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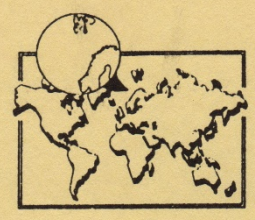

MaB
Man and the Biosphere
The Norwegian National MAB Committee

A CONFERENCE

ON

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

NYVÅGAR, LOFOTEN, NORWAY
16-21 FEBRUARY 1993

PROGRAM
CORRECTIONS TO LIST OF PARTICIPANTS
PAPERS IN ADDITION TO VOLUMES I AND II

NLVF
RURAL DEVELOPMENT

Economy & Ecology

This is an e-book version of the proceedings from the conference "Common property regimes: Law and management of non-private resources", Volume III:

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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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VOLUME III

Compiled
by
Erling Berge,
Department of Land Use Planning,
The Agricultural University of Norway

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

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Program

NLVF

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PROGRAM
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LAW AND MANAGEMENT OF NON-PRIVATE RESOURCES

16-21 FEBRUARY 1993
NYVÅGAR,
KABELVÅG, LOFOTEN
NORWAY

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Preface

The conference: "Common property regimes: law and the management of non-private resources" was initiated by the Norwegian MAB-Committee and organized by The Department of Land Use Planning and Centre for Sustainable Development at the Agricultural University of Norway. Here the interests of the MAB program and two other research programs, NLVF´s (The Norwegian Agricultural Research Council) research program for rural development and FSU´s (The Norwegian Research Councils´ Joint Committee) research program on "Economy and Ecology", were brought together with the goal of furthering our understanding of how the regimes of property rights on Finnmarksvidda (an alpine plateau) in Northern Norway and in the Barents Sea affect the resource utilization.

The "Man and Biosphere (MAB) Research Program"

The goal of the international MAB program is

- to develop a foundation for rational use and conservation of the resources of the biosphere,
- to develop a foundation for a sustainable interplay between man and environment, and
- to predict the consequences of contemporary resource utilization and thereby improve man's capabilities for efficient management of the resources of the biosphere.

The Norwegian MAB-committee has proposed to do in depth studies of renewable common resource systems by investigating the use of

- range lands by pastoral societies,
- and of marine resources by coastal populations.

In particular, it has proposed to compare the use of Finnmarksvidda by reindeer herders and their local communities with similar pastoral systems in Africa (e.g. in Sub-Saharan Sahel). Also the recurring crises of the fisheries in the Barents sea and their relations to the coastal population in Finnmark will be compared to similar situations elsewhere in the world (e.g. in Africa).

Rural Development

The Norwegian Research Council for Agriculture in 1990 initiated a research program for rural development. The program is directed at studying

1) Conditions for - and trends of - development in rural communities, 2) Economic, social and cultural strategies - and possibilities - for development in rural communities, and

3) Evaluation of development projects.

The program points out the need to study the conditions affecting the utilization of the wilderness areas both in a perspective where providing new sources of incomes for the inhabitants of the rural areas is the goal, and in a perspective where supplying collective goods for locals as well as tourists is the goal. The problems of environmental protection and sustainable utilization of resources are central.

The range of problems addressed within the program is diverse. In a part of the project, "Cultural Aspects of New Industrial Development in Rural Norway", the cultural and legal foundations for local resource appropriation have been addressed.

Economy and Ecology - Management Tools For Sustainable Development

The research program was initiated in 1991 by the joint committee of the Norwegian research foundations as a follow up of the report of the World Commission on Environment and Development ("The Brundtland Report"). The goal of the program is to contribute to the development of management tools needed for transforming our current path of development to a sustainable development.

The research program consists of five parts:

- resource management and pollution in agriculture,
- the management of the ocean,
- society, environment, and energy,
- ecology and development, and
- development of methodology.

The range of problems addressed is diverse. In particular, we should note the work of integrating biological multi-species models of large marine ecosystems and economic multi-species models of the fishery economy, and the work towards understanding the interplay between "agricultural systems" and the use of land and forest resources in Africa.

Conference facilities

The conference is held in the hotel Nyvågar in Kabelvåg, a small rural town in Lofoten in the northern part of Norway. The nearest airport, east of Svolvær, lies 14 km from Nyvågar. The flight to Svolvær from Oslo takes 2.5 hours.

Hotel Nyvågar is based on a modern replica of traditional fishermen lodges - a common building style along the coastline in Northern Norway. Lofoten is known for its spectacular natural beauty of islands,

steep cliffs and mountains rising to several thousand feet, abundant populations of seabirds and a string of picturesque fishing communities.

Acknowledgements
The conference has been made possible by the enthusiastic effort of many interested people: the administrative staff, the many contributors of papers and comments on papers and the financial assistance of various organisations.

The organisers are grateful for the financial support of

The Agricultural University of Norway,

The Norwegian Research Council for Agriculture,
-Research Program for Rural Development,

The Norwegian Research Councils´ Joint Committee,
-Research Program on Economy and Ecology,

The Norwegian Research Council for Science and the Humanities,
-National Committee for Environmental Research,
-National Committee for Development Research,
-The Steering Group for Environmental and Development Research,

The Regional Council for Northern Norway and Namdalen,

The Royal Norwegian Ministry of Foreign Affairs,
The Royal Norwegian Ministry of Agriculture, and
The Royal Norwegian Ministry of Environment.

Ragnar Øygard,
Director,
Centre for Sustainable Development,
The Agricultural University of Norway

PROGRAM

Tuesday 16 February 1993
Opening of conference

1400-1700	**Registration**	In the lobby of Nyvågar
1530	**Coffee**	
1700 - 1900	**Opening**	
	Ragnar Øygard	Opening of the conference
	Nils Chr. Stenseth	The Norwegian "Man and Biosphere Programme"
	Erling Berge	Introduction to the conference theme
2000	**Dinner**	

Wednesday 17 February 1993
Some theoretical issues

0800-0900	**Breakfast**	
0900-1200	**I Designing institutions**	
	Elinor Ostrom	Coping with Asymmetries in the Commons: A Challenge for Development
	Thráinn Eggertsson	The Economic Rationale for Communal Resources
	Gary D. Libecap	Distributional and Political Issues in Modifying Traditional Common-Property Institutions.
	Comments	Rögnvaldur Hannesson
1200-1300	**Lunch**	
1300-1530	**II Some problems of governance**	
	Jan Erik Lane/ Svein Thore Jensen	The role of the state in the management of non-private resources
	Peter Ørebech	Common and Public Property Rights Regimes to Non -Private Resources. Some Legal Issues on Self-governing Conservation Systems.
	Comments	Vincent Ostrom
1530-1600	**Coffee break**	
1600-1830	**III Human rights issues**	
	Hans Chr. Bugge	Human Rights and Resource Management
	Gudmundur Alfredsson	The Rights of Aboriginal Peoples in a Democratic Rule-of-Law State (paper presented by Brubaker)
	Comments	Lise Rakner
1900 - 2030	**Optional**	Visit to Espolin Johnson Gallery and the Lofoten Museum
2100	**Dinner**	

THURSDAY 18 FEBRUARY 1993
Resources in Northern Fennoscandia

0800-0900	**Breakfast**	
0900-1200	**IV Resources in Northern Fennoscandia: Legal Status**	
	Torgeir Austenå	The Legal Status of Rights to the Resources of Finnmark
	Heikki Hyvärinen	The Legal Status of Rights to Resources in Finnish Lapland
	Thor Falkanger	Legal Rights Regarding Range lands in Norway - with Emphasis on Plurality User-Situations
	Bertil Bengtsson	The Legal Status of Rights to Resources in Swedish Lapland (paper presented by Sevatdal)
	Comments	Hans Sevatdal
1200-1300	**Lunch**	
1300-1530	**V Resource in Northern Fennoscandia: Developments in Use**	
	Robert Paine	A Baseline for Comparison: the Resource System of Saami Society ca 1960
	Ivar Bjørklund	Saami Pastoral Society 1990: The National Integration of an Indigenous Management System
	Comments	Arne G. Arnesen (replaced by Chr. G. Lindeman)
1530-1600	**Coffee break**	
1600-1830	**VI Resource in Northern Fennoscandia: Legal History**	
	Gudmund Sandvik	Previous Regulations of the Use of Non-Private Resources in Finnmark
	Kaisa Korpijaakko-Labba	The History of Rights to the Resources in Swedish and Finnish Lapland
	Comments	Nils Jernsletten
1900-2000	**The Lofoten Fisheries**	Introduction to the excursion
2000	**Dinner**	
2100	Special work group	Elinor Ostrom

FRIDAY 19 FEBRUARY 1993
Excursion to Henningsvær and Range lands in Mali

0800-0900	**Breakfast**	
0900-1700	**Excursion to the Lofoten Fishery in Henningsvær**	
1730	**Coffee**	
1800 - 2030	**VII Range lands in Mali**	
	James T. Thomson	National Governments, Local Governments, Pasture Governance and Management
	Salmana Cisse	Common Law, Cultural Rules and Procedures in the Utilization of the Rangeland of Traditional Malian Pastoral Societies: The Case of the Fulani in the Inner Delta of Niger
	Ag-Youssouf Ibrahim	Management of Range lands in Mali
	Comments	Johan Helland
2100	**Dinner**	

SATURDAY 20 FEBRUARY 1993

The Fisheries of the Barents Sea and the Namibian territorial waters

0800-0900	**Breakfast**	
0900-1200	**VIII International problems of the Barents Sea**	
	Geir Ulfstein	The Legal Status of Rights to the Resources in the Barents Sea
	Sergei Belikov	Resource Management in the Barents Sea: the Russian Perspective
	Olav S. Stokke	Effectiveness of the International System of Fisheries Management
	Comments	Douglas Brubaker
1200-1300	**Lunch**	
1300-1600	**IX Problems of Norwegian Fisheries**	
	Svein Jentoft	The Lofoten Fisheries Management Regime: Traditional or Modern?
	Per Ove Eikeland	Distributional Aspects of Multi-Species Management in the Barents Sea Large Marine Ecosystem - a Framework for Analysis
	Ottar Brox	Recent Attempts at Regulating the Harvesting of the Norwegian Arctic Cod
	Bjørn Sagdahl	Allocation, Organization and Legitimacy Problems in the Management of Norwegian Arctic Cod
	Comments	Audun Sandberg
1600-1630	**Coffee break**	
1630-1830	**X Fishing rights in Namibia**	
	Carl-Hermann Schlettwein	Law and the Rights to Fish and Fishing in Namibia
	Pierre Roux	Fisheries Resources Conservation and Management: Namibia's New Legal Regime
	Comments	Bjørn Hersoug
1930	**Dinner**	
2100	**Entertainment**	Local musicians

SUNDAY 21 FEBRUARY 1993

Closing of conference

0800-0930	**Breakfast**	
0930-1200	**Reflections on the problems of management**	
	Nils Chr. Stenseth	What Should Modern Resource Managers Know about Biology and Ecology?
	Lee Anderson	Political Reality and Proposals for Institutional Change
1200 - 1300	**Lunch**	
1300	**Departure**	

PROGRAMME FOR THE EXCURSION TO THE LOFOTEN FISHERY IN HENNINGSVÆR, 19 FEBRUARY 1993

Introduction

Fishing has been the predominant economic activity and source of livelihood for the population in the Lofoten Archipelago since before 1100 AD. Cod and some haddock has been the main catch on the local fishing shawls. The fishing season has from the olden days represented a turning point in the yearly rhythm of life in the towns, villages and fishing hamlets throughout the many islands, inlets and fjords in the Lofoten Archipelago. Fishing vessels and fishermen come from many parts of Norway to take part in the fishing of cod during late winter and early spring. Getting a feel of the atmosphere and hustle-bustle of activities surrounding the Lofoten fishery is an experience not to be missed. Fortunately, the conference coincides with the major fishing season from February to April in Lofoten.

The excursion on Friday, 19th of February, to Henningsvær (a small fishing hamlet close to Nyvågar) is therefore centered on experiencing the Lofoten fishery from the catching of fish on the local fishing shawls to the landing and processing in local factories in Henningsvær.

The more adventures of the participants would want to enlist for a fishing trip of 3hrs duration from Nyvågar to Henningsvær. Remember to bring some warm clothes if you are choosing the fishing trip. The others will be transported by bus to Henningsvær to join up with the fishing group and visit a local fish processing firm there.

After lunch in a local restaurant, there will be a presentation of a slide show and a short talk on the Lofoten Fishery. There will also be time for a visit to a local art gallery showing an exhibition by the reputed Norwegian painter Karl Erik Harr. We will leave Henningsvær in the late afternoon for the evening session of the conference programme on rangelands in Mali.

Programme	19. February
8.00 - 9.00	Breakfast
9.00	Departure by boat from Nyvågar to Henningsvær (3 hours: Fishing group)
11.30	Departure by bus from Nyvågar to Henningsvær (Bus group)
12.00	Arrival in Henningsvær
12.15	Visit to a local fish processing plant
13.00	Lunch
14.30 - 15.30	“The Lofoten Fishery” - a slide show by Frank A. Jenssen Visit to the Karl Erik Harr Gallery
15.30 - 17.00	Walk through Henningsvær
17.00	Departure by bus from Henningsvær
17.30	Arrival in Nyvågar
17.30 - 18.00	Coffee
18.00	Session XI Mali
21.00	Dinner

ABOUT THE CONTRIBUTORS:

Gudmundur S. Alfredsson (1949) is Officer in Charge of background documentation, studies and external preparatory meetings for the secretariat of the 1993 World Conference on Human Rights, UN Geneva. He is presently on leave from this position as a visiting professor to teach public law and human rights at the Raoul Wallenberg Institute of Human Rights and Humanitarian Law, University of Lund, Sweden. He is doctor of Juridical Science (S.J.D) from the Harvard Law School. From 1985 to 1991 he has held senior positions at the UN Centre for Human Rights in Geneva and in New York. He has taught public law and human rights at the Graduate Institute of International Studies (Geneva), at the University of Iceland's Law School and at the Department of Political Science at Boston College in the U.S.A. He has published widely on human rights issues and on minority rights.

Lee G. Anderson (1943) is professor in the College of Marine Studies, University of Delaware, Newark. He got his Ph.D. in economics from the University of Washington in 1970. He has written or edited five books, including "The Economics of Fisheries Management", and many scientific papers on fisheries economics. He is a past member of the Executive Board of the Law of the Sea Institute and is currently a member of Mid-Atlantic Fishery Management Council. He has acted in an advisory capacity to National Marine Fisheries Service, and other Fishery Management Councils, the U.S. Department of State, the Great Lakes Fisheries Commission, U.S. General Accounting Office, the National Academy of Science, the Food and Agricultural Organisation of the United Nations, the Governments of New Zealand and Australia, and the World Bank with respect to fisheries management and development. He has also received grants from the National Science Foundation, Sea Grant, National Marine Fisheries Service, Food and Agricultural Organisation, and USAID.

Arne G. Arnesen (1946) is a graduate from the Faculty of Law, University of Oslo. He is employed by the Ministry of Agriculture as deputy director with responsibility for reindeer breeding and Saami rights. He is also legal advisor on interior and international agricultural policy. He has a varied experience from research on and administration of issues of interest to the Saami people. His publications include "Samenes stilling i folkeretten" (Saami Rights in International Law), Diedut 4/83, and "Reindriftsrett" (The Law of Reindeer Breeding), Oslo, 1988.

Torgeir Austenå (1928) is professor of law in the Department of Land Use Planning at the Agricultural University of Norway. He holds a Dr.Juris degree from the University of Oslo (1974). He has served as a member of a number of government committees and is currently a member of the Comité European de Droit Rural and the Saami Rights Commission. His research interests include land law and minority rights issues.

Sergei V. Belikov (1954) has since 1988 been Chief of the Pelagic Fish Laboratory in the Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO) in Murmansk. He holds a major degree in Fishery Science from the All-Union Research Institute of Marine Fisheries and Oceanography in Moscow. He has wide experience in assisting commercial fishing vessels in their fishing operations in the North East Atlantic. He is also collaborating with Norwegian scientist in initiating research cruises in the north east Atlantic. He is a member of the ICES Blue Whiting Working group and has over 40 publications within his academic field.

Bertil Bengtsson (1926) is a Supreme Court Justice at the Supreme Court in Stockholm, Sweden. He is a Doctor of Law from the University of Stockholm. He has been professor of private law at the University of Stockholm (1968 - 74) and Uppsala (74 - 76). Bertil Bengtsson has published 20 books and a large number of papers related to law of tort, insurance, contract, family, real estate, environment and constitution. He has published a book and articles on the rights of the Saami people.

Erling Berge (1946) is a research fellow (NLVF) in the Department of Land Use Planning, The Agricultural University of Norway. He holds a cand. polit. degree from the University of Bergen and a Ph.D. in sociology from Boston University. He has previously held positions in the Central Bureau of Statistics of Norway (71-75) and the Institute of Applied Social Research (79-90) and been a Visiting Fellow at the University of Essex (86-87). He has published on population issues, urban and regional problems and land use theory. His current research is concerned with cultural and organisational aspects of rural development.

Ivar Bjørklund (1949) is a research fellow (NAVF) in the Department of Social Science at the University of Tromsø, Norway. Ivar Bjørklund holds a Mag.Art. degree (social anthropology) from the University of Tromsø. He has been employed as lecturer in the Section for Saami-ethnography at Tromsø Museum (84 - 86), been a visiting researcher at the Nordic Saami Institute (86), a senior lecturer in Tromsø Museum (86) and a visiting scholar in the Department of Anthropology at McMaster University in Canada. His research and publications are related to minority issues, socioeconomic implications for the Saami people of official Norwegian management policies, and resource use of pastoral Saami people in the north of Norway.

Douglas Brubaker (1946) is currently project leader for the International Northern Sea Route Project at the Fridtjof Nansen Institute where he is writing his doctorate, "Russian Arctic Waters in International Law". He has taught international law, law of the sea, and human rights at the University of Tromsø. He has a B.S. in mechanical engineering from Stanford University and is authorised as an attorney by the California State Bar after studies at New College of California and the University of Oslo. He has done research on "International management of pollution problems in connection with oil-related activities in the Barents sea". His publications include "Marine Pollution and International Law: Principles and Practice" (forthcoming, Belhaven Press).

Ottar Brox (1932) is research director at the Norwegian Institute for Urban and Regional Research (NIBR) in Oslo, Norway. He holds a Ph. D. in Rural Sociology from the Agricultural University of Norway. He has formerly been Visiting Associate Professor at the Department of Social Anthropology at the Memorial University Newfoundland (66 -67), Assistant professor of regional science at the University of Bergen (70 - 72), professor of sociology at the University of Tromsø (1972 - 84), research director at the NIBR (1984 - 89) and research director at the Alternative Future Project (1992). Ottar Brox is one of the best known social scientist in Norway in the field of rural sociology. He has been the author of 12 books and over 150 papers in national and international journals. He is an ardent contributor to Norwegian newspapers on a host of issues and has served as an MP in the period 1973 - 1977.

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Land Tenure and Management System of Land and Water in the Inner Delta of Niger (translated from "Tenure Fonciere et Systeme D´Exploitation des Ressources en Terre et en eau dans le Delta Interieur du Niger" presented in Volume I, page 321-334)

ORIGINAL : FRENCH

LANDTENURE AND MANAGEMENT SYSTEM OF LAND AND WATER IN THE INNER DELTA OF NIGER.

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LANDTENURE AND MANAGEMENT SYSTEM OF LAND AND WATER IN THE INNER DELTA OF NIGER

The first behaviour of the first europeen explorers regarding the relationships that the african has with the natural resources namely the land and the water have for long been similar to the one of searchers both africans and africanists and managers and donors. In africa, the land in the worst has been considered for long by many theoricians as free and without any owner and in the best as subject to a collective ownership.

The related management systems are generally explained not as a technique of controlling the land but as a dependency of man to hidden forces (spirits, geius and manes of ancestors) who were the real owners.
Therefore the owner of the land was rightly found and he would serve as an intermediary between the real owners who are invisible and the daily users. Such a position can be seen at the level of the independant states whatever conception they have of a society at the beginning and shows a contempt for the traditional land tenure right and explains why the Sahel French speaking countries apply the Napoleon right.
Because of the failure of development policies based on this contempt, the searchers, states and donors raised questions on the nature of hindrances and other problems encountering the development projects. The land tenure system has been one element of interest and recognized by all. But its real nature and operations in relation with the production systems remain to be understood.

TENURE SYSTEM AND SPACE ORGANIZATION :

The inner Delta of Niger, located between higher and middle Niger (known as boucle of Niger) gets its name from a typical typography : the flat land explains the division of the river into many sections - the name delta- flooding into a vast basin , the reseroirs of the lakes of Debo and Waladou.

It has a network of tributaries (the Bani) and subtributaries (Diaka) flooding big lands (35000 km2) which, thanks to the fall, become rich rangelands invaded by thousands of cattle and sheep. The same lands are good for rice farming, and thousands of farmers, without any apparent order, use big part of these rangelands as rice fields.

Because of agriculture and pastoral value, there is a big occupation of the inner Delta which will help in understanding the nature of the relationships between the tenure and the exploitation systems namely the land and the water.
The space organization depends as well on the parts to be organized (land, water, grass) as on the objective of this organization (production systems). The space organisation is mainly seen through the organization of the exploitation of the land, the water and the space. Combining the two elements and excluding the third factor gives a working tool to social groups.

The pastoral activities are based on the combinaison of water and grass, the farming practices are based on the combinaison of land and water. Water combined to one of this element favours a fishing environment. This explains the importance - relative all the same - of the ecological divisions in the relationships between human beings in the occupation of the space.

At the beginning, this occupation was aimed at satisfying a group need- or an individual need through the group. Time distribution of activities reduces their space superposition to the minimum. This situation leads more to a complementarity between activities than to a conflict.
To maintain such a space organization, one needs not only a low density of population but also monolithical groups where there is no division in the social classes and where the social unequality is reduced. Here we can talk about sovereign right of the community recognized in the use. Such relationships have been seen in the inner Delta of Niger where the land is said to belong to the Bamabara, Marka farmers, the grass to Fulani herders and the water to Bozo fishers . Furtheremore, in such interactions, the capital ratio is low, the labour ratio is average, the backstopping services are weak even absent and are understood as depending on a traditional collective landtenure system.

Such a tenure does not at all mean that the land is vacant or witout any leader. But it simply means that the social interactions developed depend on a subsistence production and do not only use poor means of production but also social and economic organization of equalitarian type. The main aspect of such a system is that not a single family, nor a person can claim the exlusive right of occupation. However this does not mean that there is an anarchical management. There are barriers to limit the use in space and time and the right of use is granted to the member of the community only. Foreigners and visitors are accepted under excectional conditions only for limited durations.

Because of the history of the Sahel and its population outburst (both animal and human) the common sovereign right does not exist or is very limited now in the inner Delta. In fact, the communities are no longer communities. The social hierachization - not only within the social groups (master and slaves, natives and new conners, farmers and fischers) , but also the differentiation witin the same activity (cattle herders and sheep herders) has lead to situations where the land is not only a working tool but is also subject to covetousness.

Therefore the village communities are more and more replaced by family groups a part of which is out of the direct management of the land. The family properties are taken by restricted consanguine groups. The family leader is the only one responsible for the use. These properties, which were one and untransferrable at the beginning, were divided up as the rights of the owner families are broken up. So in the lake area ,the symbolic kolanut fee is remplaced by the principle of sharing the harvest between the land owner and he land user.In the inner Delta, this same symbolic fee has been replaced by the payement of tolo or grass fee. All this comes from the new value acquired by the land. The breaking up of the families to the benefice of individuals emphasizes the competitions on space occupation and leads to heavy concentration on the property. This leads to the development of socio-economic unequalities and the importance of capital and labour. The presence of small scale irrigated plots in the Delta and the drilling of wells are examples.

However some types of community properties do exist in the villages especially as obsolete or decaying remains of space organization. The community grazingfields or harima in the Delta, the transhumance paths and the village water reserves are examples. Even in these cases, " the village community " is the first to bleach the management rules of these spaces by farming in the harima, exploiting the waters and grazing in the reserves ((Boscia senegalensis).

LANDTENURE AND SOCIAL ORGANIZATION

Land tenure can be defined as a network of rules governing the relationships between human beings and their land which will determine relationships between human beings themselves. In this case, even if the land tenure history of a human group is not blended to its history, it is almost an answer to it.

In fact , the relationships between human beings and their land are based on and lead to relationships that the same human beings have between themselves. In a more remoted past, these relationships are based on selling, bying, and using, and for some years now, these relationships are those of domination and wages. In fact, the land has become a motionless place of competition for various human beings in their daily struggle for survival. Because of this first hand possible confusion between the land tenure and social organization, there is a difficulty in eliminating and isolating one of these organization.

However, by analysing and observing the land tenure systems of the inner Delta of Niger, one discovers that its physical space, its hydrological realities and its agro-ecological potentials are nothing but a forum for political struggles and economic stakes between social groups .Henceforth the traditional lineage ownertship was remodeled by including the sacred swords of the Dina. But the inclusion of the muslim right has not completely eliminated the traditional ownership right based on myths and religion. Therefore there is a coexistence of the two regulations articulated around two registers.

* This idea was developped by B.KASSIBO in "the dynamic of fishing in the inner Delta of Niger river (MALI) from the colonial period up to now.
KAWANDA Junzo, I.R.L.C.A.A , Tokyo 1987

The French colonial power brought a series of distorsions especially on the socio-economic and regulation aspects. These distorsions are like blows given to the former order. The post colonial period dominated by the ecological crisis of the seventies and eighties is a decisive landmark in the landtenure dynamics because it questions the coexisting and annihilating former schemes while other logics and cohabitations are appearing. In fact the appropriation of the space through the game of political powers takes out of it any legitimacy because the political powers in the area change both from hands and in their nature.

* Cf.S Cissé in " Space competition and now landtenure cohabitations in 5 th region. The dynamics of leyde in observations of landtenure in Mali, Feb. 1992 .

Therefore the identity of the land changes whenever one moves from one socio-political organization to another. The personality of the land is determinated by the degree of evolution of the production technics and the nature of the socio-political system. The personality which was sacred at the beginning gets gradually humanized and more and more deified. Therefore, one must ask if the relationships that the human beings have with their land do not reflect the political strategy of various social groups.

in fact, the geographical features of the space and the various physical elements of it can partially explain the magnitude of the social movements and the intensity of the productions activities. They do not determine neither their trend nor their socio-political importance. These depend on some strategy elements of the various groups who by controlling the space reduce to dependency those who are eliminated. Therefore, even if a space appropriation is done at the beginning by community groups (lineage, village, family), this follows a system of right access very hierarchycal,a hierarchy reflecting the social order.

The management of the grazingfields of the Delta can be understood in that vein : an acces order established within the same family first, the same village and the same lineage. The order is then reflected at the level of the families, the villages and the lineages. This is true for the village fishing reserves and the traditional grazingfields. Some traditional users lose their access order and privileges even if there are not many cases of exclusivity.

LANDTENURE AND PRODUCTION SYSTEMS

Since the land tenure organization is not limited to the space organization, it is also different from the distribution of the production systems. There is no connexion of cause to effect between a given type of ownership and productions system and the management of the natural resources. The pastoral system that is seen everywhere in the sahel cannot be explained by the presence of a social control of the space, or the looseness or rigor of the relationships between the human beings and their space. The livestock practices of the system namely nomadism, transhumance are applied with success where the relationships between the human beings and their land are governed by precise rules. The legal vacum seen in the oppositioin between two rights - namely the land tenure rule of the malian state and the traditional practices of the social groups - has not been followed by the elimination of the pastoral production systems but instead by an expansion of tranhumance mouvements.

The same is true for the farming production system and the agro-pastoral system that are applied anywhere in the land tenure. In fact, the involvement of the production systems in any landtenure mode shows, if necessary, the absence of a land tenure determinism in the presence of the production systems. However, for their validity, one land tenure system more than anothereone, might favour the durability aspects.

In fact, the production systems have very hard connexions with the space distribution of the various forms of production. The involvement of the production systems on the one hand and their division into sub-systems on the other hand come from these connexions. However, if it is not possible in priori to speak about land tenure determinism in the presence and connection of the production systems , the landtenure plays all the same an important role in their dynamics : the change in the land tenure system of the Delta rangelands or the village water reserves comes from the present progress seen in the pastoral and fishing systems. The land tenure determines - maybe comes from - the behaviour of the social groups regarding the production activities.

Therefore, behind the apparent space organisation through a temporary occupation of a piece of land (water, land,grass) by a specific group (farmers, fishers, cattlebreeders) there is a land tenure organization which goes beyond the social control of the land, the grass or the water by a specific group but through some functions : a leader for the lands or doutigi in bambara, leaders for the rangelands or Jowro for the Fulani, leaders for the waters or ji-tu for Bozo.

In fact, even if the sytem was operating, the various management sytems of the space found their origin in the relationships that human beings had between themselves in connexion with the object which is the space and not the contrary. The obsolete nature of the production techniques and the weak social differenciations put the space organisation and the land tenure on the same level and gives the illusion that they make one. In fact, even at that period, the two systems-namely land tenure and space organization - were governed by a series of rules which did not reconcile all the time; whereas land tenure rules govern the relationships between human beings and land - namely human groups and their statut-the space organization is based on the distribution in space and time of the production activities.

There may be a type of confusion between the space organisation of the production and the land tenure systems. This organisation is understood as a distribution of social roles in order to satisfy the material needs of the group.Then the social group has a reproducion function and is therefore a foundation in the production systems.It is a foundation but neither a geographical nor ecological determinism . Determinism , be it geographical or ecological , cannot be applied for example in the case of the rangelands of the inner Delta, nor explain the dependency of human groups, who, up to then ,have maintained priviliegious relationships with the land by otherinvaders or visitors, nor in the numerical extension in assimilating other people and groups by some nomadic herders.

CONCLUSION

land tenure as understood above , was mainly types of relationships between human beings generally considered as a group and what can be found on the land namely water, grass and crops. In that vein, land tenure means first of all relationships of usus and fructus which might explain hard connexions with the production systems the objective of which is made of various components namely water, grass, soil.

However the example of the inner Delta of Niger shows rightly that human beings /human beings relationships are added to those of human beings /land which lose their privileges and their sacred aspects. This raises the issue of the right not only on the other groups but on the land as well.

However, there was an initiation of a modern right on "the common " lands of the Delta and the present practices comply with such a position : what is meant here is that there is no position at the user level between the traditional land tenure practices and the modern regulation, nor between various land tenure logics. The logic is one and means a strong hold on a known piece of land for a direct or indirect management. Wherever the position is, the management means are similar and taken from the "active" elements of the traditional practices by the modern users or the adoption of the main principles of the modernregulation in the traditional practices.

Therefore regulation has maintained and re-used whatever can reinforce the traditional practices. The holders of the modern regulation do not disdain the vacum , weakness or even favors of the traditional regulation before using texts and laws into force as barriers.

SAAMI PASTORAL SOCIETY 1990: THE NATIONAL INTEGRATION OF AN INDIGENOUS MANAGEMENT SYSTEM.

by

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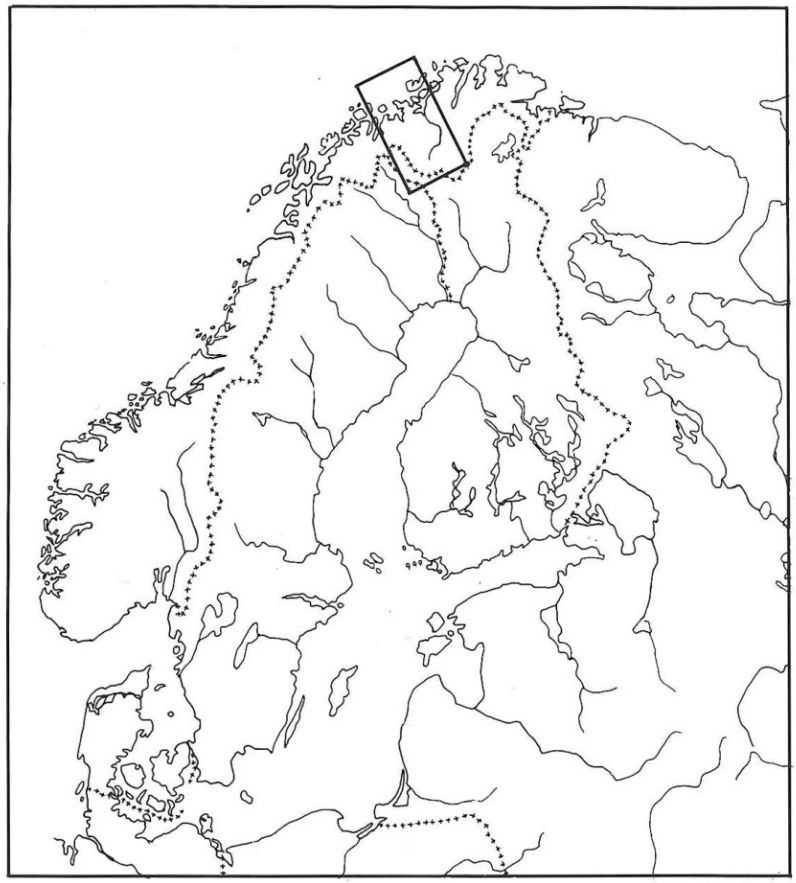


Introduction

In 1992 the Norwegian government delivered a report to the Parliament, where it was concluded that "- the law (regarding reindeer husbandry) has not worked according to its intentions. (It) has not been able to secure a balanced resource management and a viable adaption"[1].

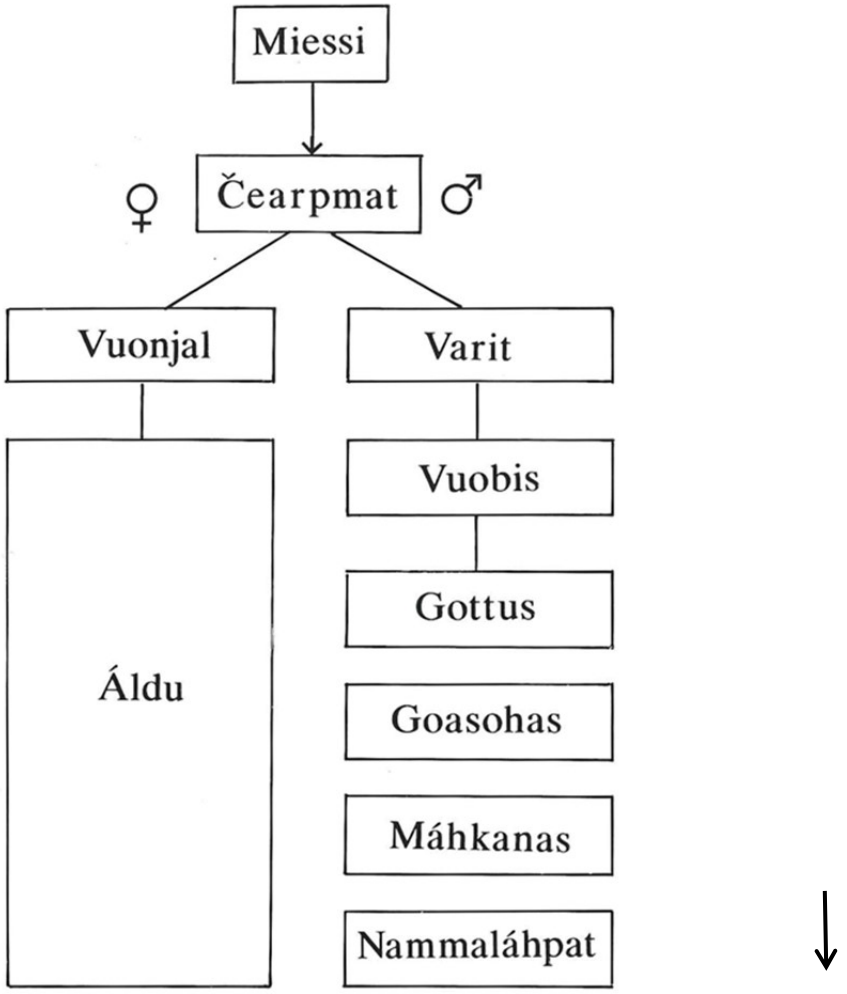
Now, these are rather harsh words being a governmental report and certainly beg for some questions. In the following I will therefore take a closer look on *why* this policy has gone

[1] St. meld. nr. 28 (1991-92) "En bærekraftig reindrift", p.67.

wrong and ask what are the consequences of this failure? The answers might shed some light on the viability of indigenous management systems in ecological terms and the consequences of the economic and political integration of such systems into the national state.

Saami reindeer herding has seen quite a few changes through the centuries, but some ecologic basics are still there. In management terms, these are reflected through concepts like *mobility and flexibility.* The general descriptions of reindeer herding tells us for instance that in the county of Finnmark more than 150.000 reindeer are moving twice a year between winter- and summer areas. It is thus rather obvious that reindeer herding has a lot to do with variation in terms of pasture.

Figure 1

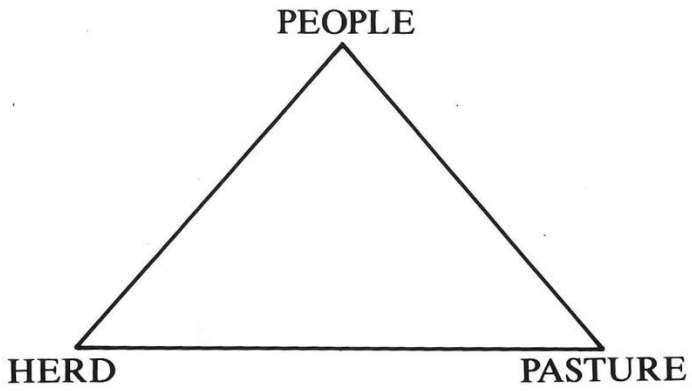


But we also have to remember that it is a question of variation in terms of animals. As figure 1 tells us, there are quite a few categories of animals in a herd. Now, different kinds of animals need different kind of pasture throughout the year. To obtain this, one has to move the animals according to the different grazing conditions. The pastoral task is to obtain the optimal relation in time and space between pasture and animal (Bjørklund 1990). This has of course, been the everlasting problem as long as pastoral adaptions has existed.

In the Saami pastoral society every animal is owned individually. The animal belongs to a boy, girl or a grown up person who cuts his or her mark in the ear of the animal. These earmarks are actually important cultural devices, which tell stories about social relations among the owners. One consequence of the individual ownership is that one must always move the herd in such a way that one takes care of the interests of both animals and the owner.
Now, this quest for mediating the relation between pasture, animals and their owners has to be organized in certain ways. It is this organization we could call an indigenous system of resource management. In the following, I will give a short outline of how this system has been based upon pastoral knowledge and organized through a Saami cultural institution called the siida.

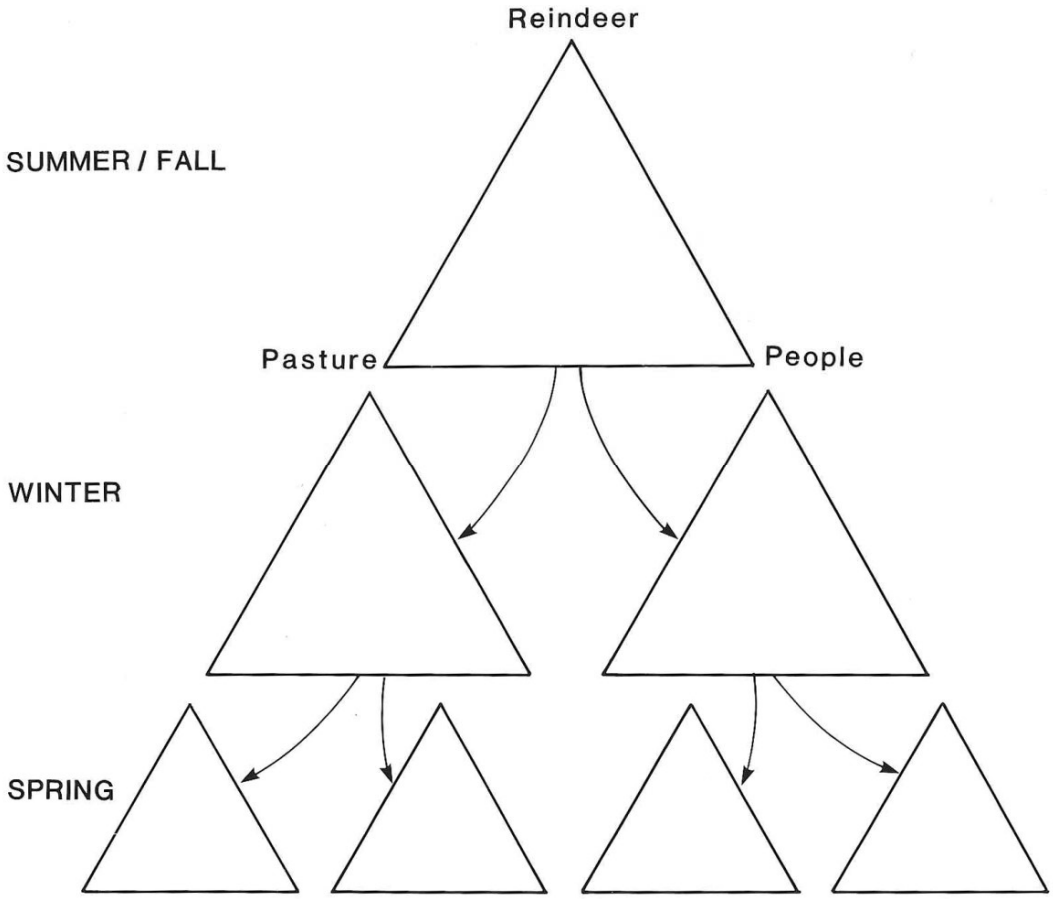
This is a form of co-operation between reindeer-owners organized through kith relations (Blehr 1964), the sibling group being the most important (Pehrsson 1957, Paine 1970). The term refers to a group of reindeer-owners who live and migrate together and to the herd of reindeer owned and herded by them. Because of the varying grazing conditions through the year, the demand for herding tasks and labor will also vary. Consequently, the siida changes size and composition through the year, as the pastoralists divide and regroup their herds. This institution thus represents a flexible co-operation unit between people and animals. By dividing and combining the herds and the personnel throughout the year, one tries to obtain the optimum relation between animals, pasture and labor (Figure 2).

Figure 2



For instance, the available pastures in a given calving area might not be enough for the number of animals who were together in the wintertime. So the reasonable thing to do is to split the winter herd into smaller herds, each moving into different calving (and maybe summer) pastures. As the herds differ in size through the year according to the various grazing conditions, so also do the demand for herding tasks, knowledge and labor. Thus, the management unit - the siida -changes size and composition through the year, as the herders are dividing and regrouping their herds (Figure 3). Their strategy is never to be in a position where the size and composition of the herd is not in proportion with the available labor and pasture. If such a situation is approaching, individual herders will try to withdraw their animals from the common herd and join other herding units -according to kinship relations and available pasture.

Figure 3



Today, this management system is no longer operating in its traditional terms.
The political and economic integration of this Saami resource regime into the Norwegian national state has been going on for 15 years. These integrational efforts have taken place along three dimensions:

1) The ideology of the Welfare State which prescripts a levelling of income and economic welfare for all. The state is supposed to be the caretaker of the interests of any member of society and the basic political goal is to provide these members with a fairly equal amount of social and economic welfare. This is done through a rather complex system of laws, regulations and political negotiations. As for the pastoral Saami, before the 1980`s they were more and less outside the corporate channels of the state and this situation constituted itself a problem for the national authorities. In addition, all statistics would tell that the income of the pastoral Saami in monetary terms was way below the national average. Furthermore, their wealth in terms of animals seemed to be rather unevenly distributed.

2) Conflicts regarding the use of land came apparent throughout the 1970`s. A growing number of land-use conflicts appeared in the reindeer herding areas because of the building of new roads, hydroelectric dams and military installations. This development led to strong

protests from the reindeer pastoralists and some of the cases were taken to court. This development culminated in the dramatic case of the Alta-Guovdageaidnu hydroelectric project around 1980.

3) At the same time, new technological innovations were introduced into the reindeer herding society. Snow scooters, and later on, motorbikes, and fourwheel drivers made new herding techniques more efficient, but also generated a growing need for money. Governmental housing programs and a fast growing supply of consumer goods only contributed to an expanding cash economy.

All these processes led to a situation where it was considered political important "to do something" about reindeer herding. In governmental language, this meant turning it into a national economic sector with specific aims and rules regarding concepts like modernization and rationalization. Because of the growing number of animals in the end of the 1970's, many Norwegians looked upon reindeer herding as a living proof of the tragedy of the commons and argued for governmental interference. Other - among them quite a few Saami - thought of it as a source of income, which could be made considerably more profitable through governmental intervention and control.

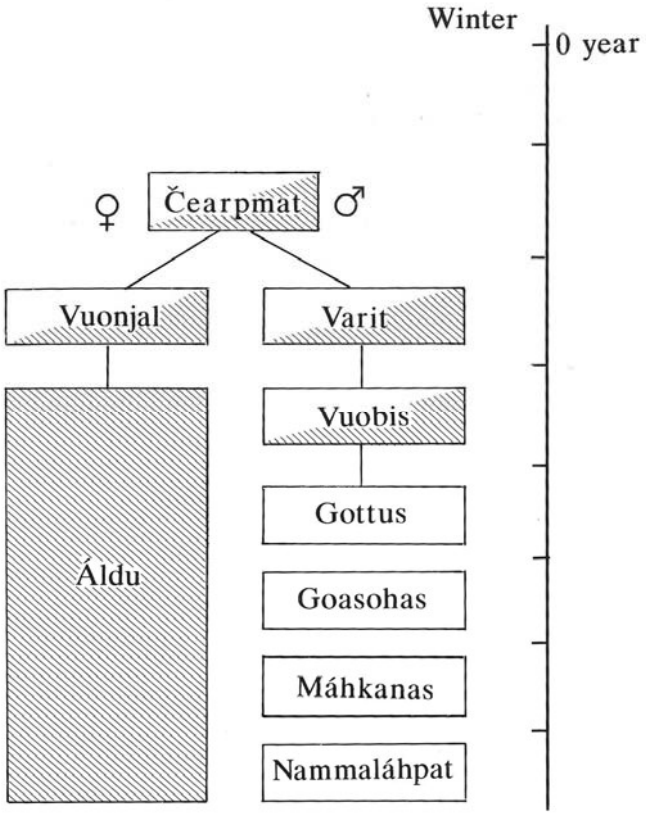
This development led to a special economic agreement in 1976 affecting all reindeer herders and a new law on reindeer herding two years later. The main intention behind the law and the regulations specified in the agreement was in national economic terms to transform the pastoralists into meat producers and thereby generate economic growth in the sector of reindeer herding. This was to be done by 1) reducing the number of animals and 2) regulating the herding activities. The rationale of the agro-economists was that fewer animals inevitably led to bigger animals and with the help of more efficient forms of herding, the production of meat would expand (Government of Norway 1985). The practical consequences of this policy was the introduction of an upper limit regarding the number of animals allowed in each district and an extensive set of regulations to rationalize and modernize the herding.

From then on reindeer pastoralism has been a management system in transition. This transition has to do with the fact that Norwegian political institutions are now taking control of the pastoral factors of production (Figure 1) - a control, which earlier, as I will show, was exercised through Saami cultural institutions. It is this process of integration which is going on today and which is generating a lot of political and social turbulence. In the following, I shall examine more closely the steps and substance of this integration, to see if there is something to be learned from the fate of this indigenous resource management system.

1) **The herd.** My concern here will be how the governmental interference grabs right into the size and composition of the herd. In order to get the governmental subsidies, everybody has to slaughter a certain percentage of his or her herd. For those who slaughter calves - which is an idea strange to pastoral values - there is an extra bonus. The government thus interferes directly with husbandry decisions (Paine 1964), regulating which animals to slaughter and which to let live. The ability to make this kind of decision was always considered the proof of being a reindeer owner of your own. Basically, this is what pastoralism is all about: To be in control of the lifecycle of the animal.

The fact that the size and composition of the herd are now regulated by governmental economists has had serious consequences for the maintenance of pastoral knowledge. As one can see from Fig.4, the number of animal categories has today been drastically reduced. The system of subsidies has made it profitable to have only 2-3 categories in the herd. Also, the mechanization has eliminated the need for draft animals. According to the governmental scheme, the ideal winter herd today consists of no calves and very few bulls.

Figure 4
Existing categories of animals versus categories to be found in the herd of today, here shaded (cp. Figure 1.)



This situation, of course, makes the herders much less flexible when it comes to manipulating the herd. For instance, the greater proportion of bulls in a herd, the easier it is to separate the herd in two parts according to gender and manage the herds in different ways and direction if for instance pasture conditions should make this necessary.

From fig. 4 we can also tell that the "modernization" of the herds inevitable has a cultural dimension too. It has greatly reduced the vocabulary - and thus the traditional knowledge - used by the herders when they speak about the animals.

2) **Pasture.** One of the most obvious consequences of the integration of Saami reindeer pastoralism has been the rapid growth in the number of animals. For statistical reasons it is very difficult - not to say impossible - to estimate the number of reindeer in Finnmark through time. Reasonable correct numbers are only available for the last ten years or so. But it seems justified to state that the number of animals has varied in cyclical trends throughout the last century (Bjørklund 1988).

However, it has now been documented how the relatively strong growth in the last 15 years is a direct consequence of the subsidizing policy (Sara 1990). Subsidies have reduced the need for slaughter, because the pastoralists are reacting according to the kind of rationality described by Chayanov more than seventy years ago among Russian peasants: Production decreases as cash income increases (Grønhaug 1976).

The political debate in Finnmark today, focuses solely upon the number of reindeer. But a growing number of animals also generate a growing number of herds, because of management necessities and cultural practices. It is in the number of herds, we find the explanation behind the pastoral turbulence of today. Because herds, as mentioned earlier, are separated according to seasonal conditions and labor demand, more herds have practical, social, and ecological consequences.

First of all the growth increased the possibility for random mixing of animals, which then had to be separated again. The increasing amount of herd separations did generate social conflicts, since such operations inevitable involved questions regarding ownership and responsibility. And furthermore: the ever repeated separations had serious effects on pasture conditions. A separation today involves a lot of motorized activity - the animals are herded together by the use of motorbikes and/or snow scooters and rushed into large corrals. When this takes place at a time of the year when the ground is not covered by snow, the results are destruction of lichen pasture. Being dry in the summertime, lichen is extremely vulnerable to any kind of wear - be it from motorbikes or reindeer hooves.

To reduce the problem of mixing the herds, long fences have been built all over the tundra. Now, these fences have impact upon Saami management practices, because such installations are not only separating herds on a permanent base. They are also permanently separating pastoral areas, making it impossible - or a criminal offence - to use pasture not assigned to you through the legal system of the state. This situation is reinforced through official regulations stipulating *when* your herd can enter and leave a given area. On the top of this development come the ever on-going kinds of land encroachments. Tourism, roads, powerlines etc. do not only reduce available pasture, but have a tendency to close off areas which are of strategic importance in the pastoral herding strategy.

The growing numbers of animals and herds have together with the reduction of available pasture, strongly reduced the most important asset of the pastoralists, namely flexibility. It is now becoming more and more difficult to cope with variations in climate or pasture conditions. Traditionally, the reindeer pastoralists were able to mediate the carrying capacity in a given area. It is very important to bear in mind that in our context the concept of carrying capacity is not a fixed size, as many biologists would argue. On the contrary, it is something which - within given biological limits - can be manipulated through management practices and herd composition. The carrying capacity of any area is something you evaluate and then mediate if necessary.

Figure 5

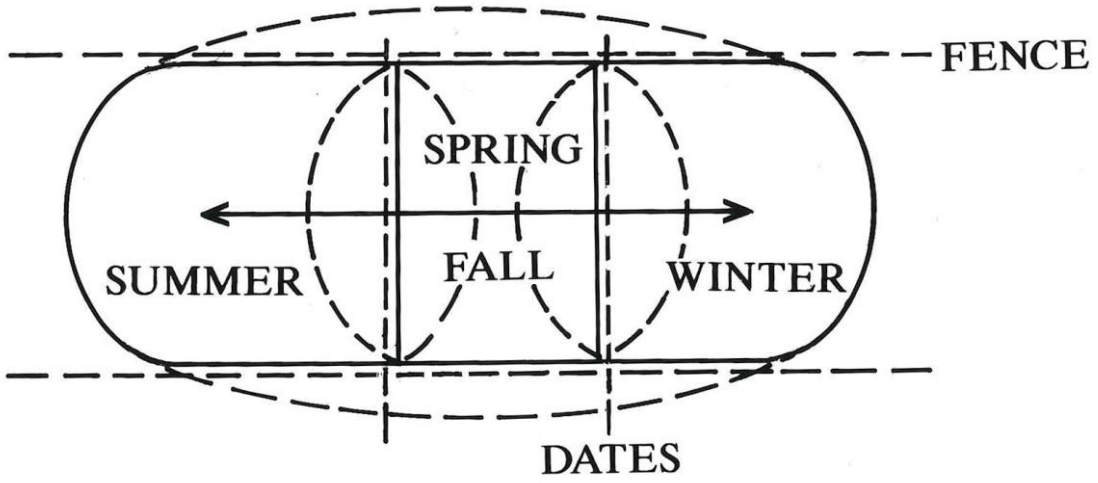


Figure 5 gives an idea of these dynamics. If for instance pasture is becoming too scarce in the summer area because herds are expanding, the answer from the herders might be to leave the area early and keep the animals longer on autumn and winter pasture. Or if the conditions in the autumn become very difficult due to climatic fluctuations one year, one solution might be to move the herd through a neighboring area, especially if it is temporarily vacant. This kind of flexibility has characterized Saami reindeer herding as long as it has existed, but is today becoming more and more problematic. Fences, pasture regulations and a growing number of herds and animals have strongly reduced the possibility of such strategies.

3) **Personell.** Today, the working units are facing problems regarding the management of both knowledge and labor. The law of 1978 introduced an official permit ("driftsenhet") for the right to be a reindeer owner. Most Saami at the time thought of this as rather irrelevant. In their view, there were quite other - and more realistic - circumstances, which decided who could qualify as a herder; like capability, talent and kinship relations. But those who happened to apply received a permit. The rest did not. And from the middle of the 1980`s, no more new permits were given out because the Department of Agriculture thought it necessary to reduce recruitment. From now on herding permits could only be obtained by succession within the family.

According to the letter of the law, the recruitment of herding units was now under control of Norwegian political institutions. Traditionally, Saami cultural arrangements had taken care of the recruitment. Animals were allocated to children at certain ritual occasions. When one received a reindeer for the first time, one also received an earmark and was thus de facto a reindeer owner. This happened both when a child was baptized and confirmed. Along with the gift, also came the responsibility of being a reindeer owner. Children learned how to take care of their animals and were thus socialized into the world of reindeer pastoralism. When the time came to marry, both spouses were in the possession of knowledge and enough animals which - together with the animals given to them as wedding gifts - made it possible to establish themselves as a new herding unit.

The facts that recruitment today depends upon legal rules and political circumstances in the Norwegian society, have profound consequences for the pastoral management of both knowledge and labor. As for knowledge, the traditional way of recruitment meant that without knowledge and skills one could not establish oneself as a reindeer owner. But within the administrative system of today, there is not necessarily a connection between knowledge and recruitment. It is not skills and knowledge which decides who get a permit, but quite other circumstances like political decisions and rules of inheritance within the Norwegian society. It has always been a basic pastoral value that all children should be able to try out their interest as herders. But it was also very well accepted that not all had the abilities to succeed. Today it is not only one's competence, but rather an official permit, which makes a person able to succeed in economic terms.

Concerning the consequences for labor, the siidas are facing a loss of flexibility and new sources of conflict. The herders are now turned into A- and B-teams, so to speak. Because of the subsidies, which followed from the economic agreement, the herding permit has become a valuable asset in monetary terms. Only those with a permit get an annual cheque from the government, those without get nothing. Understandably, this situation creates conflicts within the working units - the siida - because all members more or less do the same kind of work.

The loss of flexibility goes on both within and between the working units. If a person does not have a permit, but work as a herder - as quite a few people are - then this person is quite dependent upon somebody in the siida who has a
2 permit. In legal terms, he is the caretaker of your animals.
This situation makes it very difficult to leave the siida and turn to someone else, legally one is stuck with the permit-holder whether one likes it or not. Thus, the composition of the siida becomes more or less fixed regarding membership.

But also the relations between the siidas have become less flexible. According to the administrative infrastructure, the summer pastures are formally divided into "Herding Districts" (Reinbeitedistrikter). The winter pastures are still organized and used according to Saami customary law and traditional rules. Within each "summer district", one might find up to six or seven siidas who are different working units in the winter time. Now, these siidas have to cooperate within the "summer district", but the borders between the districts do not always reflect common interests among its members. Some siidas might have overlapping management strategies, which represents potential conflicts because the district has to act as one entity in all matter concerning common pastoral affairs.

It is for instance membership in this "summer district", which defines how much one must slaughter in order to fulfill the regulations. The district has a collective responsibility to make sure that everybody slaughter the amount specified in the economic agreement with the state. If one person slaughters less, the district might not be able to fulfill its quota and subsequently no subsidies will be paid to the district as such. If one bears in mind how much individual decisions are valued in this society - especially when it comes to reindeer husbandry - one can easily imagine the dilemmas coming out of this enforced collective responsibility.

A concluding remark to this essay, could very well be the governmental statement cited in the beginning, namely that all the efforts to integrate Saami reindeer herding into the Norwegian Welfare State has been a failure. The strategy of the herders has been to use any available means to remain in their pastoral adaption. During these efforts, the character of their management has changed.

Because access to pasture has become less flexible and the opportunity for traditional cooperation is reduced, the control over individual animals has now become less critical. Much more important is the control over the herds as such. Thus, the animals do not have to be so tame anymore. The herders have therefore developed management forms where they only exercise control over individual animals when it is necessary. These occasions are when you earmark the calves, separate the herds, and select animals for slaughter.

[2] Only 13 % of the permits in the county of Finnmark are issued to women (1994).

It is in this context the extensive use of technical equipment must be understood. It is the necessity for keeping control of the herds that motivate the herders to invest maybe half of their income in expensive technology like snow scooters, motorbikes, mobile nylon fences etc. It is this equipment -not to say its use - which today constitutes the Norwegian image of what Saami reindeer herding is all about.

It goes without saying that this development also implies a loss of knowledge related to the single animals and their habitus. The critical knowledge these days concerns herd management and the use of modern technology, not behavioral or biological characteristics among individual animals. The ongoing reduction of animal categories as presented in figure 4 is a reflection of this development.

In other words, the way the Saami pastoralists adapt to the policy of integration is by accepting what could be used in their pastoral adaption and ejecting the rest of the policy and its devices. It is these strategies which over time have created destructive traits - not only ecologically, but also in social terms. As demonstrated by the breakdown of the traditional working unit - the siida - this development has both an ecological and a social dimension. Most herders will find themselves in a double-bind situation: Any herder, who wants to act according to customary knowledge and law, will likely be punished one way or the other.

He will either become a criminal legally speaking, because laws and regulations might exclude established and well-proven forms of management. Or he might be punished economically because the policy of subsidies only pay off for the ones who manage their herds the way the state want them to - and that is a way contrary to most Saami values and customs. Processes like these put people between the hammer and the nail - or even put some into the courtrooms or the social-security system of the state.

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LAW AND RESOURCE USAGE SYSTEMS[1]

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Introduction

«Rule-of-law» is a basic instrument for societies in overcoming the problems of collective action. The «Hardinian Tragedy of the Commons» in resource exploitation is basically a problem of collective action. Only in situations with no law, with «res nullius», as e.g. fish in international seas is considered to be, have situations approximating the «tragedy of the commons» been observed. A situation with no law can occur because there was none before as for the ocean fisheries, or because of breakdown of the social order. But everywhere, also on the high seas, one can observe a movement to create law to counter the problems created by the divergence of individual and collective reason.

The system of law developed in the West since the middle ages has, according to Berman (1983), three basic sources: the will of the ruling class (the lawmaker), the moral standards as understood by human reason, and the historically rooted values and norms of the community[2]. For the study of the relations between law and the statuses of renewable resources (biodiversity, biomass, productivity, recreational value, etc.) this means that we need to conceptualize three broad phenomena: the power relations of the political system, the ideas of justice of the people affected by the legal regulations, and the historical trajectories of the political and social systems (including their institutions) in relation to the resources. These systems interact among themselves and with the ecosystem. As systems they affect the ecosystem by resource extraction and other uses, and actors within and on behalf of the systems react to salient characteristics of the resources.

In the studies presented above, we have primarily attempted to describe the legal systems regulating resource usage in northern Fenno-Scandia and the Barents Sea. «Ius in re» is among the oldest and most stable parts of legal systems. The principles lied down there have affected all later legislation, also modern resource law. To really understand the legal systems regulating resource usage as human creations and forces of development, we need to put them in the broad historical and societal perspective of Berman. This has not

[1] Thanks to Audun Sandberg, Torgeir Austenå and Hans Sevatdal for constructive comments. I hope they will forgive me if I have added new errors or questionable reasoning to what they corrected.

[2] «Social theory must therefore accept a broader concept of law than that which Marx and Weber adopted. Law is, as they believed, an instrument of domination, a means of effectuating the will of the lawmaker. But this theory of law, usually identified with the positivist school of jurisprudence, tells only part of the story. Law is also an expression of moral standards as understood by human reason. This view of law, which is associated with natural-law theory, is also partly true. Finally, law is an outgrowth of custom, a product of the historically rooted values and norms of the community. This third view , identified with the historical school of legal philosophy, can also claim - like each of the other two schools - one third of the truth.» (Berman 1983:556)

been the objective for the present studies. But in thinking further on the problems of resource governance, we need to keep it in mind.

To pursue a discussion of the critical link from form and substance of legal institutions to the various relevant statuses of resources and resource systems, we must take for granted the embeddedness of resource law in this broad tradition of legal development.

Ways of describing resource usage systems

A resource usage system can, like any system, be described as embedded in an environment and as consisting of sub-systems or member units. The environment sets a context and the subsystems give conditions for the characteristics of the system.

The studies presented in this book have described resource usage both by contextual and conditional characteristics. But the main perspective has been the contextual: the international negotiations shaping the fisheries regimes, the international and national legislation shaping the rights and duties of the reindeer herders. In the long-term project of understanding how resource governance works, they are a first step. The next step might be to investigate closer both theoretically and empirically the various types of data for each level.

A resource usage system can also be conceptualized either as an actor system or as a non-actor system. The international system of states is a non-actor system. A non-actor system is an arena where several actors engage in struggles or co-operative ventures concerning the values perceived as resting in the various resources of the eco-system. But no single actor can be said to be a «system-responsible» actor, representing the various constituent actors as a collective. In many ways, the causal dynamics of non-actor systems can be compared to the dynamics of eco-systems[3], and in most respects, they will be radically different from those of actor systems.

Considered as an actor system a resource usage system must in some sense have incorporated itself. One of the actors with interests in the eco-system, or some new body, has taken on the task of representing the collective interests of the appropriators in governing the usage of various resources of the eco-system. The creation of effective legal regimes is tied to the development of actor systems. To be effective a «system responsible» actor must be acknowledged both by a majority of the appropriators and in some way by the external community. The problems of efficiency increase as the scale and scope of the system increase.

In modern states where rule-of-law governs resource management, the external acknowledgment of the legal powers of resource appropriators is done in acts defining the system of governance for the various types of resources. The

[3] The origin of social ecological studies was analogies to ecological processes in biology as understood in the 1920´s («the Chicago School»).

success of these actor systems in their tasks depends on the one hand on the political and economic environment as well as the local struggles among the appropriators, and, on the other hand, on the qualities of the eco-system and its responses to usage.

In describing the resource usage system, we should keep in mind the various ways social and natural contexts and internal conditions shape activities and outcomes for the various units.

To explore the possibilities we shall look closer at property rights to resources in Norwegian resource usage systems.

State property or common property?

The broad distinctions of common property, state property, and private property have been seen to affect, at least to some extent, the way resources have been used. But in looking at major renewable resources like salt water fish (except anadrome species), reindeer pasture or forests in state or bygd[4] commons, the correlation between «type of property» and sustainability of use is far from high. A study of the law of salt-water fisheries compared to the legislation on forest commons or reindeer herding in Norway, show that fish, pastures or forests are not necessarily just one type of property, but a mixture (see appendix tables for details). The state is a central actor in all three examples. The fish is in a state of transition from being an open access resource to something, which today closely resembles state property. The forests in state commons is partly state property, partly commons, while forests in bygd commons are partly private property, partly commons. The resources needed for reindeer herding is not state property, not open access, not private property and not commons (as defined by Norwegian law), but have aspects of all. Most observers will concur that the sustainability of the usage of forests seems better than that of the reindeer herding which again would seem to fare better than the fish stocks. But if, and to what extent, this can be attributed to differences in legal institutions is still a matter of belief.

[4] «Bygd» is a Norwegian word which in the context of commons doesn't translate well to English. Sevatdal (1985) translates «bygd» commons as «parish common lands». But it has in connection with commons nothing to do with parish as usually understood. The concept «bygd» has been used in legal texts at least since Magnus Lagabøter's (1238-80) «Landslov» («law of the realm» from 1274 (see also page 61-66 in Solnørdal (1958)). The original meaning of «bygd» is something like «local community». And in most contexts village or local community will be the correct translation. Current usage of the word would suggest some kind of local community independent of more formally defined units such as school districts, parishes, or municipalities. Earlier in our history, bygd would be used for the smallest administrative unit, the local law district, and later the parish. In Sweden, the word would mean the same. However, in conjunction with commons this translation will not give the right associations. Because the areas burdened with rights of common throughout our history usually were tied to users from some specific local community (the bygd), the bygd became tied to a certain area recognized as «their» commons. During the past 800 years the original usage of the word «bygd» in the legal language has turned around, and today the bygd, in relation to commons, is defined as comprising of those farm enterprises which have rights of common in the area recognized in law as a «commons» (both state and bygd commons). This way of delimiting the units with rights of common has been in the law since 1687. Since translation of «bygd» to English in this case is seen as inadequate, the word "bygd" will be used.

State property is in general defined as being «owned by the citizens of a political unit who assign rule making authority to a public agency» (Hanna, Folke, and Mäler 1995 p.18).

This definition is the basis for saying that salt-water fish closely resembles state property. The Royal Ministry of Fisheries is mandated by the parliament as a rule making body responsible for the maintenance of the resource. Anybody owning an appropriately registered vessel can fish, provided the rules are followed. Yet the legal text does not either explicitly or implicitly treat the state as an «owner» in the ordinary meaning. One reason could be that not too long ago, say prior to 1917, salt water fisheries were more like an open access resource also within Norwegian waters, even if parts of it, such as the Lofoten fisheries, have state regulations (codification of customary law) going back to medieval times, and some of the coastal fishing was managed as local commons until late last century. But the increasing number of regulations is rapidly changing the nature of fishing and the direction seems to be state property.

The property rights regime called commons is usually defined as "owned by an identified group of people, which has the right to exclude non-owners and the duty to maintain the property through constraints placed on use"(Hanna, Folke, and Mäler 1995, p.18) This definition lumps all kinds of co-ownership together. Alone it is insufficient to differentiate among various resource usage systems.

The same authors further note that "Such regimes are often implemented for common pool resources, those which are difficult to divide or bound." (Hanna, Folke, and Mäler 1995, p.18). Applying this to forests we note that forests are not difficult to divide or bound in general, neither are the most important resources within forests to which rights of common[5] are defined: timber/ fuel wood, and pasture. Salt-water fish, however, is difficult to bound (but not to divide). But salt-water fish is not managed as commons. Thus the reasons for the long history of common property in forest resources and their diversity can hardly be found in technical resource characteristics. The specific historical instances of "commons" are more various than either the definition allows or the analytical distinctions of various user situations presume.

A first conclusion must be that the broad, established categories of property: common, state and private property, do not really help in closer investigations of the interrelations of law and resource systems. If we want to know exactly which aspects of the law will further a sustainable usage of the resources, more details on the legal regulations as well as on the biological statuses of the various resources in their ecosystems are needed. But which legal details do we need? What are the relevant biological characteristics of a resource system? How can we go about determining which legal institution makes what difference for the various statuses of a renewable resource?

[5] For explanations of some technical terms see Berge and Sevatdal page 195 in volume 2

Table 1 Variables used by the legal system in definitions of property rights regimes

VARIABLE	CATEGORIES	RELEVANT RESOURCE USAGE SYSTEM
Type of management unit responsible for resource system	1) actor system 2) state bureaucracy 3) municipality 4) co-managed	1) bygd commons, forest in state commons 2) reindeer herding, salt water fisheries 3) state commons except forest 4) forests in state commons, 14 special districts of salt water fisheries
Appropriator units	1) legal person (citizen, firm) 2) cadastral unit (farm, fishing vessel, herding unit) 3) registered person (individual according to registered residence)	1) state commons, salt water fisheries 2) bygd/ state commons, salt water fisheries, reindeer herding 3) bygd/ state commons, reindeer herding
Powers of local choice	1) yes 2) no	1) bygd commons, state commons, 1pecial districts of salt water fisheries 2) reindeer herding, salt water fisheries
Professional administration	1) required of actor 2) supplied by state bureaucracy 3) both 1) and 2)	1) bygd commons, 2) reindeer herding, salt water fisheries 3) state commons
Basic resource classes	1) ground and remainder 2) pasture, timber, fuel wood, 3) hunting of small game (except beaver) 4) hunting of big game 5) anadrome species 6) fresh water fish except anadrome species 7) salt water fish except anadrome species	1) bygd/ state commons 2) bygd/ state commons, reindeer herding 3) bygd/ state commons, reindeer herding 4) bygd/ state commons 5) bygd commons 6) bygd/ state commons 7) salt water fisheries
Rights of common	1) rights of common 2) no rights of common	1) bygd/ state commons, reindeer herding 2) salt water fisheries
Economic activity	1) collective required 2) individual or collective by choice	1) bygd commons, forest in state commons 2) reindeer herding, salt water fisheries
Form of ownership of resource	1) fee simple 2) in common, fractional interest 3) joint, equal interest	Varies by resource class and resource usage system
Alienability	1) inalienable 2) alienable	Resources are in general inalienable from appropriator units, but appropriator units are alienable
Quantity regulation	Varies by resource class and resource usage system	
Technology for harvesting	Varies by resource class and resource usage system	

What are the relevant variables differentiating resource usage systems?
A preliminary investigation of the kind of variation one can find in legal instruments will be helpful. A closer study of the Norwegian acts for salt water fisheries (except anadromous species), reindeer herding, and bygd and state commons in forest areas looking for the kind of distinctions the lawmakers have found necessary to introduce, might alert us to important variables. Variables listed in table 1 are used fairly often (See also appendix tables).

The survey reveals several interesting aspects, and not all of them will be apparent from the tables.

- General rules for resource management seems to be absent from the legal framework. Some of the recent legislation such as the Act on nature protection from 1970 or the Act on anadrome species and fresh water fish from 1992 contains statements of goals to manage resource to preserve diversity and productivity of nature. But the rules of how to do this are rather specific and their relation to the goal far from obvious. In regulating the use of various resources, the character of the various resources and the technology of utilizing them combine to present unique problems for the regulator. The result is resource specific regimes of regulation. The level of resource specific details varies enormously. Distinctions used in acts for resource usage systems on land are less detailed than on sea. On land such distinctions as that between timber and fuel wood, or between small game except beaver and big game are used. The act on salt-water fisheries contains much more detail. Here we find regulations for single species (e.g. seaweed, shellfish, whale, seal, lobster, crab, crayfish, shrimp, herring, cod, haddock, halibut, mackerel, angler, coalfish, capelin, ling, rosefish, and sea scorpion). One reason for the difference between sea and land might be the growth in public regulations of nature and land usage in other parts of the law (e.g. Act on Nature Protection of 19th June 1970) not applicable at sea.
- The act on reindeer herding states explicitly that the goal is to secure the well-being of reindeer herders and the status of reindeer herding as an important aspect of Saami culture. The acts on salt-water fisheries and on forests commons do not say anything explicitly about the goal of the lawmaker. But implicitly the purpose obviously is to secure sustainable conditions for an industry. Resources are regulated to create the best possible returns to the industry with one major limitation. Fair access to a resource is more important than maximizing returns for the industry. The major conflict lines in the salt-water fisheries are obviously about access.

It seems fair to say the legislation tries to pursue the following, not always or completely compatible, goals

- equity
- economic performance
- ecological maintenance

and usually also in this order in case of conflict.

The lawmaker will always have goals for acts enacted. Judging from the first known written law (from the 12th century), the major concern for rules about resources was equity and the procedural implications of that. Later on, from about the 18th century, concern about limiting the removal of timber was read into the law. The 19th century brought concern about economic performance. In addition, in our own century a concern about the sustainability of wild game populations was introduced.

Legal history of resource usage

The history of law is sometimes instructive. For forest commons, the history goes back at least to the 11th century. The reindeer herding legislation is younger, but still the «The Lapp Codicill» of 1751, regulating the movements of Saami between Norway and Sweden, is part of the legal framework. The legislation on salt-water fisheries can in principle trace its roots as far back as the forest commons. But there is a disruption of legal traditions starting early last century. Ideologically motivated liberalism enforced at least a partial break with the «local commons» management, which until then had had increasing recognition and protection[6]. Later, in the 1890'ies, some aspects of local commons management were reintroduced in a few special districts with local powers for regulation of technology and coordination of appropriation (on the Lofoten district, see Jentoft 1989). The break with tradition was probably part of a general trend. In 1848, the Norwegian parliament allowed selling out the forest commons as a response to problems of sustainable usage. But in forestry the reversal came already in 1863 (more on this below). The development of technology in the coastal fishery was significant but not large between 1830 and 1890. From then it was picking up speed. Coordination of activities became necessary. These developments made some involvement from the fishers themselves necessary and facilitated the reintroduction of local management powers. But it never developed further, in our century the rapidly growing faith in the ability of the state to regulate the activities of its citizens have been the foundation of the legislation on salt water fisheries (on the political status of co-management see Baland and Platteau 1996, ch 13).

The historical legacy of resource usage systems in Norway is definitely one of co-management. Powers have been divided between the State (the King at the start) and the local population (the «commoners»). Today this is with us in strong form in the bygd and state commons, but also, even if weaker, in the boards of the reindeer herding areas. In its weakest form, we see it in the 14 special districts in the salt-water fisheries. Its general form is differentiation of rights and duties by area. Residence of persons, or location of appropriator (farms, herding units or fishing vessels), are used to distinguish between those who legitimately can appropriate from a resource and those who cannot.

[6] See Robberstad 1978. In Finnmark the break came in the Act of 13. Sep 1830 «On Fisheries in Finnmark», see Pedersen 1994.

On the History of Forest Commons in Norway

The legal conception of common property as developed in Norwegian Law institutionalize the collective experience and historical adaptations of people depending on these resources, tempered by the perceptions of the legal profession and the lawmaker. Its basic form is medieval, and most of the variation introduced during the last 3-400 years predates the modern nation state. To a very large degree new aspects were introduced by case law as need for adaptations to new circumstances arose.

Two significant processes have shaped the development: the sale of commons by the King and the measures taken against processes of unsustainable harvesting (Solnørdal 1958:43-46).

During the 1720-30, we find concern about the conditions of the forests[7]. A paragraph limiting the right of common to timber and fuel wood to the needs of the farm had been inserted in the law of commons in Christian V's Norwegian Law of 1687. The reason then was probably more to extend the rights of the King to the resources in "his" commons, and also to further the interests of the sawmills, rather than to protect forests against unsustainable usage. But in the 18th century it came to be seen as a tool for the regeneration of the forests and enforced more strictly[8]. It was later extended to apply to pasture. It is interesting to note that the principle of limiting some rights to the "needs" of the farm is older in the relation between a landlord and his tenant[9].

The most important external impact for the development of Norwegian forest commons is simply that the King began to sell off "his commons" in the 17th century[10]. The King could sell only what was his: the ground and the remainder. He could not sell the rights of common. The rights of common remained (in theory) undisturbed. The repercussions of these sales are felt even today. The case of Skjerstad was judged in the special court on the mountains in Nordland and Troms[11] 26 April 1990, and in the High Court of Norway 19 November 1991 (Norsk Retstidende Vol 156, 1991 part II:1311-1334). The conclusion, crudely put, is that while the state lands of Nordland and Troms

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[7] See Acts of 20.August 1726, 7 October 1728, 8 December 1733, and 8 March 1740.

[8] This coincided with the first two efforts to establish as professional forest administration, the older «generalforstamt» from 1739-1746, and the younger «generalforstamt» from 1760-1771. These were modeled on German experiences. See Opsal 1956, 1957, 1958. They failed to establish themselves mostly as a result of resistance from the forest owners (Vevstad 1992:12).

[9] In the Law of Frostating (from about 1160), the tenant is allowed to cut down threes for one ship of 12 oars, but not larger without permission from the landlord (Frostatingslova XIII.4, p.190 in Hagland and Sandnes 1994). In Magnus Lagabøter's Law of the land (from 1274) the principle is repeated (VII.52, p.148 in Taranger 1915).

[10] The relationship between what we would call the King's private property and the extent of his control over the property he managed as the sovereign is an interesting topic. The expression «the King's commons» should not be taken to mean anything like his private property. In Denmark-Norway, the distinction between the private property of the king and the property of the sovereign was kept clear. It is also clear that the sovereign throughout the centuries after 1687 rather consistently worked to increase the share of profit falling to the state to the detriment of the commoners. It also seems clear that the Swedish king had more success in this than the Danish-Norwegian king had during the important 18th and 19th centuries.

[11] The King sold his lands in Nordland and Troms to Joachim Irgens in 1666 and bought them back in 1682. This sale was in the 19th century used as argument for the stipulation that the lands were not state commons.

must be considered to be state commons, the injustices done during the preceding 200 years by preventing the local population from enjoying their former rights of common, has removed all rights of common except the rights of pasture.

Mostly as a consequence of the King's sale of "his commons", new measures against the tragedy of the commons had to be introduced in the act on forestry from 1863. Both in the early 18th century and later in the middle of the 19th, the inadequate regulation of access[12] to timber in the commons and good timber markets evidently led to overuse. Limiting the right to take timber to the needs of the farm made it illegal for the ordinary farmer to take timber for sale. After the King's sale of "his" commons, the new owners did not have to observe such rules for themselves and many did not have the resources to enforce them for the commoners (where rights of common to timber existed). A situation resembling the tragedy of the commons developed both in the commons and in privately owned forests. The first reaction was to allow privatization of state commons (Act of 5. August 1848)[13]. This was ended by the 1863 law on forestry. This law introduced public control of forestry activities for all forest land, both private and commons.

In many cases, those with rights of common (or a subgroup of them) came to be owners of the ground (and then the remainder, after the rights of common were accounted for). This seems to have come about in three ways:
1) through the recognition that long use of a part of the King's commons in other ways than what was implied by the rights of common, defined property rights to the ground for the users, or
2) through buying of a part of the King's commons, or
3) through buying the ground from the investors the King first sold it to.

If those buying the ground represented more than 50% of those with rights of common the area burdened with rights of common have come to be known as "bygd commons". If they were fewer than 50% they were called "private commons". These "new" types of commons were first defined in acts from 1857 and 1863[14].
The denotation "bygd commons", however, is older. Tank (1912) traces the expression to the middle of the 18th century. The rest of the King's commons are today known as state commons.

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[12] New technology and/ or new markets can make established regulations ineffective.

[13] The act annulled §38 in the act of 20. August 1821 which said " The forest commons owned by the state shall until further notice not be subject to sale or alienation". Selling the commons had obviously been debated. But the «ideologically motivated liberalism» seems to have had more problems changing the legislation on forests than on fisheries.

[14] The act from 1857 on forest commons introduced a management system for forest commons other than state commons. In an act from 22. June 1863 on forestry, private commons were required to go through a land consolidation process dividing the forest area between the owners of the ground and the commoners. If an area was left with rights of common, it became a bygd commons. All private commons where the rights of common included rights to timber are believed to have been dissolved in this way. However, there exists private commons with rights of common to pasture, fishing and hunting of small game. One such, Meråker almenning, is discussed in NOU 1985:32,pp.36-38. Presumably, there are more of them. How many is not known and the acts enacted since 1863 have to an increasing degree disregarded their existence, since their significance was declining.

The forest commons of Norway have existed since pre-medieval times in one form or another. They have changed from being the open access "wastelands" around the local communities in pre-medieval time by way of being the King's commons open to be used by the people of the local communities, later to become the more or less exclusive property of the sovereign. The current system grew out of the struggle for control of the various forest resources among the King, the growing group of capitalists looking for investment and profit, and the local farmers. The shifting fortunes of monarchy, the industrialization of the economy, and democratization of the polity all affected the system of forest commons that emerged. What can we learn today from their form and substance?

Describing variations in the form of commons

Bygd commons and private commons are distinguished by how ownership to the ground is distributed among those with rights of common.

In state commons, the company Statskog SF holds title to ground and remainder. This company was established rather recently (in 1993, by transforming the Directorate of state forests) and the political and cultural significance of the relationship between it and the state is not quite clear. Ideally, one would want the company to hold the ground and remainder of the commons in trust for the state.

The rules governing the rights of common in state commons are rather similar to those for bygd commons for timber and fuel wood, somewhat different for pasture, fishing and hunting, and depart significantly for the structure of governance. The use of timber and fuel wood in state commons is regulated in a separate act (Act of 19 June 1992 no 60). If rights of common to timber and fuel wood exist in a state commons, the state government can decide that it shall be managed according to the law on bygd commons for timber and fuel wood. The rest of the state commons are regulated by the act on mountains (Act of 6 June 1975 no 31).

Today we can describe a bygd commons as a forest where the rights to the ground (and the remainder[15]) is inalienably[16] "quasi-owned" in common by a majority of the farms with rights of common. Here several problems appear: Which are the farms with rights of common? What are the rights of common? Which profits can those with rights of common take away? Again we have to turn to the law to see how the profits are defined and which characteristics they have been given.

[15]The most important of the remainder is today hydroelectric power, leasing of ground for cabins, and - perhaps - landscape and nature conservation.

[16]But of course there are some exceptions such as sale for conversion to agricultural land and leasing of building lots.

Rights of common is defined as rights to remove something of value from another owner's property. These «profits-à-prendre» have above been classified into 4 types.

TYPES OF PROFITS

Rights vest		
	inalienable[17]	**alienable**
in land	appendant	appurtenant
in persons	all men's rights	in gross

Norwegian law on forest commons and reindeer herding distinguish 4 groups of resources as profits. These are 1) timber and fuel wood 2) pasture for farms[18], 3) fishing and hunting, and 4) pasture, timber, fuel wood, fishing and hunting for reindeer herding.

Two of the rights of common, the rights of pasture and wood, are held inalienably[19] in joint quasi-ownership (appendant) by all farms located in the "bygd". The right of pasture includes rights to put up necessary houses for utilizing the pasture in the traditional system of transhumance. For both the right to pasture and to wood, the need of the farm will define the extent of usage. If sustainable usage of the commons is unable to supply all the farms according to their needs, there will be a proportional reduction in what they are entitled to harvest.

The rights of common to hunt and fish are held inalienably by persons in joint ownership. This means that the right is attached to the person owning the farm unit and his immediate family and household and will follow this person if e.g. the farm is leased to some tenant. There are different rules regulating hunting of big game and small game as well as access to fishing.

In the Norwegian bygd commons the right to fishing and hunting of small game can be described as an inalienable personal profit for all persons who are members of the households on the farms "quasi-owning" rights of common to hunt (a kind of local all men's right). In the state commons all persons who for the past year have been living permanently in Norway and who continue to do so hold inalienably the right to fish (except fishing of anadrome species (salmon, trout) and hunting of small game without dog[20]. The clause "without dog" is interesting as an example of a limitation on harvesting technology. The

[17] In Roman law usufruct was considered inseparably attached to the person enjoying it (Lawson and Rudden 1982, p.163). The same kind of property rights relation is today created by inalienable life interests as in protective trusts (England) or spendthrift trusts (USA) (Lawson and Rudden 1982 p.164).

[18] In state commons farms with rights of common to pasture has the right to buy land suitable for tillage.

[19] Here there are no exceptions

[20] Rules for hunting of small game with dog can be decided upon by the local government of the state commons, the municipal "mountain council", and can thus vary from one commons to the other. The mountain council can also extend the right to fish to persons without permanent residence in Norway. See Act of 6 June 1976.

municipal mountain councils managing the use of the state commons can allow hunting with dogs for all or reserve this for people from the bygd[21].

The right to reindeer herding is regulated in a separate act (Act of 9 June 1978 no 49). The rights entailed are held alienable[22] in common with equal fractional interests by all registered reindeer herders within a reindeer herding district. The rights of common to timber and fuel wood and to put up constructions can be described as being held inalienable in joint quasi-ownership by the reindeer herd. The herd, seen as a cadastral unit, is an «owner» of these rights in the same sense as the farm was described as an «owner» of rights of common. The extent of their use is limited by the needs of the herding.

The difference between the *joint quasi-ownership* of pasture and wood and the *joint ownership* of hunting is significant in relation to limiting the resource use. In quasi-ownership, the needs of the farm define the upper limit for the total allowable harvest. For hunting public authorities decide on the necessity of regulations and limits the resource use by such techniques as limitation on time periods, type of technology and areas for hunting as well as quotas and price of hunting permits.

Concluding remarks: modeling the human impact on resource systems

The loss of biodiversity, the reduction of forests, and the declining fish stocks in the oceans are seen as major problems of humankind. Around the world, there are many efforts to change and improve the management of renewable resources. Yet, very little is known of what is the best design of an institution for resource management. One strategy for learning about what works well and what does not work well enough, is to study cases with a long history of management (Ostrom 1990).

The studies presented in this book and the discussion of Norwegian resource legislation has revealed a rather bewildering complexity in the various local constellations of resources, users and institutions. The search for significant variables capturing the variation in resource usage systems has also uncovered several interesting characteristics such as the role that «ground and remainder» plays for coordination of activities and distribution of benefits, the prevalence of co-management, and the resource specific systems of rights and duties cutting across the social categories distributing the benefits from the resources.

But we cannot claim to have come closer to being able to answer questions about exactly how legal institutions affect resource usage systems.

[21]They can also limit the number of hunters of small game but will then have to distribute the hunting permits fairly among people from outside and inside the bygd.

[22]The right to reindeer herding is alienable in about the same sense as a Norwegian farm is alienable. In other words to buy you need concession from public authorities. But instead of the kin preference on the farm market, there is a requirement of ethnic and industrial attachment in the "market" for reindeer herding rights. Concession will be given only to Norwegian Saami who either themselves were active reindeer herders on or after 1.July 1979 or who have at least one parent or grandparent who were active reindeer herders on that date.

Comparative studies in the meaning pursued here is clearly not sufficient. The discussion has however clarified what the problem is.

The problem we want to solve can be conceptualized by the following figure:

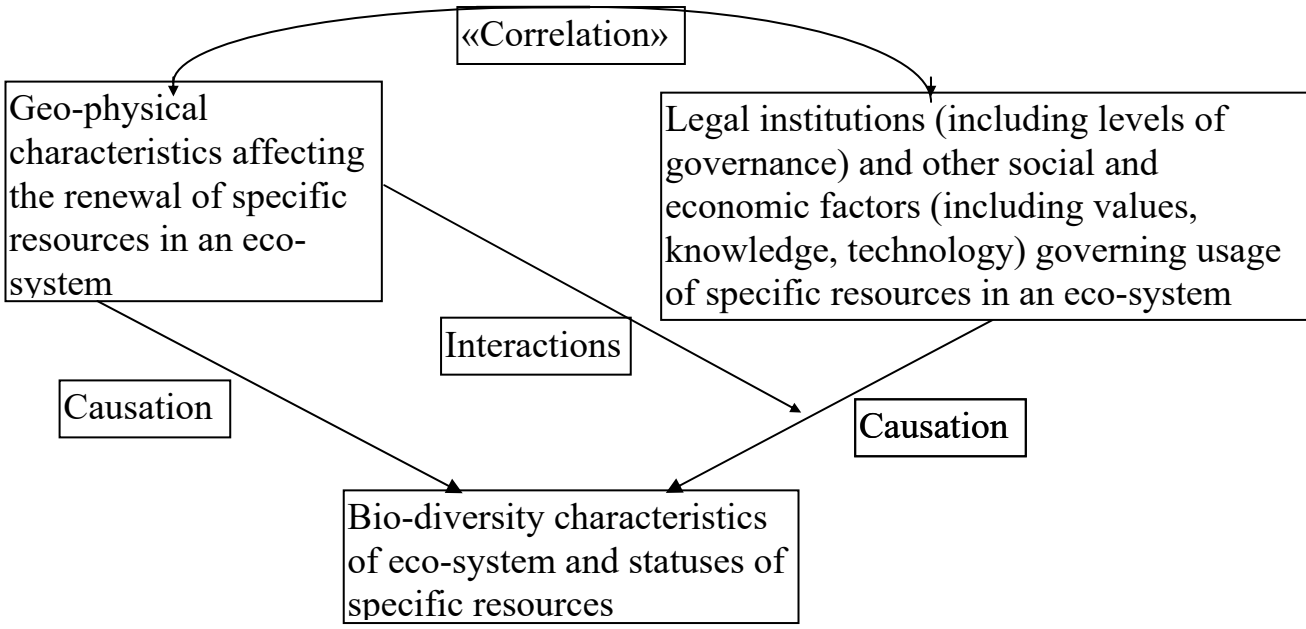

Figure 1

The figure defines a simple causal structure. The hypothesis is that the biodiversity and sustainability measures characterizing an eco-system and its resources are determined by two sets of variable characteristics. One set is the geo-physical parameters circumscribing the eco-systems and its development. The other set is the human usage of the eco-system and its resources. The figure depicts two complicating features. One is the possibility of correlations between legal and socio-economic variables, and geo-physical characteristics. Decisions on management rules are not taken without a view to the broad characteristics of the area they are intended to apply to. And even more important, the geo-physical characteristics of the area will through historical adaptations shape the world view of people living there, their values and perceptions of resources. This affects local choices of institutional solutions in governing resource usage (compare Folke and Berkes 1995). The other complication is the possibility of interactions between legal variables and geo-physical characteristics. The consequences of particular institutional variables may depend on the values of some geo-physical characteristic (such as variability in weather, elevation above sea, etc.).

To estimate the true impact of human activity we need to specify the correct model. This means we need to account for variation in resource system, geo-physical characteristics, background correlations and interactions in relation to the total impact on the various resources.

If we disregard for a moment the problems of measurement for legal institutions and other relevant social and economic characteristics as well as

eco-system and resource characteristics, the problem could be solved by collecting data on the three sets of variables for «enough cases» from «enough samples». Multivariate studies of correlations will with enough replications help us sort out the institutional characteristics, which make a difference in sustainability of a resource from those who do not.

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APPENDIX TABLE 1
PROPERTY RIGHTS REGIMES IN NORWEGIAN FOREST COMMONS, REINDEER HERDING AND SALT WATER FISHERIES

ITEMS				
REGIME TYPE	**BYGD COMMONS**	**FORESTS IN STATE COMMONS organized as bygd commons for rights to wood**	**REINDEER HERDING within the defined pasturing districts within «reindeer pasturing areas»**	**SALT WATER FISHERIES fishing in salt water except for salmon and sea trout but including whaling and seal hunting**
other names used	parish commons[23]			
Geographical areas linking resource usage and appropriator units	"bygd" and reindeer herding districts	"bygd" and reindeer herding districts	reindeer pasturing areas defined according to established usage	*Norway for most issues *14 special districts with local powers of regulation
No of units	51	8	1 - divided into 6 reindeer pasturing areas, each divided into districts	1 14 special districts
Type of unit	actor	actor	bureaucracy	bureaucracy
management and organizational variables				
system responsible actor	board elected by commoners	1) a board elected by commoners "allmennings-styret" [24] and 2) the local chapter of Statskog SF **co-manage** the wood resource	The Royal Ministry of Agriculture by delegations to the board of reindeer herding and the boards of the various reindeer pasture areas.	The Royal Ministry of Fisheries
voting rights	2 votes for each quasi-owner of rights of common	2 votes for each quasi-owner of rights of common to wood	no	no for Norway yes for special districts
professional administration	required	required	yes	yes
change of area	severe restrictions	severe restrictions	no	* Norwegian jurisdiction by international treaty * special districts by Ministry
common economic activity	variable	variable	no	no
profits for owners of ground or equivalent	variable	possible	yes	yes
duties of elected board	represent both owners and commoners, management of resources, support the improvement of the local community	1) represent the commoners, co-management of funds designed to cover road maintenance, forest rejuvenation, etc., 2) represent the interest of the owner of the ground, regulation of timber felling	implement the policy of the government	regulate use of established technology and coordinate appropriation activities

[23] Used by Sevatdal 1985, Rygg and Sevatdal 1995

[24] A board elected by the municipality ("fjellstyret") manages resources other than wood

ITEMS				
REGIME TYPE	**BYGD COMMONS**	**FORESTS IN STATE COMMONS**	**REINDEER HERDING**	**SALT WATER FISHERIES**
distributional variables				
owners		title to ground and remainder is held by STATSKOG SF in trust for the state	right of access to pasture within designated pasturing district is held by individual persons	«title» to Total Allowable Catch (TAC) is held by the state
"quasi"-owners	ground and remainder is held by a group of farms with rights of common			quotas of fish distributed by the Ministry of Fisheries are held by registered fishing vessels
form of «Quasi»-ownership	ground and remainder is held in common	ground and remainder is held in fee simple	right of access is held in fee simple	quotas are held in joint ownership
alienability	ground is inalienable from quasi-owner	ground is in general inalienable, but with exceptions	right of access is alienable among those with rights to practice reindeer herding	quotas are inalienable from quasi-owner
legitimate appropriators	*owners * rights of common are held by all legitimate farms in the "bygd", * and, if relevant, all reindeer herding units registered within the local reindeer herding district	*owners * rights of common are held by all legitimate farms in the "bygd", * and, if relevant, all reindeer herding units registered within the local reindeer herding district	* rights to practise reindeer herding are held by Norwegian citizen of Saami descent being active reindeer herder on 1. July 1979 or having one parent or grandparent being active reindeer herder	* rights to receive quotas are held by legitimate fishing vessels (in quasi-ownership)
form of ownership of rights	joint	joint	in common	joint
alienability of rights	inalienable	inalienable	inalienable	inalienable
resource systems where rights of appropriation are defined	there are specific rules governing *buildings, *pasture, *timber, *fuel wood, *hunting of small game, *fishing * pasture and wood used in conjunction with reindeer herding	there are specific rules governing *timber, *fuel wood *pasture and wood used in conjunction with reindeer herding	there are specific rules governing *movements and stopovers with reindeers *corridors for movements *pasture *infrastructure (fences, bridges, buildings etc.) *firewood and timber *hunting and fishing	there are (as of 1. Jan. 1996) specific rules at least for seaweed, shellfish, whale, seal, lobster, crab, crayfish, shrimp, herring, cod, haddock, halibut, mackerel, angler, coalfish, capelin, ling, rosefish, sea scorpion

APPENDIX TABLE 2
RESOURCE SPECIFIC PROPERTY RIGHTS REGIMES IN NORWEGIAN FOREST COMMONS, REINDEER HERDING AND SALT WATER FISHERIES

	ground and remainder in forest commons	**pasture, timber, and fuel wood in forest commons**	**fresh water fishing and hunting of small game except beaver in forest commons**	**hunting of big game and beaver**	**pasture, fishing, hunting, and wood for reindeer herding**	**fresh water fishing and anadrome species (salmon, trout)**	**salt water fish except anadrome species (salmon, trout)**
Rights of common	no	yes	yes	yes	yes	variable	no
Co-owner-ship	in common	joint	joint	joint	joint	in common	
Appropriator units	farm	farm	registered persons	registered persons	reindeer herding unit registered in the local reindeer herding district	*person registered as owner of ground *persons below age 16 are from 1 Jan. to 20 Aug. entitled to free fishing licenses wherever licences are sold *in some rivers fishing is a right of common	fishing vessel
Use and quantity regulation	internal ("owner decision")	internal ("needs of the farm")	internal ("owner decision")	external ("publicly decided needs of the species")	internal ("needs of the industry")	external («publicly decided needs of the species»)	external («publicly decided needs of species vs industry»)
Power of local choice	yes	yes	yes	yes	yes	yes	yes, in 14 separate districts