size is not the best way to avoid the taking of under-sized fish. On the contrary, argue Soviet scientists, juvenile fish are usually killed in large-meshed trawl bags and a far better protection is achieved by a combination of minimum-size regulations and prompt area closures¹³⁰.

Let us scrutinize the way this conflictual issue has been handled in the regime. While the issue had been raised by Norway in 1978, the parties agreed in the 1980 Commission meeting to use 125 mm as a minimum mesh size¹³¹. ICES had strongly recommended mesh size expansion

¹²⁹Knut Frydenlund, Foreign Policy Statement in the Norwegian Storting (parliament), 15 November 1978, in *Stortingstidende*, 1979:684. Unofficial translation.

¹³⁰This argument would have been even stronger were it not for the fact that Soviet and later Russian authorities have consistently opposed stricter minimum size requirements as well.

¹³¹Mixed Commission Protocol, November 1980:5. For materials other than cotton,

1979 and repeated it the two subsequent years¹³². Referring to this, Norway raised the mesh size issue again in 1981 and then every year until 1988, advocating an enlargement to 135 mm in the whole ecosystem¹³³. When the Soviets did not agree, Norway went along with a *unilateral* enlargement for Norwegian vessels and for foreign vessels with Norwegian licence. The Soviet side objected to the unilateral measure in a note¹³⁴, restated in the Commission meeting the subsequent year¹³⁵, *but did not raise the issue of unilateralism in the Norwegian EEZ again*. Having paid lip-service to their principled view that all regulations should be conducted jointly, the Soviets later confined themselves to stating that in their view, the agreed measure was sufficient and that they would retain this regulation¹³⁶. The vocabulary mildened even further in 1989, when the parties admitted that they still disagreed on the mesh size but that unitary measures in the whole ecosystem was a long term goal¹³⁷.

While the reluctant party has so far failed to implement the kind of measures suggested by the other party as well as by ICES, still a considerable behavioural adaptation has taken place. First, the regime has not *impeded* the Norwegian side from setting stricter standards than those agreed to. This implies both that the Soviet vessels have had to use this gear when operating in waters under Norwegian jurisdiction and that front-runner dynamics of the type present in, e.g the LRTAP air pollution regime is not ruled out¹³⁸. Second, the strong and persistent reluctance of the Soviets to go along with the proposal demonstrates the difficulty of the problem addressed, and hence, that the *1980 agreement* within the regime on 125 mm was a significant achievement. Prior to this, the parties had both had more lenient mesh size regulations. Third, urged by the Mixed Commission, the *scientific*

hemp, polyester or polyamid, the minimum mesh size was 135 mm.

¹³²Cooperative Research Report, 1980:222, 1981:245. The ACFM recommend enlargements to 135 mm for cotton, hemp, polyester and polyamid and 155 mm for other materials: the Norwegian proposal (1982) and subsequent unilateral regulation (1983) is 135 mm, up from 125 which is still the agreed measure today.

¹³³Mixed Commission Protocol, November 1981:4, repeated in 1982-88.

¹³⁴Note of 22. April 1982.

¹³⁵Mixed Commission Protocol, 1982:5.

¹³⁶When Norway in 1990 unilaterally sharpened her minimum size regulations for cod and haddock from 42 to 47 mm and from 39 to 44 mm respectively, the Soviets did not complain about the Norwegian unilateralism but made it clear that they would not follow suit either (Mixed Commission Protocol, November 1989:4).

¹³⁷Mixed Commission Report, November 1989:4, 1990-91.

¹³⁸The reference is to the so-called 30% and 50% Groups in the negotiations for the Helsinki and Sofia Protocols under the Geneva convention on Long Range Transboundary Air Pollution, regarding reductions of sulphur dioxide and nitrogen oxides respectively.

organizations were quick to respond to the needs for more knowledge on the selection issue. Since 1981, the joint Norwegian-Soviet research programme has included studies on this issue, first confined to the 125-135 issue but later taking up new issues as well such as the Norwegian fish selector device regarding cod and shrimp. As both had taken strong positions on the issue and buttressed them by scientific arguments, it would probably have been quite embarrassing for either side to give in on the mesh size issue, except perhaps if credible reference could have been made to new knowledge on it. Thus, face-saving may have been one of the assigned functions of the scientific cooperation apart from clarifying the relative merits of various selection techniques. Fourth, and related to the former point, it is interesting to note that according to Russian sources, in the period of dispute over the mesh size the Soviets have *intensified their use of area closures* within their zones so practical behavioural adaptation has taken place. Fifth, as the selection issue moved from the controversial mesh size question to an issue on which none of the parties were committed, the Norwegian *fish selector device* proposals, the Soviet and later Russian regulative response was far more positive. The two countries agreed to mandate such devices in the shrimp fishery and the Norwegians are optimistic about having the Russians use it for cod as well¹³⁹.

In conclusion, the kind of regulations recommended within the regime are highly distributive and controversial and cannot be expected to be agreed on easily on an *ad hoc* basis: indeed they are difficult to agree on even with the regime in place. The regime appears to stimulate the production of adequate regulations by allowing unilateral regulations, by focusing the political attention on selection problems and by allowing symbolic issues to be transformed into practical questions tractable by scientific investigations and technological transfers.

4.3.5. Stopping the fixed gear excesses: functional scope

Another indication that the regime has affected regulation in a positive manner is found in the way the substantial Norwegian overfishing of cod in the early 1980s was handled. As a part of the compromise on how to divide the shared groundfish stocks¹⁴⁰, Norwegian coastal fishermen were allowed to continue their operations with fixed gears, i.e. handnet, gillnet, longline and Danish seine even after the quota had been taken. This provision was a great relief to the coastal fishermen, and the additional amounts taken were not expected to raise any biological concerns. Before 1980, these expectations were proven right but at that time changes in the abundance of fish close to the coastline pushed Norwegian overfishing to levels ranging between

¹³⁹ ??? to Fiskeribladet, 26 November 1991.

¹⁴⁰ See paragraph 4.3.2.

40-100%.

The Soviet Union did not raise the issue until 1981, but from then on it expressed its deep concern over the potential ramifications of the Norwegian practice. The immediate Norwegian response was that new regulations would be introduced, and in 1983 both parties agreed that fishing with fixed gear should be limited taking into account the quotas and the stock situation. As a result the fixed gear exemption provision was removed from the Protocols and the overfishing was gradually reduced.

In conclusion, it is highly probable that the regime, by focusing political attention on a concrete case of regulation failure and by allowing it to be dealt with in an institutional framework seen by both parties as valuable, had a role in moving the reluctant party to modify his behaviour. It would definitely have been to Norway's advantage to keep the exemption, but the transparency of the system rendered it costly to insist on the previous agreement.

4.4. Enforcement

We decided in section 3 to organize our discussion of enforcement behaviour around four indicators: the extent to which the *reporting* system allows cross-checking; the frequency of *inspections*, the *violation rate*, and the *reported overfishing* of the most important commercial stock, Arctic cod. Let us look at these indicators in some detail.

4.4.1. Monitoring catch reports

In Norway, the key monitoring institutions are the Coast Guard, the Fisheries Agency Control Division¹⁴¹ and the fishermen's Sales Organizations¹⁴². The latter are obliged to *compile reports* from the processing plants and send these to the Fisheries Agency which may then cross-check with the catch reports of the vessels, sent weekly by factory trawlers and upon port call for smaller vessels. Weekly reporting by factory vessels was introduced in 1991 and was a sharpening of the existing reporting procedure. Whenever they begin or end a fishery they must report current storage. In addition, all vessels must keep updated catch logbooks, the accuracy of which is controlled by on-site *inspections*, in offshore waters conducted largely by the Coast Guard¹⁴³.

In USSR/Russia, the *report-based* monitoring over fishing is two-

¹⁴¹This organization is largely focusing quality control.

¹⁴²The biggest sales organization is the Raw Fish Marketing Board, which monopolizes first hand sales for all fishermen in the northern part of the country. This system is in the process of being deregulated.

¹⁴³See next section. North of 62N, the Surveillance Service for Fishing Banks operate as well, and in inshore waters, also the Fisheries Agency Control Division and several local bodies such as "Lofotoppsynet".

tiered. Larger vessels report daily to PINRO and VNIRO, the central information center in the Ministry, through a computerized radio system on a number of indicators including species composition, types of gear used, depth and length of trawling and other operations, by-catch etc. The summarizing album of outgoing forms makes it possible at any moment to get updated on the activities of any vessel or vessel group in any fishing area¹⁴⁴. Heads of fishing areas are to issue reports on activities within their areas. Small and medium-sized vessels report catches and effort upon port call to Murmanrybvod, the local arm of a Ministry department which pass on to VNIRO summarized catch and production figures, thus permitting the same type of cross-checking as in Norway. It should be recalled here, however, that the harvesting fleets and the processing units are all organized within one organization, Sevryba. The Ministry has elaborated a system of sanctions on false or untimely statistics. In addition, regular *inspections* are performed by Murmanrybvod on fishing grounds as well as closed areas.

In conclusion, both parties have set up a domestic monitoring system including compilation of comparable reports from different sources in the production chain, propped up by a system of on-site inspection. The independence of these various sources may vary, however. A sharpening of the reporting procedures has occurred in both countries, along with the introduction of more advanced systems for handling this information.

4.4.2. Inspection frequency, violation rate and reported overfishing

Judging by official statistics, the Russian Barent Sea zone is one marked by strict compliance. While for the entire Soviet EEZ, 7,306 inspections revealed 753 violations in 1989, none of the 118 Barents Sea inspections revealed violations of any kind¹⁴⁵. However, there are two reasons to be skeptical to this piece of information. First, as noted above, there are *clear incentives* to take more than the allotted quota; overfulfilling one's production plan by 15-20% resulted in a 20% premium on the wages for crew and captain¹⁴⁶. Moreover, failure to meet the production plans could seriously undermine the career opportunities for the captain; before 1990 he was personally responsible for fulfilling production tasks. Each crew included a so-called Captain Assistant in Political Issues, whose primary function was to control what was termed the moral-ethical climate of the team and its eagerness to fulfill the tasks. Failure could involve the captain being transferred to a less attractive vessel or denied participation in highly profitable foreign expeditions; or even rendered unemployed, the level

¹⁴⁴The system can receive and process data on 1300 vessels a day.

¹⁴⁵*Rybnoe khozjajstvo*, 1990.

¹⁴⁶Giorgy Luka, pers. comm. 29 July 1992.

of which among Soviet fishermen has been on the rise. Hence, just as in Norway, there are clear incentives to break both quantitative restrictions in order to overfulfill the plan and operational restrictions, such as mesh size, in order to avoid failure to meet the plan. Second, while they often fared better than Norwegian and third country vessels, Soviet fishermen were regularly caught violating the rules in the *Norwegian EEZ* throughout the 1980s. In 1989, for instance, 125 inspections of Soviet vessels resulted in 15 warnings and 3 arrests¹⁴⁷. There is little reason to expect the captains to behave better in their own EEZ than in the Norwegian one: the fines for violating regulations used to be twenty times higher for violations occurring in foreign zones¹⁴⁸.

Figure 5 shows the number of Coast Guard inspections conducted in the three northern zones where *Norway* claims management authority: the Norwegian EEZ including the Grey Zone, and the two indiscriminate fishery protection zones around Svalbard and Jan Mayen. Needless to say, violations vary in severity, and the figure distinguishes between incidents when the Coast Guard issues a warning, either written or oral; and when it arrests the vessel¹⁴⁹. In our measure of the violation rate, we have controlled for the problem that Soviet vessels in the Svalbard zone invariably receive written warnings from the Coast Guard because they refuse to sign the inspection papers¹⁵⁰. This is done by disregarding warnings given to Soviet vessels in this zone for the whole time period.

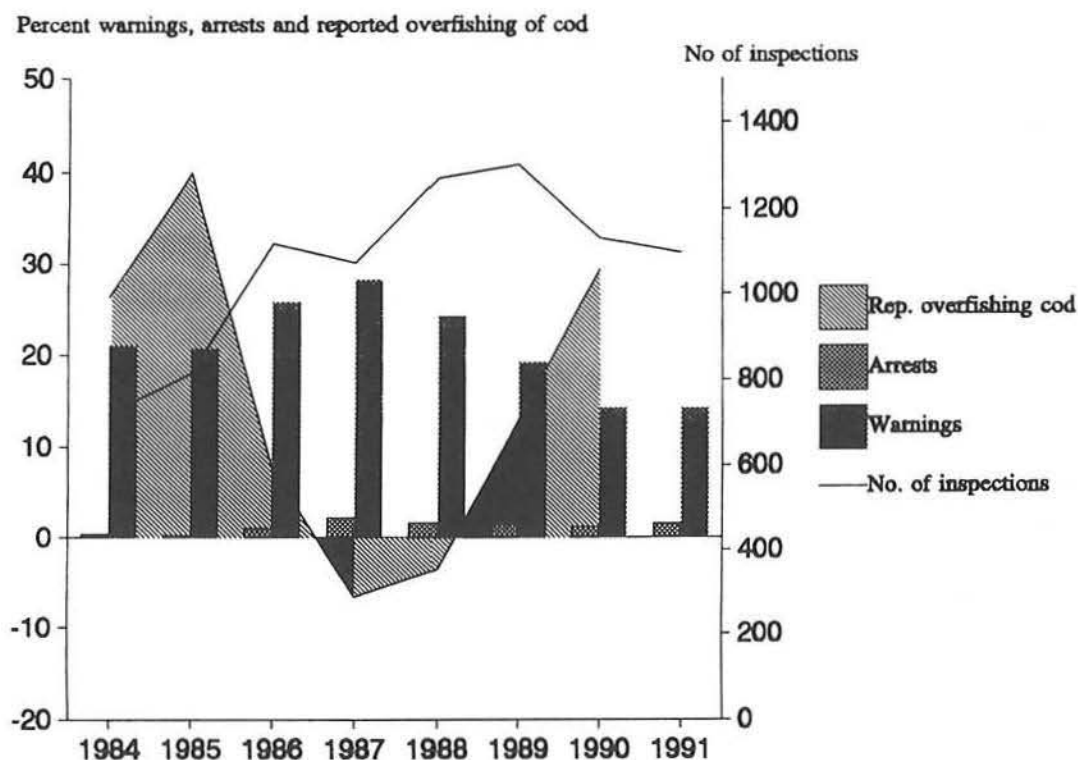
¹⁴⁷Norwegian Coast Guard materials. Note that these figures refer to the Norwegian EEZ, and not the zone around Svalbard where the number of formal warnings to the Soviets are extremely high. See section 2.

¹⁴⁸While a common fine at home would be 500 rubles, depending on the severity, violations in foreign EEZs resulted in fines of 10,000 rubles. Giorgi Luka, pers. comm.

¹⁴⁹As there is no risk of them leaving the country in order to evade punishment, Norwegian vessels are not *physically* arrested, only reported to the police.

¹⁵⁰As noted above, they are prohibited by their home government to sign them, because such signatures may be seen as strengthening the Norwegian claim to jurisdiction in these waters, a claim opposed by the Soviet Union.

Figure 5 Inspection frequency, violation rate and reported overfishing of cod. (Source: Norwegian Coast Guard)



We see in the figure a marked *increase* in the number of *inspections*, beginning in 1984 and continuing until late in the decade when it drops slightly. One would expect as a result that the *violation rate* would be depressed by this, for two reasons. First, more frequent inspections increase the risk perceived by a potential violator that he will be exposed, and this in theory should make him more careful. Second, we know that the Coast Guard, based on experience, have their "favourites" among vessels operating in an area. These are vessels known to be especially unreliable and hence the ones most likely to yield disclosure of violations. Hence, a larger number of inspections, which makes careful selection less essential, should in theory imply that relative effort is moved from a hard core of violators to the average

fisherman. Simultaneously, we would expect reduced *overfishing*. Both of these hypotheses appear to be confirmed by the figure. The reported overfishing is dramatically reduced from 1985 through 1989¹⁵¹, and the violation rate has *dropped* from roughly 25% in 1984 to slightly above 15% by the turn of the decade. However, the predictable drop of the latter is interrupted in the time period from 1986 to 1988 when the violation rate actually rises sharply. This might be explained, however, by the fact that unlike the rest of the decade, these years the cod and haddock quotas were set so high that the fishermen were actually unable to take them¹⁵². For haddock, the under-fishing ranged between 40% and 60%. While this surely relieves the inconvenience of quantitative restrictions, it dramatically boosts the incentive to break operational regulations. In their report for 1988, the Coast Guard confirmed that mesh size violations were the most frequent type occurring in the Norwegian zones.

Summing it up, while we lack time-series data on the Soviet side, the four indicators we have employed to measure *Norwegian enforcement activity* all seem to suggest that its intensity has been growing throughout the 1980s. The question, then, is the role the *regime* can have played in prompting this development.

4.4.3. The role of the regime

There is little doubt that domestic enforcement institutions would have been there even in the absence of the international regime. They are set up primarily to meet domestic needs. The major importance of the Barents Sea regime in facilitating the enforcement of fisheries regulations is by decoupling it from the conflictual issue of sovereignty claims, thus allowing enforcement activities even in the disputed area in the Barents Sea; and by directing attention to the compliance function and rendering poor performance politically embarrassing.

Regarding the *decoupling* function, the key regime element is the Grey Zone Agreement with its separate systems of enforcement in the disputed area. We argued in section 2 that in this Agreement the parties sought to strike a balance between fisheries management concerns, fear of political incidents and the fact of competing claims to sovereignty. *Without* some kind of arrangement, various outcomes would have been likely and none of them perceived as too attractive for the coastal states. i) In order not to provoke the territorial jealousy of the other, both parties might have refrained from intrusive monitoring in the disputed area. In an increasingly regulated fishery, however, such a blind spot would have been quite intolerable, especially as the fish have

¹⁵¹Indeed, there seems to be an almost perfect fit between variations in inspection frequency and reported overfishing. As we shall see immediately, however, the reduced overfishing these years is probably largely due to steep drops in the abundance of cod.

¹⁵²For Arctic cod, this is demonstrated in the figure.

been very profuse in the disputed area in the period under discussion. Moreover, the parties would have had to abstain from the regulation and enforcement of third countries as well, quite detrimental to the thrust of the emerging Law of the Sea. The fish stocks would have been likely victims of such an avenue. ii) Alternatively, one of the parties could have kept a low profile and left regulation or at least enforcement to the other. There is little doubt that this would have seriously undermined the former's sovereignty claims. iii) Finally, both parties could have behaved as if they were in charge of the disputed area and conducted both regulation and enforcement on all vessels in the zone. As the Svalbard experience shows, Norwegian inspections of Soviet vessels in an area in which her jurisdiction is not clarified would be likely to meet opposition from the Soviet government, and this opposition should logically be even stronger when the area in question was claimed exclusively by the Soviet Union. The same argument, although softened by the asymmetry in general power relationship, would be valid for Soviet inspections of Norwegian vessels. In both cases, there would be a considerable risk of embarrassing incidents leading to diplomatic activity and possibly conflict escalation.

True, for each party, the regime solves only *half* of the problem of conducting management in disputed waters, as it allows enforcement only for vessels licensed by itself. It gives no access whatsoever on the enforcement behaviour of the other party: the decoupling is only partial. This point can be generalized to the entire ecosystem; indeed, were it not for the unsettled boundary line, a system of mutual inspection rights in each other's waters might have been quite attractive. *In conclusion*, however, the regime has been instrumental in meeting part of the fisheries management needs in the disputed area and given the political-legal setting, this would have been hard to achieve without such a regime or at least a similar one in place.

The second way the regime can have stimulated enforcement activity is by *drawing political attention* to state practices and making leniency politically costly at home or abroad. An illuminating example of the latter is the way the current inspection problems on the Russian side, related to the decentralization of the fisheries administration, have been affected by the presence of a bilateral regime. During the summer of 1992, evidence was mounting that Faroe vessels fishing on Russian licences were overfishing their quota by two to three times¹⁵³, and Norway raised the issue with the Russians, referring to the third country quota agreed to in the annual negotiations¹⁵⁴ and the need for

¹⁵³*I.a.*, several Norwegian dailies reported that Faroe exports of cod in 1991 was twice as high as the reported catches would permit (*Fiskaren*, 26 August 1992). The accuracy of these reports were later questioned.

¹⁵⁴Director General Gunnar Kjønneøy in the Norwegian Ministry of Fisheries to *Fiskaren*, 12 August 1992. Mr Kjønneøy is the Norwegian representative in the Mixed Commission.

adequate control measures. While the initial response was that Russian authorities had no evidence of illegal operations, a few weeks later the Faroese were thrown out of the Russian zone despite the fact that they had bought additional quotas from Russian companies¹⁵⁵.

Regarding the role of the regime in stimulating *domestic* criticisms of implementation and enforcement practices, two observations are relevant. First, the bilateral regime has rendered it more difficult for the coastal states to blame poor management performance on the collective action problems inherent in large-number management systems. While they can still blame each other, the regime has boosted the accountability of the fisheries authorities in the two states. Second, it has increased the visibility of decision-making by permitting the production of operational scientific advice and clear behavioural standards towards which behaviour can be measured and evaluated. Both points serve to strengthen the domestic critics of the fisheries policy. These are partly environmental organizations such as the Norwegian Foundation for the Protection of Nature or Greenpeace, both vociferous critics of the high quota line of the Mixed Commission. They are also found in scientific organizations outside the department structure. In USSR/Russia, as noted, there were several highly critical articles on the management performance in the Barents Sea in the late 1980s, published by local and republican press¹⁵⁶.

5. Conclusion

This paper has addressed regime effectiveness along two dimensions: problem solving and behavioural impact. These two dimensions are closely connected: a necessary but not sufficient condition for solving problems is the capacity to *affect the behaviour* of those actors who are relevant to the problem. When specifying the *problem* addressed by the Barents Sea fisheries regime, we started out with a general outline of the dilemmas and tasks of fisheries management. We concluded that it would be useful to examine five clusters of variables in order to judge the effectiveness of the regime in question. Two of them were environmental and three behavioural: the health of the stocks and industries, and the scientific, regulative and enforcement activities conducted by the two member states.

Based on developments on the *biological* and *socio-economic* indicators, the regime is hardly impressive although we did note that the three shared stocks managed by the regime did not fare any worse than exclusive Norwegian stocks such as redfish and herring. We pointed out, however, that limited knowledge about the relative impact

¹⁵⁵*Fiskeribladet*, 28 August 1992.

¹⁵⁶Then Director of the Department of Biology at the Kola Science Centre under the Soviet Academy of Sciences, G. Matishov, made a special report in 1988 which aroused public attention and earned him a poor reputation in the fisheries management bureaucracy.

of changes not related to the regime, such as temperature shifts or marine pollution, render it difficult indeed to decide whether or not the situation would have been worse had it not been for the regime. Needless to say, this is a general problem of causal analysis and one that pertains to the three behavioural variables as well. In the latter, however, the causal leap is not as great and the counterfactual reasoning involved in *any* single case study is easier to perform. As to the *scientific aspect* of problem-solving, we concluded that the regime did little to weaken the traditionally close links between fisheries science and administrative or even industrial bodies. Moreover, due to the International Council for the Exploration of the Sea (ICES), most of the highly useful and quite deep bilateral cooperation between the coastal states would probably have occurred even in the absence of the regime. When noting, however, that the central position given to scientific investigations and advice in the management process established by the regime is likely to have facilitated the extraction of funds for these activities, and also the role the scientific cooperation has had in picking up and trying to render more tractable controversial issues like the mesh size regulations, a moderately positive assessment seems warranted. This conclusion is stronger regarding *regulation*. While the regime fails to mitigate the considerable role played by industrial interests in the elaboration of rules and restrictions, we have tried to show that it has rendered it easier for the member states to remain comparatively loyal to the scientific advice forwarded by ICES. A regime characteristic believed to be especially useful in this respect is the fact that the inter-party division of shared stocks is fixed by a set of percentage keys. Moreover, we have shown that the regime has facilitated regulations widely believed to be conducive to rational management such as reciprocal fishing allowing both the targeting of larger fish and the exchange of quotas; the extension of similar selection measures to the entire ecosystem area; and, once the exception became biologically threatening, the extension of quota limits even to vessels fishing with conventional gear. A similar conclusion is in order regarding *enforcement*: our four indicators of enforcement activity suggests growing intensity on the part of the coastal states. We have buttressed this conclusion by demonstrating that the regime stimulates this activity by de-coupling it from the difficult sovereignty issue; by focusing attention, at home and abroad, on enforcement activities; and by providing a regular forum where practical approaches to improve it can be thematized and organized.

Our assessment, therefore, of the effectiveness of the Barents Sea fisheries regime is mixed. On the one hand, it has failed to produce the environmental and socio-economic situations it was meant to. On the other hand, our analysis of the behavioural variables suggests that the regime has probably *contributed positively* to the environmental and social situation, in the sense that it would probably have been even

worse in the absence of the regime. That said, however, we have not gone far in this paper towards delineating precisely *how much* improvement we should require before judging a regime effective.

Let us finish by musing tentatively on the various *causal mechanisms* we have invoked in our argument, i.e. the processes by which the regime has affected the collective handling of the fisheries management problem¹⁵⁷.

One of the possible mechanisms mediating between the regime and actor behaviour is that it might *change* their identity or *roles*. It is tempting, of course, to elaborate on the changing role Norway and the Soviet Union assumed by the introduction of the current fisheries regime. While previously only the foremost among a large group of equals, the introduction of the EEZs and the subsequent development of the bilateral regime gave Norway and the Soviet Union exclusive management authority. This affected their incentives by securing both a greater share of and more control over the benefits of sound management of the fisheries stocks. Such a discussion would not be strictly to the point, however, as the relevant contrast is not the period prior to the current bilateral regime but what the situation would have looked like today without it. In the assessment of effectiveness made in this paper, the counterfactual comparison has always been a situation where Norway and the Soviet Union are in charge of their own EEZ but without the bilateral institutional arrangement in place.

Another mechanism highlighted in the regime literature is *authority*: actors might comply with the regime as a matter of routine simply because it is seen as the proper thing to do. As noted, it is hard to substantiate a direct causal link between the constitutive documents of the present regime and the actual handling of practical tasks associated with knowledge production, regulation and enforcement. The reason, it will be recalled, is the vagueness of language in these agreements and their failure to specify the balance to be struck between the two major goals identified, conservation and utilization. It is more interesting, therefore, to start out from the recommendations produced within the Mixed Commission, and two points stand out when we do. First, as they are regularly implemented by the coastal states in their domestic legislation, the regime may appear as highly authoritative. The caveat is, of course, and this is the second point, that as recommendations are made by consensus they never go beyond what both parties can agree to. Hence, it is not that the actors behave in given ways because the regime tells them to, which would be a case of an authoritative regime, but rather that the regime tells them to behave in given ways because they want it to.

A third mechanism pursued in the collaborative project of which this paper is intended to form a part, regards the way the regime modifies

¹⁵⁷These mechanisms are elaborated in more detail in Levy, Osherenko and Young (1991).

Barents Sea fisheries regime does not have built-in rewards for compliance or some sort of punishment for behaviour detrimental to its goals. As noted, it is based on coordination of autonomous behaviour rather than joint regulation or enforcement. On the other hand, the regime does imply a greater degree of visibility regarding behaviour in this area and thus greater exposure to criticism at home or abroad. Indeed, it is natural to link this mechanism with that of the regime's effect on *domestic alignment patterns*. We have seen that criticism of current policy has been voiced from various quarters in both countries, and the critics feed on the fact that the regime ensures regular and publicly available standards by which behaviour can be evaluated.

By stimulating and integrating scientific knowledge in the annual deliberations, the regime definitely *facilitates learning* or the modification of goals and priorities. As our discussion of the behavioural variable shows, however, the mechanism that has been the most fruitful in sensitizing us to regime impact is that it may serve to *enhance cooperative problem-solving* among the participants in the areas of knowledge production, regulation and enforcement.

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THE LOFOTEN FISHERIES MANAGEMENT REGIME: TRADITIONAL OR MODERN?

by

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Abstract

What is traditional and what is modern in fisheries management is not always clear. In academic fisheries management literature "co-management" is described as definitely modern. It is seen as a solution to many of the problems of existing regulatory systems, either the centrally enforced rules and regulations at the state level or the informal management practices that prevail at the local level. However, in many European counties co-management systems have existed for decades and in some places even centuries. One example of a system which we today will label "co-management" is the regime that has been in place in the Lofoten fishery of Norway since 1897. This paper traces the roots of this system, how and why it was introduced. It also describes its particular organizational form. What are the lessons to be learned from this management experience, for instance in relation to a recent proposal of establishing Saami fisheries zones?

Distributional Aspects of Multispecies Management of the Barents Sea Large Marine Ecosystem - a framework for analysis

by

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1. Introduction

Fisheries managers in the North East Atlantic will face new challenges if the concept of Multispecies Management (MSM) is brought into the management arena. Questions have been raised as to whether this concept is yet mature for application by practitioners, and whether it actually provides them with a better device for making decisions than what traditional single species assessments have done. The answer to the first question basically is NO.

In this paper, we will discuss the second question, whether MS models constitute a better device for successful fisheries management than single species models have done. As the discussion will show, they will not necessarily do so, due to complex distributional effects that MSM may give rise to.

Such effects will be analysed within an institutional economic framework. By way of comparison, we give a general view of how traditional neo-classical fisheries economics approaches distributional questions (or rather ignores them) - both in a single- and a multispecies context. We show how an extension of single species assessments, in which multispecies interrelationships are accounted for, exaggerates distributional problems.

Finally, we elaborate on future challenges that MSM could place on those in charge of managing the specific area in question, the Barents Sea. All of them are discussed in light of the institutional economic framework outlined before. We also suggest some tentative responses to the challenges, first and foremost extended cooperation among the parts affected by distributional problems that will prevail from MSM. As MSM belongs to the future, however, parts of the discussion will necessarily be tentative and contrafactual. In spite of this, it hopefully will shed some light on challenges currently facing fisheries managers in the Barents Sea and elsewhere, and hopefully, the institutional economic framework could stand on its own, providing some insight into the issue of how management decisions may create distributional problems, even though it is based on single-species assessments.

Before we proceed, however, we will give a general view of the rationale behind MSM, and the MS modelling carried out for the Barents Sea.

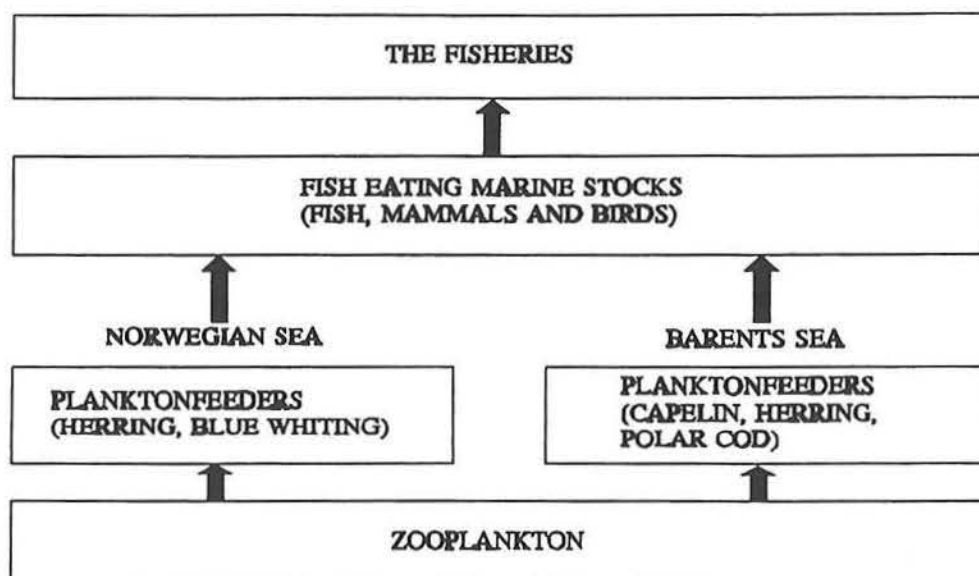
2. MSM of fisheries

2.1. The scientific basis

Marine scientists pursuing a MS research programme aim at revealing interrelationships between predator and prey species. Which species feed on which species, and how much of various prey species makes up the predator's diet? With this effort, scientists search for parameters to feed into their models for the purpose of describing the interactions between the different trophic levels which constitute the ecological system. Oceanographical information (currents, salinity and temperature) is fed into the model as well to account for biomass oscillations attributable to natural variation in the species' marine environment. Through this modelling, scientists aim at understanding, explaining and predicting biomass oscillations. Furthermore, by applying information derived from the MS model, scientists aim at obtaining greater ecosystem stability, since oscillations attributable to anthropogenic influence (harvesting) could be sought avoided with improved recommendations on what should be the relevant catch mix of the various species when prey-predator interrelationships are accounted for. Somewhat simplistic, one may say that scientists aim at increasing the stability of the ecosystem, by recommending a catch mix which renders the stocks in equilibrium with each other.

With respect to the MS modelling efforts for the Barents Sea, however, scientists have not yet arrived at consensus on what should be the most appropriate approach to be applied in building the models. Nor does any consensus exist as to how extensive models should be (in terms of number of species and areas to be included) before models are sufficiently comprehensive for application by managers. This dispute is partly attributable to the 'eyes of the beholder', i.e. whether it is a biologist, a statistician or an oceanographer who approaches the problem. Today, most effort is concentrated on in-depth modelling of a cod-capelin model confined to the Barents Sea. However, other models worked upon extend the number of species and the area to be included, linking the Barents Sea and the Norwegian Sea together as one ecosystem unit. This latter approach will be at the bottom line of this paper, as this is most relevant for us showing as it does how a MS approach to management may involve a host of difficult and unprecedented distributional aspects.

Fig. 1. The structure of the Norwegian Sea - Barents Sea Ecosystem



(Source: Hamre, 1990)

The extended MS model is referred to as the Hamre model¹⁵⁸. It links the Norwegian Sea to the Barents Sea through stock interrelationships as an ecosystem basically confined to four distinct trophic levels.

In this ecosystem model, Man constitutes the top level, being predator on level II and level III species. Level II species are competitors to Man as predators on level III species. Of special interest is the division of level III into two branches, the Norwegian Sea and the Barents Sea. In the former, herring constitutes the most important prey for level II species together with the semipelagic blue whiting. In the Barents Sea, the capelin links primary production to carnivores in a similar manner as the herring does in the Norwegian Sea, while the Polar cod is the corresponding semipelagic species.

Although the herring stock was all but extinct in the late 1960s due to massive overexploitation, it plays an important role in the model. When the stock was depleted, it changed its migration routes. Originally, the spent herring moved northwestwards into feeding areas in the Norwegian Sea after it had spawned in Norwegian coastal waters. Today, the feeding area is limited to Norwegian littoral waters. The Hamre model indicates that the herring collapse is one of the most

¹⁵⁸Named after its creator, Johs. Hamre at the Norwegian Marine Research Institute.

important explanations of the ecological and hence economic crisis experienced in the Barents Sea fisheries in the 1980s. The depletion of herring triggered a severe instability between the trophic levels of the area. Data of variation in climate and age structure of the stocks of cod and herring have shown that a warm climate is favourable for the recruitment of both stocks. In the warm period of the early 1970s several abundant year classes of cod were recruited, whereas the herring failed to recruit due to depletion of the spawning stock, (Hamre 1989). The stock/recruitment function of herring suggests that in periods with favourable recruitment conditions the strength of the year classes is proportional to the size of the spawning stock. The supply of juvenile herring as food for the cod is thus proportional to the abundance of the adult herring stock, whereas the cod may recruit strong year classes on relatively low stock levels. This means that in a state of reduced stocks, for instance after a long period of cold climate and/or heavy exploitation, a latent imbalance state of the predator-prey relationship between cod and herring may develop, triggered when a warmer climate occurs. In the early 1980s, when the climate became warmer, the cod stock was large enough to recruit strong year classes, whereas the herring, which needs a large parent stock to produce abundant year classes, could not take full advantage of the improved recruitment conditions.

At the same time, in the years 1984-85, there was no substantial decline in the larval production of capelin. The failure of recruitment, i.e. the collapse in the capelin stock in 1986, may thus be explained by the favourable climatic conditions that resulted in abundant year classes of juvenile herring which fed down the capelin fry.

However, although the stock of juvenile herring was sufficiently abundant to cause recruitment failure of capelin, it was too small to meet the cod's food demand, and an abrupt food shortage developed. The entire ecosystem broke down. Cod suffered from starvation and turned to cannibalism, the Arctic seals invaded the Norwegian coast and birds died in thousands. Capelin, however, characterized by an opportunistic way of living, has a remarkable ability to adapt to unfavourable conditions, and during the four year ban on catches introduced in 1986, the state of the stock has improved rapidly. Thus, increases of yield in the coastal cod fisheries has been pronounced, and the crisis in the fisheries seems to have past climax for the time being. The herring stock is, however, still recruitment overexploited, and its feeding migration is still confined to Norwegian littoral waters. However, surveys by Norwegian and Russian vessels indicate that the stock extends its migration from year to year, and may retain its pre-depleted migration pattern if allowed to rebuild. The ecological consequences of rebuilding the stock are impossible to predict. However, from a fisheries management point of view, highest priority

should be given to the rebuilding of the herring stock in order to restore the balance between the trophic levels of the area (Hamre, 1990).

2.2. The economic basis

Economists feed the information derived from the scientific models together with different economic parameters (harvesting costs, revenues, and catch effort efficiency), into their bioeconomic models. They aim at arriving at answers as to how total allowable catches should be set and how catch quotas should be allocated between fleets and fishermen in order to derive maximum values from the fisheries, or to phrase it in economic terms, to maximize the fisheries resource rental or economic efficiency. Whereas total allowable catches needs to be regulated by the manager due to the fact that fish stocks are common property resources and would otherwise be overexploited, the market could ensure an efficient allocation of quotas between fleets and fishermen, according to neo-classical bioeconomic theory.

When stock interrelationships are accounted for, bio-economic MS models recommend revised total allowable catches for the various species, reflecting the fact that some species should be less harvested to increase the food base for other, more valuable species. Accordingly, a reallocation of quotas will be needed to increase the economic yield from all of the fisheries put together.

So far, economic MS modelling for the Barents Sea has been concentrated on the two species cod and capelin, reflecting the fact that only the interrelationship between these two species has been properly parameterized by marine scientists. So far, the results indicate that less harvesting should take place on the capelin stock which currently constitutes the most important food base for the cod stock in order to augment economic yield from the fisheries as a whole. Economic aspects of the extended Hamre model have yet not been investigated.

3. The fisheries manager's choices

The policy-maker, or the fisheries manager, borrows the results from scientific and economic models when taking action on management. As no consensus has yet been achieved on either approach or 'scope' of the MS models, the manager has to choose among uncertain alternatives if MS models are to form the basis of his decisions. His choice of a scientific model will depend on a host of factors, like which of them are most frequently supported by scientists, which of them are simplest to apply, or which of them have already been applied by the economists in their modelling effort. However, as no MS model for the Barents Sea is yet sufficiently developed, we could ask why worry about MSM? However, if we anticipate that scientists will come up with a reliable MS model in the future, (and this is evidently their intention), then

there still are some decisions to be taken that managers should contemplate on in advance. One of them is related to the economic basis, more specifically, to whether or not the traditional bioeconomic approach - and its recommendations on how catch quotas should be allocated in order to maximize efficiency - actually should be chosen as basis for his management decisions. Although the traditional bioeconomic models provide answers on how efficiency could be increased, it says little about income distribution, and they are scant on how income redistribution among fleets and fishermen could give rise to distorting feed-back effects on efficiency. Our debate on whether or not to choose the traditional bioeconomic approach centers around this latter issue. The debate is relevant even in a single species context. Its relevance increases in a MSM-context, however, as extended income distributional effects will then be seen. We will come back to the income redistribution associated with MSM in section 4.

First, we will present the institutional economic framework, developed for the purpose of analysing income distributional effects. This will be contrasted to the traditional neo-classical approach.

As noted above, according to neo-classical bioeconomic models, resource rentals or efficiency may be increased by reallocating catch quotas from less to more efficient vessels (as long as efficiency is not at its maximum). The manager is regarded as having the power to reallocate in order to increase efficiency, and no secondary effects of reallocation are accounted for. Whenever maximum efficiency is achieved, a stable equilibrium exists.

However, the assumptions underlying the models do not exist in the real world. The manager is not all-powerful, His decisions are bound to another challenge, they need to be accepted as legitimate by those affected by them - the fishermen. Our institutional approach leaves the manager with three major concepts that should be accounted for when he makes his decisions. In addition to stability and efficiency which concern the traditional approach, legitimacy is regarded as highly relevant.

The three concepts are closely interrelated. First, unpredictable oscillations in biomass (instability), complicate efficient investment decisions in the fishing fleet. Similarly, inefficient investments (e.g. excess investments compared to the resource basis) may increase the pressure on the stocks, and eventually lead to ecosystemic instability. Furthermore, a policy (regulation of catch capacity) incapable of preventing either ecosystem instability (depleted stocks) or economic inefficiency (excess investments and revenue problems), may cast doubt on the manager's capabilities, i.e. the legitimacy of his policy. At last, and of the utmost importance, a policy not conceived of as

legitimate, may not be capable of preventing economic inefficiency and ecosystemic instability either. How illegitimate policy may ultimately lead to economic inefficiency needs some clarification.

Today, in the western hemisphere at least, it is generally accepted that open access to fisheries often leads to excess investments in harvesting capacity and overtaxation of stocks. One of the most important duties for fisheries managers is therefore to regulate catch effort, or rather to limit open access situations. He can do so by choosing between various instruments like licences, quotas, etc. Any regulation is 'plastered with burdens', in that fishermen adverse to restrictions of their occupation. However, some regulatory measures are conceived of as worse than others, the reason being that they are regarded as 'unfair'. Often, regulation associated with quota and income reallocation between groups of fishermen seems to meet most resistance, which indicates that within fisheries communities values exist on what should be regarded as a 'fair' income distribution. Such an assumption diverges from the neo-classical approach in which fishermen are regarded merely as individual instrumental profit maximizers without any preferences for income distribution. According to the institutional economic approach a perception of 'unfairness' occurs when income distribution is threatened by reallocative regulation. 'Unfair' policy is not legitimate, and failure to comply with regulation (irregular fishing), may very well be conceived of as nothing but resistance to 'unfairness'. The latter assumption is supported by observations that threats of non-compliant behaviour are frequently submitted to fisheries authorities whenever a new form of regulation is conceived of as bringing forth 'unfair' income redistribution. Recently, resistance by many fishermen to a proposal for regulating Norwegian fisheries by issuing transferable quotas was based on income distributional arguments. Similar resistance could be seen in other countries. As long as surveillance and control are limited, (as is often the case at sea), non-compliant behaviour in terms of irregular fishing is not easily prevented. Illegitimate policy may therefore lead to overfishing of the quotas. In periods of depleted stocks, ecosystem instability may be exaggerated as may economic inefficiency.

Thus, although neo-classical bioeconomic models may provide valuable insight, like pointing at the need for limiting open access fisheries to prevent overexploitation of stocks, their prescription of how quotas should be allocated to achieve economic efficiency may be of limited value, due to their ignorance of how efficiency may be affected by feed-back mechanisms generated by income redistribution and a lack of legitimacy. A consequence should be that prior to effectuating regulation, managers should thoroughly examine the functioning of fisheries communities' social systems in order to procure the proper regulation.

4. Distributional aspects of MSM.

The previous section elaborated on how distributional effects and legitimacy of management are basically ignored by neo-classical bioeconomics, and how illegitimate regulation may have spill-over effects on ecosystem stability and economic efficiency. Furthermore, an alternative approach was developed in order to shed light on the issue. This section will go more into detail on how MSM may give rise to redistributive effects, both at the national and the international level. We will start with a hypothetical example from the Barents Sea.

Today, a bilateral fisheries agreement between Norway and Russia set up a fixed sharing of the TACs of three Barents Sea stocks cod, haddock and capelin. The TACs of cod and haddock are shared equally while Norway receives 60% and Russia 40% of the capelin quotas.

Assuming, under the assumption that multispecies research reveals that in order to maximize total economic yield of the Barents Sea according to traditional bioeconomic models, then the stock of cod predating on capelin should be augmented by reducing harvests on the capelin stock. At the same time less young cod specimens should be harvested in order to increase the stock's reproduction rate.

First, this will bring forth redistribution of quotas nationally, as fishermen purse-seining the capelin will have to reduce their catches. Fishermen harvesting the cod will gain.

Reducing catches of younger year classes of cod will also alter the domestic fishing pattern, as more harvesting would take place in the coastal waters off Norway, where the adult cod has its spawning grounds, at the expense of harvesting the younger cod specimens in their nursery grounds further out in the Barents Sea. This will benefit the coastal fleet at the expense of long-distance trawlers and factory vessels.

Second, redistribution of quotas will take place at the international level as well, as the relative distribution of quotas between Norway and Russia will be altered. Less harvesting of capelin will affect Norway more severely than Russia as Norway according to the fisheries agreement historically has been endowed with a larger proportion of the capelin quotas.

The cod quotas, by contrast, are shared equally between the two countries. So, although Norway has gained in absolute terms by reducing capelin harvests to enable greater returns from the more valuable cod stock, she has lost relative to Russia.

This hypothetical but not unrealistic example¹⁵⁹ illuminates how MSM recommendations could change the relative distribution of the cod and capelin quotas between the two countries, provided the fixed sharing of the stocks is maintained and no quotas are transferred from Russia to Norway to compensate for this relative loss.

As accounted for in the previous section, redistribution of quotas may give rise to legitimacy problems, non-compliant behaviour and succeeding spill-over effects on economic efficiency. The asymmetry that may occur with respect to quota endowments - nationally, between the cod and the capelin fisheries; internationally, between Russia and Norway - as a consequence of applying MS recommendations, may in a similar way be regarded illegitimate by the losing parties. Domestic acceptance of the entire fisheries agreement may thus be weakened, and in the worst case, fishermen may decide to totally disregard the quota regulations. To maintain domestic support for the agreement, the contracting parties should thus be aware of such potential redistributive effects. A substitution of the current fixed quota sharing with a more flexible system should perhaps be considered.

If we extend the number of species and the area to be included in the model, like in the Hamre-model outlined in section 2.1., even more complex distributional effects could occur, nationally as well as internationally.

Light may be shed on this by introducing a map where migration routes for the 'key species' in the Hamre-model are projected on a political map showing national 200-mile exclusive economic zones. The migration routes of the Atlanto-Scandian herring stock are those of the pre-depleted stock.

The map shows that during their life-cycle the 'key species' are proliferated within several national economic zones and within areas characterized by diffuse management jurisdiction - like international high seas areas, the 'Grey zone' and the Fishery protection zone off Svalbard. Bearing in mind that all of the species are interrelated, the map also indicates the intricate web of interdependence that exists between the states sharing the stocks.

Distributional effects may become more extensive if the Atlanto-Scandian herring stock is to be incorporated in the multispecies models¹⁶⁰. One should emphasize, however, that much of the

¹⁵⁹The TACs of cod and capelin were set according to multispecies considerations. The capelin TAC was reduced by 150 000 from the level recommended by the Advisory Committee on Fisheries Management, the International Council for the Exploration of the Sea, to secure a proper food base for the cod stock.

¹⁶⁰A project aiming at incorporating the herring stock into the multispecies models

discussion below is speculative, founded on marine research yet to be confirmed¹⁶¹

The Hamre model explains the collapse of the fish stocks in the entire Barents Sea in 1986 by the poor state of the herring stock, and thus gives it an important position in the multispecies web. It also says that in order to retain the balance between pelagic species and carnivores in the entire area, measures should be taken for rebuilding the herring stock as quickly as possible, (Hamre, 1990).

Two different political problems arise from this:

1. Rebuilding the herring stock
2. Once it has been rebuilt, sustaining the stock at this new level.

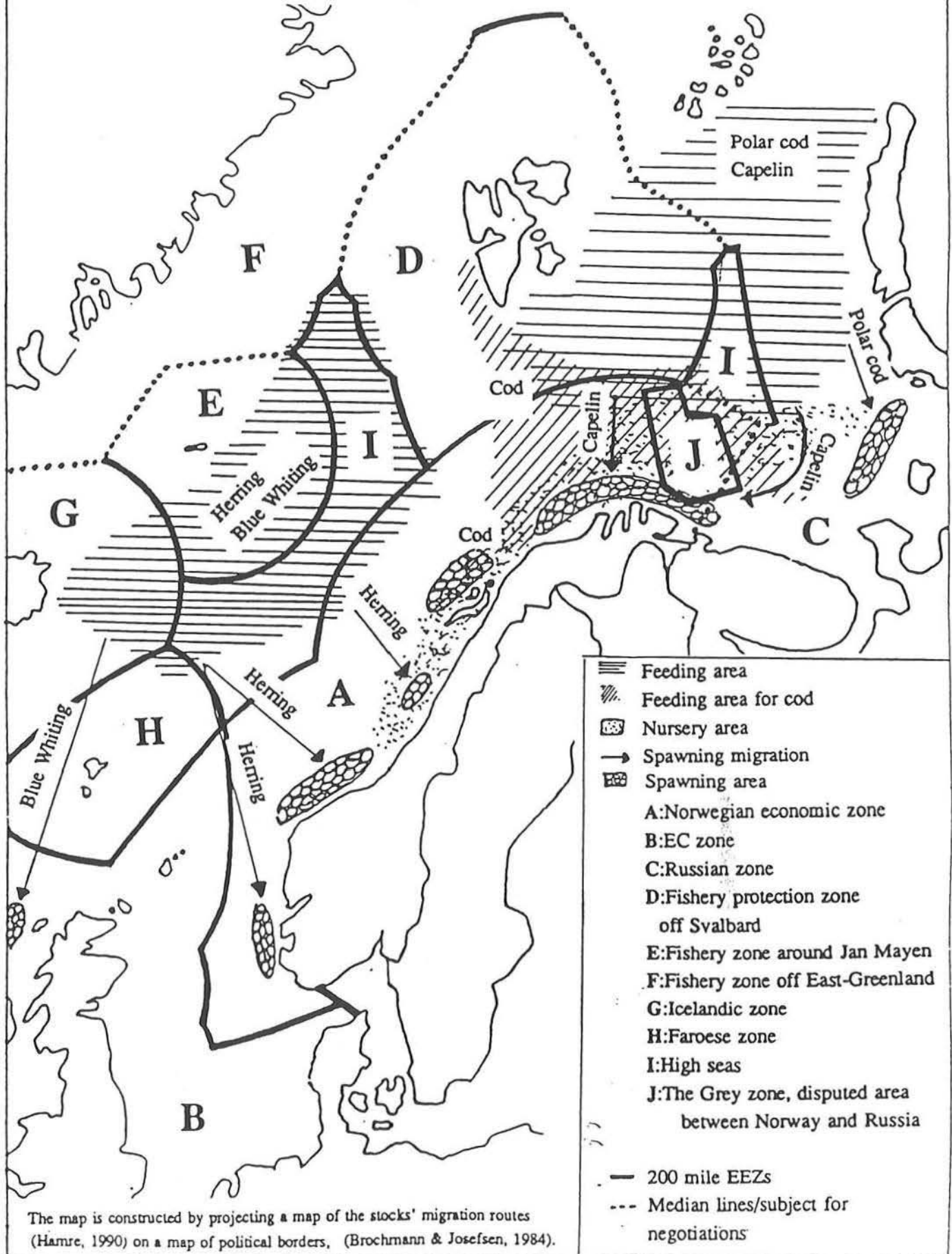
Despite the poor state of the herring stock, harvesting has taken place each year since depletion. This may very well have delayed the rebuilding of the stock. Today, the herring stock is estimated at some 1.5 - 2 mill. tonnes, and thus viable for small scale harvesting. However, unless harvesting is kept under strong control, new collapses may be expected. Such control has proved difficult. In addition, the herring stock has each year been used as a bargaining chip in the bilateral fisheries negotiations between Norway and Russia.

Although it has proved hard to rebuild the stock, maintaining it at a high level once rebuilt, could prove even harder - not least if the stock retains its old migration pattern. Whereas prior to its depletion it fed mainly off the north-east coast of Iceland (see map above), today, both spawning and feeding areas are restricted to Norwegian coastal waters. The herring stock has thus changed from being a highly migratory regional fish stock to becoming mainly a national Norwegian stock. If allowed to recover, the stock may very well retain its pre-depleted regional migration pattern. Recalling the stock's importance in a multispecies context, the management picture suddenly looks more complex, socio-economically and politically.

has already started at the Institute of Marine Research. Personal contact, Johs. Hamre, the Norwegian Institute of Marine Research, 1992.

¹⁶¹ However, the hypotheses guiding much of the multispecies research at the Norwegian Institute of Marine Research, stress the importance of the Atlanto-Scandian herring stock as one of the 'key species' in the ecosystem web. The anticipation that the herring stock will retain its predepleted migration route if allowed to recover is supported by observations from Norwegian and Russian research vessels. Personal contact, Johs. Hamre, Norwegian Institute of Marine Research.

Fig. 2. Map of the Barents Sea Large Marine Ecosystem, migration routes of the 'key species' and jurisdictional borders (EEZs).



The stock will become a shared stock mainly between Norway and Iceland, (probably also the Faroe Islands), whereas prior to its depletion it was mainly an international stock due to the ocean regime in place at that time, (prior to the implementation of 200 mile EEZs). However the stock will still pass international waters on its migration routes. Thus, the stock will probably become subject to harvesting by other interested countries, not least because closure of other important high seas areas in recent years due to implementation of EEZs, has left an increasing number of long distance operating vessels from various nations out of operation. These vessels are constantly searching for alternative fishing areas, not least in the high seas. Important questions regarding who is to decide on herring quotas and how to distribute them could therefore arise. Satisfactory answers to these questions will become essential if herring is regarded a 'key' for establishing and maintaining stable higher yields, and if reaching such stability at a higher level should prove successful.

Major parts of the Norwegian Sea will necessarily increase in importance in what could be called the Barents Sea Large Marine Ecosystem (LME), and the political centre may shift southwestwards. Apart from the EEZs of Norway and Russia, the Svalbard zone and the Barents Sea "loophole", the Barents Sea LME will also envelop the EEZs of Iceland, the Faroe Islands and the Norwegian Sea high seas 'loophole'. An increasing number of actors, both international and domestic, voicing their claims on new distributional aspects may thus be expected to result in severe political conflicts.

Areas with diffuse management jurisdiction, like the two "loopholes", may entail pitfalls for rational management. Even though management could be carried out in a sound manner within the national economic zones and sound management of shared stocks could be agreed upon between neighbouring countries, depletion of stocks could persist in these high seas 'loopholes'. As long as such depletion is liable to generate imbalance between the trophic levels of the ecosystem in its entirety, as was probably the case with the depletion of the herring stock, even exclusive national stocks may be affected.

Prior to the collapse of the Norwegian spring spawning herring, huge masses of different predators pursued the herring in its annual spawning migration towards the Norwegian west coast rendering the Norwegian spring fisheries amongst the world's largest. Thus, if herring retains its pre-depleted migration pattern, the same could easily happen to other species as well. Although there is no systematic scientific work estimating the total magnitude of the biomass transfer, there are indications that Icelandic saithe was one of the species that followed the herring migration every year. Hence, "new" species

interactions may be discovered in the future indicating that multispecies management may have far more widespread distributional aspects than could be anticipated today. This also raises the question whether or not all parties will actually gain from a multispecies approach to management of the Barents Sea LME, which entails rebuilding of the herring stock. Moreover, 'new' distributional effects between domestic fishermen may occur as well. These will probably be most noticeable in Norway. The (fishery) economic centre could move southwards, reestablishing the cities on the west coast as the most important fisheries centres at the expense of the northern region of Norway. However, most likely all parts of the country will gain and the current conflict between northern and southern fishermen may disappear. Nevertheless, even moderate distributional effects may give rise to political conflict (legitimacy problems) and may force managers to consider compensation mechanisms to counteract redistribution of quotas.

5. Distributional aspects and interdependence - is a new regime required?

Enormous challenges must be faced before the theoretical idea of multispecies management can be applied for working out practical management systems. The large distributional aspects which could succeed a change in the management approach could endanger the legitimacy of management, and in turn the acceptance of the multispecies approach. We have pointed to hypothetical examples in which a lack of legitimacy and efficiency (and how they interact) may exist at both national and international level. Moreover, we have touched upon how inclusion of the herring stock in the multispecies models may give rise to even more complex distributional problems than those prevailing today with the simple cod/capelin-model applied by the bilateral Norwegian-Russian fishery commission. (However, the present-day state of biological research is too sparse even to guesstimate these effects). At this stage, one can deduce that increasing complexities and interdependencies will be revealed, as future multispecies research increases our knowledge of interrelationships between the species inhabiting the Barents Sea Large Marine Ecosystem.

So, if the scientific results should actually have any significant impact on actual management, one should be prepared for a more complex managerial situation in the Barents Sea area. We therefore ask whether the bilateral management regimes that exist in the area today are capable of coping successfully with the additional complexity of management questions if a multispecies approach should be chosen as guideline for future management of the area. In our view, a multilateral regime seems more suitable for the purpose, because

unilateral or bilateral actions taken in management questions will, as revealed by multispecies research, often affect other countries' interests. Thus, in order to bring ecosystem level and decision level more in line, a multilateral regime might be a more suitable management system than the existing bilateral management agreements.

However, although the latter could easily be agreed to, important problems remain to be solved before a multilateral regime can operate successfully. Unless it is properly equipped for the purpose, practical management can not be expected to be more successful. Too often, poorly equipped multilateral bodies have proved incapable of successfully managing fish stocks. The introduction of national EEZs was partly a response to this fact. Thus, there are several important questions that need answers before the situation is ripe for a regional management body to replace or supplement the existing bilateral arrangements. First, who should be represented in this body? Second, what kind of issues should be placed on the agenda? Third, what kind of decision rules and enforcement tools should be ascribed to the body? And consequently, how should the division of tasks be between this body and national management bodies?

None of these questions have clearcut answers, and each is so complex that entire books can be required for discussing the matter. In this final section we will only briefly touch upon the two first.

Participation

All seas are interconnected by currents, and human activity onshore as well as offshore affects the marine environment. International cooperation is thus needed for coping with important environmental and resource management questions. However, the international community cannot be engaged in everyday management questions all over the world, since capacity and degree of everyday affectedness is too limited. Furthermore, the effectiveness of such a system involving too many people will be too limited. It is possible to discern particular ocean areas that constitute distinct ecosystems, although they are not entirely closed off from others. The fauna of these constitute a web of interrelated species, and multispecies research reveals the character of such interrelationships. Such distinct ecosystems could be applied as a point of departure when deciding who should participate in management. Interrelationships between agents are stronger within these ecosystems than outside, between ecosystems. Wherever ecosystems overlap, co-operation between the two may be required. The distinct Barents Sea Large Marine Ecosystem, as seen on the map in section 4, encompasses areas in the Barents Sea and the Norwegian Sea, and touches upon the EEZs of Norway, Iceland, the Faroes, Russia

and Greenland¹⁶². The area may be identified as a semienclosed area, which reinforces the idea of the system as a feasible unit for joint management. The bulwark of species interrelationships (based on current scientific research) are mainly those that link cod, capelin and herring together (with blue whiting and polar cod as less important species). Some links exist between this area and EC waters because of the migration of the blue whiting stock. Moreover, whale stocks migrate long distance and may therefore constitute a link between several of the distinct ecosystems. However, as a practical management unit, the system may certainly be regarded as relatively closed off from other similar systems. The map in section 4 indicates which countries 'share' these interrelated stocks, and thereby identifies the above mentioned countries as the most affected parties, which obviously should participate in a joint regional management effort.

The question of participation is somewhat more complicated, however, due to the high seas areas found in the Barents Sea and the Norwegian Sea. Other countries operate in the Barents Sea "loophole" today, and may be expected to commence fishing in the Norwegian Sea "loophole" if herring retains its pre-depleted migration pattern into this area. The question of a broader participation therefore has to be raised, first and foremost of incorporating the EC as a member of a future regional management body. EC countries are less affected than the countries with direct proximity to the area, however. Moreover, with a higher number of participants characterized by a varying degree of affectedness, one might expect increased difficulties as to reaching unanimous measures for action, and so less effective management. Instead of EC participation in the regional body one should perhaps formalize cooperation between the Barents Sea LME management body and EC fisheries management bodies. Such cooperation is necessary, both because the Barents Sea LME is interlinked with EC waters as described above, and because EC fishermen could be expected to continue, and maybe increase fishing in the Barents Sea "loophole", and commence fishing in the Norwegian Sea "loophole" if the herring stock returns.

The question of participation is not limited to governmental representatives, however. One could also expect other groups of actors to be interested in becoming delegates to a new regional management body. Fishermen, environmental groups and indigenous people alike may claim special interests for management of the fish resources. Participation of these groups could be necessary for ensuring the required legitimacy of management. A standard type of multilateral resource regime, in which participation is granted through membership

¹⁶²Greenland is certainly involved if marine mammals are included in the management arrangement.

in subcommittees, may thus be recommendable. Final decisions will thus be reached at the government level, after discussions in the various subcommittees, in which e.g. fishermen from all of the contracting states participate in preparatory meetings. Thus, cooperation and communication could be facilitated through several forms of attachment, ranging from consultative status to observer entitlements, etc.

The regional agenda

What kind of issues should be on the agenda of a regional fisheries management regime of the Barents Sea LME? Fisheries management is far more than mere regulation of catch effort. Large Marine Ecosystem management will have to pay considerable attention to conservation of the physical environment necessary for sustaining the marine species. Although excessive harvesting may constitute a threat to fish stocks and the ecosystem as a whole because of species interrelationships (as illustrated by the herring depletion), degradation of the marine environment may constitute an even graver threat to living resources. The Barents Sea LME is no exception, rather the opposite. One can list a multitude of problems that should be considered as challenges for a regional multispecies regime. However, an overload of issues may limit efficiency, and hence, I will only comment on what I conceive of as major challenges.

1. Coordination of the parties' fishery policies

Coordination of fishery policies may become a focal point for a regional fisheries management regime. A common strategy for mitigating institutional problems related to open access situations and legitimacy deficiencies that may succeed a redistribution of quotas should constitute the essence of this coordination. With respect to the former, open access situations are most likely to be found in the high seas areas constituting parts of the regional management area. The regional regime should work for finding a more clear cut jurisdiction for these areas. A question of importance, is whether international law should be changed, transferring management responsibility over adjacent international waters to the regional regime composed of states most severely affected by illegal fishing in these waters. Legitimacy deficiencies could be mitigated by establishing a flexible quota exchange system, in which compensation mechanisms are incorporated to minimize redistributive effects of quota reallocation between the different parties.

2. Joint surveillance and enforcement

A regional design of a common system of surveillance, to control compliance of fisheries arrangements and to monitor the environment and the resource situation alike, could be regarded as important.

Priority should be given to the establishment of a common 'independent' guard, in which people from all the cooperating states work together on the same vessels, exercise the right to control all vessels operating within the region, the high seas included.

3. Assess the feasibility of opening up national EEZs for fishermen from the other contracting states

As a multispecies approach to management could highlight that e.g. harvesting of young cod specimens should be reduced in favour of increased harvesting on mature fish, and thus that less catching should take place in the Barents Sea and more in Norwegian coastal waters, the regional regime should assess the feasibility of opening the national EEZs to harvesting for fishermen from the entire region. For legitimacy reasons, open entry should not be permitted unless agreed upon by national fishermen and unless carried out under strict control.

4. Joint management of marine mammals and coordinated international performance with respect to management issues

The Hamre model also includes marine mammals. A regional body should also have the management responsibility over these stocks. The International Whaling Commission regards the mammals in a single species context, and the present discussion of a future moratorium for 'ethical' reasons departs too much from a rational, ecological point of departure. A regional multispecies regime, should perhaps integrate the newly established 'shadow' Commission, the North Atlantic Marine Mammals Commission, agreed upon by Norway, the Faroe Islands, Iceland and Greenland 9 April 1992.

5. Environmental issues

Being waters encompassing polar regions, the area in question may be particularly vulnerable to environmental stress. Environmental threats have unfortunately gained an alarming topicality since it became known that the former Soviet Union had dumped huge amounts of radioactive wastes in the waters off Novaya Zemlya. In a similar way as with surveillance of fish stocks, regional cooperation on surveillance of the marine environment should be developed, in which all member states participate.

6. Joint multispecies research and strategies for management that are open to new scientific results (flexibility)

Finally, a joint research scheme on multispecies and marine ecosystem research should be initiated at the regional level. A broad participation of researchers from all the affected countries could increase the legitimacy of the scientific process, increasing the prospects for science to influence the political course.

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Recent attempts at regulating the harvesting of the Norwegian Arctic Cod

by

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Solving the problem of the commons in arbitrarily assumed environments is easy. All you need is a model of the fish resource, a Schaefer curve and some assumptions about fishermen's behavior. Finding practically operative and politically legitimate solutions to the complex of problems involved in actual traditional fisheries is a very different task. Usually "the twain never meet". One sort of people do one thing, and a different sort of people do the other. Or worse, because it is so difficult to solve the second task, energy is spent on solving the first one instead, which may involve making empirical conditions conform to the arbitrarily chosen assumptions of the model. Anita Maurstad (1992) has even demonstrated that Norwegian attempts at regulating the North Norwegian smallboat fishing have tended to create the assumptions of common property theories: Unlimited acquisitiveness, disregard of the aggregate effects of individual choices, elimination of informal limits to harvesting efforts, and, as a consequence: Overfishing.

In seminars such as this, I have met people who feel that they need no empirical knowledge of the region, people or culture in question, as they possess analytical tools which work under all conditions, and which make regional variation appear as background noise. They tend to deliver identical solutions when asked to give advice to governments responsible for very different regions, resources, peoples and cultures.

I hope that I have been knocking down open doors now, but one can never be sure. So I find it necessary to start out by giving you a short sketch of the realities of North Norwegian fishing, stressing features that may be little known to people from afar.

Salient features of North Norwegian fishing

1. First of all, one has to keep constantly in mind the immense richness of the fish populations feeding on the phytoplankton-based food system of the Barent Sea. Mere numbers are of course meaningless to most of us, unless put in relation to something graspable: In the 1970-ties, the migratory capelin every winter transferred a biomass of 2 million tons from the Arctic to the Finnmark Coast. If we divide this enormous

crop by the population of this province, i.e. 70.000, we end up with 30 tons per capita, i.e. 150 tons to a family with 3 children. That equals the milk production of 50 cows.

I have given these numbers just to stress the abundance of North Norwegian resources in relation to the regional population, ignoring the problems posed by the interest of "outsiders", i.e. the global fishing fleet, in the Norwegian-Arctic cod and the other rich resources of the area. There are resources enough in the Norwegian waters to secure the actual population of North Norway a level of welfare that compares well with the rest of Europe.

2. This should indicate that fishing is no marginal occupation in the region, a primitive activity that people have to fall back upon if they have no other ways of making a living. A very simple calculus can show the potential of fishing to "squeeze out" other activities, to the extent that the abundance of natural resources may be blamed for the late, slow, erratic and mainly failed attempts at "industrializing the region":

A reasonably good daily catch: 500 kg a NKR 8,-= 4.000 kr

8 hours of ordinary labour a NKR 50,-= 400 kr

Other variable costs (app.)= 100 kr

Incentive to fish= 3.500 kr

My simple point is that fishermen's earnings on good days easily comes to several times the current wages. A calculus made up for the 1950-ies would look alike, only that fish prices as well as wages would be appr. 1/10 of the present rates. Before the Raw Fish Act of 1938, however, fish prices would reflect the shadow price of the fishermen's labour, and some times come very close to zero. But since the fishermen's organizations got control of the landing price, we may safely say that the Northern coastal population have been living - not from the labour of their hands, nor from the interest of their invested capital, but from the resource rent provided by the abundant Nature.

3. It is also very important to keep the political context of North Norwegian fishing in mind. Up to the last years, the smallboat fishermen have been able to block any reforms visibly threatening their livelihood. Outside capital have been effectively kept out of primary fishing even through a long time into the postwar period. When shipowners tried to close off whole fjords with big nets in 1890, they were chased away by thousands of angry men waving fish hooks. These tools were soon after replaced by the parliamentary vote, which were used to legislate against non-fisherman capital, keeping outside forces away until many years after the war, when trawlers were given

to certain fish plants. The differentiation tendencies within the egalitarian fishing communities were curbed during the first postwar period by many propertyless fishermen being made able to buy their own small boat. But at the present time, the "haves" seem to cooperate to remove the right of the "have-nots" to fish in the commons. But the main point is that fishermen could never be ignored in the national political processes. Even today, the Norwegian Prime Minister has stated that Norway cannot join the EEC without the consent of the fishermen.

This indicates that there are very narrow limits to what solutions to the problem of the commons can be proposed in Norway. Outright marketable quotas have been tried out in discussions, but withdrawn because of opposition from the coastal fishermen.

4. Given the richness of marine resources in Norwegian waters, and the political influence of the fishermen, one might wonder why "the tragedy of the commons" has not occurred long ago, as it should according to the model. People kept fishing from the Stone Age to the 1970-ties without any indication of depleting the stocks, except locally and temporarily.

I have tried to explain this elsewhere (Brox 1990), with reference to the migratory nature of most fishstocks, and notably cod, considering the limited mobility of the fleet. But the limited "appetite" of peasant households as economic decisionmakers must also be taken into consideration, as well as the limits to marketing in this remote area. Whatever growth occurs in the fishing effort would basically be due to population growth, and as long as the expansion in fishing was "horizontal" in this sense, the carrying capacity was not exceeded. This did not happen before the fish could be pursued everywhere the year round, and marketed at any time, small fish as well as mature ones. Overfishing was not a consequence of population growth. - As we shall see, some practical conclusions may be drawn from that.

5. Twenty years ago, one could have constructed institutional solutions to the problem of the commons without paying any heed to the employment implications. At that time, the mobilization of labour was considered to be the bottleneck in Norway's growth process, and anything that could "release" labour from the primary industries would be welcomed by national planning authorities, if not by local communities. There was a marked shortage of labour in all centres, in the provinces as well as in Oslo. This has completely changed by now. There is no need nowhere for redundant fishermen, and each of them by necessity would increase the number of families on welfare or unemployment insurance by one. Thus, there is no need for solutions

that presuppose a reduction of fishery employment. Otherwise, it would be a case of making the fisheries more "profitable" through measures that made the whole economy less profitable. A regulating system that tended to reach equilibrium by shedding manpower may serve certain fishing interests, but increase the problems of the nation at large. Any kroner earned in the fisheries by reorganization would then have to be paid through the national systems responsible for individual welfare.

What should a regulating system do?

Most institution builders in this field are usually content to demand that a regulating system 1) keeps the actual harvest within sustainable limits (TAC) and 2) keeps the effort down to what is necessary to harvest the TAC, i.e. avoid too much zero-sum competition among the harvesters. With reference to my sketch of the historical development of North Norwegian fishing, and the actual situation of the coastal population and the economy of the nation, I find it right also to demand that 3) the right to fish should be kept open to the whole coastal population - within limits set by the two first conditions.

The reason why the common fishing grounds must be kept open should be obvious: If and when the fish resources can be restored, the attractiveness of fishing as compared with any other way of making a living by the lesser educated in the fishing villages will make it impossible to keep the right to fish "closed off" to the benefit of an arbitrarily selected few. The legitimacy of the regulating system, and the authorities generally, will not survive a situation where Tom will have to accept unemployment insurance, or very lowpaid work ashore, whereas his brother Harry is allowed to make 5000 kroner a day through an activity highly evaluated by both. This is a problem that cannot be solved by means of police, fines and prisons. The political repercussions, and the possibilities to institutionalize a regulating system, should be obvious. - Thus, keeping the common open is not only a question of social justice, but also a question of legitimacy and of economizing with the resources of the nation.

The performance and potential of alternative systems

I will now compare the institutional arrangements actually tried out or proposed in Norway, especially with regard to whether they promise to fulfill the 3 demands specified above.

Briefly, the alternatives may be described in these terms:

1. Dualism is based upon the traditional difference between off-shore trawling and coastal fishing with passive gear like gill nets, longlines and handlines. Basically, the trawlers are given a certain share of the

total allowable catch, e.g. 35%, from which each is allotted a certain number of tons. The inshore fleet can freely compete for the remaining 65%. Even if certain attempts are made to keep down the number of inshore fishermen, there is in effect no way in which fishing effort can be controlled in the inshore or coastal side of the divide, whereas the number and size of trawlers are effectively controlled by central authorities.

With certain modifications, one may say that "dualism" has been in operation in Norway for at least 20 years. We will return to its performance below, after having described the different modifications that has been tried out or proposed.

2. Boat quotas. Keeping the aggregate catch of the coastal fleet within its share of the TAC has always been a practical problem. When the TAC had to be reduced drastically at the end of the eighties, the Department of Fisheries took advantage of the opportunity to introduce "boat quotas", which means that the allowed number of tons are divided between a limited number of boats according to size, cost or number of crewmen. Those who had not been harvesting cod during the last previous years, were usually denied participation. When criticized for this, the Minister declared that "thousands of fishermen" would have to leave the industry in order to make it profitable.

Basically, "boat quotas" is an attempt to eliminate "dualism" through introducing the principles practised in the trawler fleet to the part of the inshore fleet that is considered "viable" by the fisheries establishment.

3. Group quotas imply that a defined category of participants compete freely for a certain part of the TAC. In principle, that was the situation in the coastal fleet before the introduction of "boat quotas". Now it is being practised for the many coastal fishermen who has not obtained any boat quota. The Department of Fisheries has proposed to make "group quotas" into a more important element of the regulating system, removing "boat quotas", but the proposals have been rejected by the fishermen's organizations as well as by the Parliament majority.

4. Company quotas. Up till now, a fishing company owning 3 trawlers, each of them being allowed to fish x tons, has actually had to operate all 3 vessels. Now the company will be allowed to fish 3 x tons by means of the equipment that the management finds most suitable and economical, which means that the company now longer will have to legitimize its right to a certain amount of the resource by its activity or the size of its capital investment or technical equipment. No such ideas have been circulated as far as the coastal fleet is concerned. If we

consider the scale of operations, however, boat quotas imply the same principle: The skipper-owner can fire say, one of his three crewmen, and still retain the same quota. In both cases, the company acquires property-like rights to the fish stocks.

5. Individual quotas. The TAC is simply divided by the number of registered fishermen. If the landing value of next years total allowable catch is calculated to 7,5 milliard kroner, and there are 25.000 fishermen, each of them will be allowed to land fish worth 300.000 kr. It is up to them if they will use small or large boats, handlines or seines, or if they will go for large quantities of (cheap) coalfish or smaller quantities of (expensive) ripe cod.

This system has been proposed by me (1989), based on ideas from northern smallboat fishermen. It has been rejected by the Department of Fisheries, but a modification of it has been proposed by some fishermen's unions on the west coast. It has also been included in the party programme of the Socialist Left.

6. Tradable quotas. The principle is well known from economic literature. It has been proposed introduced in Norway through the government giving, for free, almost any participant a certain quota, which is property in the sense that it is protected by state power and freely marketable. Regardless of whether quotas initially were given to individual fishermen, boats or companies, they would inevitably end up with the most "efficient" units, i.e. the participants willing to pay most for them. Tradable quotas have been proposed by the federation of offshore fishing companies and the political parties of the right, but has been rejected by the coastal fishermen and the left-and-center parliamentary majority.

7. Area regulations. This is a undeveloped concept, little discussed outside of smaller professional groups. Marine biologists of the University of Tromsø have established the existence of large, stationary and probably regionally endogenous coastal fish populations, especially of cod. The limited range of these populations indicate that they cannot be properly protected and exploited through national regulatory systems. This means that fishermen's organizations, municipalities and regional scientific bodies may be given shared responsibility (co-management), which is more difficult when we are dealing with populations migrating between different provinces and even nations.

At the same time, the "area regulation" concept may be applied to migratory stocks as well. The Arctic Cod feeds and ripens into reproductory age in the Barent Sea, and pass along the coast of the provinces Finnmark and Troms en route to the Lofoten spawning

grounds. If protected in the Barent Sea, and allowed to feed on sufficient capelin and small herring, the spawning population may not need very much protection except against certain types of gear to produce enough eggs and sperm to secure reproduction.

There may, in other words, be alternatives to nationwide quota systems, alternative ways of protecting the cod populations against overexploitation, combining co-management of local populations with protection of migratory varieties in the unripe stages, against overfishing as well as against depletion of plancton eaters. It goes without saying that "area regulation" presuppose better scientific understanding of the multispecies systems than we possess at present, as well as a good working relationship to other nations with rights in the same resources.

Comparison of systems

I will now briefly discuss and compare the merits and shortcomings of the institutional arrangements briefly described above, according to the 3 demands stated on p. 5. In addition, I shall discuss the problem of legitimacy, i.e. the costs of control and policing, of fishing.

1. Maintenance of fish stocks. Excepting "area regulation", all systems are based upon an estimate of TAC. Granted that this estimate is not far off mark, aggregate catcher should be kept safely within MSY, and there will be no overfishing.

"Area regulation" is based upon better knowledge of local fish populations than we at present possess. It is supposed that local bodies (fishermens unions, municipalities) can decide upon gear restrictions, closing off areas and seasons etc., generally avoiding quantity restrictions, and counting upon informal mutual controls and sanctions.

"Area regulation" of migratory cod and other migratory species is based upon improved knowledge of population dynamics. But we can safely say that all systems based upon TAC estimates presuppose such knowledge as well. It is also a strong argument that the Arctic cod population was maintained at at very high level as long as there was no harvesting of unripe cod off shore and no exploitation of small herring and capelin in the Barent Sea.

There is a certain risk that a system based upon protecting the young cod and unlimited harvesting of the spawning age groups may imply under-exploitation: If the availability of cod feed is the bottleneck factor, a certain quantity of the growing cohorts can be harvested without diminishing the aggregate growth of each cohort. But with abundance of plancton eaters in the Barent sea, each 1 kg cod caught in

the feeding grounds easily means a 4-7 kg valuable ripe cod less to the coastal fishermen.

2. Avoiding excess of efforts

The system which I have called "dualism" developed in Norway during the last twenty years, clearly shows the importance of this point. The offshore fleet has generally been very profitable to the owners and crew, whereas there has been a lot of bankruptcies and other economic problems in the inshore, coastal fleet of smaller vessels. Popular opinion, stimulated through the activity of PR officers of the fishing companies, and in line with current opinion trends, usually perceives the difference between "oldfashioned" coastal fishing and "modern" trawler fishing as something like the difference between spinning wheels and textile factories.

As I have demonstrated elsewhere (1991), the economic performance of the two fleets is easily explicable by means of the elementary concepts of fishery economics: Given that both fleets have to stay within a certain share of the TAC, the "profit" (or rather profit + resource rent) will depend upon whether the aggregate fishing effort can be adapted, minimized or kept down. This is possible in the trawler fleet, as the number of licences is limited, and each vessel has been granted a certain quota. Fishing effort can be limited to what is technically necessary to land the allotted quantity. In the inshore fleet, however, the "tragedy of the commons" is maintained: The fishing effort cannot be kept down, as all units have to compete to get a share in the TAC, and since all units somehow is technically able to increase efforts. There will not be any overfishing, as long as the fleet is sent ashore as soon as the TAC has been landed, but the aggregate effort will then - in principle - be equal to the revenue. There will be no profits, and no resource rent from one of the richest fisheries in the whole world.

"Boat quotas" in the coastal fleet may be considered an attempt to apply the principles from the offshore fleet inshore. It will work as far as the economy of the skipper-owner is concerned, as he can reduce his crew to adapt the fishing effort to his allotted catch.

The combination of "company quotas" and "group quotas" preferred by the present Minister of Fisheries would maintain and strengthen the problematic dualism in Norwegian fisheries, i.e. increase the freedom of trawling companies to adapt the effort to a given quota, and institutionalize the marginality of the coastal fleet.

"Company quotas" cuts the tie between investment and rights in the offshore fleet. The company can reduce its investment, but keep its

share of the fish property. Even if "boat quotas" in the inshore fleet is an approximation of the same principle, there is an important difference: The right to fish is formally tied to the physical boat. A small boat may get 8 tons of cod, and a bigger one 50 tons. The skipper may fire fishermen to improve the economy of his operation. But if there are no more men to fire, he can only adapt his fishing effort to the revenue by acquiring a larger quota. Because quotas are a function of boat size or cost, he will have to buy a bigger boat to improve his economy. This means that a very important aspect of "the tragedy of the commons" is maintained: The participants will have a constant motive to increase their effort to enhance their shares of the limited resource. The only way to avoid this is to introduce - and maintain - a rule to the effect that people are bound to stay in the boat size category in which they happened to be when the system was introduced. Many people would say that this kind of institution equals going back to feudal ages: If two neighbours happened to possess boats of different sizes in 1990, their families shares of the resource will be correspondingly different for all time to come.

"Boat quotas" may work in the short run, as established fishermen and their unions consider themselves as reasonably well served by the system. But it is untenable in the long run, as it is bound to be either too dynamic (giving every participant strong motives to acquire larger vessels) or too static (freezing property relations in the industry).

The fishermen's union, representing all established interests in primary fishing, is strongly against "tradable quotas" (even if the deepsea sub-union is in favour). But it is obvious that "boat quotas" inevitably will lead to "tradable quotas" as the market seems to be the only solution to the problems generated by the dynamic of a boat quota system. "Boat quotas" will be a machine continually producing arguments for tradability. At this point, it will suffice to point to the obvious advantage of tradable quotas over boat quotas: Also in the long run, the fishing effort will be adapted to the expected catch, as participants will have no motive to increase the effort unless they have purchased the resource property from someone else, who will stop or reduce fishing.

Anomalies produced by "boat quotas" will continue to turn up in the media and recruit new members to the tradability creed: Fishermen from the south coast of Norway have transported their boat on the railway to the north - thousands of kilometers away - to fish their cod quota on the Lofoten spawning grounds. The material object - the boat - can in this case be considered a deed to a piece of property, that the three men had to carry along - in addition to their persons - to cash in a rent given to them by the Government. A child could see the economic advantages that could be achieved for the nation if the three fishermen

instead could have sold their quota to a northern fisherman with unutilized capacity.

As far as "individual quotas" are concerned, they share the advantages of other unit quotas (boat and company quotas) in that the zero sum competition of free fishing and "group quotas" is avoided. The individual fishermen will, to increase his net income, only acquire enough capital equipment to land his allotted quota. Excess of effort does not increase his economy, only increase his costs and reduce his net income. If he has no alternative use for his own labour, he will be inclined to economize with labour-saving equipment, which implies, in the aggregate, that a maximum share of the fishing revenue will go to remunerate labour for which there is no alternative use. If there is excess vessel capacity in an outport or in a district, many fishermen will find that purchasing their own boat will be less profitable than negotiating about a berth with boat-owning neighbours. In some localities, fishermen will tend to fish individually, in others, even 2 or 3 crews might share a medium-sized boat, operating in shifts during good seasons.

"Area regulation" is a relatively new concept, and practical solutions of this category has scarcely been explored for their merits and shortcomings. The strong points of this system lie elsewhere (regional distribution, equity, social justice, diversity, legitimacy, flexibility, maintenance of local cultures). Ability to avoid zero-sum competition and generate economizing with production factors is not built into the system, like it is in the "unit quota" arrangements. If it is ever introduced, it must be because we believe that people in common have a capacity to develop insitutional arrangements that solve their common problems - provided that this can be done on a scale that makes shared information and harmonization of interests possible. Local negotiations may of course generate local solutions that make use of elements of some of the other systems involved, like individual, boat or internally tradable quotas, and in that case, the adaption of efforts to catches may be as good under "area regulation" systems as it is under the other arrangements discussed.

3. Keeping the commons open

Keeping in mind that certain institutional arrangements have been introduced with the intention to get "thousands of people out of the fishing industry", we should not be surprised that some regulatory systems fail on this point, if they are implemented strictly according to the book. Company, boat- and tradable quotas imply that the commons are "enclosed", shared between a limited number of beneficiaries, who may, helped by state power, keep out everybody else. Outsiders may of course buy a share of the enclosed property, but in principle, the

resource rent will be retained by the original beneficiaries.

Attempts have been made to secure that tradable quotas - or boats that have been allotted a quota, which amounts to the same - are not sold out of the municipality, province or region. In this way, it is supposed that the economic fundament of local communities or coastal districts can be maintained. Experience shows, however, that this is an illusion: Privatization implies a dynamic that inevitably eliminates all obstacles to freedom in the market. A fisherman borrows money and buys a boat (with a cod quota) one year, falls ill next year and has to sell his boat. But he cannot find a buyer in his own district who is willing to pay enough, and the poor man face bankruptcy, losing his house etc. In other districts, however, there may be buyers. The fishermen's unions, the banks, newspapers, political parties and almost everybody else will side with the sick man against "bureaucracy", and the rules limiting marketability have no chance to survive. Thus, traditional, egalitarian fishing communities are very likely to gradually be closed out of the commons, and the right to the regional resources concentrated elsewhere, and probably, in a few years, traded on the stock exchanges of the world metropolises.

"Group quotas" keep the commons open, as any registered fisherman may participate in harvesting. But the system implies institutionalization of marginality, as it allows for the aggregate revenue to be "eaten up" by the aggregate effort of labour and capital. The coastal population will maintain its access to the commons but under conditions which secure that there will be no resource rent for them to harvest. Significantly, there has been increased pressure on the "group quotas" through new participants who actually have been fired from units allowed to decrease their efforts and still maintain their shares in the fish property.

"Individual quotas" imply that the resource rent from the fish property is shared between all registered fishermen. The commons is kept open, at the same time as the aggregate catch does not transcend the maximum sustainable yield. The system does not preclude certain "thresholds" slowing the process of being registered, like a small registration fee, a certain level of documented experience in fishing, and even residence in certain districts. It is very important to give young people in fishing villages open access to the industry, but it can be argued that status as a fisherman, which implies right to a share of the nation's common property, could be granted on the condition that one renounced upon other rights, like for example unemployment benefits. A rule to that effect would also represent a certain "threshold" slowing the access to the industry.

"Area regulation" presuppose local control and institutional development. It is of course possible to imagine local established interests taking control and closing the commons to the local "have-nots". If that is a real risk, it means that local political bodies must be granted a share in the control, along with fishermen's unions or coops. I think, however, that exclusion of large categories of coastal people is more likely under nationally established and upheld rules, than under local control, more based on shared and manysided information and legitimation processes.

The problem of legitimacy

Any standard textbook of fishery economics, usually advocating marketable quotas, i.e. privatization of the commons, tends to stress the necessity of securing the permanence of the system. Privatization will not work if investors risk eroding of the system, by for example allowing in "new" (e.q. traditional, local) participants "for political reasons". It is obvious that if most of the population of a regime finds a regulatory system unjust, irrational or a robbery of rights that people have had for centuries, it must be difficult to guarantee the investments of fishing companies in shares of the formerly common property.

Working through their unions and political parties, the coastal fishing populations have managed to reject tradable quotas, advocated by economic expertise, the political right, parts of central bureaucracy and the owners of deepsea vessels. The unions have also rejected "group quotas" generally, to avoid zero-sum competition, but seem to accept, without enthusiasm, the combination of "boat quotas" for the most established fishermen and a "group quota" for the rest, i.e. old fishermen, young people who cannot find a berth with a skipper, part time fishermen (who used to be the great majority of participants!), and of course those who are fired by skippers and fishing companies wanting to reduce their costs.

Coastal fishermen seems to find it right and just that skippers with an expensive boat get a higher quota than someone who do not have any substantial investment in the industry. Strong language is sometime heard about "unserious" fishermen, i.e. people who only fish under especially favorable conditions, even if they tend to help adapt the aggregate fishing effort to catching chances. People "who are not fishermen", i.e. who have other jobs or trades ashore, are especially harshly condemned, if they try to supplement their income through parttime fishing.

"Boat quotas" have made it possible for authorities who want some sort of private property in fish stocks introduced, to get elements of privatization accepted by the unions and parts of the political specter.

Those with less substantial investments in the industry have been attempted pacified through the "group quota" system. But the present combination is a vulnerable one, as far as popular consensus and legitimacy is concerned:

Imagine the situation in a Finnmark outpost, where 30 fishermen are allowed to take advantage of rich stocks of migratory cod and haddock making may be 5000 kr a day. They may have 20 brothers and neighbours with no rights to fish, and who have to make do with unemployment insurance or fishplant, temporary labour at 500 kr a day. - As long as the rules of the game is settled by Norwegian political bodies, it is rather unlikely that a system colliding so frontally with local ideas of justice and equity, can survive.

If the national labour market had been like it was up to the 1980-es, coastal people deprived of their rights would probably have sought employment in national or regional centers, and disappeared from contact with their privileged neighbours. But today they have nowhere to go, and their presence in the fishing villages makes it very likely that the expected growth in the fish stocks also will mean more participants in the fishery.

It is important to keep in mind that we are now referring to an activity to which there is "easy access", in the sense that there are few natural or technical "barriers" to participation. The grounds may be within sight, and the fish can be caught with cheap gear by people of ordinary coastal skills in small boats, at any rate in the best seasons. People can only be kept out of participation by means of certificates, licenses, fines and police.

From this point of view, we understand that there are important non-technical advantages attached to the forms of fishing that takes place off-shore and with larger vessels. A "latent function" of deepsea trawlers and larger purse seiners is that participation is easier to control. To increase offshore fishing effort by one unit, you may need NKR 100 million, a political decision, venture capital and bank credits. In contrast, tens of thousands of individual actors can increase the fishing effort in inshore fishing by very small investments, even if the number of licensed boats are attempted kept down. Big boat fishing is controlable, smallboat fishing is not. When it is taken for granted that central control of fishing effort is the key to profitable fisheries, the preference of authorities for large units is understandable, even if they may be technically superfluous.

The escalated attempts of the last years to get "thousands of people out of the fishing industry", to borrow the words of one of the latest

ministers, may have created the illusion that coastal people now, after one hundred years of struggle, at last have resigned and accepted the expropriation of their heritage. But one has to keep in mind that it is easier to keep satisfied grazing animals out of a infertile field than it is to keep hungry animals out of green and tempting meadows. At the same time as the available population of cod will be six times larger in 1994 than it was in 1989, the country as a whole will go from negligible unemployment to 10%, and may be more in the north.

Considerations of sustainable legitimacy, as well as the national labour market situation, will have to play a more important part in academic contributions to problem solving in the fisheries. Solutions that are perceived by the coastal population as unjust are impracticable, and solutions that increase national unemployment are too expensive.

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The Namibian Fisheries Resource And The Role Of Statutory Law, Regulations And Enforcement Of Law In The Utilization Of The Fisheries Resource In Contemporary Namibia.

by

CARL-HERMANN GUSTAV SCHLETTWEIN

1.INTRODUCTION TO THE BENGUELA SYSTEM AND THE NAMIBIAN MARINE ENVIRONMENT

The sea off Namibia is known to be highly productive due to the upwelling of nutrient rich waters from the cold Benguela current which flows north-wards along the coast. As with other coastal upwelling systems, the fauna of the Benguela current is dominated by fish species that can utilize the rich plankton production in the upper water layers. However, relatively few species make up the bulk of the total fish biomass: clupeid, pilchard and anchovy represent the pelagic inshore fauna; horse mackerel, with smaller and varying amounts of chub mackerel the offshore small pelagic fish; hake, often termed demersal, inhabit the whole water column with its main distribution offshore, but extending into shallower waters inhabited mainly by the juvenile part of the population.

In addition there are a number of less abundant fish and shellfish species, in particular, snoek, kingklip, sole, monkfish, squid, tuna, deep sea crab and rock lobster which are, however, of significant economic importance.

Until independence, these resources were not managed on an integral basis. The responsibility for the management of resources and the regulation of the fisheries was divided between the South African administration in Windhoek for the inshore fisheries up to the 12 nm limit, and the International Commission for the Southeast Atlantic Fisheries (ICSEAF) for the offshore fisheries. The results of this mismanagement were amongst others that Namibia, at independence, inherited a fisheries resource which was grossly overfished and depleted, with some of the valuable species having been replaced by less desirable species. The growth of the cape horse mackerel stock as a consequence of the collapse of the pilchard and hake stocks due to overfishing is an example of this phenomenon.

2.CONSTITUTIONAL PROVISIONS

Namibia has since Independence embarked on an almost unique effort to rebuild its ailing fish resources. The main objective being to rebuild

the country's depleted fish resources and at the same time develop a Namibian fishing industry integrated in the national economy and contributing to the economic growth and hence political stability in the country. This effort has in several ways influenced the policy formation as well as the legislation regulating the utilization of this particular resource.

It is noteworthy in this regard, that Chapter 11 of the Namibian Constitution, provides for "Principles of State Policy". These principles "...shall not of and by themselves be legally enforceable by any Court, but shall nevertheless guide Government in making and applying laws to give effect to the fundamental objectives of the said principles."

For instance article 95(1) of the Namibian Constitution stipulates that "The State shall adopt policies aimed at the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future;..."

In pursuance of, amongst others, this constitutional provision the key policy objective stated in the Government White Paper "Towards Responsible Development of the Fisheries Sector" calls for the utilization of the country's fisheries resources on a sustainable basis and the development of industries based on them in a way that ensures their lasting contribution to the country's economy and overall development objectives.

With regard to the economic order of Namibia and ownership of natural resources articles 98 (1) and (2) as well as article 100 of the Namibian Constitution have relevance.

Article 98 (1) provides for an '...economic order based on the principles of a mixed economy with the objective of securing economic growth, prosperity and a life of human dignity for all Namibians." The policy objective to "Namibianise" the fishing industry is founded on this constitutional provision. Further, the creation of a National Fisheries Corporation by an Act of Parliament can be seen as giving effect to article 98 of the constitution.

Article 100 of the Namibian Constitution stipulates that "Land, water and natural resources below and above the surface of the land and in the continental shelf and within the territorial waters and exclusive economic zone of Namibia shall belong to the State if they are not otherwise lawfully owned." To ensure the enforcement of this principle one of the first acts promulgated by the National Assembly was the Territorial and Exclusive Economic Zone of Namibia Act which

provides for Territorial waters, a Contiguous Zone and a Exclusive Economic Zone. This was later followed by the Sea Fisheries Act and its regulations.

3 SPECIFIC MANAGEMENT POLICIES FOR THE MAIN STOCKS

Before I turn to some of the sector specific pieces of legislation and the enforcement thereof let me briefly touch on some of the management policies for the main stocks and the reasons for them.

3.1 HAKE

The average annual total allowable catch (TAC) for hake set by ICSEAF before Independence was about 400 000 tonnes, a figure in no way consistent with the available biomass. In order to redress the situation rapidly, the then President-elect of Namibia requested ICSEAF member countries even before Independence to withdraw their fleets. The new Government subsequently radically cut the TAC to 50 000 tonnes for the remainder of 1990. For the 1991 fishing season the TAC was set at 60 000 tonnes, for 1992 90 000 tonnes and for 1993 120 000 tonnes. The aim was and still is to restrict catches in such a way as to allow the stock to increase to 4 or 5 times of its present level. In addition, a ban on trawling in water shallower than 200 m was put into force, pursuant of the policy to establish exploitation patterns capable of improving the protection of juveniles and small-sized fish.

In spite of registering a doubling of the fishable biomass since 1990, the present volume is still only about a quarter of the biomass at which the stock would peak and support a Maximum Sustainable Yield. Consequently, the TAC for 1993 was kept at 120 000 tonnes, which is also in line with keeping fishing mortality below 20%. This programme is showing definite signs of success as preliminary results for last year indicate a further substantial increase in the hake biomass.

3.2 PILCHARD

Of the Namibian fisheries resources, the collapse of the pilchard (*Sardinops ocellatus*) was perhaps the most dramatic. From an estimated biomass of about 6 million tonnes in the late 1960's the biomass dropped to a meagre 50 000 tonnes in 1980. In 1980 all directed catches for pilchards were stopped.

A slow process of keeping the canning industry alive and rebuilding the stocks ensued. This resulted in a present stock biomass of about 800 000 tonnes. This is not yet a total recovery but there are at least encouraging signs.

Until a consistent stock recovery is demonstrable, pilchard fishing is

allowed only to supply fish to the labour intensive canning industry and limited amounts to the less labour intensive fish meal plants. So far this policy appears to yield the wanted results. For the first time in many years the age structure of the stock has recovered to include four age classes. The presence of three and four year old fish bodes well for the future because recruitment from older fish is thought to be much better than from smaller, young fish.

3.3 ANCHOVY

The initial policy on this species which is less valuable than pilchard and is used mainly for fish meal production, was to limit catches until the stock has recovered. Recent experience on the Namibian coast however indicates that anchovy biomass build-up fluctuates irrespectively of fishing mortality. In addition, it also appears that increases in anchovy biomass can be seen as response to the development of the pilchard resource. Taking this into account it therefore appears to be the most practical venue to extensively fish anchovy when abundant and holding back TACs when they are not. Whether both pilchard and anchovy can be managed in a balanced way to yield substantial catches from both stocks remains to be seen.

3.4 CAPE HORSE MACKEREL

This stock is in a healthy state. Since the possibility exists that it constitutes a competition for the increasing pilchard and hake stocks, the policy is to maintain fishing at a high level, allowing fishing mortality at a level of about 30% of the total biomass. Recent biomass surveys indicate a stock size of between 1.5 and 3 million tonnes. A TAC of 450 000 tonnes was therefore maintained for the past three seasons.

Purse seining of horse mackerel in the offshore area is encouraged because the risk of taking pilchard as bycatch is diminished. Midwater trawling is restricted to a water depth greater than 200 m to minimise accidental (or even deliberate) pilchard and hake bycatches. Recent reports from surveys indicate that these measures are proving successful and hake bycatches are now down from 15% to about 3% of the total landings.

3.5 ROCK LOBSTER

This resource has been dramatically depleted and therefore drastic catch restrictions are applied in a programme to rebuild the stock. Prompted by the extremely low catch of 376.4 tonnes for the 1990/91 season the TAC for lobster was cut back from the pre-independence 2 000 tonnes to a mere 100 tonnes for the past season. For the current year a TAC of 200 tonnes is made available. The cut in TAC has been quite traumatic for the lobster fishing companies and significantly

reduced employment opportunities in the industry. To compensate for the lost fishing opportunities temporary hake quotas were allocated to the affected companies.

Maintaining low quotas and upholding the minimum size (which allows for females to breed at least twice before recruiting into the fishable population), should ensure a recovery and future sustainability.

3.6 CRAB

Special measures were introduced to protect the red crab (*Chachyon marineta*) resource. Thus the number of crab licences have been reduced from five to four, catches are restricted to depth greater than 400 m to protect females and juveniles and larger mesh sizes or escape gaps on traps are being introduced. Extensive tagging programmes to facilitate the assessment of biomass from tag returns is under way. Spider crab is being exploited at low levels only and research to assess stocks is implemented.

3.7 MINOR SPECIES

A number of minor species, for example different tuna species, snoek (*Thyrstites atun*) and species that are landed as bycatch to the white fish industry such as different species of squid, kingklip (*Genypterus capensis*) and monk or angler fish (*Lophius upsicephalus*) are targeted. With the exception of snoek, these have not been the aim of specific management measures and are now also being looked into for their development potential.

Tuna is targeted and may prove easier to protect and manage than fish that come as bycatch of other species and considerations are on the way for determining the best catch technology. Also, the possibility of demarcating zones for either long lining or trawling has been considered in order to afford some protection to kingklip and to avoid gear competition. The management of snoek, however, may prove difficult.

Certainly the total ban on the use of any form of gill net or drift net in Namibian waters will go a long way to protect the larger pelagic species such as tuna.

Joint efforts by countries bordering the south Atlantic will enhance efforts by individual countries to rebuild and protect especially the migrant species like tuna.

4. THE CONTRIBUTION OF FISHERIES TO THE NATIONAL ECONOMY

Namibia's policies on fisheries strongly reflect the contribution of fisheries to the national economy, and Namibia's dependence on

expanding that contribution. Key features of the contribution are:

4.1 THE FISHERIES SECTOR AS MAJOR CONTRIBUTOR TO THE ECONOMY

Whereas in the pre-Independence year 1989, fisheries (excluding fish processing in the enclave of Walvis Bay) contributed US \$ 16.8 million to Namibia's GDP, this figure rose to US \$ 120.7 million for 1991 and US \$ 148.8 million for 1992. The estimate for 1993 is in the order of US \$ 188.1 million.

Fish processing in Walvis Bay alone increased from US \$ 14.2 million in 1989 to US \$ 34.2 in 1991, with estimates for 1992 and 1993 being 40.2 and 47.3 million respectively.

Altogether this makes an impressive increase. Expressed in per cent the contribution rose from 2.11 in 1989 to 8.6 in 1991, and with projected figures of 9.5 and 10.5 for 1992 and 1993 respectively.

This increase is due to a number of factors, the most important one being the establishment of an EEZ and the resulting control over the offshore resources. Further the increased portion of white fish landed and processed ashore and the consequent value addition significantly contributed towards the said increase.

Lastly, the introduction of so called quota fees, a form of royalties, for the major species such as hake, horse mackerel and pilchard generated further revenue.

In the two year period from 1989 to 1991, fisheries is estimated to have contributed nearly 40% of the growth in the Namibian economy. For 1992 the value of fisheries output is projected to overtake agricultural output and by 1993 the value of fisheries output is projected to reach 60% of the value of output of the mineral sector which would make it the second largest contributor. In terms of growth in employment opportunities the fisheries sector unfortunately did not perform as impressively. It is estimated that the sector currently utilizes a work force of approximately 5000 persons. Nevertheless, the fisheries industry can already be counted as one of the major industrial employers in Namibia.

4.2 FISHERIES AS CONTRIBUTOR TO GROWTH IN EMPLOYMENT, OUTPUT AND INCOMES IN NAMIBIA

The gains recorded so far have been achieved in a period where the focus of the fisheries policy has been on stock recovery. If this policy is successful, and there are already indications that it is working, then there will be scope for further substantial growth. In the medium term (5-10 years) and based on current international market prices the value

of the Namibian fisheries is projected to be in the order of US \$ 420 million.

Prospects for the other major sectors are less encouraging. Agricultural output is limited by the scarcity of suitable land and water. The mining sector, especially diamonds and uranium, is presently the most valuable sector of output. However, these resources are non-renewable and their prices are vulnerable and fluctuate as is the case for most of the base metals. There is still room for future activity from further exploration and exploitation, but additional output gains are likely to bring higher economic and environmental costs. The potential conflict of interests between offshore mining activities with fisheries could be seen a point in case.

4.3 THE NEED FOR SUSTAINED GROWTH IN THE FISHERIES SECTOR

The first Government of an independent Namibia has inherited an economic structure characterised by harsh economic disparities and social inequity. It is estimated that 70% of the national income is received by 5% of the population, while much of the rural population live in relative poverty, with little opportunities at hand for employment or income, and with only limited access to basic services. Reducing the disparities requires major expansion of resources to be committed to basic services, especially health and education, and to infrastructural development and maintenance, required for economic advancement and an expansion of job opportunities in less developed areas. Government programmes are aimed at poverty alleviation with sustained growth, so that it can address disparities without disruptive redistributive measures. For this strategy to succeed Namibia must have sustained growth in output, jobs and income from the fisheries sector.

5. LEGAL PROVISIONS

As was stated earlier there are three Acts that need to be discussed with regard to the management of the fisheries sector, viz. the Territorial and Exclusive Economic Zone of Namibia Act, the Namibian National Fishing Corporation Act and the Sea Fisheries Act. In this paper only those parts of the Sea Fisheries Act will be discussed that regulate access to the resource, utilization of the resource and some control measures. My colleague, Adv P. Roux will further elaborate on the Sea Fisheries Act as well as the Territorial and Exclusive Economic Zone of Namibia Act and the National Fishing Corporation Act and the enforcement of these.

5.1 THE MAJOR IMPLEMENTING MECHANISMS OF THE SEA FISHERIES ACT

The purpose of the Sea Fisheries Act is to establish the legislative basis

for the management and development of Namibia's marine resources. The Act provides for the exercise of control over sea fisheries and related matters in order to secure conservation of the marine ecology and the utilization of marine resources in ways that provide maximum benefits to Namibia.

The major implementing mechanisms provided for in the Act are the RIGHTS OF EXPLOITATION (part IV), QUOTAS (part V), and LICENSE (part VII). These are parts of a carefully designed approach to the management of the marine resources. In a way, Namibia has been fortunate not to have been burdened by a large existing industry and to have begun to actively manage its resources at a time when the level of operation of its own industry is relatively low in relation to the potential. The growth of the industry can therefore be brought in line with the stock recovery and over capitalization can be avoided. Further, the pressure for over-exploitation and the reduced economic efficiency is minimised. Instead, long term sustainability of the resource and the resulting profitability for the industry can be achieved.

The three part system of rights of exploitation, quotas and licences is designed to do just that. Let me now explain how these three components fit together to serve the needs in managing and developing the industry.

5.1.1 RIGHTS OF EXPLOITATION

The rights of exploitation are the longer term framework within which access to the resource is granted. They are a relatively stable instrument intended to be granted for periods sufficiently long to encourage applicants to make the necessary investments in vessels and shore-based facilities.

The Act sets down criteria which the Minister may have regard to when considering applications for rights of exploitation. Those criteria clearly focus on the extent of Namibian control of the proposed fishing activity and the promotion of a more competitive processing sector. In the pre-Independence regime processors were protected by issuing processing quotas. The present Act does not provide for such a system and the processors are obliged to compete to buy fish from vessel operators. However, it is important to note here that the interests of investors in the processing industry are covered in the Foreign Investment Act.

Further, rights of exploitation are not transferable, except with the approval of the Minister and then only if the quota (or a portion thereof) is also transferred to the same person.

5.1.2 QUOTAS

The second major fisheries management mechanism provided for under the Act is the establishment of quotas. The Act makes provision for the Minister to determine the total allowable catch (TAC) for a particular species available for allocation of quotas and to grant quotas accordingly.

Quotas are a more flexible, shorter term instrument, by which it can be ensured that the level of fishing by holders of rights of exploitation is properly related to the abundance of the resource and to the relevant economic factors. Quotas are likely to be allocated annually, but may be allocated for longer or shorter periods in response to circumstances in the fishery concerned.

This part of the Act puts in place a key element of the UN Law of the Sea Convention relating to coastal states sovereign rights in the exploitation of the living resources of the Exclusive Economic Zone.

As a comment I want to add that the establishment of TACs and the allocation of viable quotas will be a challenging task. It can only succeed if it is based on sound scientific information, socio-economic considerations and if the resources are not sacrificed for short term commercial gains.

As is the case with rights of exploitation, quotas are only transferable with the approval of the Minister. Also, the Act provides for the payment of quota fees, ensuring that users of fisheries resources make an appropriate contribution to the welfare of the people of Namibia to whom these resources belong.

Independent financial resources are required to ensure the availability of sound scientific data on which the determination of TACs and the allocation of quotas is based, and they are provided for by means of the Sea Fisheries Fund. The purpose of the fund is to finance research and development with relation to the utilization, protection and conservation of marine resources; the utilization of the sea and sea-shore; improved methods for the catching of fish; the breeding of fish or the cultivation of aquatic plants; and the manufacturing, processing and marketing of fish and or aquatic plant products.

5.1.3 LICENCES

The third major fisheries management mechanism provided for in the Act is the requirement that fishing vessels and factories have to be licensed. The licensing requirements fill several purposes. Firstly, they are the instrument with which the overall capacity of the fishing fleet is kept in balance with the availability of the resources of each fishery.

Fishing vessels play a key role in any fisheries. Therefore licensing of vessels is the measure through which detailed conditions for fishing operations can be prescribed by means of regulations. The licensing provisions further allow management of the different kinds of vessels, i.e. they are the measure which enables the authority to ensure a continuous optimal fleet composition consistent with the status of the resources, economic factors and coastal infrastructure. For example the balance between trawlers and long line vessels as well as the balance between freezer trawlers and wet fish trawlers in the hake fishery has to be dealt with.

It is important to note that in terms of the Sea Fisheries Act "licence" has not the meaning of "permission to access the resource". It entitles the holders of exploitation rights and quotas to operate fishing vessels in accordance with the statutory requirements of the Sea Fisheries Act.

5.2 CONTROL MEASURES

The most important control measures provided for in the Act are the powers to stipulate conditions subject to which a quota may be utilized, a vessel or factory may be licensed and last, but not least, the power to translate provisions of the Act into specific regulations. They are comprehensive, and they have to be. Any fishing industry of the scale we have in Namibia is highly technical and complex, dependent on constant change from market developments, new technologies and fluctuations in the availability of resources.

The fact that Namibia is a country with a small economy in need to channel financial resources generated by one sector (in this case the fishing sector) to non-productive sectors such as education and health, dictates a lean budget for a control system. Realising the above a control system was designed where the onus to report back on catches, positions, entrance and exiting fishing grounds, etc. is with the operators. In addition, regular port calls for inspection purposes are required. Trans-shipping of fish and fish products without authorization is prohibited. Stowage of fishing gear in a manner that it is not readily available for catching of fish when passing through Namibian waters without authority or through particular areas in which they are not entitled to fish is required.

6. CHECKS AND BALANCES

In common property regimes the importance of checks and balances cannot be over emphasised. To accommodate this the Sea Fisheries Act provides for the establishment of a "Sea Fisheries Advisory Council". Its membership is drawn from the Ministry of Fisheries and Marine Resources, other Government institutions, the different branches of the fishing industry, representatives of employees in the industry and professional experts from outside the Public Service, thus representing

the whole sector.

The Council is required to be consulted before the determination of TACs to be made available through quota allocations. It therefore actively participates in the decision making process when it comes to determining the key managerial mechanisms. It is also charged with advising Government in the management and development of sea fisheries in general.

The Council is furthermore to be consulted on the application of levies for the Sea Fisheries Research Fund. This establishes a process of accountability for the use of the Fund over and above the normal Government accounts.

7. CONCLUSION

Namibia's fishing resources are potentially large and valuable. They can support a highly productive industry which could contribute significantly to the national economy. This contribution to the economic growth, together with a system of quota fees payable by resource users, is essential to achieve the basic objective of redressing existing economic and social disparities.

Although the fisheries resources of Namibia can be seen as being managed under a common property regime, the three part system of allocating long term rights of exploitation, quotas and licenses provides private entrepreneurs with the incentive to invest in and develop the fisheries sector.

The fact that Namibia at Independence inherited depleted fish resources and that its own industry operated at levels much lower than the potential, was a blessing in disguise. It affords Namibia the opportunity to, in a sense start with a clean slate which allows it to avoid the mistakes that have been made in most other fishing nations.

The pitfalls of over-capitalization and wasteful practices such as dumping of less valuable catches that so often are the results from open access to resources are avoided by the system of allocating quotas and licensing individual vessels. This system allows for enough flexibility to react to changes in the markets as well as to fluctuations of the resources.

Namibia, as a coastal state, has sovereign rights over the living resources within its Exclusive Economic Zone. This principle as provided for in the United Nations Law of the Sea Convention is fundamental to the policy of establishing TACs and the allocation of quotas. Through independent funding of the required scientific research and the participation of representatives of the different sectors

of the economy in the decision making process sustainable utilization is ensured.

Open access systems as the one in operation in the pre-Independence years have proved to be unsustainable and are therefore rejected.

Last, but not least, the fisheries resources of Namibia are common property. The State as guardian of these assets has to ensure the sustainable utilization now and in future. To my mind, the only way to ensure this domestically is by means of constitutional provisions, followed by the required sector-specific policies, legislation and regulations.

FISHERIES RESOURCES CONSERVATION AND MANAGEMENT: NAMIBIA'S NEW LEGAL REGIME

by

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TRADITIONAL SYSTEMS OF RESOURCE MANAGEMENT AND FISHING RIGHTS

Traditional systems of management and historic or traditional rights to fish that involve conservation practices, forms of tenure and other cultural rules of access were never developed by local fishermen along the Namibian coast. Traditional fishing practices were never established due to the inhospitable nature of the largely unpopulated Namibian coastline which forms the Namib desert stretching from the Oranje River in the south to the Kunene River in the north. The fishing communities of Walvis Bay and Luderitz, the only two fishing ports on the Namibian coast have never exercised the freedom to fish unregulated without statutory control of resource management. Although fishing has been carried out in Namibia from the earliest times, the trawling industry was only established at the beginning of this century and it was only during the 1940's that a pelagic and other shoal fish industry developed,¹⁶³ whereas the first regulatory control for the better protection of fish had already been introduced in 1922 (Proc. No. 18 of 1922).

Namibia has a modern management regime where the State has the exclusive responsibility for the management of the resource and the protection of the marine environment.

¹⁶³See: Fuggle and Rabie, Environmental Concerns in South Africa : Technical and Legal Perspectives at p. 261, for a brief history of marine resource exploitation.

THE COMMON LAW

The Common law of Namibia is Roman Dutch law. Roman Dutch law "as existing and applied in the Province of the Cape of Good Hope (South Africa) at 1st January 1920" was introduced by Proclamation 21 of 1919 to be the common law of the territory of South West Africa. Legal continuity was preserved and it continues to apply in Namibia by virtue of the provisions of Articles 66(1) and 140(1) of the Namibian Constitution, but subject to the qualification, however, that it is for the courts of Namibia to interpret and pronounce on the content and development of such common law in Namibia.¹⁶⁴

In accordance with such common law the right of fishing in the open sea was common to all subject to any established local customs amongst fishermen such as the custom that the first arrival would have the first trek.¹⁶⁵

With the introduction of increasing regulatory control over marine resources inroads were made from time to time into such common law by the statutory regimes that applied.¹⁶⁶

Under the provisions of Article 66 of the Namibian Constitution only so much of the common law and customary law that does not conflict with the Constitution or any other statutory law still remains in force.

The common law right of unrestricted access to fishing was accordingly modified in 1922 when the first regulatory control was introduced and progressively repealed by subsequent legislative developments that replaced it by a common property fishing regime where the State controls the utilization and access to the resource. Under the present legal regime that is governed by the Sea Fisheries Act, 1992 read together with the Sea Fisheries Regulations (Government Notice No. 1 of 1993 published in Government Gazette No. 1 of 4 January 1993) no person may utilize a marine resource without having been granted a right of exploitation in terms of the Act and the exploiter is restricted to a quota allocation. No fishing vessel may operate in the territorial sea and exclusive economic zone of Namibia without a licence with the imposition of fishing conditions.

TRADITIONAL FOREIGN FISHING INTERESTS

On the issue of traditional foreign fishing interests, Namibia does not recognize any right of access for any foreign fishing fleet on the

¹⁶⁴See: Redondo v The State (an unreported judgment of the Supreme Court of Namibia dated 18th June 1992) at 20 - 26.

¹⁶⁵Van Breda & Others v Jacobs & Others 1921 AD 330.

¹⁶⁶See: Redondo at 24.

grounds of traditional fishing.

There is no special provision contained in the national fishing legislation which affords a preferential right of access to foreign fishing interests on the basis that they have long fished the waters.

The foreign fishing vessels that engaged in fishing in Namibia's waters before Independence were all ordered by the Namibian Government to leave when it generated the exclusive economic zone. According to evidence given in Redondo v The State (an unreported judgment of the Supreme Court of Namibia dated 18th June 1992 at 37), as many as 250 foreign vessels fished in Namibian waters immediately before Independence. Since these foreign vessels had severely damaged the stock and in particular the hake resource through dramatical depletion by over-exploitation, Namibia was under no obligation in international law to negotiate a phasing-out agreement or arrangement. It cannot be argued, as Portugal did in reply to the Canadian 12 mile fishery proposal at the 1958 Geneva conference, that the coastal State should be obliged to respect the rights of foreign fishermen who had been engaged in fishing for a long period of time without damaging the stock. Scientific assessments show that in 1969, when foreign fishing commenced the total hake stock in Namibian waters was approximately 2,385 million metric tonnes, and had decreased to approximately 0,486 million metric tonnes in 1990.

In any event true historical rights to access have not been established by these foreign fishing fleets. The foreign fishing interest was only relatively recently established in 1969 when the pelagic fishing stocks in Western European waters became depleted and Namibia's fishery resources became a major focus of attention of foreign fishing vessels.

It was also during this period (1969) that the International Commission for Southern Eastern Atlantic Fisheries (ICEAF) was formed under its founding treaty. No treaty rights to traditional fishing were derived¹⁶⁷ from the ICEAF treaty or any other treaty binding on Namibia. Namibia was never made a party to the ICEAF but was merely referred to by the member States as the coastal authority.

Nor is Namibia under any legal obligation at international law to recognise any traditional foreign fishing rights.

I wish to point out at this stage that an outstanding feature of the Namibian Constitution is that it is 'international law-friendly'. Article 144 incorporates the general rules of public international law and

¹⁶⁷See: O'Connell, The International Law of the Sea, Vol. I at 536 - 8.

international agreements binding upon it into the law of Namibia. Under Article 96 an 'internationally fully law-abiding' framework is established which "fosters respect for international law and treaty obligations" and "encourages the settlement of international disputes by peaceful means".¹⁶⁸

The Law of the Sea Convention, 1982, clearly provides that the rights of the coastal State in the EEZ are exclusive with respect to the limits of its harvestable capacity. Article 62 establishes that having declared an allowable catch, the coastal State is free to determine its harvestable capacity and only where it does not have the capacity to harvest the entire allowable catch is the coastal State obliged to give access to its EEZ to other States in respect of the surplus through agreements or other arrangements.

Article 62(3) of the Convention which establishes the "general surplus rule" that governs access to the EEZ in respect of the surplus to other States, is carefully worded. It does not refer to "traditional rights". Without indicating any priority it sets forth a list of relevant factors and foreign fishing interests that the coastal State has to take into account in giving access to other States to its exclusive economic zone in respect of any available surplus.

One of the relevant factors which the coastal State is obliged to take into account is the need to avoid economic dislocation in States whose nationals have habitually fished in the zone. Under this rule traditional fishing interests have not been given priority over other interests, namely land locked States (Article 69) and developing States in the sub-region or region (Article 70).¹⁶⁹ The provision also acknowledges other national interests.

The above consideration will generally not be applicable to Namibia and is particularly not applicable to access to the hake resources - the primary interest of foreign fishing among Namibia's fish resources. There is at this stage a limited (if any) surplus available and the development and growth of the local industry is being promoted. The economic dislocation that may have been caused in some of the States concerned occurred as an inevitable result of over-exploitation and has already occurred.

¹⁶⁸See: Erasmus, The Namibian Constitution and the Application of International Law in the 1989/90 South African Yearbook of International Law at 81 and Szasz, Succession to Treaties under the Namibian Constitution at 65.

¹⁶⁹See: O'Connell supra at 565 - 8 where he states that:

"The range of claimants to the diminished allocatable resources in the EEZ has widened. The effect of the EEZ upon states which have habitually fished is thus likely ... to be more drastic than the concept of preference."

There exists, therefore, no basis in international law upon which it can be argued that the economic dislocation which may have taken place was caused by the establishment of Namibia's exclusive economic zone and the disruption of foreign fishing operations and that it should now be taken into account when considering giving access to any surplus fishing opportunities when the resource recovers.

LEGAL HISTORY

The first statutory control was introduced in 1922 under the Sealing and Fishing Proclamation (Proc. No. 18 of 1922).¹⁷⁰ to provide for the better protection of fish and seals in the South West African territorial waters. The proclamation introduced the requirement that fishing boats had to be licensed and prohibited their use without a licence or in no compliance with the conditions of the licence.¹⁷¹ The Administrator of the territory of South West Africa was given the power to; appoint close seasons and prohibited waters; limit, restrict or prohibit the catching of any species of fish and give special protection thereto.¹⁷² The Administrator was further empowered to make regulations and impose penalties for the contravention thereof pertaining inter alia to the following: daily returns; the regulation of fisheries; sizes of marketable fish; mesh sizes, methods of catching fish and the licensing of nets; and the protection and preservation of fisheries.¹⁷³

Proc. 18 of 1922 was amended by Proc. 36 of 1930 and extended the licensing requirement to factory vessels.

Proc. 18 of 1922 was replaced by the provisions of the Sealing and Fisheries Ordinance, 1949 (Ord. No. 12 of 1949) which consolidated the laws relating to sea fisheries and sealing.¹⁷⁴ Whilst retaining the protective controls and prohibitions established under the provisions of Proc. 18 of 1922 (set out above) it provided for further conservation practices such as the declaration of marine sanctuaries¹⁷⁵ and established wider regulatory powers aimed at the protection of the

¹⁷⁰Proc No. 18 of 1922, insofar as it related to fisheries was amended by Proc. No. 36 of 1930 and Proc. No. 1 of 1936.

¹⁷¹Section 12.

¹⁷²Section 6.

¹⁷³Section 5.

¹⁷⁴Ord. No. 12 of 1946 was amended by Ord. 26 of 1967; 38 of 1967; and 9 of 1969. The Ord. applied to the entire extent of the South West African coastline including Walvis Bay; See in this regard: **R v Akkermann** 1954 (1) SA 195 (SWA)

¹⁷⁵Compare **R v Bester and Others** 1952(3) SA 273 (SWA)

marine environment¹⁷⁶ with a more extensive list of offenses that carried increased penalties and forfeiture clauses.¹⁷⁷ The Ordinance also introduced a processing licensing and quota system fixing the maximum quantities of fish that may be treated by a factory.¹⁷⁸

The Sea Fisheries Act, 1973,¹⁷⁹ (Act 58 of 1973) (The South African Act) and its regulations¹⁸⁰ in turn replaced Ord. No. 12 of 1949 and by virtue of section 24 applied to the territory of South West Africa.

Article 140(1) of the Namibian Constitution incorporated Act 58 of 1973 into the law of Namibia and it continued to apply to Namibia until it was repealed by the Sea Fisheries Act, 1992.

It re-enacted most of the provisions that were contained in Ord. No. 12 of 1949. Among the important provisions that had a bearing upon conservation and management were the following: the establishment, control and management of fishing harbours; the registration and licensing of fishing boats; the licensing of fishing factories; the stipulation of closed seasons and of quotas; the control of fishing nets and of other methods of catching fish; specific measures to protect lobsters and other kinds of fish, and the control of whaling.¹⁸¹

The provisions of Act 58 of 1973 were inadequate in that they did not cover the following matters:

- there was no provision made for the granting of defined fishing rights and the orderly exploitation of the resource.
- no proper quota and catch control existed. Processing quotas-licences were granted to established processing houses which protected their interests, and it lead to monopolistic conditions prevailing in the industry.
- quotas were transferable and that system was abused by the marketing of 'paper quotas' to foreign interest groups.

The (unamended) provisions of the Territorial Waters Act, 1963 (the South African Act) governed the maritime zonal regime and prior to

¹⁷⁶Section 25.

¹⁷⁷Section 18.

¹⁷⁸Section 2.

¹⁷⁹Act 58 of 1973 was amended insofar as it applied to the territory of South West Africa by Act 57 of 1975, Act 22 of 1976 and Act 99 of 1977.

¹⁸⁰The regulations were contained in Government Notice 1912 of 12 October 1973 as regularly amended.

¹⁸¹See: Joubert, *The Law of South Africa*, Vol 10, (Sea Fisheries) by J. A. Faris at 161 etc., for an analysis on Act 58 of 1973 and Fuggle and Rabie, *supra*, at 269-273.

Independence it established a limited exclusive fishing zone of 12 nautical miles for the territory of South West Africa.¹⁸²

Act 58 of 1973 contained no provision in any way limiting or restricting foreign vessels from fishing in the exclusive fishing zone of South West Africa. The provisions of Section 8 of the Act which dealt with the licensing of fishing vessels and factories was not applicable to foreign vessels and confined to the terra firma and to the territorial waters.¹⁸³

It is against this background of legislative shortcomings that the Namibian legislature shortly after Independence enacted the Territorial Sea and Exclusive Economic Zone of Namibia Act, 1990 (Act No. 3 of 1990) to establish an exclusive economic zone and through an act of promulgation by reference incorporated the provision of Section 22A¹⁸⁴ of Act 58 of 1973 into Namibian law.

Section 22A then prohibited the unauthorized use of a foreign vessel as a fishing boat or factory within the exclusive economic zone of Namibia with an increased maximum penalty of R1 million.

The Sea Fisheries Act, 1992 followed and established an advanced system of rights of exploitation - quotas and licensing requirements with provisions designed to exercise proper quota and catch by regulatory control of fishing and factory vessels which I shall now proceed to explain.

UTILIZATION OF THE FISHERIES RESOURCE AND THE RIGHT TO FISH IN CONTEMPORARY NAMIBIA

The utilization of Namibia's fisheries resources is foremost governed by the Namibian Constitution, the Supreme law of Namibia and further regulated and controlled by the Sea Fisheries Act, 1992 (Act No. 29 of 1992) and the Sea Fisheries Regulations promulgated thereunder by

¹⁸²See: C.F.P Briesch and D.M. Powell, Fishing for Convictions : The Namibian Maritime Zonal Regime and The Incorporation of the Sea Fisheries Act 58 of 1973 into Namibian Law in 109 (1992), South African Law Journal 129; Pineiro and Others v The Minister of Justice and Others (an unreported judgment in the High Court of Namibia dated 17 June 1991) at 23-26; S v Martinez 1991 (4) SA741 (NmHC) at 747-750; and Redondo at 8-10.

¹⁸³See: Redondo at 11-13; and S v Martinez supra at 750; and S v Curras (an unreported judgment of the High Court of Namibia dated 13 February 1991) at 12-13.

¹⁸⁴Act 58 of 1973 was amended by Act 98 of 1977 to insert inter alia Section 22A into the principle Act but confined the scope and application of the section to the Fishing Zone of South Africa which included the area around Walvis Bay and the off-shore islands. The Namibian Act No. 3 of 1990 in turn incorporated the section as it applied to Walvis Bay into Namibian law. see: S v Martinez supra at 750; S v Curras at 1-2; and Redondo at 34.

Government Notice No. 1 of 1993 (Government Gazette No. 1 of 1993).

THE NAMIBIAN MARITIME ZONAL REGIME

It is necessary to make reference to the Namibian maritime zonal regime as it determines the extent of Namibia's marine resources and has a direct bearing on the scope and application of the fisheries legislation. No exclusive economic zone (EEZ) existed before Independence. Article 100 of the Namibian Constitution refers to an exclusive economic zone and read with section 4(1) of the Territorial Sea and Exclusive Economic Zone of Namibia Act, No. 3 of 1990 (the "Namibian Act 3 of 1990") created an exclusive economic zone for the entire Namibian coast line from the middle of the Orange River in the south to the Kunene River in the north including Walvis Bay and the off-shore islands extending outside the territorial sea of Namibia within a distance of 200 nautical miles from the low water line.¹⁸⁵

The Sea Fisheries Act, 1992 (Act No. 29 of 1992) and the Sea Fisheries Regulations, 1993, apply by virtue of section 4(3) of the Territorial Sea and Exclusive Economic Zone of Namibia Act, 1990 (Act No. 3 of 1990), read with Article 1(4) of the Namibian Constitution, to the entire exclusive economic zone of Namibia as defined in Act No. 3 of 1990, including the EEZ around Walvis Bay and the off-shore islands.¹⁸⁶

Namibia exercises sovereign rights and jurisdiction under the specific legal regime of the EEZ over the exploration and exploitation of marine resources within the exclusive economic zone in terms of the provisions of the Sea Fisheries Act, 1992.¹⁸⁷

CONSERVATION AND RESOURCE MANAGEMENT

In respect of the utilization of fisheries resources the provisions of Article 95(1) of the Namibian Constitution stipulates that as a principle of State policy "[the] State shall actively promote and maintain the welfare of the people by adopting, *inter alia*, policies aimed at the... maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and the utilization of living natural resources on a sustainable basis for the benefit of all Namibians both present and

¹⁸⁵See: *S v Martinez* at 750 B - E; *S v Curraz* at 6; *Redondo* at 8-10; and the article by Briesch and Powell.

¹⁸⁶The definition of 'Namibia' in Article 1(4) of the Namibian Constitution expressly includes the enclave of Walvis Bay and the off-shore islands as part of the national territory of Namibia. The Namibian legislature and the courts are bound by Article 1(4) to exercise jurisdiction over Walvis Bay; See: *S v Martinez* at 750 and *Redondo* at 18 and 26.

¹⁸⁷Section 3(b) of the Act.

future ...". The legal status of the provisions relating to principles of State policy as defined in Article 101 of the Constitution is that they do not constitute legally enforceable norms but are intended as guide-lines to the Government in making and applying laws. The principles also constitute second-and-third generation human rights that is, socio-economic rights and particularly rights to a sound ecosystem. They furthermore have the force of presumptions of statutory interpretation and will, in time, gain the force of law through judicial precedent.¹⁸⁸ Pursuant to this constitutional guiding principle and by giving effect thereto, the Namibian Government in its White Paper titled "Towards Responsible Development of the Fisheries Sector" (presented to the National Assembly by the Minister of Fisheries and Marine Resources December 1991) adopted as the Government's main objective for the fisheries sector the following policy namely "to utilize the country's fisheries resources on a sustainable basis and to develop industries based on them in a way that ensures their lasting contribution to the country's economy and overall development objectives", and in regard to Conservation of stock:

"The Government is committed to rebuilding depleted fishery stocks to their level of full potential. This will be accomplished through a programme of catch restrictions and other regulations over an expected time period of 5-10 years.

All stocks will otherwise be exploited on a sustainable basis and at moderate levels, in general below that estimated to give maximum sustainable yields. Regulation measures for the purpose of adjusting the exploitation levels will include TAC specifications by stocks, effort restrictions by fleet limitations, and closures of the fishery by the time periods or areas."

The National Fishing Corporation of Namibia Act, 1991 was enacted in 1991 to implement the above Government policy objective and it makes provision for the incorporation of a National Fishing Corporation as a public limited liability company within the framework of the Companies Act, 1973 for the purpose to exploit the fisheries and other marine resources of Namibia, whilst at the same time contributing towards the development and efficiency of the industry as a whole.

The objectives of the Corporation is to carry out normal business of a fishing company for profit and shareholders gain such as the catching, processing, marketing and selling of fish and other marine resources. Provision was also made for the Corporation to facilitate, promote, guide and assist new businesses and undertakings with a view to

¹⁸⁸Gretchen Carpenter, The Namibian Constitution - Ex Africa Aliquid Novi After All? in 1989-90 South African Yearbook of International Law 21 at 56-7.

promote Namibian interest in the industry, particularly in human resources development in fisheries.

Government will retain control of the Corporation by virtue of its capital structure in which the Government holds 51% of the shares with voting rights.

The Act was designed to attract private investment in the Corporation in favour of Namibian interest but allowing minority participation by foreign companies. An incentive to private investment is the fact that the Government's participation in the profits of the Corporation is limited to 15%.

The principle of State policy in Article 95(1) of the Constitution was incorporated into and further amplified by the provisions of section 2 of the Sea Fisheries Act, 1992 regarding the determination of general policy which provides as follows:

"The Minister may from time to time, determine the general policy with regard to the conservation and utilization of the Namibia marine resource to be applied with a view to -

- (a) the protection of the marine ecology;
- (b) the promotion, protection and sustained utilization of the sea, its resources and derivatives thereof to the greatest benefit of all Namibians, both present and future." (my emphasis)

This provision which determines the primary principles according to which resource management is to be conducted require that proper conservation and management measures be taken designed to protect the marine ecology and restore and maintain fisheries resources with the sustainable utilization of the resource at a yield which will produce the greatest overall benefit for Namibia.

For the purpose of determining allowable catch, it introduces the concept of the 'optimum sustainable yield' as an alternative standard for Namibia, rather than the scientifically related maximum sustainable yield equation.¹⁸⁹

¹⁸⁹See: O'Connell, supra, at 565, and the definition of 'optimum sustainable yield' in the Fishery Conservation Act, 1976, United States of America.

Such principles of fishery management and conservation practice conforms to international law and more particularly with the Law of the Sea Convention 1982. Article 61(1)-(3) of the Convention, having established the right of the coastal State, to exclusively determine the extent of the allowable catch in its exclusive economic zone, proceeds on the basis that the coastal State, taking into account the best scientific verified estimates is obliged to take measures designed to maintain or restore population of harvestable species at levels which can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors, including the economic needs of coastal fishing communities and the special requirements of developing States.

As pointed out by O'Connell, The Law of the Sea, Vol. 1 at 565:

"... by qualifying maximum sustainable yield according to relevant environmental and economic factors, including the economic needs of coastal fishing communities, [it] has weakened the scientific character of the determination which the coastal State is obliged to make of the level of exploitability as a step towards the determination of the surplus available for allocation. The formula is a composite one, in which subjective judgments of an economic character modify objective judgments about verifiable ecological facts."

There are, therefore, no constraints on Namibia's right to set a total allowable catch (TAC) at a lower level than that which is scientifically required to maintain populations at level that can produce the maximum sustainable yield (MSY). It may determine a TAC at lower levels designed to restore populations and rebuild stocks, or it may do so for sound economic reasons. For example, setting a TAC at a lower level than that related to the MSY may, by reducing supply to key markets, contribute to maintaining prices. Limiting fishing activities will also generally help to maintain catch rates and therefore profitability. It would therefore, for example, for economic reasons, be perfectly legitimate under Article 61 to set a TAC less than the MSY in order to maintain catch rates and thereby sustain profitability and the economic viability of the local fishing industry.

FISHING RIGHTS

As pointed out above, traditional fishing rights of unrestricted access to the sea were never established in Namibia and whatever common rights to the freedom of fishing existed, they have been replaced by a common property regime where the State exclusively controls the utilization of marine resources and access thereto.

The Namibian Constitution in Article 100 established sovereign ownership of natural resources within the territorial waters and exclusive economic zone. Its provisions proclaim *inter alia* as follows:

"... natural resources... within the territorial waters and the exclusive economic zone of Namibia shall belong to the State if they are not otherwise lawfully owned."

The provisions of Article 100 have to be read and applied subject to Namibia's commitment under its Constitution to respect international law and treaty obligations.

In relation to the application of international law, Article 144 of the Namibian Constitution provides that:

"Unless otherwise provided by this Constitution or Act of Parliament, the general rules of public international law and international agreements binding upon Namibia under this Constitution, shall form part of the law of Namibia."

In order to give effect to international law the Sea Fisheries Act, 1992 incorporated in section 3(b) the specific legal regime that applies in international law in the exclusive economic zone and claimed:

"the sovereign rights of Namibia with respect to exploration and exploitation" of marine resources within the exclusive economic zone.

Within the territorial sea it exercises sovereignty over the resource.¹⁹⁰

A sophisticated quota - licensing system with comprehensive regulatory control measures was adopted under the Sea Fisheries Act, 1992.

The system consists of the following primary implementation instruments:

- the granting of rights of exploitation;
- the determination of total allowable catch;
- allocation of quotas;
- licensing of fishing and factory vessels;
- licensing of foreign vessels under a fishing agreement in respect of the surplus quota of the allowable catch;
- monitoring of quota holdings;
- regulatory control over fishing vessels and factories;
- law enforcement.

¹⁹⁰Section 3(a)

Rights of exploitation

A right to utilize Namibia's Marine Resources can be granted by the State exclusively. The Act created the legal framework for the orderly exploitation of fish and other marine resources by which fishing rights defined as a right of exploitation, can be acquired to utilize the resource. In terms of section 14 of the Sea Fisheries Act, 1992

"Any person who desires to acquire a right to utilize living marine resources, aquatic plants, shells or guano for commercial purposes may apply to the Minister.... for a right of exploitation."

When considering the granting of a right of exploitation the Minister may have regard to criteria set forth in the Act and regulations. The criteria can be grouped under the following headings:

- Commercial viability;
- Namibian interest;
 - Regional development within Namibia;
 - Multilateral and bilateral co-operation;
 - Conservation and economic development of marine resources.¹⁹¹

In order to ensure that the objectives of the Act are realized, a right of exploitation is not transferable, except with the approval of the Minister and then only if the quota (or a portion thereof) is also transferred to the same person.¹⁹²

A right of exploitation confers on the holder thereof, referred to in the Act as an 'exploiter',¹⁹³ a long-term right to utilize the resource. The exploiter is not per se entitled to access as of right, but must first acquire a quota allocation.¹⁹⁴

Quotas

The Act created a quota allocation system that facilitates the implementation of proper conservation and management measures and policy to ensure that fishing by exploiters are controlled and related to the catching of an allowable catch with an optimum sustainable yield for Namibia qualified by relevant environmental and economic factors.

Quotas also provide the instrument by which catch can be effectively controlled. Fishing efforts by quota holders are controlled by monitoring transshipments and landings through inspections and reconciling them with quota holding.

¹⁹¹Section 14(2) of the Act read together with regulation 2(2).

¹⁹²Section 14(10).

¹⁹³Section 1, the definition of "exploiter".

¹⁹⁴Section 16.

The Minister, after consultation with an advisory council, determines (from time to time) the total allowable catch (TAC) for a particular species which shall be available for the allocation of quotas during a specified period.¹⁹⁵ The total allowable catch of the various harvestable species is presently determined annually.

Quotas are denominated in absolute quantities and defined in the Act as "the maximum mass or quantity of fish of a particular species allocated to a person which such person may catch during a specified period in a defined area."¹⁹⁶

The Act sets about a mechanism to ensure that quotas are distributed fairly amongst exploiters.

Quotas are granted to exploiters or refused by the Minister in accordance with guidelines prescribed by him and are granted on such conditions as the Minister may determine.¹⁹⁷ Guidelines prescribed in the regulations by the Minister for the allocation of quotas incorporate the criteria applicable to the granting of a right of exploitation.¹⁹⁸

The Government revises revenue from levies on quotas. A quota fee determined by the Minister in a notice in the Government Gazette is payable in respect of a quota allocation.¹⁹⁹

Quotas are not devisable or transferable except with the prior approval of the Minister.²⁰⁰

The Minister may, when the total allowable catch of a resource is to be reduced as a conservation measure, suspend, cancel or reduce a quota allocated.²⁰¹

Licensing

The Act, like most fisheries laws, provides for a licensing regime that regulates and controls the catching of fish and the use of fishing and factory vessels in Namibian waters.

The licensing of vessels implies a policy of 'licence limitation' by which the number and sizes of vessels that have access to the resource as well as their overall catching capacity can be controlled and limited in

¹⁹⁵Section 15.

¹⁹⁶Section 1, definition of "quota".

¹⁹⁷Section 16(1).

¹⁹⁸Regulation 3(2).

¹⁹⁹Section 20.

²⁰⁰Section 18.

²⁰¹Section 17(4).

relation to available catch to prevent overexpanded fleets and over fishing.

No vessel may be used as a fishing vessel or factory in Namibian waters unless it has been licensed in terms of the Act.²⁰² The licence is issued by the Minister subject to such conditions as the Minister may determine.²⁰³

Through the imposition of comprehensive conditions and the regulations extensive controls are exercised over fishing and factory vessels.

The most significant of such condition, being catch control by quota specification. Quotas are allocated to fishing vessels fixed in relation to the catching capacity of the vessel as a condition of the licence. With the quota linked to the fishing power of the vessel and monitored overfishing is more effectively contained. Some of the other important conditions that may be imposed are those pertaining to the area within, and the period during which the vessel may fish, methods and fishing gear that may not be used or which may not be carried on board the vessel, species which may not be caught, sizes, discarding, by-catch, transshipment, inspection and the placement on board of fishery control officers. These conditions may equally be imposed in respect of foreign fishing vessels operating in Namibian waters under a fishing agreement with another State or community of States.²⁰⁴ Failure to comply with the conditions entitles the Minister to cancel the licence.²⁰⁵ The licence is not transferable.²⁰⁶

Foreign fishing

Special provision is made in the Act for foreign fishing that puts in place the key element of the Law of the Sea Convention, 1982 pertaining to giving access to other States to the surplus of the allowable catch through agreements.

The Act establishes a legal framework in terms of which Namibia can negotiate on conditions it deems fit, a fishing agreement with another state or international organisation representing a community of States, to authorise the operation of fishing and factory vessels in such foreign State, or a member State of such community of States, within the

²⁰²Section 26(1).

²⁰³Section 26(5).

²⁰⁴Section 27(2)(c).

²⁰⁵Section 26(7)(a)

²⁰⁶Section 27(8).

Namibian waters.²⁰⁷ Whenever such agreement has been entered into, the Minister may, upon application by the owner of a foreign vessel to which the agreement relates, issue a permit authorising the owner to operate it within the Namibian waters as a fishing or factory vessel. The permit is issued for such period, subject to such conditions and restrictions and against the payment of such fees as the Minister may determine.²⁰⁸ This permit is also not transferable.²⁰⁹

The White Paper also encourages the formation of mutually beneficial joint ventures between Namibian companies and foreign enterprises whereby the latter are expected to contribute in terms of capital investment as well as technology transfer.

Other Control Measures

The regulations contain detailed and sophisticated provisions that make provision for an extensive control system, particularly over foreign vessels operated within Namibian waters. They are the regulations of a modern management regime similar to those of Canada and Norway.

The Government of Namibia does not presently have the manpower and surveillance capacity nor the financial resources to effectively monitor and patrol the full extent of the area of approximately 187,500 square nautical miles covered by the exclusive economic zone. The State is only able to utilize two ill-equipped patrol vessel one of which it owns and one which it charters.

The regulations were consequently designed to assist the Government in its control efforts and place the burden on vessel operators in respect of reporting at entry and exit from the exclusive economic zone;²¹⁰ notification of off-loading and transshipment times,²¹¹ logging and report backs on catches²¹² and compulsive regular port calls and inspections²¹³ etc. For the same reason, unauthorised transshipment of fish or fish products at sea is prohibited and unless authorised by the licence may only be carried out in a fishing harbour under the supervision of a fishing control officer.²¹⁴ Fishing gear has to be stowed away as prescribed in the regulations by a fishing vessel that is not authorised to operate in Namibian waters and when any fishing

²⁰⁷Section 27(1).

²⁰⁸Section 27(2)-(3).

²⁰⁹Section 27(4).

²¹⁰Regulation 46.

²¹¹Regulation 47.

²¹²Regulations 32 - 35.

²¹³Regulation 45.

²¹⁴Section 27 of the Act read with Regulation 47.

vessel transmits a marine reserve or closed area.²¹⁵

The important regulations that have a bearing on compliance control are the following: the establishment of catch control - (a vessel that carries fish or fish products caught within the Namibian waters may not take it out of the Namibian waters, unless the catch has been inspected and no further fishing operations have been carried out by the vessel since the inspection); inspections and the carrying of fishery control officers on board (who have to be provided with food and officers class accommodation and be remunerated by the vessel owner); marking of fishing vessels and gear; and reporting requirements (any fishing or factory vessel that enters or leaves the Namibian waters has to report by radio on inter alia the quantity of fish carried on board).²¹⁶

In addition to the standard provisions that are normally contained in fisheries regulations, such as marine reserves, closed areas and closed periods, the regulations have sophisticated provisions on methods of trawling, drift nets, trawl nets and purse-seining that may not be used or that may not be carried on board by different vessels, their mesh sizes, maintenance of mesh openings and prohibited attachments.²¹⁷

The provisions enumerated above are not an exhaustive catalogue, the regulations however, are comprehensive and cover the whole field of fishing activities including angling from the shore line.

LAW ENFORCEMENT

The Namibian fisheries regime, being regulatory, depends largely on enforcement by criminal law through the judicial system.

The independent judiciary system of Namibia exercises its judicial power subject only to the Namibian Constitution and the law, and may not be interfered with by the Executive. Judges are appointed by the President on a recommendation of an independent Judicial Service Commission and have tenure of office. Criminal trials are conducted subject to the due process of the law in accordance with the bill of rights that includes fair trial procedures.²¹⁸

The Sea Fisheries Act, 1992 carefully describes offenses that have a bearing on conservation, without detailing these, post-independence court proceedings have shown the significance of the special set of

²¹⁵Section 30 of the Act.

²¹⁶Part VII of the Regulations.

²¹⁷Part III.

²¹⁸Chapters 3 and 9 of the Namibian Constitution.

provisions pertaining to illegal fishing by foreign vessels in Namibian waters. Any owner, lessee, charterer or master that operates a foreign registered fishing or factory vessel in Namibian waters without a licence is guilty of a serious offence, which carries a maximum penalty of R1 million with mandatory seizure and forfeiture of the vessel, fishing gear and catch upon conviction.²¹⁹

The Act incorporated the bond and other security procedures established by Article 73(2) of the Law of the Sea Convention, and provides for the release of foreign vessels upon the posting of a bond in an amount equal to the reasonable value of the vessel.²²⁰

An outstanding feature of the Act, is the presumptions that aid the state in proving offenses. When trying an offence a court may apply any of the following presumptions if it is proved that:

- a fishing vessel was used in connection with an offence, it is presumed that the offence was committed by the fishing gear carried on board the vessel, and in respect of all fish and fish products found on the vessel;
- a net, line or cable was cut or released from a vessel, or abandoned, it is presumed that the vessel was fishing at the time;
- a vessel carrying a cargo of fish has over a period of two or more days, maintained a presence or generally remained in Namibian waters, or covered a particular area or periodically reversed its course to and from Namibian waters, it is presumed that the vessel operated within Namibian waters;
- processed fish or fish products in excess of one metric ton and was found on board a factory, it is presumed that the vessel operated as a factory within Namibian waters;
- samples taken of fish on board a vessel have certain characteristics, it is presumed that the whole cargo has the same characteristics.

These presumptions may obviously be rebutted by evidence to the contrary.²²¹

Recent events in Namibian waters have underlined the practical importance of these substantive provisions. Bearing in mind Namibia's limited surveillance and patrol capacity to control the vast area over which the EEZ extend, the fisheries resource, a valuable

²¹⁹Section 33(P) and 35

²²⁰Section 38.

²²¹Section 36.

national economic asset is particularly vulnerable against unauthorised exploitation.

The eminence of these enforcement measures was confirmed by the Namibian Supreme Court in Redondo's case. It held the offence to be "a serious economic crime against... Namibia" and stressed "the need to deter potential offenders... insomuch as the unlawful depletion of Namibia's fishing resource effects, all the inhabitants of Namibia not only because fishing is a source of food, but an economic resource as well."²²²

²²²per Ackermann A.J.A. in Redondo supra at 38 and 40; See further S v Martinez supra at 762 D-E; and S v Pineiro & Others supra.

WHAT SHOULD MODERN RESOURCE MANAGERS KNOW ABOUT BIOLOGY AND ECOLOGY?

by

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Abstract

*The man is selfish
of nature.*

The paper focuses on which facts about nature managers - and social scientists and other non-biologists - never should forget (presuming, of course, that biologists do remember these facts). These are:

- There is a finite amount of biological material on this earth, a limitation which is due to the amount of energy comming in from the sun is limited. Man - and technology - can do very little about this limitation. Technology does in general reinforce the intensity of overexploitation generally caused by man (and his selfish nature, partly being a result of natural selection). Indeed, we should never forget about the nature of man, nor about effects of man in nature.

Technically, such limitations bring about the phenomenon of carrying capacity and the existence of density dependence. It is indeed an observation which never should be forgotten that of the species having been investigated with this in mind, there is either no detectable degree of density dependence (which might be caused either by there in fact being no such density dependence or, which is more likely, the data being too imprecise or unaccurate to be able to detect such dependency), or a statistically significant negative density dependence. There is only one exception to this observation, human which has a significant positive relation between its specific population growth rate and its population size. It is likely that this dicotomy represent a basic cause for the environmental and developmental problems of today. / 3

- We as humans cannot substitute biological resources as food with any other material.

We may be able to feed more people if all feed at a lower trophic level than if all feed at a higher level. Nevertheless there will always exist a limit.

- There is a fact of today that the number of people on this planet grows faster than the growth of their food resources. Furthermore, it is a fact that the production of food tends to level off, whereas there is no detectable similar flattening off of the population curve. Basically, this is the Malthusian argument, an argument we must never forget: it may not apply just now, but with the facts we are faced with, it will sooner or later apply. Then, we ought according to the precautionary principle act as if there already are too many people on this planet.

Biologists on the other hand should be reminded about the need for equalizing the wealth among peoples of this planet. Unfortunately, natural scientists tend to forget Marx and his social science colleagues, whereas social scientists and others tend to forget about Malthus. 2

- We should never forget that the stability many politicians seems to aim at restoring may not exist; although ecologists and evolutionary biologists do have theories about the existence of such stabilities (e.g., the Gaia hypotheses), they seem by and large to be very uncertain about the existence of such stability (and harmony). Indeed, it is not a precautionary action to believe that such a stability does exist.
- We should never forget about the laws of physics, and in particular not about the two laws of thermodynamics. The first law of thermodynamics is that of "conservation of energy and matter" and states that matter and energy cannot be created and destroyed. The second law of thermodynamics states that all energy of all sorts, whether it is light, potential, chemical, kinetic, or whatever, tends to change itself spontaneously into a more random, or less organized, form.

Entropy

As part of the presentation, a discussion and specification of the sustainable development and management principle will be given. A discussion of the precautionary principle (and scientific uncertainty and incompleteness) will also be given as an integrated part of the presentation.

ROLE OF THE STATE IN THE MANAGEMENT OF NON-PRIVATE RESOURCES

by

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INTRODUCTION

In the theory of common-pool goods the role of the state is based on three assumptions. First, it will come into the theatre *ex post*. First, the state is called upon to take action in relation to so-called market failures within its own territory, either by employing state legislation counteracting externalities in the employment of common-pool resources or placing such resources in the public domain. Second, the state may preserve the resources of *terra nullius* by negotiating international regimes that regulate the use of common-pool resources outside of its territory (Hardin, 1968; Hardin, 1982).

Second, the theory of the tragedy of the commons is based on the model of the prisoners' dilemma expressing the logic of over-utilization of common-pool resources. Implicit here is the assumption of asymmetry, viz that all the states involved both can and will operate as a rational actor maximizing the public interest. *Ex post* the state can overcome the failure of collective action by finding and implementing an institutional structure that counteracts the collective action problems in relation to common-pool resources.

Third, there is a basic teleological assumption about state behaviour in the sense that the states desire to implement feasible solutions to the problem of managing common-pool resources. This not an innocuous one, because it is in its turn based on assumptions about preferences schedules of the leaders in the state that may not be universally true. Why would the state always act functionally in relation common-pool resources? Actually, any functionalist theory of state activities in relation to the common-pool bypasses the *ex ante* role of the state as well as the occurrence of asymmetrical interaction between e.g. rich and poor states.

We will state our reservations to the applicability of these assumptions in relation to a concrete example: the tragedy of the Baltic Sea. The emphasis will be upon the asymmetric relationship between states involved in ecology reciprocities where some of these states also play a

major role ex ante the search for an international regime that could handle the management of common-pool resources. What if the state is not part of the solution to the tragedy of the commons but instead part of the problem?

BALTIC SEA TRAGEDY

There is no lack of knowledge about the predicament for the Baltic Sea. It is one of the most scrutinized areas of the world, and there is ongoing continuous monitoring of the conditions in this area. Its ecologic importance is without doubt immense for the nine countries that share its coastline, harbouring some 16 million people. In addition, the catchment area of the Baltic Sea is much larger, covering countries with some 80 million people, as some of the rivers of Belarus, the Ukraine and the Czech and Slovak Republics find their sources here.

Ecology of the Baltic

The Baltic Sea, a semi-closed area of about 415 000 km², is the largest body of brackish (low salinity) water in the world and is distinguished by its division into a series of basins of varying depths. Of tradition, there has been much fishing in its various parts, the Bothnian Bay, the Bothnian Sea, the Åland Sea, the Gotland Sea, the Gulf of Riga, the Gulf of Gdansk and the Bornholm and Arkona basins and the Belt Sea (see the map).

The Baltic Sea (map):

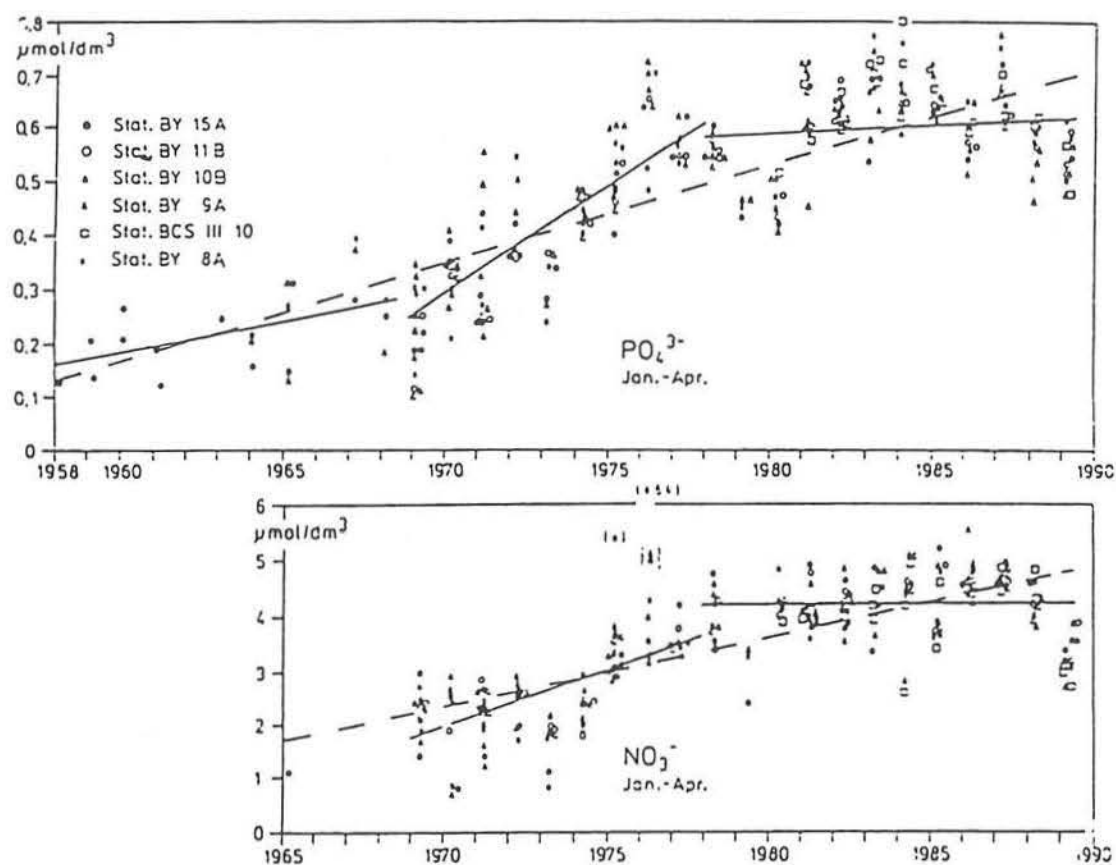
All the evidence points to a serious deterioration of the environmental situation of the Baltic Sea. In combination with the stagnation of the deeper water, the pollution of the Baltic Sea may now be described as a threat to its living resources (Helsinki Commission, 1992: 5/3). The parts affected by pollution have grown, particularly along the coasts of the industrialized countries. In addition, the type of pollutants have changed considerably, as industrial and agricultural wastes came to contain more toxic substances. Most coastal areas are now as seriously affected as some heavily polluted inland waters. The various airborne pollutants creating background contamination in most of the oceans of the world have seriously affected the Baltic Sea.

The state of the marine environment of the Baltic Sea is monitored by the Helsinki Commission (HELCOM). Since 1979 the Commission has been collecting data within the frame of the Baltic Monitoring Programme (BMP). The monitoring data provided by all Baltic Sea States are stored and processed in the HELCOM Data Base established by the Commission on the consultant basis. The Commission has published two periodic assessments of the state of the marine environment in the Baltic Sea, and by comparing the first assessment period (1979-1983) with the second period (1984-1988), it is possible to recognize changes in the ecosystem of the Baltic Sea.

The comparability of data is quite good, since the guidelines from HELCOM have standardized the collection of the monitoring data. After all it has been some difficulties in the collection of data from the coastal water, because the political situation in the eastern countries in the region before the fall of communism made it impossible for foreign experts to assess the state of the environment in the coastal waters. Some of the assessments of polluting emissions from eastern countries were also manipulated and underestimated. It has been impossible to harmonize the methodological basis for the collection of data from pollution sources until the political changes in the Baltic Area in the end of the 1980s. Therefore, the BMP and HELCOM have mainly dealt with the effects of the pollution on natural resources of the Baltic Sea. The assessments of the effects of pollution have been done in different levels of the water, from the surface to the bottom layers. Bottom compounds have also been regularly analyzed.

The main negative changes in the marine environment were those concerning trends toward increasing nutrient concentrations which cause a higher biological productivity. The organic material produced in this process consumes oxygen during its microbial destruction, thus contributing to the more frequent oxygen depletion and occurrence and spreading of hydrogen sulphide in the bottom water layer of the Baltic Proper, the Belt Sea and Kattegat under stagnant conditions. Nutrients

consist of phosphate, phosphorus, nitrate and inorganic nitrogen. The total load of nutrients have increased in the last few decades. Today, the emissions of nutrients have been stabilized at a high level in almost all parts of the sea. Exceptions are Kattegat and the Gulf of Riga, where the concentrations of both phosphate and nitrate are still increasing. We can look more specifically at the long term trend of concentrations of nutrients in the surface layer of the South-Eastern Gotland Sea. From the beginning of 1970s both phosphate and nitrate started to increase dramatically. In the 1980s, the concentration of nutrients have been stabilized at a high level (see fig). The situation for the concentration of nutrients in the South-Eastern Gotland Sea is more or less the same as the overall trend for the Baltic Sea.



Nutrient trends in the surface layer of the south-eastern Gotland Sea in winter, Station BY 15 = BMP J1; Station BCS III 10 = BMP K1 (Nehring and Matthäus, 1990).

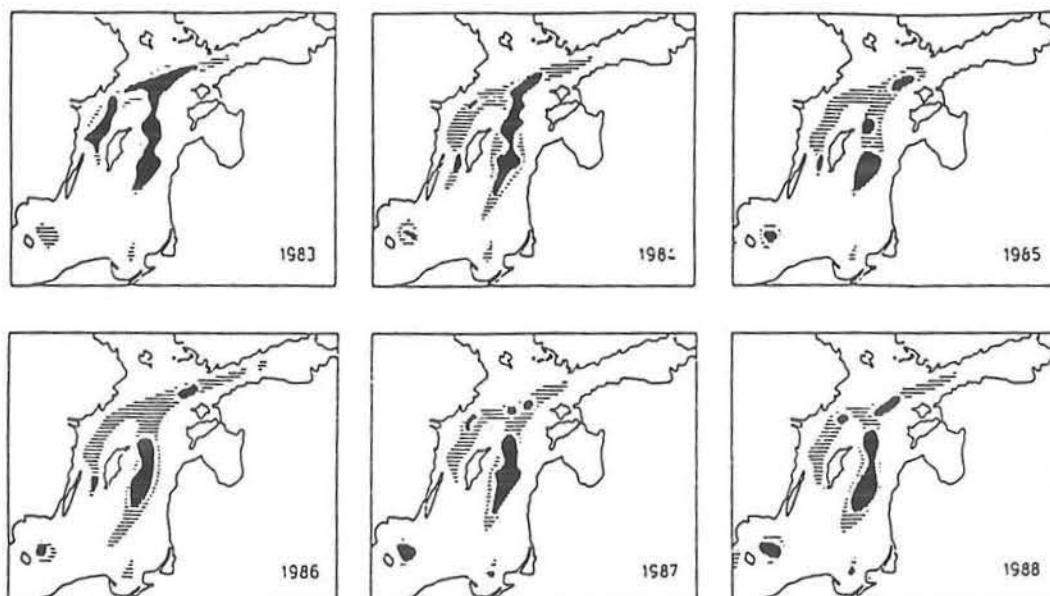
Untreated wastewaters from industry, municipals and agriculture are responsible for the high concentrations of nutrients in the Baltic Sea. The problems with untreated wastewater are of major dimensions in the eastern parts of the Baltic Area, where very often treatment equipments are totally missing. In the region of St.Petersburg e.g., the sewage from more than 2 million inhabitants is flowing untreated out in the Gulf of Finland. In addition to directly outflow of nutrients to the Baltic, airborne pollution is responsible for 50 % of the nitrogen load in the Baltic Sea.

Total-N Load into the Baltic Sea in 1990
t/a

Subarea	Rivers	Urban Areas	Industries	Total
BOB	35 033.7000	1 629.5000	1 567.4260	38 230.6260
BOS	42 985.0000	1 398.6000	3 096.9840	47 480.5840
ARC	7 870.0000	939.5000	1 101.0960	9 910.5960
GUF	109 529.5000	30 045.0000	867.9050	140 442.4050
GUR	11 730.0000	5 060.5000	281.0900	17 071.5900
BAP	159 175.8000	24 660.1750	2 462.8100	186 298.7850
WEB	38 821.0000	7 071.9739	1 582.9420	47 475.9159
SOU	7 591.0000	6 815.1100	311.1370	14 717.2470
KAT	41 340.0000	4 373.7970	851.4680	46 565.2650
Total	454 076.0000	81 994.1559	12 122.8580	548 193.0139

The depletion of oxygen, as an effect of the nutrient concentrations, has seriously effected all living resources in the sea. The decreasing level of oxygen is significant in the deep waters. The reason for that is mainly the lack of inflow of fresh water from the North Sea and Skagerak. The last great inflow of freshwater was autumn 1976. The critical load of oxygen is at least 2.0 ml/l for the survival of e.g. cod eggs. The decline of oxygen results in formation of hydrogen sulphid in the bottom sediments. Hydrogen sulphid is destructive for the ecological system of the sea and the main reason for that about 100.000 km² of the bottom of the Baltic Sea is currently declared as "biological dead" (Helsinki Commission, 1992: 2/2). The "dead bottoms" are found in the Gulf of Finland, in the Baltic Proper and the Kattegat and is about one third of the entire area of the sea floor (see figure next page).

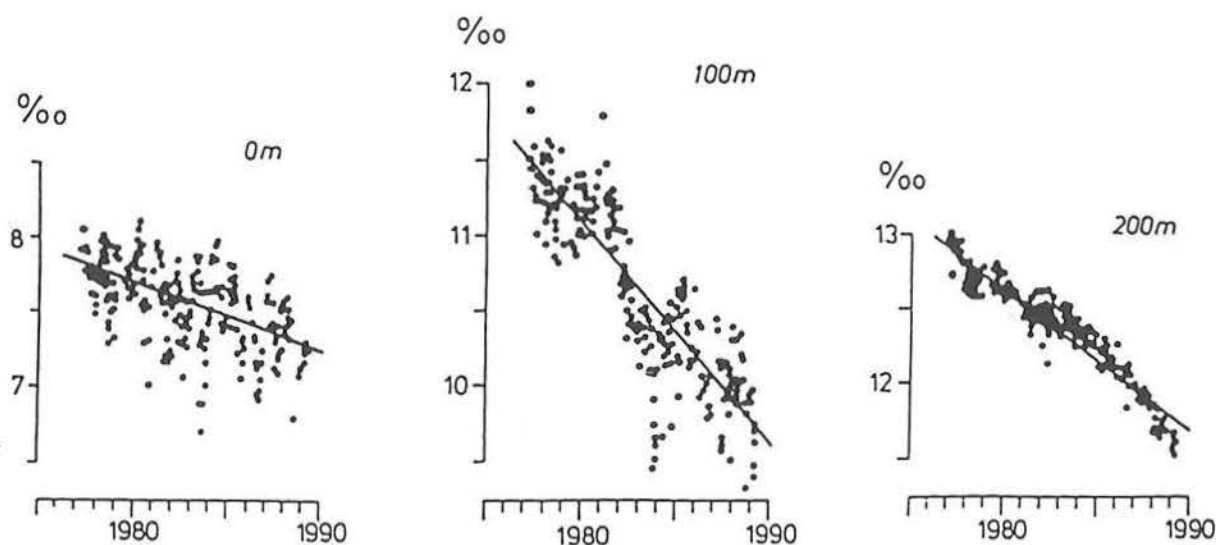
Figure



Occurrence of hydrogen sulphide (black areas) in the deep basins of the Baltic Proper between 1983 and 1988 (after Nehring and Francke, completed after Andersin and Sandler 1989). Shaded areas show oxygen concentrations below 2 ml/l. The maps give maximum coverage of the observed areas during each year.

The Baltic Sea is one of the largest sea of brakish water in the world, with low salinity. Some of the species living in the Baltic Sea need a minimum of salinity for their existence. Therefor, the balance between outflow of water without any salinity from the rivers and the inflow of salinity water from the North Sea and Skagerak, is of great importance for the ecological system of the Baltic Sea. The last major inflow of water from North Sea and Skagerak was in the autum of 1976. The reason for the lack of inflow of water from the North Sea and Skagerak, is a methorological one in combination with the topographical character of the Baltic Sea. The narrowly Sound with high sills makes the inflow of salinity-water very difficult. The consequence of that is a badly water exchange and depletion of salinity in the Baltic Sea, particularly in the deep sea layers.

Figure



Variations of salinity in the Gotland Deep (BY 15 = BMP J1) during 1977-1989 at the surface and at 100 and 200 m depth.

The consequences of the great reduction of salinity on the marine environment are many. The main effect is the problem with reproduction for many species, which are depending of a minimum of salinity in the water. If the salinity is too low, the eggs of many species sink to the bottom of the sea and stay unfertilize. That is one of the reasons for the last years dramatical reduction in the stock of cod in the Baltic Sea.

As an illustration of the change in the state of the marine environment of the Baltic Sea, we can look more specifically at the stock of cod. This year, the Swedish Government has forbidden commercial fishing on cod from mars 15 to august 15 (Dagens Nyheter, 27.01.1993). The International Baltic Sea Fishery Commision (IBSFC) has reduced the cod Total Allowable Catches (TACs) for the Baltic Sea as a whole from 100.000 tonnes in 1992 to 40.000 tonnes in 1993. Both of these steps indicate efforts for conservation of the two cod stocks in the Baltic Sea, after years with overfishing. Of the most commercial important species, cod is probably the species most negatively affected by the eutrophication. For successful reproduction in Baltic deep waters cod needs relatively high oxygen concentration. With increased eutrophication the frequency of low concentrations of oxygen, or anoxia, increases in the Baltic Area (S.Hanson, L.G.Rudstam, Ambio 1990: 123).

Many harmful or toxic and persistent substances not found in the natural environment such as PCBs, DDT, polychlorinated camphenes, and polychlorinated terphenyls (PCTs), have found their way to the Baltic Sea. Other examples of harmful substances detected in Baltic Sea biota in the 1980s are chlorinated terpenes, halogenated paraffins, polyaromatic hydrocarbons (PAH) and chlorinated pesticides, such as chlordane and dieldrine. These substances are both highly toxic and some of them also bioaccumulating. The ban on the use of mercury compounds in particular in the pulp and paper industry and a drastic reduction of mercury discharges from chlorine-alkali industry, have resulted in some decrease of mercury concentrations in fish, but many coastal water areas are still seriously contaminated (Helsinki Commission 1992: 2/3).

Trace element concentrations in fish and shellfish have not changed remarkably since the 1980s. Mercury values do not significantly differ from those in the North Sea and the North-East Atlantic. Both mercury and lead loading are high in the Kattegat and the Sound, but the lead concentrations in fish and shellfish appear to be decreasing. It is possible that this is already an effect of the increased use of unleaded petrol. Loads of cadmium, mercury and lead are highest in the Baltic Proper, corresponding to five to seven times the background level (Helsinki Commission 1992: 2/3).

3We have seen that the the main threats to the marine environment of the Baltic Sea are the highly concentrations of nutrient, the decline of oxygen, the badly inflow of fresh salinity water from the North Sea and emission of harmful substances to the sea. The state of the marine environment has changed dramtically the last decades, and today the size of the bottom area which are defined as "biological dead" is as big as 100.000 km².

The International Regime

The first attempts at creating some international regime for handling of the environmental protection of the Baltic Sea were taken in the early 1970s. Finland initiated negotiations between the so-called coastal states of the Baltic Sea in 1972 thar were held after the United Nations Conference on the Human Environment in Stockholm the same year. The goal was to arrive at a coordinated effort counteract the rising pollution an depletion of the Baltic Sea.

The pollution of the marine environment was one of the first types of environmental problems to be dealt with internationally. The critical environmental situation in the Baltic Sea Area was fairly well-known among the experts at that time, and an international convention was

long-desired. The recognition of the environmental situation in the Baltic Sea called for a comprehensive response from all the states surrounding the Baltic Sea, and there was a need to coordinate national environmental policies in order to protect the marine environment. However, the political situation in the area at that time was adversely affected by the East-West conflict. The conflict also affected the Stockholm Conference, since Soviet Union and the Eastern European states boycotted the conference. The reason for that, was the Western refusal to recognise the German Democratic Republic. However, the recognition of GDR later in 1972 made it possible to sign international agreements, and therefor the signing of The Convention on the Protection of the Marine Environment of the Baltic Sea Area - the Helsinki Convention two years later can be seen as an endeavour to normalise the political relations between the Baltic Sea states (Hjorth, 1992: 17).

All the Baltic States signed the Helsinki Convention, where article 3 states that all states will "prevent and reduce the release of polluting materials and protect and improve the marine environment of the Baltic Sea Area" (Fitzmaurice, 1992: 233). This regime went into operation in 1980, when all the Baltic States have ratified the Convention. An international organisation was established in order to administer and coordinate the implementation of the Convention. The Baltic Marine Environment Protection Commission, Helsinki Commission, HELCOM. The Commission plays a major role in the monitoring of the state of the marine environment in the Baltic Sea, and has been the central forum for international environmental cooperation concerning the Baltic Sea.

More concrete steps have been recommended in the two declarations from 1988 and 1990 at the ministerial levels. The turning point in the direction of more concrete steps was the Rönneby Conference, 1990. At ministerial level it was decided that the Helsinki Commission should start the work of more concrete steps in the direction of how to save the marine environment of the Baltic Sea. That was the start on a process which led to "The Baltic Sea Joint Comprehensive Environmental Action Programme". The political changes in the post-Communist countries made it possible for the Commission to recommend concrete actions for cleaning up the polluting industry of every country in the region. In the philosophy of "cost efficient abatements", the work of the Commission ended up in an action plan, which was signed in April 1992. In addition to the coastal states in the Baltic Area, Norway, Czech and Slovak Federal Republic, Ukraine and the European Economic Community signed "The Baltic Sea Joint Comprehensive Environmental Action Programme". The Action Programme consists of 132 hot spots, which are the most critical

pollution sources to the Baltic Sea. The programme is estimated to cost 18.000 millions ECU, and will be finished in 2012.

The main question today is who gonna pay the bill of 18.000 millions ECU. There is no agreement about that between the Baltic States. The Commission has suggested a plan of how to finance the Action Programme, where financial institutions like European Bank for Reconstruction and Development (ERBD), the European Investment Bank (EIB), the Nordic Investment Bank and the World Bank play a major role. The situation in the post-Communist countries is in many ways critically, and there is disagreement between them and the western countries about who should pay the abatements of the eastern countries. There have to be an agreement on the financial topic. If not, very little will be done to 105 of the 132 Hot Spots which are located in the post Communist countries. That is the main challenge for the Baltic Sea cooperation today.

The steps toward "The Joint Comprehensive Programme for Environmental Protection of the Baltic Sea".

INSTITUTIONAL TELEOLOGY

Theoretically, the tradgedy of the commons problem like for instance that of the Baltic Sea is modelled as a prisoners' dilemma. Whereas the classical statements of the difficulties in arriving at first-best solutions in relation to common-pool resources were pessemistic (Hardin and Baden, 1977), the new institutionalism has brought optimistic tones into the debate (Ostrom, 1991). It is claimed that the collective action difficulties in protecting common pool resources may be overcome by the establishment by means of voluntary exchange mechanisms of institutional principles that guard against the destruction of the common pool.

The model of the prisoners' dilemma for the analysis of the tradgedy of the commons starts from the assumption that symmetrical states that confront collective action problems may develop meta-strategies in order to reach coordination landing on the cooperative strategy. As long as there is a likelihood that the interaction between the participants will be reiterated, the reciprocal choice of a tit-for-tat strategy will result in the choice of the Pareto-optimal solution, i.e. cooperation for environment protection (Axelrod, 1984). Slowly the common pool resources problem will become manageable by means of a voluntary exchange mechanism, leading to agreements that are self-enforceable among the participant actors (Ostrom, 1992).

States may employ a special institution to make the collective action problem of common pool resources manageable, viz the identification

and implementation of a so-called international regime (Young, 1989). International regimes offer "social institutions governing the members of the international society" (Young, 1989: 6). If such an international regime is extensive, comprising a number of rules, and backed by organizational resources, then it could constrain its members towards first-best-solutions (Krasner, 1982).

International negotiations leading to institutional regime choice could thus be instrumental in overcoming the collective action difficulties in protecting common-pool resources. Neo-institutionalism predicts that optimal institutions will be forthcoming when rational actors choose between alternative institutional framework - so-called equilibrium institutions (Shephse, 1989). In the Coase tradition, small groups will establish optimal institutions, i.e. rules that guarantee optimal outcomes, as long as transaction costs are not staggering (Coase, 1988).

Yet, the neo-institutionalist analysis of the selection of institutions is driven by an implicit functionalist notion of the state that is not warranted, at least not a priori. The resolution of the collective action problem in terms of the institutional choice of a regime for handling the common-pool problems is based upon an assumption about specific preferences of the state. The crux of the matter is that the real preferences and behaviour of some states, like e.g. poor states may not fit with the presuppositions of the prisoners' dilemma model of the tragedy of the commons.

COLLECTIVE ACTION: PRISONERS' DILEMMA PROBLEM?

It is true that the management of common-pool resources involves collective action problems. Assuming individual rationality, protecting the commons is a public good that will not be forthcoming on the basis of only voluntary exchange. No single actor has the incentive to allocate this public goods because of the N-1 and 1/N problems. As long as a group of size N members protect the commons by not using the commons, N-1 actors would always benefit from exploiting the commons. If one actor allocates the public goods, i.e. does not exploit the commons, then s/he could at best only hope for 1/N share the benefits from her/his contribution.

The existence of N-1 and 1/N collective action problems in relation to the allocation of a good implies that there will an undersupply of the good (Olsen, 1965). However, if the preferences of actors have a specific shape, then institutional solutions could be introduced. Modelling the common-pool resources problem as

a prisoners' dilemma implies precisely such an opportunity for the participants (Diagram 1).

Diagram 1. The Prisoners' Dilemma

		A	
		Cooperation	Defection
B	Cooperation	-2, -2	-10, -1
	Defection	-1, -10	-5, -5

Actually, despite the pessimistic tone in the tragedy of the commons literature there is hope in relation to the tragedy of the commons when it is modelled as a prisoners' dilemma predicament. The dominant strategy in terms of individual rationality results in destroying the commons which would be the irrational or Pareto-inefficient solution for the collectivity. There is a first best solution - cooperation, cooperation - that could be forthcoming by the establishment of a proper institutional mechanism enforcing the Pareto-optimal solution.

The state could offer such an institutional mechanism for the management of the tragedy of the commons either its own area of authority, either protecting non-private resources or treating them as state owned resources. However, with regard to the management of international non-private resources the collective action problems remain acute. Whether the state will take such action to attempt to protect the common-pool resources around its borders depends on both its capacity to act and its preferences when international regimes are to be set up.

What is even worse, there may exist no first-best solution to the management of the common pool resources when states interact as sovereign actors in dealing with the tragedy of the commons. The prisoners' dilemma picture of the collective action problem in relation to common pool resources is not overly pessimistic but too optimistic. The prisoners' dilemma model the repetitive negotiation between states over common pool resources has having a Pareto-sanctioned solution that is socially acceptable. A number of reasons may be adduced to the effect that this is not the correct analysis.

First, a state may not be able to cooperate in the management of the common pool resources, as it may simply lack the resources necessary to take action to protect the commons. If the first-best solutions are not achievable, then the tragedy of the commons cannot involve a prisoners' dilemma game.

Second, a state may not wish to cooperate in the management of common pool resources. The prisoners' dilemma game builds upon the following symmetric preferences with regard to the two fundamental alternatives of action: cooperation versus defection from among two interacting states, A and B:

(1) A' preferences: Defection by A and cooperation by B, cooperation by A and cooperation by B, defection by A and defection by B, cooperation by A and defection by B.

(2) B' preferences: Defection by B and cooperation by A, cooperation by A and cooperation by B, defection by A and defection by B, cooperation by B and defection by A.

The paradox of the prisoners' dilemma arises from the preference profiles (Wildavsky, 1991). If both states unilaterally seek their first alternative, then they will end up in their third alternative, which is not Pareto-optimal. But the tragedy of the commons may result from other and more cruel preference profiles.

Suppose that state B both lacks the capacity and the will to take the cooperation alternative. Then, there will only exist two outcomes: defection by B with cooperation by state A, or defection by B with defection of also state A.

The prisoners' dilemma is a much too optimistic model of the tragedy of the Baltic Sea. The former Communist states will not for a long time be capable of nor wish to cooperate by undertaking large scale and costly actions in order to protect the Baltic Sea. Thus, the predicament is not that of the Prisoners' dilemma, i.e. the preference profile:

(P1) DC, CC, DD, CD,

but that of the deadlock game, i.e. preference profile:

(P2) SD, DD, CC, DC.

The prisoners' dilemma model implies symmetry between the players. However, whether this assumption applies or not is an empirical question. The tragedy of the commons may result not only from a symmetrical predicament between actors, but also from an asymmetrical predicament among the players.

The first and most conspicuous aspect of certain common-pool problems is that the players at the state level take action from different

circumstances and with different preferences. This is not to deny that many times the management of common-pool resources involve the kind paradox modelled in the Prisoners' dilemma game or the Chickem game (DC, CC, CD, DD). But this is not necessarily so. The management of common-pool resources may involve collective action problems at the same time as the players look upon the situation differently and defend asymmetric interests.

STATE ACTOR: CAPACITY AND INTERESTS

In comparative government it is generally acknowledged that states are different not only in terms of institutional set up but also with regard to system capacity and performance. The interpretation of the interaction of states in international regimes must be based on an understanding of such differences between states. These capacity and performance differentials have an impact upon how states behave in relation to externalities and reciprocities in relation to other states.

In the literature modelling collective action problems each state is treated as a rational player. There is discussion neither about what kind of actor the state may be interpreted to be nor whether the states engaged in interaction are the same in crucial aspects such as system capacity and collective preferences.

States that take part in the creation of an international regime may make very different deliberations about what the cons and pros are of alternative schemes. With regard to ecology and environment issues groups within the same state may differ considerably on how they estimate risk, hazard and opportunity, not to say costs (Wildavsky, 1989). The variety of orientations among states to the outcomes of the tragedy of the commons will reflect such country opinions, in particular among those people who have a decisive influence on policy-making in the field of ecology. There may exist large distances between state stand-points corresponding to the gulf between internal groups in terms of environment assessment and demand for action (Wildavsky, 1991).

Environment policy-making is a function of two factors:

- (1) Feasibility: Are there options that the state may realistically pursue that have a probable impact upon the amelioration of the tragedy of the commons? The information function reflects the technology available in society.
- (2) Desirability: Are some of the feasible programmes worth undertaking? The evaluation of the expected value of alternative

policies reflects not only the objective costs involved in each programme but also the subjective marginal willingness to pay.

States differ considerably on both (1) and (2). The boundaries of the set of feasible policies are drawn by on the one hand the access to advanced information and on the other hand by the possession of economic resources to be employed at the implementation stage. The set of desirable policies may be either large or small depending upon the values at stake. Finally, the joint set of feasible and desirable policies may as a matter of fact be empty, because the desirable programmes are not feasible or the feasible policies are not considered worth their costs.

Policy feasibility being determined by available technological knowledge and policy desirability expressing the variety of preferences among leaders, it is small wonder that there will be sharp differences both between states and over time in the capacity and willingness of states to take part in international regimes.

It may be predicted that the level of affluence matters much for the capacity and willingness of states to act in relation to the tragedy of the commons. The joint set of feasible and desirable policies with regard to common-pool resources increases with the rise in living standards. The implication is that collective action problems involving rich and poor states result in asymmetric relationships.

THE EXPLOITATION OF THE RICH BY THE POOR

Protecting the Baltic Sea is a concern for few rich countries - the Nordic states and Germany - and some poor countries - the post-Communist states. But they are very differently concerned about the tragedy of the Baltic Sea. It is not the case that any of the coastal states are less affected by the slow destruction of the common-pool, but the basic situation involves asymmetry between the joint set of feasible and desirable environment policies of these states.

The reciprocities between the rich and poor states in this area of the world are formidable, because the rich states cannot exclude themselves from the pollution of and depletion by the poor countries. Non-excludability is combined with subtractability, because when the poor countries use the common-pool resources in various, they decrease the size of the pool also for the rich countries. Thus, the losses for the rich countries from the predicament of non-excludability and subtractability may be enormous.

At the same time the poor states have all the advantages of free riding upon the efforts of the rich states to decrease their consumption of the pool. Since it is impossible to internalize the benefits of public goods to the group that allocates it, the poor countries will get something for nothing. Allocating environmental protection the rich states cannot exclude the poor from benefitting even if they contribute nothing. If a rich state considers saving the Baltic Sea as having the highest priority, then it may accept that it can only reap $1/n$ of the benefits from its contribution.

The collective action problem involving asymmetry between states is much worse than a simple prisoners' dilemma where the calculation of meta-strategies implies the choice of the first-best solution. Where asymmetry holds there is no strategy available for state A which would force state B to cooperate. The commitment of the rich states to environmental protection in their own countries implies that the tit-for-tat strategy option is simply not there. And ending up in the worst outcome for the entire collectivity of actors may for the poor states be better than reaching the cooperative outcome, because it is either non-feasible given the resources the state commands or there is little interest in the desirability of protecting the common-pool? What, then, should state A do? A has to accept that the poor state exploits the rich one, i.e. it has to pay part of the bill for the poor states when they cooperate, i.e. one part is taking on the allocation of the public good itself while the other part free rides.

EX POST AND EX ANTE

When the state enters an international regime that has been established in order to counteract collective action problems such as in our case the pollution as well as the depletion of the Baltic Sea it in no way enters ex post as an independent actor with no commitments. In stead it is characteristic of the state as an actor in international ecology regimes that its role ex ante has a profound impact upon the problem, i.e. it is responsible for a number of actions that have had an immense impact upon the problem. Again, the state is not only part of the solution but also involved in the evolution of the tragedy of the commons. The ex ante role of the state is a different one with regard to the rich state and the poor state.

The Communist state displayed a negligence towards ecological matters that is on such a scale that it is difficult to account for. The term "ecocide" has been identified in order to conceptualize the state's impact upon the environmental predicament in Eastern Europe. As a collectivist movement it is strange that Communism would pay such little respect to ecological interests. In any case, the Communist state is

poor meaning that its set of feasible activities in terms of ecology policies is small. But its set of desirable policies has been even smaller.

Even if ecological awareness is growing in the new governments of Eastern Europe, there is the *ex ante* predicament that the former governments in these countries are very much responsible for the pollution and depletion of the Baltic Sea. As long as these new states do not take action themselves in order to improve upon what their predecessors neglected, they come to the international regime as more a part of the problem than a part of the solution. If they can do little by themselves, why would they enter a Prisoners' dilemma game in order to reach the cooperate solution: - CC, when they do on their own worsen the predicament even more year by year?

TOWARDS THE SOLIDARITY GAME

Since the tit-for-tat strategy is not really available for the rich countries, taking into account the huge investments in their own country in the management of ecology policies for a number of years, the only strategy when facing the negligence of the poor countries is to redefine the terms of the interaction. The rich state cannot play reiterated Prisoners' dilemma games with the poor state, because it can not force the latter from the defection alternative to cooperation. Thus, the rich state must offer incentives to cooperate for the poor state by taking on part of the costs for reducing the harmful activities in the poor country that bring about pollution and depletion of the common-pool resources. This is not to say that the rich state should not continue its own programmes to reducing the damage done by the rich country. However, it may in reality be more effective to allocate part of the resources for ecology programmes from the rich country to the poor country.

Moving out of the deadlock situation stemming from asymmetry and *ex ante* commitments, the rich state would arrive at a pattern of interaction and reciprocity with the poor state that may be modelled as a solidarity game:

Diagram 2. The Solidarity Game

		B	
		Cooperation	Defection
A	Cooperation	2, 2	-1, 1
	Defection	1, -1	1, 1

When the management of the common-pool resources is based on the state incentives modelled as in Diagram 2, then there will be convergence towards taking multi-lateral action against the tragedy of the commons. The preference profile would be: CC, DC, DD, CD.

The arrival of the rich and poor states at a cooperative strategy is based not only upon the activities that the rich states undertake themselves to combat pollution and depletion, but also upon the contribution of the rich states to the initiation and implementation of activities by the poor states that would reduce pollution and depletion. The poor states would choose the cooperative solution, because they receive a sort of side-payments, although targeted to environment policies.

Since the collective action problems have been overcome not through a reiterated Prisoners' dilemma game but by means of recognition of the rich states of their own vulnerability due to the different valuation of the tragedy of the common, the problem now becomes a technical one of finding the most efficient policies in terms of a cost/benefit analysis.

THE HUMILIATION OF THE POOR BY THE RICH

The allocation of resources to activities that protect common-pool resources may be looked upon as an easily solvable optimization problem, where first-best solutions may be stated with regard to alternative inputs of ecology programmes from the rich and the poor states. Alas, things are far from simple due to the fact that the players are states in an asymmetrical interaction where the poor states *ex ante* are very much part of the problem themselves.

States do not only engage in rationally instrumental activities. States express a number of values, among which autonomy, sovereignty and choice are very important and much visible. Participating in the management of common-pool resources is a mean-end rational activity, where costs in relation to benefits can be carefully calibrated. Expressing state sovereignty is a value rational activity, where a lot of prestige is at stake. When rich states invite poor states to cooperate in international regimes orientated towards instrumentally rational activity in order to manage common-pool resources, then value rational action expressing state prestige may threaten the implementation of first-best solutions.

Diagram 3 presents an analysis of what first-best solutions could look like in the case of the tragedy of the Baltic Sea. Combining ecological activities from both state A and state B the pollution and depletion of the Baltic Sea may be counteracted: the more of activities or the more of efficient measures the more the common-pool resources are protected. Level 1 to Level 3 identifies different levels of

environmental protection given the possible combinations of activities from the two state - so-called isoquants. The costs of such activities may be expected to differ widely between the rich and the poor states, as very elementary policies are needed in the poor state whereas the addition of new policies to an already existing set-up would cost very much in the rich state. Thus, we arrive at the first-best solution F in Diagram 3, given the specific costs of A:s measures and B:s measures -so-called isocost lines.

Diagram 3 in here

Now, F may not be implementable, because it is either shameful to the poor state or requires too much of resource transfers from the rich state to the poor state. There is the danger in an international regime orientated towards e.g. the tragedy of the Baltic Sea that it would involve too much influence of the rich capitalist states over the poor post-Communist states or that the technology superiority could lead to the humiliation of the poor by the rich.

First-best solutions in instrumental international regimes set up to the management of common-pool resources may be non-implementable, because the distance between the states is too large. Once the poor states accept transfer payments from the rich states targeted to specific ecology programmes, then there is the accompanying exchange-power problem (Blau, 1964). The rich states would never pay for the clean-up activities of the poor states if they were not granted substantial power in the international regime to outline the means and ends of environment measures.

Thus, there arises a different kind of collection action problem. In an asymmetric interaction where the stronger part gives advice to the weaker part, then there is bound to rise power relations that are difficult to accomodate within the framework of sovereign states. If first-best solutions cannot be achieved because of state prestige, then what would second-best solutions look like?

CONCLUSION

From being initially pessemistic about handling the tragedy of the common problem there is now more potimistic tones coming from the neo-institutionalist analysis of the sources of the origin and preservation of negotiated rules that offer first-best solutions to the problem of managing common-pool resources. The tragedy of the commons is described by means of priosoners' dilemma model, and the Pareto-effeicient solution - CC - is achievable by the resort to institutions that may be backed by mutual consent and interests.

We argue that this new analysis is much too optimistic. The establishment of international ecology regimes to attack the tragedy of the common problem are beset with difficulties that are not regognized in the simple prisoners' dilemma model. Besides the elements of ex ante state commitments, assymetric interaction between different kinds of states and functionalist state roles, there are in addition the opportunistic aspect of state action which make states diverge from first-best solutions simply for reasons of state prestige.

PAGES 315-320 ARE MISSING

Salmana Cisse,
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TENURE FONCIERE ET SYSTEME D'EXPLOITATION DES
RESSOURCES EN TERRE ET EN EAU DANS LE DELTA
INTERIEUR DU NIGER

La première attitude des premiers explorateurs européens, face aux rapports que l'homme africain entretient avec les ressources naturelles, notamment la terre et l'eau a été longtemps celle des chercheurs tant africains qu'africanistes mais aussi celle des développeurs et des bailleurs de fonds. La terre en Afrique fut longtemps considérée par beaucoup de théoriciens comme vacante et sans maître dans le pire des cas et dans le meilleur des cas comme soumise à une appropriation collective.

Les liens apparents de production sont généralement expliqués non par une maîtrise foncière mais par une sujétion de l'homme aux forces occultes (genies, esprit, manes des ancêtres...) qui en seraient les véritables propriétaires fonciers. D'où l'existence toute trouvée du maître de la terre qui servirait d'intermédiaire entre les véritables propriétaires invisibles et les usagers quotidiens. Une telle attitude est rencontrée aussi au niveau des Etats indépendants, quelle que soit leur conception de société au départ et éclaire leur mépris affiché pour le droit coutumier et l'adoption par tous les pays francophones du Sahel du droit napoléonéen.

Cependant, l'échec des politiques de développement érigées sur le soubassement du mépris du droit traditionnel (ou à côté de lui) a poussé les chercheurs, les Etats et les bailleurs de fonds à se poser des questions sur la nature des blocages, sur les réalités contre lesquelles achoppent les projets de développement. Le système foncier s'est avéré être l'un des éléments qui méritent

tent de retenir le plus d'attention ; l'existence d'une tenure foncière est reconnue mais la question de savoir sa nature réelle et son mode de fonctionnement par rapport aux systèmes de production restent posés dans un certain nombre de cas.

SYSTEME FONCIER ET ORGANISATION SPATIALE :

Le Delta intérieur du Niger, situé entre le Haut Niger et le Moyen Niger (appelé aussi Boucle du Niger) tire son nom d'une topographie particulière : un territoire plat et affaissé détermine la division du fleuve Niger en de multiples bras - d'où le nom de delta - qui se jettent dans une vaste cuvette, les bassins des lacs Debo et Waladou.

Il y présente un réseau d'affluents (le Bani) et de défluents (le Diaka) inondant de vastes terres (35 000 km²) qui, à la faveur de la décrue deviennent de riches pâturages envahis au fur et à mesure du retrait des eaux par des dizaines de milliers de bovins et d'ovins ; ces terres sont aussi aptes à - et recherchées pour - la riziculture : des milliers de cultivateurs, sans ordre apparent, transforment chaque année une partie importante de ces pâturages en champs de riz.

Cette valeur agricole et pastorale des terres du Delta intérieur du Niger a conduit à une occupation de l'espace en trainées massives, espace qui nous servira de cadre dans la compréhension de la nature des rapports entre tenure foncière et systèmes d'exploitation des ressources naturelles notamment la terre et l'eau.

FONCIER ET ORGANISATION SPATIALE :

L'organisation spatiale dépend autant des éléments à organiser (terre, eau, herbe) que de l'objectif visé par cette organisation (systèmes de productions). L'organisation spatiale s'est donc essentiellement traduite par l'organisation de l'exploitation des supports physiques de l'espace à savoir la terre, l'eau et l'herbe ; la combinaison de deux éléments de ce trinome en excluant ou en minimisant l'influence du troisième facteur détermine et circonscrit un objet de travail autour duquel s'affairent les groupes sociaux.

La combinaison de l'eau et de l'herbe détermine ainsi l'objet des activités pastorales, celle de la terre et de l'eau celui des pratiques culturelles ; l'eau, combinée à l'un de ces éléments, en fonction de son importance devient un milieu favorable pour la pêche. D'où l'importance - toute relative cependant - souvent clamée des divisions écologiques dans les rapports entretenus par les hommes dans l'occupation de l'espace.

Celle - ci vise au départ la satisfaction d'un besoin du groupe - ou de l'individu à travers le groupe. La distribution des activités dans le temps réduit au minimum leur superposition spatiale ; ainsi dans une telle perspective on trouve plus une complémentarité entre les activités qu'une situation de conflit.

Une telle organisation de l'espace, pour exister suppose non seulement une faible densité du tissu social par rapport à l'espace à organiser mais aussi des groupes monolithiques où la division en classes sociales est inexistante et l'inégalité socio-économique très modérée. On peut à ce niveau parler d'un droit

souverain sur la terre appartenant à la communauté jouissant essentiellement de l'usus. De tels types de rapports ont pu exister dans le Delta intérieur du Niger où la terre est dite appartenir aux cultivateurs Bambara, Marka..., l'herbe aux éleveurs Peuls et l'eau aux pêcheurs Bozo. Par ailleurs, de tels types de relations se traduisent essentiellement par un faible coefficient de capital, un coefficient de main d'oeuvre moyen, des services d'appui sous développés sinon inexistants et sont compris comme relevant d'une tenure foncière dite collective traditionnelle.

Une telle tenure ne veut nullement dire que la terre est vacante et sans maître mais simplement que les rapports et relations sociaux développés autour d'elle sont pendant à une production de subsistance et utilisent non seulement de faibles moyens techniques mais aussi des organisations sociales et économiques de type égalitaire. Le trait essentiel d'une telle tenure repose sur le fait qu'aucune famille, ni aucune personne ne peut en revendiquer le droit exclusif d'occupation. Cet état de fait n'entraîne pas cependant leur exploitation anarchique ; des garde fous institutionnels en limitent l'usage dans le temps et dans l'espace et seuls les membres de la communauté peuvent jouir de ce droit. Les étrangers et les visseurs ne sont acceptés qu'à des conditions exceptionnelles pour des durées limitées.

L'histoire de la zone sahelienne et l'explosion démographique tant animale qu'humaine font de nos jours qu'il existe peu ou pas de droit souverain communautaire sur la terre dans le Delta intérieur du Niger. En effet, les communautés y sont tout sauf communautaires : la hiérarchisation sociale non seulement au sein des groupes sociaux (maîtres et esclaves, autochtones et alloch-

tones...) mais aussi celle des groupes sociaux (les sociétés pastorales par rapports aux sociétés de cultivateurs, celles - ci par rapport aux sociétés des pêcheurs), la différenciation au sein d'une même activité (éleveurs de bovins et éleveurs de chèvres par ex.) ont créé des situations où la terre est non seulement objet de travail mais aussi objet de convoitise.

Ainsi, les communautés villageoises sont de plus en plus remplacées par des groupes familiaux dont une partie est exclue de l'exploitation en faire valoir direct de la terre. Les possessions familiales sont appropriées par des groupements restreints de consanguins. Le chef de famille est seul maître de l'usage que l'on peut en faire. Au départ indivis et inaliénables, ces possessions se sont morcelées au fur et à mesure qu'éclatent les familles détentrices de droits. Aussi, les prix de kola symboliques ailleurs sont ils remplacés par le principe du partage de la récolte dans la Zone Lacustre entre celui qui possède la terre et celui qui travaille, et par celui du paiement du tolo ou prix de l'herbe dans le Delta intérieur du Niger, toute chose sanctionnée par la nouvelle valeur acquise par la terre.

Ces familles se disloquant au profit des individus accentuent la concurrence quant à l'occupation de l'espace et débouchent de plus en plus à une concentration assez forte de la propriété ; celle - là se traduit par le développement des inégalités socio - économiques, avec comme conséquence l'importance prise par le coefficient du capital et celui de la main d'oeuvre. L'avènement des petits périmètres irrigués privés dans le Delta, le fonçage des puits individuels ou peut s'en faut dans ses berges sahéliennes relèvent de ce niveau.

Il y a néanmoins certaines formes de propriété communales qui résistent encore dans les villages essentiellement comme formes résiduelles d'une organisation d'espaces revolus ou en voie de l'être. C'est le cas par ex. des espaces paturables communs tels que les harima dans le Delta, les pistes de transhumance empruntées par les troupeaux, les plans d'eau villageois. Forme résiduelle en ce sens que " la communauté villageoise " est généralement la première à violer les règles de gestion et d'exploitation de ces espaces : la mise en culture des harima en principe interdite, l'exploitation illicite des plans d'eau et la cueillette des baies sauvages (*Boscia Sénégalensis*) mises en défens leur sont imputables.

FONCIER ET ORGANISATION SOCIALE :

Le foncier peut se définir grossièrement comme l'ensemble des règles régissant les rapports entre l'homme et la terre et ces rapports dont la nature est déterminante par ailleurs dans les relations existant entre les hommes. Ainsi, même si l'histoire foncière d'un groupe humain ne se confond pas avec son histoire, elle en est presque une réplique.

En effet, les rapports liant l'homme à la terre part des - et débouchent sur les - liens que les hommes entretiennent entre eux : rapport de clientélisme et de servage dans un passé plus ou moins lointain, rapport de domination et de salariat depuis quelques années. Tout se passe en effet comme si la terre n'est qu'un lieu passif de l'affrontement des différents groupes humains dans leurs luttes quotidiennes de survie. D'où toute la difficulté de décrocher et d'isoler l'une des organisations à l'autre à cause

justement de cette confusion possible à prime abord entre les deux formes d'organisation foncière et sociale.

Cependant, l'observation et l'analyse des rapports fonciers du Delta intérieur du Niger tendent à faire découvrir que son espace physique, ses réalités hydrologiques et ses potentialités agro-écologiques ne seraient à la limite qu'un piédestal nécessaire des luttes politiques et des enjeux économiques que se livrent les groupes sociaux.* Ainsi l'ordre ancien basé sur une appropriation lignagère de l'espace consacrée par la coutume fut remodelé par l'incursion des lances sacrées de la Dina. Cependant le droit théorique musulman introduit par cette dernière n'a pas pu gommer complètement l'appropriation : traditionnelle à fort relent mystico - religieux ; d'où une coexistence entre deux législations s'articulant sur des registres différents.

* Cette idée est reprise chez B. KASSIBO in " La dynamique de la pêche dans le delta intérieur du fleuve Niger (Mali) : de la période coloniale à nos jours

KAWANDA Junzo, I.R.L.C.A.A., Tokyo 1987

L'arrivée du pouvoir colonial français amena une série de distorsions surtout sur le plan socio - économique et législatif qui apparaîtront comme des coups de boutoir portés à l'ordre ancien. La période post coloniale dominée par la crise écologique des années 70 et 80 marque un tournant décisif dans la dynamique foncière par la remise en cause de tous les anciens schémas cohabitants ou s'annihilant tout en laissant apparaître en filigrane d'autres logiques et d'autres cohabitations.* En fait, l'appropriation de l'espace par le jeu des pouvoirs politiques lui en

lève toute légitimité juridique dans la mesure où les pouvoirs politiques dans la région changent non seulement de main mais fondamentalement de nature.

* Cf. S. CISSE in " Concurrences spatiales et nouvelles co-habitations foncières en Seme Région : La dynamique des leyde in Observation du foncier au Mali, Fev. 1992

La carte d'identité de la terre change ainsi chaque fois que l'on passe d'une organisation socio-politique à une autre ; le degré d'évolution des techniques de production et la nature du système socio-politique les sous tendant déterminent la personnalité de la terre : sacralisée au départ elle fut tour à tour humanisée puis de plus en plus réifiée. D'où la question de savoir si la nature foncière des rapports que les hommes entretiennent autour d'elle ne relève t-elle pas d'une stratégie politique des différents groupes sociaux.

En effet, les caractéristiques géographiques de l'espace et les différents éléments physiques qui le composent n'expliquent qu'en partie l'ampleur des mouvements sociaux et l'intensité des activités de production ; ils ne déterminent ni leur sens, ni leur importance socio-politique. Ceux - ci relèvent des éléments de stratégie des différents groupes qui en dominant l'espace subjuguent ceux qui sont écartés de la maîtrise spatiale. Ainsi, l'appropriation de l'espace même opérée au départ par des groupes communautaires (lignage, village, famille) l'est selon un système des droits d'accès très hiérachisé, hiérarchie qui reprend et reflète en gros les hiérarchies sociales.

Il en est ainsi par exemple de l'exploitation des pâturages du Delta : un ordre de préséance est établi d'abord au sein d'une même famille, d'un même village et d'un même lignage. Cet ordre se repercute ensuite entre les familles, les villages, les lignages. Ceci est vrai pour les plans d'eau destinés aux pêcheries mais aussi pour les points d'eau pastoraux traditionnels. Si les cas d'exclusivité systématique ne sont pas nombreux, les préséances et les privilèges des uns finissent par chasser une bonne partie des usagers traditionnels de l'exploitation spatiale.

FONCIER ET SYSTEMES DE PRODUCTION :

De même que l'organisation foncière ne se réduit pas à l'organisation spatiale, de même elle est différente de la distribution des systèmes de production. Il n'y a pas de lien de cause à effet entre telle forme de propriété et tel système de production et d'exploitation des ressources naturelles. Le système pastoral que l'on rencontre un peu partout dans le Sahel ne s'explique ni par l'existence d'une maîtrise sociale de l'espace parcouru, ni par la lâcheté ou la rigueur du rapport liant l'homme à la terre. Les modes d'élevage de ce système à savoir nomadisme, transhumance, se pratiquent avec succès là où les rapports de l'homme à la terre sont régis par des règles précises. Le vide juridique créé par l'écartèlement et l'opposition de deux droits, à savoir la législation foncière de l'Etat malien et les pratiques foncières traditionnelles des groupes sociaux n'a pas été suivi par la disparition des systèmes de production pastorale mais plus par l'amplification des mouvements de transhumance.

Il en va de même pour le système agricole de production et pour le système agro-pastoral qui se rencontrent sous toutes les latitudes foncières. En fait, l'imbrication des systèmes de production quel que soit le mode de tenure, démontre s'il est nécessaire l'absence d'un déterminisme foncier dans l'existence des systèmes de production. Cependant, pour leur validité, une forme foncière plus qu'une autre pourrait en favoriser les aspects de durabilité.

Les systèmes de production présentent plutôt des relations très dures avec la distribution spatiale des différentes formes de production ; l'imbrication des systèmes de production d'une part et d'autre part leur décomposition en sous systèmes trouvent leur existence dans ces relations. Cependant, s'il n'est pas possible de poser a priori un déterminisme foncier sur l'existence et l'agencement éventuel des systèmes de production, le foncier joue néanmoins un rôle important dans leur dynamique : le changement de statut foncier des pâturages deltaïques ou des plans d'eau est à l'origine de l'évolution actuelle des systèmes pastoraux et piscicoles. La nature du foncier détermine - et peut être dérivée - des comportements des groupes sociaux du point de vue des activités de production.

Ainsi, derrière l'organisation spatiale apparente qui se traduit par une occupation momentanée d'une portion de l'espace (terre, eau, herbe) par un groupe spécifique (cultivateurs, pêcheurs, éleveurs) se profile en filigrane une organisation foncière qui va déjà bien au delà de la maîtrise sociale de la terre, de l'herbe ou de l'eau par un groupe défini mais à travers quelques fonctions de prétrises : maître des terres ou Dou - tigi

des Bambara, maîtres des pâturages ou Jowro des Peuls, maîtres des eaux ou Ji - tu des Bozo.

En fait, même quand ce système fonctionnait, les différents systèmes d'exploitation de l'espace trouvaient leur fondement dans les rapports que les hommes entretenaient entre eux par rapport à l'objet qu'est l'espace et non le contraire. Le caractère rudimentaire des techniques de production et les faibles différenciations sociales ravalement l'organisation spatiale et le maillage foncier au même niveau et créait l'illusion que les deux se confondaient. En effet, même à cette époque les deux systèmes - foncier et organisation spatiale - étaient régies par un ensemble de règles qui ne se coïncidaient pas toujours ; alors que les règles foncières régissent des rapports entre l'homme et la terre - il s'agit ici des groupes humains et de leur statut - l'organisation spatiale quant à elle repose sur la répartition dans l'espace et sur la distribution dans le temps des activités de production.

Il peut cependant apparaître une certaine forme de confusion entre organisation spatiale de la production et systèmes fonciers ; celle - là est alors comprise comme une distribution des rôles sociaux en vue de satisfaire les besoins matériels du groupe ; celui - ci à ce moment là a pour fonction la reproduction sociale du groupe, et à ce titre est un fondement des systèmes de production. Fondement et non déterminisme géographique ni même écologique ; en effet, le déterminisme, qu'il soit géographique ou écologique ne pourrait expliquer par exemple dans le cas des territoires pastoraux du delta intérieur du Niger, ni la sujétion des groupes de population ayant jusqu'alors maintenu des rela-

tions privilégiées avec la terre par d'autres - envahisseurs où visiteurs, ni l'extension numérique par assimilation d'autres individus et d'autres groupes par les éléments pasteurs nomades.

CONCLUSION

La tenure, telle qu'elle est comprise dans ce qui précède serait essentiellement des formes de rapport entre l'homme, généralement saisi comme groupe et ce que la terre supporte c'est à dire l'eau, l'herbe, les cultures. Dans cette veine la tenure implique à prime abord des rapports d'usus et de fructus et ce qui pourrait expliquer des relations très dures avec les systèmes de productions dont l'objet principal est justement constitué par ces différents éléments à savoir eau, herbe, sol.

Cependant, l'exemple du delta intérieur du Niger nous le montre bien, à ces rapports homme / terre se superposent les rapports hommes / hommes qui peuvent prendre le pas sur les premiers qui en perdent et leurs caractères privilégiés et leurs aspects sacrés : dès lors est posé par le groupe le problème de droit non seulement sur les autres groupes mais aussi sur la terre.

Aussi, les prémisses d'un droit moderne sur les terres "communales" du delta existaient déjà et les pratiques actuelles confortent une telle position : ce qui est soutenu ici, c'est qu'il n'y a pas d'opposition au niveau de l'exploitant entre les pratiques foncières traditionnelles et la législation moderne, ni entre deux logiques foncières différentes. La logique est une et vise la main mise sur un espace déterminé aux fins d'une exploitation directe ou indirecte ; les moyens utilisés sont identiques, quel que soit le pôle auquel on a affaire et repose sur

l'utilisation des éléments "vivants" des pratiques traditionnelles par les exploitants modernes ou par l'adoption des principes généraux de la législation moderne dans les pratiques traditionnelles. Ainsi, dans les pratiques traditionnelles actuelles tout ce qui peut concourir à renforcer les positions du traditionnel est récupéré au niveau de la législation moderne et réutilisé ; de même les tenants de la législation moderne ne dédaignent pas les vides ou les faiblesses voire les largesses de la législation traditionnelle avant de se conforter sur les accoudoirs des textes et des lois en vigueur.

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THE HISTORY OF RIGHTS TO RESOURCES IN SWEDISH AND FINNISH LAPPLAND

by

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Nordic Sami Institute

1. Introduction

The problems concerning the existence of indigenous peoples are similar all over the world. The key word is the right to utilize natural resources: the situation varies from a total lack of such rights to being legally and economically more or less an "endangered" species. Indigenous cultures are tightly integrated, and breaking bonds with traditional livelihoods has posed and poses a threat to entire cultures.

One such group is the Sámi in Northern Fennoscandia. Their habitat stretches from about Røros in Norway through the northern parts of Sweden and Finland to the Kola Peninsula in Russia. Conservative estimates put the total number of Sámi at 70.000.

Life on strictly local terms has required extreme adaptability of the northern indigenous peoples. Nature is barren and unproductive, a circumstance readily apparent when looking at the livelihoods the people are engaged in. Throughout the region the traditionally most important livelihoods have been hunting of land and sea mammals, fishing, and, particularly in Northern Eurasia, reindeer herding. Subsistence has necessitated great mobility, which is reflected in the social systems developed among the peoples. Permanent

habitation in villages has not existed traditionally. Usufructuary areas - whatever the bases for their use may have been - have been extensive all over.

Globally, the issue of rights for indigenous people is often referred to as "aboriginal rights". This term is an effort to recognize that indigenous peoples have a right to land and water through some principle of natural law, namely they are the original inhabitants of their land and they have actually used the land to this day.

In Scandinavia, particularly in Sweden and Finland, the situation is decidedly different. The Sámi, while never actually been conquered, became true judicial subjects of the state very early on, and the prevailing legal system recognized various rights to land and water use for them. For this reason the question of Sámi land rights in Sweden and Finland is not only a question concerning history and international law, but a question highly concerning the legal history in the whole country and Lapland specifically.

2. On the origins of Sámi culture

It is difficult to talk about Sámi culture or analyze its past without at least some discussion on whom the Sámi are. The origin of the Sámi is, of course, a matter independent of official government definition and goes back far into prehistory. Although it is not possible to present a completely accurate account on the origin of Sámi culture, a useful common factor seems to be discernible with the so called asbestos ceramics in northern Fennoscandia. Asbestos ceramics spread to the north about 1500 B.C., and came to prevail over all Finnish Lapland, northern Sweden, Finnmark in Norway and the Kola-peninsula - the very area that has been traditionally populated by the Sámi.

In other words, the range of asbestos ceramics seems to represent the common denominator by which we are able to extract from the past a cultural range that is internally homogenous and clearly distinguishable from the surrounding cultures. The other common denominator is naturally language. The differentiation of the language into its own family of languages is seen by

linguists to have taken place simultaneously with the above material process. In those days, thousands of years ago, the Sámi culture, among many other cultures, was something else than the state culture. The process which resulted in us talking about the Swedish, Finnish, Norwegian and Russian Sámi was long. The institutional methods employed by the later states in their rivalry for dominance over the northern areas involved a combination of taxation, buildings of churches, trade, and, above all, setting up a judicial and public service administration in the area. The success of Sweden in this rivalry was quite considerable. It resulted in Sweden's control over a vast area that comprises much of today's Sweden and Finland: the Lapland region of West Bothnia (Västerbottens Lappmarker). It is the judicial-historic past of this area that I have examined in my dissertation published 1989 and will shortly sum up in the following presentation.¹

3. The nature of Swedish-Finnish legal system

Until the beginning of the 13th century, law in the area of what is today Sweden and Finland could mostly be termed as customary law. This applied to Lapland as well. Gradually, province by province, written law came to be developed. This initially resulted in many different provincial laws.

The first laws pertaining to the entire state date from the mid-1300s and from the year 1442.² In 1809, when Finland and Sweden separated, the general law in force in the country was the Code of 1734.

Due to these facts, Sweden-Finland could clearly be considered, in their legal development, to be among the rank of countries with their own statutory law. In reality this has meant and means, that legal guidelines in a dispute must first be sought in written law (that is, not case law). Additionally, disputes concerning land and water areas have in our legal system traditionally been so-called non-mandatory disputes. They could not even have come up for action without the initiative of the private complainant. These facts prompt

¹ Korpijaakko, Kaisa, Saamelaisten oikeusasemasta Ruotsi-Suomessa. Helsinki 1989.

² The country and city codes of King Magnus Eriksson and King Kristofer.

one to ask, what the Swedish-Finnish ownership fundamentally was like, according to written law. Some short comments on this.

4. On title to land in Sweden-Finland

A closer analysis shows that land ownership can be understood as the sum of two bodies of statutes dealing with the same matter from two different perspectives. On the one hand, the law defined the basis by which a person in general could be considered a landowner. In this context the law exhaustively listed various forms of recognized legal title: inheritance, contract of sale, gift etc. The idea was, and still is, that in case of dispute, such title had to be proved in order to verify the existence of a right.³

On the other hand, the law provided for protection under law that a landowner enjoyed on the concrete use of his land. In this case the law listed up all actions that, from the point of the landowner, constituted illegal interference with his property.⁴ Legal acquisition and protection under the law formed the core of Swedish-Finnish land ownership rights.

This right of ownership had a strong background in customary law, which also became evident in earlier legislation on land ownership. From the 1500s, changes in political and economic life began to affect the legal development to an increasing extent, which meant quite significant breakdown of the traditional concept of land ownership. Sweden-Finland did not enter a wholly feudal period in its development as did most countries in Europe, but for the peasant, the title to land became subject to a large number of previously unknown restrictions, starting in the mid-1500s.

³ This by presenting the original document concerning the legal act.

⁴ These lists were in older legislation very detailed: using another's fields without permission, fishing and hunting without permission etc. were all listed separately.

But, in spite of everything, if a peasant succeeded in remaining independent under increasing burden of taxation and other pressures, he came to be officially called a Freehold peasant.⁵ The privileged freehold controlled by the nobility, formed a second category of real estate in addition to taxable land. Both these two titles can nowadays be deemed to have included the most elementary criteria of land ownership rights.

The rest of the land, the third category, belonged to the Crown. A tenant on Crown land did of course not have ownership rights to the land he used, but used it against a rent.

5. Rights of the Sámi in Sweden-Finland

a) Sámi land use

The tax rolls for Lapland, which represents the earliest primary sources of the past from the mid-1500s, indicate, that the Sámi (or better the Lapps) inhabited and used lands within certain defined units of land called Lapp villages. A Lapp village used to cover a vast area of land and was, in modern perspective, to be compared with municipalities better than typical villages.

The Lapp villages were however not the only units of land partitioning in Sámi society. Within a Lapp village, each family controlled over and used a clearly defined area of land which the documentary sources have termed as hereditary or tax lands. In Sweden-Finland, the life of each Lapp family and its means of livelihood were decisively focused on one unit of such land.

The sparse population within the Lapp villages can be seen as a direct relation to both the natural conditions of the area and to the means of livelihoods available within this area. The principal means of livelihood of the Sámi were hunting, fishing and reindeer herding; hunting and fishing were indigenous to

⁵ In Swedish "skattebonde", Finnish "verotalonpoika".

Lapland while reindeer herding came to be developed at some later date. Since the Arctic environment is barren and unproductive, a great deal of territory was (and is) needed to make these traditional pursuits into a viable means of livelihood. The problem of scarcity has to be seen from an entirely different perspective in the north than it is in the south: the stage at which scarcity of land and water areas emerged in the Sámi livelihoods, occurred much sooner than in agrarian livelihoods.

Since the mid-1600s cases between Sámi have been decided in annual rural court sessions, of which exact records were kept on how justice was administered among the Sámi. The local court sessions were held once a year in each Lapp village within the vast area of Lapland. Besides the Swedish judge, the jury or panel served an integral part of the court. The jury consisted of the Sámi in each village, later on also newsletters, according to the law altogether twelve men. Litigation among Sámi was both common and diverse, involving all conceivable aspects of human culture that might come up in such communities. A prominent concern in Sámi litigation was a need to protect sources of income, the right to use land and water. Although usufructuary areas - the so called tax-lands belonging to individual families - were large, one never seems to have had too much land, even not necessarily enough. In the light of the principle of sustainability this approach is wholly consistent: in Sámi land use system the people lived on what the nature could give them yearly, but on the other hand, only certain places - a good fishing place, a rich pasture for the reindeer and so on - yielded enough nourishment and other necessities. That is why these were important and had to be protected.

b. Legal title to land

Even a brief look at the documentary sources, especially the court records, shows that the families within the Lapp villages considered the tax-lands they used as their "own": "to own" is actually the very concept they used when describing their relation to the land. The privileges connected therewith were strongly defended against other families and outsiders. In other words, the

nature of Sámi livelihoods has been no obstacle for very strong ambitions constituting a kind of private right to the lands.

Based on documentary sources, the key problem of my research has been to clarify the precise nature of the legal status of the Lapp villages and the private tax-lands within the judicial system of the time. The problem can best be summarized by the following question: were the hereditary lands of the Sámi or the Lapps⁶, regarded as their "own" only according to local practice and custom, or was this title legally recognized in the same way as, for instance, the farms of peasant proprietors were during the same period of time.

The right of a Freehold peasant mentioned before can be seen as a collection of various elements - rights as well as obligations - described in detail in legislation. If a peasant met the criteria, he could be considered in a later examination on the matter to have owned his land by dint of so called taxpayers' right. If the criteria were not met, the answer is naturally the opposite.

As far as the Lapps are concerned, the matter can be - and I think it must be - considered within the same framework and the same principles. If we consider the extensive range of documents related to the legal position of the Lapps on the whole, particular criteria based on specific points in legislation can, indeed, be distinguished. The overall picture of Sámi land rights to be found in historical documents can be reduced to the following statements.

The courts in Lapland did apply Swedish law, but the laws and legal practice did not, in my view, endeavor to dismantle or change the unique system of land use among the Sámi or the legal principles connected with it. On the contrary, Swedish law in a way expanded and stretched, as it were, to cover and protect the Sámi system of land use. One of the most important rights

⁶ The term "Sámi" is based primarily on ethnic criteria and it is not used consistently in old documents. The people who lived in Lapland, used land and water for fishing, hunting and reindeer herding and paid a land tax for these livelihoods were called Lapps.

was, that the property was transferable, i.e. it could be inherited, sold etc. A closer analysis over the Lappish court records show, that this was the case in Lapland, too. The tax-lands belonging to private Sámi families were transferable property to the same extent as the land of a Freehold peasant. Under the conditions of Sámi society, the most common and important form of land transfer was inheritance: this guaranteed undisturbed land use from generation to generation. Succession of land proceeded in accordance with the principles set out in the Inheritance Code.

A Lapp could also resort to other measures concerning his or her land although this was not as common. The source material does however indicate some actual sales of land and especially of certain lakes. In other words, it was legally possible. As in the case of peasants land, the land was subject to redemption on the basis of rights of inheritance, a characteristic which distinguished the land clearly from Crown land. A tenant on Crown land could not transfer it to his heirs any more than he could to anyone else.

The Lapps certainly enjoyed so called protection of possession with regard to their taxable land. Where violations of rights occurred, provisions on unlawful use were applied. In practice this has meant hundreds of cases concerning fishing, hunting or reindeer herding without permission on another Lapps tax-land.

The court documentation also contains a great deal of information on the boundaries of Lapp villages and also private tax-lands. Court decisions on such boundary disputes indicate precisely, place name by place name, where the boundary between the villages or the lands lay.

It is also clear that the tax which the Lapps paid on their lands was a land tax in nature. Land registers detailing taxes and taxable lands were also drawn up from time to time, and they were the same as those drawn up for peasants' property. Given the size and difficult conditions obtaining in Lapland, preparation of such registers was quite an accomplishment in itself.

Neither did the colonization of Lapland take place with the conscious intention to disregard or override the rights of the indigenous population. New farms were to be established primarily in unused areas. If these did not exist, the matter had to be negotiated with the Lapp concerned. Mines and the like could not be set up just anywhere on a tax-land. The procedure followed was the same as that specified in law protecting a Freehold peasant's property in connection with such measures.

Put briefly, if these same criteria prove that a peasant once had ownership rights to his land, the corresponding conclusion ought to be - or, in my opinion - **must be** admissible in the case of the Sámi/Lapps. If all criteria are met, and this is what the documents show, the Lapps must be seen as having owned their land in the same way as the Freehold peasants of the time did. This right is the direct predecessor of today's right of ownership.

6. The legal status of the Sámi changes, into negative direction

In the present day situation the circumstances described above may seem almost unbelievable. However, one must remember that the perspective is crucial when evaluating the past. From the point of view of Sweden-Finland the Sámi living in the periphery of the country were in fact politically very important. At that time it was thought that only the Sámi were capable of inhabiting the regions permanently and thereby ensuring the sovereignty of the state in the area. Their loyalty had to be secured through favorable treatment on the part of the state.

It has become customary to point out that the change in Finland's status in 1809 did not entail the loss of previously acquired rights. In 1809 the bond between Sweden and Finland broke and Finland became a Grand Duchy within the Imperial Russian Empire. In his sovereign pledge Alexander I promised to strengthen and solidify both previous constitutional laws and the liberties which each social class had obtained. Generally speaking this has also been the case: the change in status did not affect citizens' property rights.

In the north the assurance made by the Czar did, however, not have a complete application. Over the years, the land title of the Sámi/Lapps gradually came to be dropped from most of the official records and, in a haphazard manner, forgotten.

The most crucial and devastating circumstance was obviously the fact that the northernmost regions of Finland were for long periods without any local court institution that had been so important earlier. Local court sessions were only occasionally held in the north and, even then, these were presided over by judges unfamiliar with previous praxis and local customs. The people therefore lost not only the forum which had been so instrumental in assisting them maintain a necessary order concerning land use. They also lost to have their possibility to get proper written documents over their rights, documents, that could be used as a proof in later disputes concerning the same land.

There were naturally many other reasons for the development, too, but one common dominator was the goals and ideals connected with the creation of the nation-states. Doctrines of race and so called racial hygiene were becoming virtual scientific disciplines at the time. The brachycephalic feature of the Sámi was invoked to dub them an inferior race compared to the Swedes, Finns and Norwegians. Their entire culture was termed barbaric and a manifestation of culture at a lower level of development than civilization proper.

In addition to losing the previous important court institution, the land title of the Lapps gradually came to be omitted from public land registers as well. The Finnish Lapps or better, the Lapp villages, did pay land tax on the lands and waters within the village as recently as 1924, but this very year all the prevailing land taxes in the country were abolished by law.⁷ The result was that no information on the previous land title of the Lapps existed when the general parceling of land was carried out in northern Finland by law given already in 1925. The end result was, that the hereditary lands of the Lapps came to be categorized as some kind of undefined "government lands". In

⁷ 1924/295.

Finnish practice this has meant the transfer of some 3 million hectares of land to the state ownership (i.e. 10 % of the whole area of Finland). This land is currently administered by the National Board of Forestry.

7. Conclusions

As it is clear that the state authorities of Finland, Sweden and Norway take it for granted, that the state owns the lands and waters in the Sámi area, it is interesting to examine, which legal grounds these claims are based on. After having familiarized myself with all possible literature on the question and after having followed the official decision-making process concerning the northern areas in general, I think it is well founded to say, that the explanation is very simple by its nature. The claims of the states have been essentially based on the premise that, in the course of history, the Sámi never acquired a real land title to the lands they used. In other words, it is meant, that the areas inhabited by the Sámi have been considered as ownerless areas, "Terra nullius", where, according to law, the state acquired title in the absence of another owner.

This explanation has also enjoyed the support of several disciplines. According to several historians, lawyers, economists etc., the development of all people progresses from a hunting and fishing stage to nomadism and after this to the highest possible level, to "civilization", that is the agricultural stage. As hunters, fishermen and nomads it was not possible for the Sámi to acquire a title to the land according to these theories.

In my view, the extensive documentation on the legal rights of the Sámi/Lapps proves without doubt, that the typical relations and elements constituting land ownership rights developed irrespective of whether the land in a particular case was used for farming or not. The rules of behavior associated with land ownership rights seem to have no logical connection with the nature of the livelihood engaged in; the institution has been governed by the need for legal regulation stemming from scarcity of resources. Hunters, fishermen and nomads may have needed, and the Sámi certainly did need

ownership rights to land as a means of regulating their mutual relations. Contrary to earlier interpretations, the Sámi/Lapps recognized the basic problem of ownership centuries ago, and have sought to have norms associated with ownership applied to their legal relationships. This goal did not go unrealized, for the legal system of previous Sweden-Finland did protect the rights of the Sámi in the same way it protected the rights of the peasants.

THE LEGAL STATUS OF RIGHTS TO THE RESOURCES IN SWEDISH LAPLAND

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1. Most of the inhabited mountains of Northern Sweden are owned by the State, although the ownership has not been registered in the land register; in certain parts, there are also private owners, above all forest companies. However, at the same time the Saami - or, more correctly, the reindeer herding Saami - have particular rights to land and water in those parts and the adjacent forest territories; in all, these rights cover about one third of the area of Sweden. The rights are regulated in a detailed way in the Reindeer Farming Act (1971; here abbreviated RFA). As will appear from the following, this Act does not render the whole truth about the legal status of the Saami, but as an introduction it may be useful to describe the main principles of the Act-. Some of these rules have recently been changed; a Government Bill concerning amendments in the Act has been passed by the Parliament in December 1992. The new rules have come into force on July 1st, 1993. In this survey, also the earlier rules will be dealt with to some extent.

The RFA can partly be regarded as a kind of monopoly legislation which grants an exclusive right to the Saami to carry on reindeer grazing in Sweden. However, an essential part of the Act deals with the rights of the Saami to land and water, called reindeer herding rights. These are described as the right of the Saami to use land and water for their own support and the maintenance of their reindeer. This description implies that it is a special sort of usufructary right for which the Act does not prescribe any time limit. The reindeer herding right includes reindeer grazing, hunting, fishing, and some felling of lumber. The right has until now belonged primarily to such persons of Saami heritage whose parents or maternal or paternal grandparents had reindeer herding as a permanent occupation. According to the new legislation, the reindeer herding right belongs to the Saami population and is founded upon the usage of time immemorial (§ 1). However, the right can only be exercised by Saami villages, and the amendment will not mean any real change in this respect. (It should be noticed that the term "village" here denotes a particular type of legal person, being a reindeer corporation rather than a village in the usual sense of the word; see below.) Although it is not clearly stated in The Act, it is evident that a reindeer herding right is not transferable, nor can it be mortgaged.

According to § 3, the reindeer herding may be carried out year-round in the mountain lands along the Norwegian border in regions defined in the Act; in the counties of Norbotten and Västerbotten above what is called the Cultivation Border (of old denoting the line above which the land should be, in principle, reserved for the Saami) and elsewhere on Crown land where such land has herding has been

carried on of old; in the county of Jämtland and Kopparberg, moreover, in certain districts particularly designated for reindeer grazing. Further, during the period October 1-April 30, reindeer herding is permitted in such areas outside the regions just mentioned where grazing has traditionally taken place during certain parts of the year (viz. in most of the forest regions of Northern Sweden, in certain parts extending even to districts not far from the Gulf of Bothnia). In the last mentioned territories, the reindeer herding right may be compared to a kind of easement (servitut) connected with the more extensive right that the Saami can exercise in the mountain area, in about the same way as an ordinary easement, in Swedish law, is connected with the ownership of real estate profiting by the right. - The two types of regions mentioned will here be called whole-year herding area and winter herding area, respectively.

The reindeer herding right is carried out by Saami villages on separate areas assigned to each village (§ 6). As mentioned above, the function of these villages is in the common interest of the members, to manage the reindeer farming in the grazing area of the village. They are not allowed to carry out any other economic activity than reindeer herding (§ 9). When registered, the Saami village becomes a legal person. In questions concerning reindeer herding rights the Saami village represents its members (§ 10). In principle, solely certain persons who carry on or have carried on reindeer farming and members of their family may be member of a Saami village (§§ 11 and 12). If membership is refused to a Saami intending to exercise reindeer farming, the County government can grant him admission, provided that there are particular reasons; thus, the Saami village cannot even decide on its own which persons should be permitted to carry on reindeer grazing on the land allotted to it.

The authority founded on this usufructuary right is divided between the Saami villages and its members in a rather complicated way. The Saami village has the right, for the common need of its members, to use the grazing area allotted to the village for reindeer grazing. Within this area, it may erect certain facilities required for reindeer husbandry, with the permission of the owner of the land. For this purpose, the necessary lumber may be felled in the reindeer grazing mountains and to a limited extent in other parts of the area, too. However, the felling of growing coniferous trees require the permission of the owner and user of the land, and remuneration shall be paid for the root value of growing trees; exception is made for lumber felled on certain Crown land and for deciduous trees otherwise felled in the reindeer grazing areas. -Moreover, the Saami village has the right to move reindeer from one part of the village grazing area to another. The members, for their part, are permitted to construct small facilities required for reindeer husbandry and to fell the necessary lumber for this purpose as well as to fell lumber above all on Crown land for the construction or renovation of their family homes. They may also hunt and fish in the outlying parts of their village's grazing area in the reindeer grazing mountains. (§§ 15-18, 21, 25). According to the new legislation, also other Saami may be permitted to take wood intended for handicraft on the reindeer mountains and on certain other Crown land.

A person holding reindeer herding rights cannot be deprived of this usufructuary right on the grounds that he has violated the rules of the Act or otherwise neglected his duties in the exercise of this right; by decisions of certain agricultural authorities, however, his use of land maybe limited in so far as concerns the size of the herd, reindeer grazing, and felling of lumber (§§ 15, 22). Further, the usufructuary right may be terminated against the will of the holder in certain other cases. Until now, the government could decree that the use of a particular area should cease if it was required for some purpose which could motivate expropriation according to the Expropriation Act or else was of vital importance to the public interest, if the area had small significance for reindeer herding, the use could even be terminated in this way as soon as the area was required for the public benefit. However, according to the new legislation, the rules of the Expropriation Act shall be exclusively applicable in this situation. - Damage and inconvenience to reindeer herding or hunting or fishing rights shall be compensated; if the damage or inconvenience does not affect any particular person, it is generally divided evenly between the Saami village in question and the Saami Fund - a public fund, the means of which are used to the benefit of the reindeer herding, the Saami culture and Saami organizations. (§§ 26, 28).

Otherwise, the owner or user of whole-year herding land must not take any measure causing considerable inconvenience to the reindeer herding, unless the land shall be used according to a municipal plan or for other activities that can be authorized according to special rules (30 §). In these cases, the Saami are not entitled to any compensation.

Neither Saami villages nor members of such villages may grant rights which are parts of the reindeer herding rights, except that ex-members may be allowed to hunt or fish for his household needs, free of charge, in the village area. Otherwise, the authorities of the state are in charge of all granting of rights in the reindeer grazing mountains. Usufructuary rights may be granted only if it is possible to do so without any considerable inconvenience to reindeer herding; as for hunting and fishing, a condition is that granting the right is compatible with good game management or fishing conservation, and does not encroach to any appreciable extent upon legislated hunting and fishing rights of the village members. Except when exclusive fishing rights to a given body of water is granted, no permission from the Saami village is required (§ 32). If the right granted involves exploitation of natural resources, the State is to make compensation for the damage or inconvenience caused to reindeer herding; otherwise, a fee shall be charged (except when the right implies lumber felling), unless there are special reasons for granting the right free from charge. The compensation or the fee is divided between the Saami Fund and the Saami village in question. (§ 34).

It appears from the above that the RFA builds on the assumption that the areas covered by the Act are not owned by reindeer herding Saami. However, the text does not expressly deal with the ownership of the land.

To sum up, the complicated system of the RFA implies that the right of the Saami in these areas is a kind of usufructuary right comprising above all reindeer grazing but also other rights connected with this, as constructing certain facilities, using lumber for household needs and using migration paths; further, hunting and fishing are included. Certain of these rights can be exercised by the Saami village, certain others by the individual Saami; further, in some respects the party entitled is the Saami fund, representing the whole Saami population.

If a non-member of the village interferes with the enjoyment of such a right, the village or person entitled can claim a remedy in an ordinary court of law, in the same way as an owner whose right has been infringed; in this way, damages may be claimed, as well as an injunction to cease an illegal activity (although at least the latter expedient does not seem very practical). In case of a legal exploitation of the resources, the Saami village can claim compensation according to a similar procedure as an owner. An intentional violation of the Saami rights to natural resources can involve criminal liability; here, too, the village or the individual Saami has the same legal position in the trial as other injured parties.

However, the power of the Saami to use and exploit the resources in question is limited in several ways, in civil law, the reindeer herding right enjoys less protection against measures taken by the authorities and the landowner than other similar rights to use land and water, for instance easements created by the land authorities. The weak position of the Saami in this respect appears clearly when the rules concerning the abolishment of reindeer herding rights and the granting of usufructuary rights are compared to the ordinary principles of Swedish law. Here, attention should be called to the imperfect protection against encroachment above all the possibility of the landowner to change the use of the land or take any other measures affecting the reindeer farming without any compensation to the Saami provided that the inconvenience cannot be regarded as considerable; further, there are reasons to emphasize the lack of influence of the Saami when fishing and hunting rights are granted on the whole-year herding land. Also in other respects, there is no way of transferring a reindeer herding right except by accepting a Saami as member of the Saami village.

An essential idea behind these rules, most of them originating from the first Reindeer Grazing Act (1886), is that the limitations of the Saami rights are justified by the monopoly exercised by the Saami concerning the reindeer grazing business; the RFA is regarded as part of the public law rather than the land law, and consequently it will seem natural that the Act regulates the reindeer herding right according to what seems appropriate essentially from an economic point of view. In general, this approach seems to have been predominant among Swedish jurists for more than 100 years, at least among those who have not studied the historical background of the rules. Even the Bill of 1992 expresses this attitude in some parts, (See 4 below).

The rules of the RFA concerning the protection of the reindeer herding right are supplemented by some important regulations in the Forestry Act. Evidently, the

possibility of reindeer farming depends to a considerable degree upon the state of the forests used for grazing. According to the Forestry Act, lumber felling on whole-year herding areas may not take place without previous consultation with the Saami village affected. Further, the County Forestry Board ("skogsvårdsstyrelsen") shall decide whether timber felling in certain slow growing forests will have such detrimental effects upon the reindeer farming, that it should not be permitted, above all then the grazing areas will be reduced to such a degree that the possibility to keep the number of reindeer permitted is affected or the ordinary gathering and moving of the herd is impossible. If felling is permitted, the Board can lay down conditions that certain measures shall be taken that are obviously required to protect the reindeer farming.

2. The outlook predominant in the RFA was challenged by the Saami in the much discussed Taxed Mountains Case (North Frostviken Saami village and others v. the State; "skattefjällsmålet", reported in Nytt juridiskt arkiv 1981 p. 1). The case concerned, in the first instance, the ownership of certain areas in the province of Jämtland known as taxed mountains (after an administrative proceeding in the 1840s involving taxation and land partitioning). A number of Saami villages claimed, on historical grounds, to be rightful owners of these areas or, secondly, to have several types of limited rights to the same areas, among others rights of reindeer grazing, hunting, fishing, felling of lumber, harvesting, cultivation, gravel mining, other mining, minerals, landowners' share in mines and hydraulic power, the Saami claimed a declaration that all these rights existed on the basis of civil law, irrespective of the RFA. The State maintained that it owned the properties in dispute and that only the rights specified in the RFA belonged to the Saami.

The process finally reached its conclusion by the judgment of the Supreme Court in 1981, where several issues of essential importance for the Saami rights were dealt with in a thorough way. The Saami parties lost on all points; as most jurists have not had time and patience enough to read the whole report, running to 253 pages, a common opinion has been that the Saami claims were altogether groundless. However, the matter is more complicated than the decision may seem to imply.

First, it should be emphasized that the judgement does not definitely solve the problems concerning Saami rights in other parts of Sweden. The Court underlined that it was not possible to form an opinion upon the legal status of the Northern mountains, which were not subject of the dispute in question. However, in the discussion of the material presented by the parties, the Court made some statements concerning the earlier rights of the Saami that have considerable interest in this context. Thus the Court found it necessary to examine the rights that the Saami would have had to the taxed mountains irrespective of the RFA, which implied an investigation of the historical background not only in Jämtland but also in the rest of the Swedish mountain areas. As a link in this analysis, the Court declared that it was possible, at least during the seventeenth century, to acquire land by using it for reindeer grazing, hunting and fishing, without cultivation of the land or even permanent residence in the area. In doing so, the Court disclaimed the common

supposition that "nomads cannot acquire ownership rights". The statement has no counterpart in previous Scandinavian precedents and should be of great significance for future standpoints on the rights of the Saami in Sweden (and in Finland, too), provided that legislators and courts will pay due attention to the position taken by the Court; as will appear from the following, most jurists are apt to disregard the statement, probably in view of the possible implications for the ownership of the State.

However, this pronouncement by the Court had no decisive influence upon the outcome of the case. According to the court, the requisites for this type of land acquisition by the Saami would be in cases where they were not permanently domiciled in an area that their use of the land had to be intensive, longstanding, and basically undisturbed by outsiders; further, somewhat fixed boundaries for the area in use should be required. None of these prerequisites were regarded to have existed in Jämtland at the critical time, *viz.* in the middle of the 17th century. According to the Court, it was at this time that the Saami had the chance to be considered owners of the mountains, as the State, by later legislations (the forest regulations of 1683) eventually caused the unowned land in Northern Sweden to come under State ownership.

It appears from the decision that the possibilities for the Saami to acquire ownership rights might have been better further north in Sweden, where the use of mountain land was more intense, more undisturbed, and where there were also forms of village organizations which could be considered as owners of the land. In fact, the only valuable evidence pointing to Saami ownership concerned the northernmost parts of Sweden and the present Finnish Lapland. The Court had no reason to deal more thoroughly with the Saami rights in these areas, as the litigation did not apply to them. But the decision did state that the State would not have been able to refer to the regulations just mentioned with regard to land owned by the Saami at that time, as the regulations only applied to unowned land.

The implications of the standpoint of the Court as to the ownership will be dealt with in the following, in connection with certain later historical investigations.

As for the limited rights that the Saami claimed in the second place, it should be noticed that they demanded that the Court should establish that these rights were still in existence, irrespective of the legislation; the limitations prescribed by the RFA should, in consequence, be deemed to be invalid. Such a claim would only have been approved if the legislation had been considered clearly unconstitutional; this was denied by the court (although one member dissented concerning the regulation of hunting and fishing rights, which was regarded as discriminatory insofar as the Saami lacked any influence upon the granting of such rights). The Court had no reason to discuss whether the Saami could claim compensation because they had been deprived of certain rights to natural resources through the reindeer farming legislation. However, the Court (as a kind of *obiter dictum*) concluded that their right of use was constitutionally protected in the same way as ownership rights; this

did not mean that it was protected against expropriation and similar measures, but the rights could not be taken from the Saami without compensation being made for the loss, according to the Swedish Instrument of Government (ch 2 § 18).

3. As mentioned before, the Swedish authorities and jurists in general mostly regarded the judgement in the Taxed Mountain Case as a confirmation of the traditional view that the rights of the Saami did not amount to ownership rights in any part of Sweden, and that the reindeer herding right essentially was based upon the RFA; it was even argued that the rights were more limited in the Northern mountains than in Jämtland, which is clearly contradicted by the findings of the Court.

However, the government commission that was appointed in 1982 to examine the legal status of the Saami (the Saami Rights Commission) was fully aware of implications of the judgement. In a report of 1989, the Commission proposed several amendments in the RFA in order to give the Saami a more effective protection against such measures of the owners of reindeer herding lands as would encroach upon the reindeer farming; among other things, the Commission proposed that certain forestry activities that would be detrimental to the reindeer grazing should depend on the permission of the County Forestry Board. Further, the Saami right was defined as a right sanctioned by immemorial use. The details can be omitted here; anyhow, most proposals intended to strengthen the Saami position were opposed by numerous authorities and organizations commenting upon the report. The result of the discussion was the not too effective protection afforded by the Forestry Act (see 1 above) and the amended RFA; as appears from the above, it implies rather modest changes in the legislation, although it is underlined that the Government considers the protection of the reindeer herding rights as important.

In this connection, mention should also be made of the recent legislation concerning Saami hunting and fishing rights, which the Saami regard as a serious menace to their legal position. As mentioned before, the Saami have a right to hunt and fish on the whole-year areas, although they cannot dispose freely of the right. At the same time, the State has the hunting and fishing rights in the capacity of owner of the land. The relationship between the rights of the State and the rights of the Saami is not quite clear, the Saami claim, with some support in the findings of the Court in the Taxed Mountain Case, that they originally had the exclusive hunting and fishing right which has gradually been reduced by various legislation and acts of the authorities. However, according to the Game Act (1987) the Saami shooting right is not on the same level as the rights of owners and tenants on the land, and the new legislation implies a considerable extension of the possibility for local authorities to grant hunting and fishing rights in the whole-year herding regions; the foremost aim is to satisfy the increasing need for these kinds of spare time occupations among tourists as well as local people. Of course, this state of law is incompatible with the idea that the Saami originally possessed an exclusive right to these natural resources.

The general attitude of the Swedish Government to the Saami rights is further illustrated by the statements in the Saami Bill concerning the ILO convention (no.

169) concerning indigenous and tribal peoples in independent countries. According to article 14 in the convention, "the rights of ownership and possession of the peoples concerned over lands which they traditionally occupy shall be recognized". In the Saami Bill, the responsible Minister stated that this article was obviously incompatible with the Swedish state of law and that it probably was founded on relations altogether different from those applicable to the Swedish Saami. Hence, it would not come into question to ratify the convention. The Parliament too rejected proposals to ratify the convention, although in less definite terms.

4. So far, the position of the Saami does not seem very promising from a juridical point of view. The efforts of the Saami Rights Commission to improve their legal status by creating a more efficient protection has only partly succeeded, and the detrimental effects of forestry and tourism upon the Saami activities are likely to increase. However, these negative traits may be partly compensated by the development in legal history, provided that proper attention is paid to the implications of the findings. Above all, the historical investigations of Kaisa Korpijaakko concerning the legal status of the Saami in the 17th and 18th centuries should reasonably have a considerable impact on the opinion among jurists and politicians. Above all in her doctoral thesis (*Saamelaisten oikeusasemasta Ruotsi-Suomessa*, 1989) she demonstrates in a very convincing way that, as far as concerns the Lapp areas of Torne and Kemi in the northernmost parts of Sweden and Finland, the Saami were treated by courts and other authorities as owners of the land (or, more precisely, possessors of taxpayers' rights that later developed into ownership) at least until about 1740; this holds true of Saami villages as well as individual Saami. Further, it is shown that all the requirements for a Saami ownership specified by the Supreme Court in the Taxed Mountains Case were fulfilled in these parts: an intensive, longstanding and essentially undisturbed use by Saami villages in areas with comparatively fixed boundaries. The Court had pointed out the possibility that such areas may have existed in the North; now, Kaisa Korpijaakko has apparently proved their existence.

If these results are accepted (as is the case at least among Finnish legal historians) it might have far-reaching consequences for the Saami rights in northern Sweden. As mentioned before, the royal regulations of 1683 on which the claims of the State on the northern mountain districts is based only concerned land without owners; if the Saami possessed the mountains in the capacity of owners, their rights were not affected by the regulations. In that case, it is not clear how the State between 1740 and the first reindeer farming legislation in 1886 would have acquired ownership to these regions; anyhow, the State cannot refer to any of the ordinary ways of acquiring good title to land originally owned by others. Still more surprising is that the hunting and fishing rights that the Saami must have exercised as owners now have been degraded to second class rights that they are not even permitted to dispose of. Even if there are small chances for the Saami villages to be declared rightful owners of the mountains today, the mere possibility of such ownership will strengthen their legal position to a considerable extent.

Kaisa Korpijaakko's thesis has not yet been translated to Swedish, which may partly explain that it has not made any particular impression upon the Government and the Parliament, however, it has been referred to in the legal discussion, and important parts of her findings have been presented in shorter papers during the eighties. The Saami Rights commission mentioned her investigations, and when the Law Council in 1990 examined an earlier draft to a Saami Bill (containing essentially the same proposals as the Bill of 1992) the Council called attention to the fact that according to recent historical research the ownership of the State had been called in question as far as concerned the northernmost parts of Sweden and Finland. However, the Law Council did not wish to express any doubt concerning the essential basis of the legislation proposed; if new lawsuits concerning the reindeer herding right should lead to other conclusions as to the nature of the right, it was assumed that the legislation if necessary would be reconsidered. - In the Bill of 1992, the statement of the Law Council was shortly mentioned; the reference to Kaisa Korpijaakko's research was passed over in silence. According to the Minister, the statement did not give cause for any particular comments on his part. As mentioned before, the Government as well as the Parliament has not considered it possible to adopt the ILO convention concerning indigenous and tribal peoples. Apparently, the possibility of Saami ownership to certain mountain regions was not seriously considered in this context either. One explanation might be that the mere idea of such a right was too disturbing from a political aspect in view of the legislation proposed.

5. It appears from the above that the legal position of the Saami varies according to the point of view from which it is discussed. The government (independently of political color) prefers to leave Saami ownership out of account, the existence of a rather strong usufructuary right based upon immemorial usage is acknowledged, but concerning the protection of the right the interests of forestry, other industry and tourism often outweigh the Saami interests. The same, of course, is true of the opinion among forest companies and other property owners in the North, as well as among the local population on the whole. The general idea seems to be that the judgement of the Taxed Mountains case has finally settled the question of Saami rights in all the mountain regions of Sweden.

On the other hand, one need not be a Saami, nor even particularly partial to the Saami, to feel a strong doubt concerning this somewhat light-hearted attitude to this complex legal problems. It would be an exaggeration to speak of the Saami having a strong case insofar as concerns the ownership question; however, the arguments that they can adduce seem to have sufficient weight to give the State a lot of worry, if the question of ownership to the northern mountains are brought before a court. As for the limited rights included in the reindeer herding right, the new legislation hardly does full justice to the Saami standpoint. The possibility that the rights of the Saami are far stronger than the legislation has assumed should call for some caution on the part of the Government and other owners of the land in question. However, the solutions given by the amended RFA are probably not so manifestly unconstitutional that the rules can be put aside by a Court.

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