

**THE INTERNATIONAL ASSOCIATION
FOR
THE STUDY
OF
COMMON PROPERTY**



**Fifth Common Property Conference
REINVENTING THE COMMONS**

**24 - 28 MAY 1995
BODØ
NORWAY**



INTERNATIONAL
ASSOCIATION FOR THE
STUDY OF
COMMON
PROPERTY

CONFERENCE ORGANISERS

International Association for the Study of Common Property
Agricultural University of Norway
Høgskolen i Bodø
University of Trondheim

FINANCIAL SUPPORT

The conference organisers wish to thank the following for their financial support:

Danish Ministry of Foreign Affairs.
Norwegian Ministry of Foreign Affairs,
Norwegian Agency for Development Co-operation,
Swedish Agency for Research Co-operation with Developing Countries,
The Research Council of Norway,
Landsdelsutvalget for Nord-Norge
The Norwegian Association of Mountain Councils (Norges Fjellstyresamband)
Bodø Municipality
Nordland Fylke
The Norwegian Farmers Association

**THE INTERNATIONAL
ASSOCIATION
FOR
THE STUDY
OF
COMMON PROPERTY**

**THE BOOK OF
ABSTRACTS**

**Fifth Common Property Conference
REINVENTING THE COMMONS**

**24 - 28 MAY 1995
BODØ
NORWAY**

BOOK OF ABSTRACTS

TABLE OF CONTENTS

Part 1 Plenaries	3
Part 2 Abstracts	35
Part 3 Special sessions	177
Part 4 Table of contents	183

PART 1
PLENARIES

Tore Gundersen,
The Royal Ministry of Foreign Affairs,
Oslo,
Norway

NORWEGIAN POLICY ON RESOURCE MANAGEMENT IN THE NORTH.

ADDRESS OF WELCOME BY POLITICAL ADVISER TORE GUNDERSEN TO THE 5th WORLD CONFERENCE OF IASCP - THE INTERNATIONAL ASSOCIATION FOR THE STUDY OF COMMON PROPERTY, BODØ, NORWAY, 24 - 28 MAY 1995.

Resource managers, scientist, ladies and gentlemen. It is a great honour for me to welcome you to Norway. And considering the topic of your concern, I am particularly pleased that you've taken the long way to Northern Norway.

Through all times, natural resources have been a cornerstone of Norwegians' way of life. And nowhere are natural resources more crucial than here in Northern Norway. In this harsh, Arctic environment, people have learned to live with nature in a very special way. The numerous local communities along the coast have turned to the ocean for a living. Thus, the bounty of the ocean - the living marine resources - have always been at the centre of attention in this part of the world. And one thing we know for sure; the bounty of the ocean has important common property features!

To this day, fish has been by far the most important of the living marine resources. Introducing you to Norwegian policy on resource management in the north, I will therefore emphasize fisheries management. But first, let me elaborate on a central issue regarding the management of indigenous people's resources.

To parts of the sami population, Norway's indigenous people, reindeer herding has been the main source of income through generations, not least of great cultural value. The present situation in reindeer management policy offers interesting perspectives on the practical challenges of common property.

Current Norwegian policy, in line with the development in international law, acknowledges the importance of securing the material base for traditional Sami activities. A vital indigenous culture is dependant on this material basis. As for reindeer herding, this connection is obvious.

The industry in itself represents an important part of Sami culture, and is totally dependant on the use of traditional grazing grounds for its continuance. Today, reindeer grazing lands are not only threatened by industrial development, communications, mass tourism and pollution. Traditional Sami reindeer herding, with individual ownership of the animals and collective rights to the grazing lands, has now proven unable to self-regulate the number of reindeer to put in the field.

With the development of specialized meat production for marketing, on top of continous loss of land, the means of traditional internal regulation have been inadequate to keep herd sizes in accordance with the available grazing capacity.

In consequence, Government in cooperation with the Association of Sami reindeer herders, has been compelled to take the measures for reduction of herds, in order to prevent disaster. Positive results have been achieved, but the problem is not permanently resolved, and will need further attention. There is broad agreement between Government, herders and the Sami Assembly (Sametinget) that regulation is necessary, and also that measures must be shaped in accordance with traditional Sami common resource use. In spite of difficulties ahead, this consensus gives reason for optimism.

The management of Norwegian fisheries is a more complex issue, an issue of international dimensions. Fish is shared by groups of nationals. Fish is shared by nation-states. And fish is shared by generations. As you would probably be more aware of than most others, these features create great challenges. One has to ensure that the resources are harvested on a sustainable basis, and at the same time one has to be concerned with fair distribution of access to the resources. These two concerns are not easily reconciled.

The global shortage of fish is steadily increasing. World catches are doubled since 1970 and are currently in the order of 80 million metric tons a year. Of a total of 170 different groups of fish stocks globally, only 50 are not either overfished or fully utilized. At the same time we know that if every one of us is to consume the same amount of fish thirty years from now as we do today, world fish production would have to be doubled once more. Fish farming cannot fill the gap. Thus, the strategic importance of controlling fish resources will be increasing. As will the pressure on managers of world fisheries. So how do we maximize the yield, and at the same time protect the biodiversity of the ocean? This is at the crux of Norwegian fisheries management.

Generations of experience have taught us that knowledge, regulation and enforcement are the crucial prerequisites for success. Norwegian fisheries management is a thorough intermixture of scientific investigation, diffusion of knowledge to regulators and strict enforcement of the rules. The fishermen themselves are closely involved throughout the process, thus the voice of those regulated is heard. The latter is not the least important, since it enhances the legitimacy of the management regime.

Norwegian fishermen take part in all phases of the management process, from collection of data for scientific purposes, through the regulatory decision-making, to the enforcement and control systems. Most important in this respect is the Norwegian Fishermen's Association, with its many sub-organizations. Hardly a single piece of legislation or regulation is passed without a formal hearing of the Fishermen's Association's view. Together with other relevant organizations, the Fishermen's Association also has representatives at the Council of Regulations, an advisory body to the Director of Fisheries. In this advisory body, the entire industry is given a formal right to influence the regulation of Norwegian fisheries. Also there are well developed channels of day to day communication between the Fishermen's Association and various governmental bodies.

The fishermen and representatives of the industry also take part in the shaping of Norway's international fisheries policy. They are members of Norwegian delegations to negotiations, and take a significant part in the preparations of these.

There are several important benefits from this system of direct fishermen influence. First of all, it gives the authorities the best available knowledge of the fishermen's positions on various issues. Secondly, it facilitates the distribution of quotas, since the various groups of fisheries have to agree among themselves before their umbrella organization presents their joint position to the government. And thirdly, as already mentioned, it improves the legitimacy of the system, thus increasing the probability of compliance.

Our knowledge about the marine ecosystem is vastly improved the last few decades. We have bitterly experienced the consequences of overfishing, and our scientific community has improved their means and methods. We now work hard on the multi-species approach to fisheries management, which reveals how different species interact. This involves not only different species of fish, but also marine predators such as whales and seals. Improved knowledge of multi-species interaction has in some instances enabled Norwegian administrators to set more precise catch quotas, thus reducing the risk of inadvertently damaging fish stocks.

Proper regulations have been made more achievable as our knowledge is improved. Norwegian commercial fisheries in general, as well as the fishing efforts in specific fisheries, is restricted and regulated by a body of legislative and administrative instruments. Restrictions on fishing effort include licences restricting entry, restrictions to which gear to be used and quantitative limitations on the catches, such as quotas and minimum size. Another essential part of the Norwegian conservation philosophy is the ban on discarding. The discard ban applies to all economically interesting species.

A basic problem in fisheries, which is true in Norway as well as internationally, is the vast overcapacity in the industry. Too much capital is invested per unit of fish resource to be harvested, thus creating a dangerous incentive for overfishing. Due to this, both knowledge and regulations could be in vain without proper control and enforcement measures. One has to make sure that the catch quotas are respected. It can be no surprise to anyone that the respect for regulations is directly related to the quality and frequency of the control measures, and the character of the sanctions for breaking the rules.

The Norwegian control and enforcement system is horizontal: We control the fishing activities and enforce the regulations at every level, from the fishing operations at sea to the fish trading on shore. The essential part of the Norwegian enforcement scheme is the commonly agreed need to physically survey all the transactions in relations to fishing. The corner-stones of control and enforcement are the Coast Guard, the Directorate of Fisheries and the sales organizations. The latter plays a crucial part, as it is owned by the fisheries industry itself. Again, one important purpose of incorporating the industry is to increase the legitimacy of the control and enforcement scheme.

This triangular management scheme of knowledge, regulation and enforcement has given very promising results: The total allowable catch for cod in the Barents Sea has not been as high as the current level since the late 1970s. And Norwegian spring-spawning herring, the silver of the ocean, is more abundant today than it has been for 30 years. As a matter of fact, it is currently one of the world's largest fish stocks.

As a leading nation within international fisheries, Norway has always played an active part in the United Nations' long endeavours towards an international regime for the management of the seas. The strong pursuits payed off in 1977, with the establishment of 200 nautical miles economic zones - an important breakthrough for coastal state interests. This assignment of property rights was a giant leap away from the almost anarchic situation which had ruled the seas throughout history. The result was to improve discipline by giving management authority to those with a vested interest in sound and sustainable management.

The coastal states can not stand alone one by one, though. The creation of national economic zones did not change the fact that many of the largest and most important fish stocks are straddling or migrating stocks - they are shared between two or more states. Such common stocks can only be sufficiently managed by establishing direct negotiations and cooperation between the coastal states regarding the regulation within the zones. In the Barents Sea, a system of cooperation and negotiation has been established between Norway and Russia. In the context of the Joint Norwegian-Russian Fisheries Commission the two countries share the responsibility for management of the fish stocks in the Barents Sea. The cooperation rests on a set of agreements which serves to ensure rational and responsible management, based on joint measures. The Joint Commission manages resources worth more than one billion dollars annually.

Through our common efforts, Norway and Russia have improved the connection between science and management at the international level. The annual quotas for total catch are based on recommendations about harvesting levels given by the International Council for the

Exploration of the Sea (ICES). This is an international organization, where Norwegian and Russian scientists are represented, together with scientists from a number of other countries.

It is important to Norway that all countries involved in the management of a common resource have the same routines and efforts regarding control. Thus, we have developed close cooperation with Russia in this field as well. We have continuous exchange of data of registered fishing and landings at Norwegian ports, so that Russian authorities can double check the data they receive from their own fishing fleet. We encourage other countries receiving Russian landings to do likewise. We also receive information on all Russian vessels allowed to fish cod, so that the Norwegian Coast Guard can intervene if anyone should act illegally. Representatives of Russian authorities have been observers at port controls of Russian vessels in Norway. In addition, Norway has supported Russia in developing new fisheries legislation, as well as the creation of a new control regime.

Through annual agreements, the two countries decide total catch quotas and the distribution of these, including the distribution to third countries. It is particularly in cod fisheries this joint effort has led to strict regulation, and periods of extremely small quotas. At times, this has been a painful process, but it has been necessary to ensure our common long term goal; maximum sustainable yield. Currently this yield is 10 billion Norwegian Kroner annually in landed value.

The relations between Norway and Russia have been further strengthened since 1993, when the Barents Euro-Arctic Council was established. This multilateral forum of all the Nordic countries, Russia and the European Union has the potential of providing an important framework for dealing with problems of transnational character in the Barents region. The Council is still in its infancy, and since it does not deal with the oceans and marine issues, I prefer not to elaborate this further. Instead I would like to lead your attention to the challenges of high seas fisheries.

The national economic zones of 200 miles constitute not only a limit, but a serious limitation, to the current regime of international fisheries management. This became evident in the recent conflict between Canada and the European Union in the Northwest Atlantic. It is equally evident to Norway in the Barents Sea, where third country vessels have entered the fishing banks outside our National Economic Zone - tempted by the rich and healthy fish stocks, a result mainly of prudent management by Norway and Russia.

Norway and Russia seek to ensure that when we make quota agreements with third countries, these countries limit their fishing to the quotas given by the coastal states, regardless if the fishing takes place inside or outside the coastal states' areas of jurisdiction. This has been complied with by vessels from states with quotas in the Barents Sea.

In the summer of -93, however, a number of trawlers sailing under flags of convenience, followed by a number of Icelandic trawlers, started unregulated fishing operations in the "Loophole", international waters just outside Norway's and Russia's national economic zones. Since the Convention of the Law of the Sea does not accord coastal states the authority to enforce regulations in international waters, even if the stocks in question are subject to regulation, Norway and Russia have not undertaken any form of physical intervention.

The situation deteriorated dramatically last summer, when trawlers from Iceland and trawlers under flag of convenience, such as Belize, the Dominican Republic and Cyprus, started to fish illegally in the fisheries protection zone around Svalbard. This zone is not international waters, but rather, subject to Norwegian regulation. Not one of the countries mentioned has historical rights either in the Barents Sea in general or in the fisheries protection zone. The Norwegian Coast Guard reacted in accordance with the rules currently in force and international practice, by giving verbal and written warning, firing warning shots and finally by severing trawls after

repeated, provocative contravention of the prohibition against fishing in the fisheries protection zone.

The area around Svalbard is the most important nursery area for cod in the Barents Sea, and is therefore particularly vulnerable. Resource management in the Barents Sea would become impossible without regulation of fisheries in this area.

Genuinely equal treatment is the aim of Norwegian fisheries management in the Barents Sea. In order to achieve this, on the basis of traditional fisheries, the European Union, Poland and the Faroe Islands may fish in the fisheries protection zone, in addition to the coastal states, Norway and Russia. Norwegian management practice is generally accepted by all countries that have traditionally fished in the area, since this ensures sustainable utilization of the resources and high yields for the holders of fishing rights.

If the free riders continue to serve themselves in the Barents Sea, this treasury in the far north is very much in danger of serious depletion. What is more, nations allowing their vessels to undermine sincere conservation efforts, are undermining not only management regimes, but also basic tenets of ocean law.

In a situation where the international fishing fleet has vast overcapacity, and serious shortage of resources due to years of overfishing in national economic zones, it is of the utmost importance to reduce fleet capacity. Measures to this end must thus be an integral part of any country's resource management policy.

The development of proper rules and enforcement measures for international fisheries is of vital importance to Norway. As a matter of fact, it is so important that a few months ago we signed a bilateral agreement with Canada regarding mutual enforcement of fisheries regulations outside the two countries' economic zones. Through this agreement Canada and Norway have made a pioneering achievement in the pursuit of responsible fishing.

But bilateral agreements on international waters can not replace multilateral ones. It is widely acknowledged that the Law of the Sea has to be supplemented regarding high seas fisheries. The United Nations Conference on Straddling and Highly Migratory Fish Stocks currently in its fifth session, gives a strong and convenient framework for this extremely important endeavour. The objective is to reach agreement on a convention which will supplement and specify international law, in order to strengthen the position of the coastal state.

Norway plays an active and important part as a member of the so-called core group at the conference, which works to ensure the interests of the coastal states regarding straddling and migratory fish stocks. In this respect we place great emphasis on enforcement. From what I already mentioned regarding domestic fisheries regulation, it is obvious that an agreement on international fisheries management is of limited value if there is no enforcement regime for such management. At the UN Conference, Norway holds that the main concept must be to give enforcement authority to parties with actual fishing rights within regional fisheries arrangements. In our view, this is the only way of achieving sustainable management of this common property of global importance.

Against this background, I hope Bodø and Northern Norway will give you inspiration to share and deepen the knowledge of your intriguing and very important field of study.
Thank you!

Erling Berge,
 Department of sociology and political science
 University of Trondheim
 Norway

A PROLEGOMENA TO "REINVENTING THE COMMONS"

The program committee has chosen the theme "Reinventing the Commons". Commons have existed throughout all recorded history as an integral part of the resource management of local communities. With the emergence of the modern state and the capitalist economies, the commons of local communities around the world found themselves in a losing battle with advocates of state ownership or individual ownership. The traditional knowledge embodied in the well established institutional frameworks was not cast in a form understandable to the bureaucrats of the state even in the cases where the bureaucrats might be willing to consider them on their merits. And often enough they were not cast in a form which made them adaptable to a changing environment. To survive, the practical knowledge of the benefits of commons have to be recast in the analytical language of academic disciplines.

However, there is another reason which makes the theme doubly appropriate for a conference on the commons located in Norway. The Norwegian government has recently aptly demonstrated how the loss of old institutions is a creeping ill no one is immune to. In 1992 the Norwegian Parliament repealed a more than 800 year old law of Norwegian Commons. During a major revision of the text of the Commons Act, its oldest and most profound part was deleted. A part of our cultural heritage is gone. This loss needs to be mourned. But the change of words is significant.

In one of our oldest written law codes, the Frostatings Law, written down around 1100, the very first line in the first paragraph in the section on the Commons is the same as the one we find in Magnus Lagabøters Lawbook of 1274, in Christian IV's Lawbook of 1604, and in Christian V's Lawbook of 1687. And throughout the numerous changes in the Commons Act during the 19th and 20th century the first line in the first paragraph has been standing unchanged. In 1992 the Norwegian Parliament deleted it, with the approval of those involved, the new act taking effect from 1993.

Why did the Parliament think it prudent to do so, to take away a paragraph which has served us well for more than a 800 years?

To understand that, is to understand the necessity for reinventing the commons. The line which was deleted simply says "The Commons shall remain as they always have been"

"The King's Commons shall remain as they have been of old,".

What does this mean? That the commons have been unchanging throughout more than 800 years, and that now the government wants to change it? Obviously not. The Commons of Norway have seen as much if not more change than the rest of the Norwegian institutions for utilisation of resources, and if anything the deletion of this line inaugurates a period of less change.

So what is the big fuss all about, then?

I believe that this line in the law of the Commons goes to the heart of the relation between a government and a people. It tells each citizen that the King will protect his rights in the Commons. Their rights will remain as they believe they always have been. The line builds the trust of the people in the Rule-of-Law. The line assures them that the King will give them

justice if they feel their rights have been violated. Their rights will be restored to the situation as it was before, as it always has been.

Thus the deletion of the line from the Act is more than cultural vandalism, it speaks of a loss of understanding of how to build trust in a government. It speaks of a lack of understanding for the precarious nature of sustainable utilization of resources.

The easy repealing of the practical knowledge embodied in the old institutions speaks of the necessity of reinventing the commons. But not only of that. I think we need to reinvent the Rule-of-Law as well.

One of the emerging conclusions from the very diverse work of the members of this association is the importance of the Rule-of-Law for the sustainable use of resources and the ultimate well-being of the people living by these resources.

As an extension of this, I think it will prove fruitful to take as a working hypothesis that the "Wealth of Nations" is founded on the Rule-of-Law, rather than the free competition of economic actors. One may even say that the free competition of economic actors presupposes the Rule-of-Law, and that they can be free only in the sense that Rule-of-Law will give every citizen freedom within the law.

The "reinvention" of the commons is the academic exploration and search for deeper understanding of how and why institutions of common ownership can manage resources in an equitable and sustainable way in a changing environment and benefit the local communities depending on them for their survival.

This "reinvention" is now well along within the research community and our Association is at forefront.

David Feeny
 Department of Economics, McMaster University
 Hamilton, Ontario L8N 3Z5,
 Canada

OPTIMALITY, SUB-OPTIMALITY, NIRVANA, AND TRANSACTION COST: FORAGING ON THE COMMONS*

*Abstract derived from tentative draft of Presidential Address prepared for the Fifth Meeting of the International Association for the Study of Common Property, Bodo, Norway, May 25, 1995.

Introduction

Much of the literature on the management of common-property resources is focused directly or indirectly on enhancing the evidential basis for the formulation of policy. Therefore the assessment of the effects of a variety of factors, including institutional arrangements, on outcomes associated with the exploitation of common-property resources is a common theme.

But how do we measure outcomes? How do we know how well we are doing? A number of relevant categories of outcome measures have been proposed or used in literature. Prominent among these are measures of economic efficiency, equity, and sustainability (see for instance Berkes, Feeny, McCay, and Acheson 1989; Feeny, Berkes, McCay, and Acheson 1990; Feeny 1992; Norgaard 1992; Oakerson 1992; Ostrom 1992; Ostrom, Gardner, and Walker 1994; Rothenberg). Each of these categories includes a diversity of measures and indicators.

A large number of challenging issues arise in selecting outcome measures including the choice of viewpoint from which to assess outcomes, time horizon, choice of normative system, measurement properties of the indicators selected (including reliability, reproducibility, validity, and responsiveness), and practical implementability of the indicators. For the most part, I will ignore these difficult issues.

To simplify the analysis, without implying any lack of legitimacy to alternative viewpoints (or special legitimacy to the viewpoint selected), I am going to assume an anthropocentric viewpoint. An outcome that matters is human welfare. I am assuming that a fundamental objective in managing common-property resources is to enhance the welfare of human beings *f* both current and future generations.

Again without implying any lack of legitimacy for equity and sustainability as measures of outcome, I will focus my attention on the use of economic efficiency as an indicator of outcome.

Concepts of Economic Efficiency

I will begin with textbook style definitions. For the outcome to be efficient a number of conditions have to be met. For instance with respect to the level of production, efficiency occurs at the level at which marginal social benefit equal marginal social cost. Similarly with respect to the use of inputs, production efficiency occurs when marginal factor cost equals marginal factor revenue. Thus in the context of common-property resource management, where by definition there is a negative externality (Oakerson 1992; Berkes, Feeny, McCay, and Acheson, 1989; Feeny, Berkes, McCay, and Acheson 1990), the efficient level of utilization of the common-property resource occurs when the cost to the user and the cost the user imposes on all others are just balanced by the benefit derived by the user. A related criterion used in economics is Pareto optimality. A particular allocation is Pareto optimal (taking the existing income distribution and distribution of rights as given) if there is no change that would make someone better off while making no one worse off.

These concepts are powerful, in particular as normative standards against which to compare outcomes derived in abstract economic models. The operational content of these criteria is, however, often quite limited. Just as "assuming there are frictionless" pulleys is useful to understand the principles of physics, $MSB = MSC$ is a useful standard against which to compare various equilibrium outcomes derived within models. Nonetheless it is useful to examine, in a cursory fashion, some selected evidence on the efficiency of common-property resource management.

Evidence on Optimality

Without claiming generalizability and representativeness, I will briefly examine evidence on optimality in three contexts: abstract bargaining models, controlled laboratory experiments, and natural field settings. A few "case studies" from these categories of inquiry will be examined.

Bargaining Model

Imagine the following extended thought experiment. The "three amigos," three potential users of a common-property resource, discover a commons f a meadow suitable for grazing sheep. Each person is endowed with a technology for exploiting the commons and a reservation value, the return they can obtain in some alternative use of their time and thus the minimum they require to make it worthwhile for them to remain and exploit the commons. The production technology is such that for each herdsman output increases with the activity level of the herdsman but at a diminishing rate. In addition, each user imposes a cost on all users and that cost increases at an increasing rate. Production generates a negative externality.

What will the outcome be? Rodgers (1994) examines outcomes in a number of institutional settings. If the three amigos are able to exclude other potential users of the meadows but impose no restrictions on the activities of mutual owners, the resulting uncoordinated activity levels are not efficient. If instead the three amigos also bargain among themselves what will the equilibrium look like? Will the bargaining solution be efficient f will it match the socially optimal level of utilization of the commons? Rodgers (1994) shows that a variety of solutions to the bargaining problem are possible. Rodgers also shows that it is unlikely that the three users will bargain to the socially optimal plan. In the bargained solution the users are likely to do better than if they ignored the negative externality and acted in a totally uncoordinated and atomistic fashion. They are also unlikely to reach the best possible outcome. Part of the intuition behind this result is that each user guards his self interest and even though he is aware that total returns from exploiting the commons could be higher, he has little personal incentive to curtail his grazing effort further. Rodgers (1994) also shows that in a number of circumstances, efficiency can be improved if one user, the manager, unilaterally sets access prices for use of the meadow. On the other hand, access prices set by bargaining are unlikely to lead to efficient levels of activity. Furthermore, if the resource is privatized, it is likely that efficient activity levels will be achieved. In general, bargaining solutions are unlikely to be efficient unless there is an allowance for side payments.

Even in the abstract world of a bargaining model, it is not easy to achieve optimality. Bargaining and coordination have considerable potential to do better than a total lack of coordination but are unlikely to achieve the normative ideal. Thus the three amigos are successful in that they avoid the "tragedy of the commons" and in that they are able to devise a solution that will permit them to continue to use the commons without degrading the resource. The three amigos are also successful in that the solution provides each of them with a higher level of welfare than their reservation utility. But the solution is unlikely to be a first best optimum.

Controlled Laboratory Experiment

Do participants in controlled laboratory experiments that capture a key characteristic of common-property situations, rivalry or subtractability, achieve the most efficient outcome? The

experimental literature indicates that certain characteristics of the environment, for instance the provision for communication, monitoring, or sanctioning, often enhance the efficiency of the outcomes (Feeny 1992; Ostrom, Gardner, and Walker 1994; Hackett, Schlager, and Walker 1994). In most experimental environments the costs of establishing and maintaining the rules of the game f the costs of operating the institutional framework in which the experiment takes place f are borne by the experimenters. Even in such environments, subjects often, but not universally, fail to achieve the optimum allocation of resources (Ostrom, Gardner, and Walker 1994, p 196). Although it is often the case that subjects avoid the "tragedy of the commons" outcome and do achieve considerable levels of cooperation, full optimality is not a routine outcome.

Field Settings

It is not difficult to find case studies that conform to the predictions of the "tragedy of the commons" paradigm. It is also not difficult to find "success" cases. In these cases users are able to exclude outsiders. Users are also able to create and maintain institutional arrangements that provide for sufficient coordination and enforcement and achieve outcomes that avoid the serious degradation of the resource (see for instance National Research Council 1986; Berkes 1989; Bromley et al 1992; Feeny, Berkes, McCay, and Acheson 1990; Ostrom 1990; Ostrom, Gardner, and Walker 1994). But are these outcomes optimal? Given the difficulties of operationalizing criterion such as Pareto optimality it is difficult to know. Nonetheless an examination of a few "success" cases tends to indicate that while users of the commons are able to fashion workable solutions to their problems, they are probably not achieving first best outcomes

For instance take the successful South Asian village irrigation and grazing systems described by Wade (1988, 1992). Villagers are able to cooperate in a limited number of activities. Villagers in fact achieve a great deal through cooperation. For instance, collusion with respect to bidding for the monopoly on the local sale of alcohol generates important revenues for village schools. Fees for post-harvest grazing rights also generate sizeable revenues. Collective action enables the villagers to divert additional water into the village-managed irrigation system and successfully maintain that system. Is the outcome optimal? Probably not. Although the rules governing the allocation of water are consistent with the maintenance of a stable coalition of water users and appear to be viewed as equitable, the resulting allocations are unlikely to be efficient. The cost of providing water to "tailenders" f plots located distant from the point of water intake for the system f is higher than the cost of providing water to the "headenders". The rule adopted by the users in allocating water rights is that everyone's plot must be adequately wetted. Thus the distribution of water is unlikely to be efficient because it allocates "too much" water to high-cost of delivery users (tailenders) and too little to low- delivery cost users, headenders. Furthermore, the village council exerts little or no influence over crop mix. The village council does not attempt to influence decisions about how much land is planted in water-hungry paddy or, more generally, on how much land will be used in a given season and thus make demands on the irrigation system. It is likely that coordination among farmers could obtain a cropping pattern and schedule that would generate higher net yields, given the available water, than the pattern that emerges when each farmer is free to choose on his own (Wade 1988, p 217, 224). Similarly while the village council does regulate grazing on common lands, it does not regulate the number of head of livestock to be grazed (Wade 1988, p 213, 217, 224). Again the accomplishments of the villagers are formidable; they are quite successful in avoiding the "tragedy of the commons". Nonetheless in theory they could do even better.

Nirvana on the Commons

Is this apparent sub-optimality cause for concern? Or is it result of comparing reality to an abstract first-best solution? The answer to both questions is yes. Two key elements of the naturally occurring ("real") world that are absent in our simplified first-best abstract model help account for these divergences. First, given the voluntary nature of these arrangements to manage the commons and given the frequent lack of institutional arrangements to compel

cooperation, each participant can, to some extent, hold the collective agreement "hostage" to satisfying their requirements. Thus the nature of the collective arrangements observed is often somewhat minimal f enough cooperation to ensure that virtually everyone in the group is better off but without exhausting the gains from cooperation. To exploit these additional gains would require much more elaborate forms of cooperation, often necessitating an array of side-payments to ensure that virtually everyone still found the new arrangements beneficial. In the field, we seldom observe such elaborate and complex systems. Instead we observe simple systems that rely on simple rules.

Simple rules provide for a low level of transaction cost f the second (and overlapping) missing element in our first-best abstract model. Simple rules are readily and widely understood. Simple rules are more readily enforced. The "minimal" cooperative solutions observed in field studies economize on transaction cost in negotiating and specifying agreements and in enforcement by relying on simple rules (Ostrom 1992).

Higher levels of cooperation can be achieved if the institutional arrangements facilitate limited forms of coercion. For instance Meiji Japan facilitated local-level investments in small-scale irrigation systems by passing the 1889 Arable Land Replotment Law that stated that if two-thirds of the landowners in a given area voted for a project it was binding on all landowners in the area affected (Feeny 1988, p 188). Such an institutional arrangement provides a mechanism to overcome hold outs and reduces significantly the ability of potential participants to hold collective projects "hostage". Such arrangements by reducing the costs of coercion are, of course, also open to abuse.

Thus the first-best solution Pareto optimality criterion is useful as a normative standard but provides attenuated practical guidance as a measure of success f even from the narrow point of view of anthropocentric economic efficiency. Nirvana is not in the choice set. So how do we know how well we are doing? To what should we compare existing institutional arrangements? We should compare existing arrangements not only to an ideal norm, the first-best solution, but also to other existing or potentially implementable practical arrangements. In making these comparisons we need not only to examine the outcomes (the benefits associated with the use of the arrangements) but also the cost of creating and maintaining such arrangements f the transaction cost.

The Need to Measure Transaction Cost

One part of the "solution" to this problem is to gather information, both qualitatively and quantitatively on the transaction cost associated with the institutional arrangements we study. Descriptions of these transaction cost are not, of course, absent from the accounts we have. We are told about meetings, encounters with magistrates, appearances in court, elections, field guards, and much more.

The case study literature also indicates that in some cases these meetings have a variety of purposes and consequences. Thus while the fishermen in the coffeehouse in Alanya are allocating seasonal rights to fishing sites they are also ingesting tea and exchanging gossip (Berkes 1992, p 170).

Should we charge all of the time spent in such encounters to the transaction cost of managing the fishery? Probably not. Meetings in the coffee house are valuable as forums for conducting the business of the community, for instance the allocation of fishing rights. Such meetings are also, in part, a final consumption good, the sharing of fellowship.

Of course, arguments that transaction cost are important are not new in the literature on the management of common- property resources. Wiggins and Libecap 1985 point to the importance of contracting costs in inhibiting unitization of oil pools. Johnson and Libecap 1982 and Karpoff 1987 stress the importance of contracting costs in affecting the management of

fisheries. These authors also highlight the distributional consequences of various management options, again indicating the limited scope of voluntary agreements.

Wallis and North provide evidence on the sizeable quantitative magnitude of transaction cost in the context of the coordinating function of markets. Although the context is not identical to the context of common-property resource management, the conclusion that transaction costs are quantitatively important probably does generalize.

The key point is, however, that we need to go further in obtaining a comprehensive description of time and effort spent in creating and maintaining collective arrangements. When it is possible to meaningfully quantify some components of transaction cost (for instance time spent in formal meetings and fees and fines paid), we need to do so. We also need order of magnitude qualitative data on the level of transaction cost associated with various institutional arrangements for managing the commons.

Because enforcement also depends on the underlying normative behavioral codes or cultural endowments (Feder and Feeny 1991, 1993; Feeny 1988; Hayami and Ruttan 1985; North 1990b, 1994; Ruttan and Hayami 1984), we also need descriptions about the nature of the society in which these arrangements are found. What is it like to live in that setting? How much autonomy do individuals and households have? To what extent, in which domains, and under what conditions does the will of the community override the interests of the individual? We also need to know about the characteristics of the community in which the resource management takes place. Does everyone know everyone's business?

How to Develop Quantitative Measures of Transaction Cost

One approach to measuring transaction cost is to borrow from the frameworks of economic evaluation and economic accounting. Methods developed for cost-benefit analysis and the construction of estimates of national income provide guidance. A simple approach is to split the measurement process into steps. The first step is the quantification of the amount of resource or time used in operating the institutional arrangements. The second step is the valuation of that time or resource utilization. Participant observer and ethnographic investigations provide an opportunity for obtaining reliable and valid estimates of the quantities. The choice of basis upon which to value the quantities will often be less straightforward. For purposes of illustration, assume that human time is the chief input involved in operating the institutional arrangements *f* the chief component of transaction cost. Thus we can record person-hours. To return to our earlier example of the coffeehouse in Alanya, what do we do with time devoted to "producing" more than one "outcome"? Arbitrary decisions will have to be made; the key is to develop widely agreed upon conventions for allocating time spent simultaneously on more than one production process. Sensitivity tests can be used to assess the quantitative impact of whatever arbitrary rules of thumb that are selected.

A related issue is the valuation of the time or resources used to operate the institutional arrangements. At what rate should be value the time? In well-developed market systems, time could be valued at the going wage rate for such a person. Even this choice is, however, not quite so obvious. Should we use the marginal after-tax wage rate? In the absence of a well-developed labor market, more sophisticated methods for imputing the value of time may be indicated. Although the answers one obtains can obviously be affected by the choice of technique, similar problems have been handled successfully in a number of literatures. Situations involving the management of common-property resource management while perhaps a bit more challenging, should be amenable to these, and other approaches.

Conclusions

As we accumulate evidence of the level of transaction cost we can come to more informed evaluations of the transaction cost of collective arrangements and benefits derived from those

arrangements. Such evidence is crucial in developing an empirically grounded collection of practical operational measures of success on the commons.

We have made intellectual progress on our studies of the commons. We have gone beyond the simple *f* but powerful *f* deterministic models of the tragedy of the commons paradigm that were interpreted as saying that if it is held in common it will be degraded (Gordon 1954; Scott 1955; Hardin 1968). We have perhaps flirted a bit too much with the argument that "communal" is better. Nonetheless we have documented that communal arrangements can and often do enhance human welfare. We now need to take a more thorough, comprehensive, and refined look at the cost of operating the institutional arrangements used to govern common-property resource management, in whatever property-rights regime the resource is held.

Bonnie J. McCay,
Department of Human Ecology, Cook College, Rutgers University
New Brunswick, NJ 08903
USA

NETTING MEMORIAL LECTURE

This talk is an appreciation of Robert McC. Netting's work as a "cultural ecologist." His ethnographic field research spanned vast distances, from Nigeria to Switzerland, but it consistently spoke to questions about nature, culture, and institutional arrangements. My selection of the works to be explored will be "Fighting, Forest, and the Fly", "What Alpine Peasants Have in Common", a paper for the National Research Council on property rights, his textbook "Cultural Ecology", and his recent book "Smallholders, Households: Farm Families and the Ecology of Intensive, Sustainable Agriculture". I try to suggest what some of his contributions have been to anthropology and what, in particular, they have meant to my own more modest attempts to grapple with "the question of the commons".

Jean Claude Mounolou and F. Fridlansky
 University of Paris, Centre de Génétique Moléculaire, CNRS
 Paris,
 France

BIODIVERSITY: SCIENTIFIC STAKES AND RELATED INFERENCES

Biodiversity perceptions are many and eventually contradictory. However the rising concern on its short-term evolution urges a significant investment in research and in the integration of new information into the decision making process. From a scientific point of view Biodiversity appears to be a loose concept and one needs to associate it with the impact of human activities on nature. This leads to several questions, two of which will be discussed: Is biotechnology a salvage or a scourge to the general biodiversity concern ? Should we promote more stringent conservations or should we rely on an evolution guided by the caution principle ?

The French scientific community has embarked on a multifacial national programme to promote research, communication and transfer to decision makers and field operators. The coherence of this approach with international or local projects as well as its future is both interesting and debatable.

Ted Benton,
 University of Essex,
 Colchester,
 UK

BIODIVERSITY

The term 'biodiversity', and the emergence of a global debate about its loss is a recent event. However, the reality of biodiversity loss has long been experienced, and protested by rural populations, especially in the poorest and most ecologically threatened parts of the world. In my talk, I want to explore two related questions One is: why is this question now urgently pursued in the global arena The second is how do the ambiguities and silences in the international debate both express and exclude social, economic and political divisions and contradictions?

What is 'biodiversity'? How do we measure its loss? Why is its loss important? Biodiversity may be defined in terms of the genetic diversity of all the populations of species on earth Overwhelmingly this diversity is the current outcome of millennia of random mutation and natural selection. Diversity is most obviously expressed in differences between species, but there is also considerable genetic diversity within and between populations of the same species. But biodiversity may also be defined in terms of 'phenotypes' the observably different varieties, species, genera and higher level taxa of living organisms. Finally, biodiversity may be defined in terms of the diversity of assemblages, or communities, made up of interacting populations of many different species, together with their inorganic conditions of existence - ecosystems

Already we can see that conflicts of interest are at work in these rival definitions The main proximate causes of human-generated biodiversity loss are urbanisation, agricultural intensification, air and water pollution, deforestation, and over-exploitation of fragile environments. These processes impact on biodiversity at the level of the ecosystems - destruction or transformation of wetlands, heaths, marine and coastal environments, temperate woodlands and tropical rain forests, species-rich grasslands, and so on. Their fundamental causes are social and economic: the economic and political power of the transnational

agrochemical, engineering and processing companies, the structure of rural and urban landownership, the policies of the multilateral financial agencies, global disparities, of economic, political and military power, the globalisation of economic decision-making, and factors internal to nation states, such as class, ethnic and gender divisions, political corruption social fragmentation, and endemic poverty,

To focus the global debate on biodiversity on this escalating problem of ecosystem destruction, and to do so in a way which has any prospect of addressing the underlying issues, would be to call into question the massively powerful vested interests which preside over these institutions and shape their policies. The more radical NGOs and some 'Third World' leaders and representatives of indigenous peoples do pose the question in these terms. However, the principal concern of the governments of the 'rich' countries is with loss of biodiversity, as defined in terms of genetic variation. This does, of course, have implications for ecosystem conservation, which gives a superficial impression of consensus over conservation: species-rich ecosystems must be protected if genetic diversity is to be conserved. But there is no consensus on why, in whose interests, or through what mechanisms this apparently agreed aim is to be pursued.

The agenda of the governments of the 'North', and of the transnationals in seeking international regulation of the conservation and use of biodiversity has three main elements. The first is the role played by local ecosystems as resource-bases for some basic needs-meeting on the part of families of low paid wage workers. The second derives from what is sometimes called the 'second contradiction of capitalism' (James O'Connor). Capitalism is held to have a built in tendency to destroy its own conditions, which is an alternative source of economic crisis to the ones traditionally identified by Marxists. In relation to intensive capitalist agriculture, for example, genetically uniform 'monocultures' are vulnerable to disease, and are intolerant to wide environmental variations. These agricultural systems require high levels of nutrient and pesticide inputs, and they tend to reduce the organic content of soils. Problems of erosion, pesticide residues and water pollution compound the direct socio-economic problems which they cause. More particularly, the spread of intensive systems takes place at the expense of traditionally managed or pristine ecosystems which are much more genetically diverse. The 'contradiction' for this food production system is that its 'technical fix' response to these problems relies on utilising the genetic diversity of related wild and traditionally cultivated crop varieties. Preservation of and access to these 'genetic resources' and so to the know-how of indigenous peoples and peasant farmers is thus a key strategic requirement for Northern-based agribusiness.

The third element in this Northern agenda is potentially even more significant. Across a whole range of industrial sectors, but most especially pharmaceuticals and agribusiness, a new wave of global capital accumulation will be based on biotechnologies. The basis of life itself is already in process of commodification, a form of 'enclosure of the commons' more extensive, more intensive, and more dangerous than any of its historical precedents. Biodiversity as raw material and means of production in this new wave of capital accumulation is not defined in terms of ecosystems or even in terms of species and varieties, but in the reductionist language of genetics: genes and genomes are the direct objects of manipulation and commercial exploitation. The key problem for this element in the Northern agenda is that the global centres of biological diversity, and most especially the tropical rain forests are situated in the countries of the 'South'.

This has suggested a global bargain: the North may be given access to the genetic diversity and local knowledge of the South, in exchange for - what? Rescheduling of debts to Northern banks? A 'fair and equitable sharing of benefits derived from research and development and use of biological and genetic resources' (Agenda 21, 15.4 (d))? Or transfer to the South of the new biotechnologies? It is deeply improbable that any such bargain could be struck, and even less likely that it would ever be implemented on the Northern side. But what is more my

concern is to ask if any such bargain would actually benefit either the rural poor of the South or the cause of biodiversity itself. If the main aim of the North is to preserve the conditions for a new wave of global capital accumulation, this imposes a very specific meaning on the term 'conservation'. In this strategy, conservation means establishing exclusive rights to the exploitation of the products of both nature and traditional gatherers and cultivators. In this commodification of nature, the multidimensional place of access to and engagement with a rich living environment in the lives of many millions of people is under attack. The 'benefits' may flow to some Southern elites, but the outcome could take the form of a new and more deadly form of bio-economic imperialism.

Finally, I want to consider the prospects for existing and potential social movement coalitions to gather forces, develop strategies and offer visions which might take us towards an alternative future.

Ole Henrik Magga,
Sami Parliament,
Guovdageaidnu,
Norway

RIGHTS FOR INDIGENOUS PEOPLE

Douglass C. North,
Washington University, St. Louis
USA

THE NEW INSTITUTIONAL ECONOMICS AND DEVELOPMENT

In this essay I intend to briefly summarize the essential characteristics of the new institutional economics, to describe how it differs from neo-classical theory, and then to apply its analytical framework (as I see it) to problems of development.

I

The new institutional economics is an attempt to incorporate a theory of institutions into economics¹. However in contrast to the many earlier attempts to overturn or replace neo-classical theory, the new institutional economics builds on, modifies, and extends neo-classical theory to permit it to come to grips and deal with an entire range of issues heretofore beyond its ken. What it retains and builds on is the fundamental assumption of scarcity and hence competition--the basis of the choice theoretic approach that underlies micro-economics. What it abandons is instrumental rationality--the assumption of neo-classical economics that has made it an institution-free theory. Herbert Simon has accurately summarized the implications of this neo-classical assumption, as follows:

If we accept values as given and constant, if we postulate an objective description of the world as it really is, and if we assume that the decision maker's computational powers are unlimited then two important consequences follow. First we do not need to distinguish between the real world and the decision maker's perception of it: he or she perceives the world as it really is. Second we can predict the choices that will be made by a rational decision maker entirely from our knowledge of the real world and without a knowledge of the decision maker's perceptions or modes of calculation (we do, of course, have to know his or her utility function). (Simon, 1986, p. s 210) In a world of instrumental rationality institutions are unnecessary; ideas and ideologies don't matter; and efficient markets--both economic and political--characterize economies.

In fact, we have incomplete information and limited mental capacity by which to process information. Human beings, in consequence, impose constraints on human interaction in order to structure exchange. There is no implication that the consequent institutions are efficient. In such a world ideas and ideologies play a major role in choices and transaction costs result in imperfect markets.

The place to begin a theory of institutions, therefore, is with a modification of the instrumental rationality assumption. We are still a long way from completely understanding how the mind processes information, but cognitive science has made impressive strides in recent years.

Individuals possess mental models to interpret the world around them. These are in part culturally derived--that is produced by the intergenerational transfer of knowledge, values, and norms which vary radically among different ethnic groups and societies. In part they are acquired through experience which is "local" to the particular environment and therefore also varies widely with different environments. Consequently there is immense variation in mental models and as a result different perceptions of the world and the way it "works." And even the formal learning that individuals acquire frequently consists of conflicting models by which we interpret the world around us.

¹Section I of this essay is drawn from the John R. Commons lecture given at the American Economic Association meetings in January 1992 and subsequently published in the American Economist (Spring 1992, pp 3-6) under the title "Institutions and Economic Theory".

Individuals make choices on the basis of their mental models. Individuals do learn, and changes in mental models stem from outcomes inconsistent with expectations; but in Frank Hahn's words "there is a continuum of theories that agents can hold and act upon without ever encountering events which lead them to change their theories." (Hahn, 1987, p. 324) In consequence there is not one determinate equilibrium which will obtain; but multiple equilibria can occur.

The incomplete information and limited mental capacity by which to process information determines the cost of transacting which underlies the formation of institutions. At issue is not only the rationality postulate but the specific characteristics of transacting that prevent the actors from achieving the joint maximization result of the zero transaction cost model. The costs of transacting arise because information is costly and asymmetrically held by the parties to exchange. The costs of measuring the multiple valuable dimensions of the goods or services exchanged or of the performance of agents, and the costs of enforcing agreements determine transaction costs¹.

Institutions are formed to reduce uncertainty in human exchange. Together with the technology employed they determine the costs of transacting (and producing). It was Ronald Coase (1937 and 1960) who made the crucial connection between institutions, transaction costs and neo-classical theory; a connection which even now has not been completely understood by the economics profession. Let me state it baldly. The neo-classical result of efficient markets only obtains when it is costless to transact. When it is costly to transact, institutions matter. And because a large part of our national income is devoted to transacting, institutions and specifically property rights are crucial determinants of the efficiency of markets². Coase was (and still is) concerned with the firm and resource allocation in the modern market economy; but his insight is the key to unravelling the tangled skein of the performance of economies over time, which is my primary concern.

How does this new institutional approach fit in with neo-classical theory? It begins with the scarcity hence competition postulate; it views economics as a theory of choice subject to constraints; it employs price theory as an essential part of the analysis of institutions; and it sees changes in relative prices as a major force inducing change in institutions.

How does this approach modify or extend neo-classical theory? In addition to modifying the rationality postulate, it adds institutions as a critical constraint and analyzes the role of transaction costs as the connection between institutions and costs of production. It extends economic theory by incorporating ideas and ideologies into the analysis, modelling the political process as a critical factor in the performance of economies, as the source of the diverse performance of economies, and as the explanation for "inefficient" markets.

I will expand on this last point--inefficient markets--because it highlights the major contribution that the new institutional economics can make to economics, economic history, and economic development. Coase began his 1960 essay by arguing that when it is costless to transact, the efficient neo-classical competitive solution obtains. It does so because the competitive structure of efficient markets leads the parties to arrive costlessly at the solution that maximizes aggregate income regardless of the institutional arrangements. Now to the extent that these conditions are mimicked in the real world, they are mimicked because competition is strong enough via

¹The transaction cost approach is unified only in its agreement on the importance of transaction costs. The approach developed here might most appropriately be termed the University of Washington approach. Oliver Williamson has pioneered a somewhat different approach.

²Wallis and North, "Measuring the Transaction Sector in the American Economy, 1870-1970" in Engerman and Gallman, 1986 found that 45% of national income was devoted to transacting in 1970.

arbitrage and efficient information feedback to approximate the Coase zero transaction cost conditions and the parties can realize the gains from trade inherent in the neo-classical argument.

But the informational and institutional requirements necessary to achieve that result are stringent. Players must not only have objectives but know the correct way to achieve them. But how do the players know the correct way to achieve their objectives? The instrumental rationality answer is that even though the actors may initially have diverse and erroneous models, the informational feedback process and arbitraging actors will correct initially incorrect models, punish deviant behavior, and lead surviving players to the correct models.

An even more stringent implicit requirement of the discipline-of-the-competitive-market model is that when there are significant transaction costs, the consequent institutions of the market will be designed to induce the actors to acquire the essential information that will lead them to correct models. The implication is not only that institutions are designed to achieve efficient outcomes but that they can be ignored in economic analysis because they play no independent role in economic performance.

But these are stringent requirements that are realized only very exceptionally. Individuals typically act on incomplete information and with subjectively derived models that are frequently erroneous; the information feedback is typically insufficient to correct these subjective models. Institutions are not necessarily or even usually created to be socially efficient; rather they, or at least the formal rules, are created to serve the interests of those with the bargaining power to create new rules. In a zero transaction cost world, bargaining strength does not affect the efficiency of outcomes; but in a world of positive transaction costs it does--and it thus shapes the direction of long run economic change.

It is exceptional to find economic markets that approximate the conditions necessary for efficiency. It is impossible to find political markets that do.¹ Because it is the polity that defines and enforces property rights, it is not surprising that efficient economic markets are exceptional. Moreover once an economy is on an "inefficient" path that produces stagnation it can persist (and historically has persisted) because of the nature of path dependence.

Institutional path dependence exists because of the network externalities, economies of scope, and complementarities that exist with a given institutional matrix. In everyday language the individuals and organizations with bargaining power as a result of the institutional framework have a crucial stake in perpetuating the system. Paths do get reversed (witness Argentina--from growth to stagnation in the past half century; or Spain-- the reverse since the 1950s). But reversal is a difficult process about which we know all too little--as witness the ongoing fumbling efforts at such reversal in central and eastern Europe. The reason is that we still know all too little about the dynamics of institutional change and particularly the interplay between economic and political markets. But let's see how far this analytical framework will take us.

II

An institutional/cognitive story of long run economic change begins by examining the changing initial conditions confronting diverse groups of individuals. As tribes evolved in different physical environments they developed different languages and, with different experiences, different mental models to explain the world around them. To the extent that experiences were common to different tribes the mental models provided common explanations. The language and mental models formed the informal constraints that defined the institutional framework of the tribe and were passed down intergenerationally as customs, taboos, myths that provided the continuity that we call culture and forms part of the key to path dependence.

¹See the author's "A Transaction Cost Theory of Politics", *Journal of Theoretical Politics*, Fall 1990

With growing specialization and division of labor the tribes evolved into polities and economies; the diversity of experiences and learning produced increasingly different societies and civilizations with very different degrees of success in solving the fundamental economic problems of scarcity. The reason for differing success is straightforward. The complexity of the environment increased as human beings became increasingly interdependent, and more complex institutional structures were necessary to capture the potential gains from trade. Such evolution required that the society develop institutions that will permit anonymous, impersonal exchange across time and space. But to the extent that "local experience" had produced diverse mental models and institutions with respect to the gains from such co-operation, the likelihood of creating the necessary institutions to capture the gains from trade of more complex contracting varied¹. The key to this story is the kind of learning that organizations acquired to survive. If the institutional framework made the highest pay-offs for organizations piracy, then organizational success and survival dictated that learning would take the form of being better pirates. If on the other hand productivity raising activities had the highest pay-off then the economy would grow.

There is no guarantee that the perceived pay-offs will favor the latter rather than the former and indeed economic history bears abundant testimony to economic growth being the exception. The long evolution of the western world from the relative backwardness of the tenth century to its growth, pre-eminence, and hegemony by the eighteenth century is striking not only because of the relative failures in the rest of the world (China and Islam for example) but equally for the diverse degrees of success in the west itself². What went wrong with the failures and more urgently why is it so hard to make it right? An explanation entails some analysis of the institutional requirements necessary to capture the productivity implications of modern technology.

The second economic revolution which began in the second half of the nineteenth century was the systematic application of the modern scientific disciplines to technology and more broadly to the economic problems of scarcity³. For those economies that could realize their potential the productivity implications have resulted in standards of well-being simply unimagined by prior generations. But to realize the advantages of this technology has entailed a fundamental restructuring of economic activity and more than that of the entire society. The economic restructuring involves realizing the productive implications of world-wide specialization and division of labor. While Chandler (1977) has captured some of the key elements of this transformation for individual firms, the overall costs of co-ordinating and integrating economies--transaction costs--entail economy-wide restructuring including the development of a polity that will enact and enforce the rules of the game necessary to such integration.

Why is such a polity so difficult to accomplish? A simple parable derived from game theory highlights the dilemma. Co-operative solutions in game theory are most likely when the play is repeated, when the players have complete information about the other players' past performance, and when there are small numbers of players. Let me turn that story around; co-operation is difficult to achieve when the play is not repeated or there is an endgame, when the players do not possess information about the other players, and when there are large numbers of players. In those circumstances the gains from defection typically outweigh the gains from co-operation.

¹Ronald Heiner (1983) in a path breaking article first articulated the connection between uncertainty and institutions and suggested that institutional development could be arrested using an argument similar to that advanced here.

²See Jones (1981 and 1988), Rosenberg and Birdzell, (1986) and North and Thomas (1973) for explanations of this evolution.

³See North (1981) chapter 13, "The Second Economic Revolution" for an elaboration of this argument.

The second economic revolution created an economic world characterized by impersonal markets and all the attendant characteristics of the latter game theoretic conditions. To overcome them entails the creation of institutions that so structure the rules and their enforcement as to alter the pay-offs to induce co-operative solutions. This analysis is hardly new (although the terminology may be different). Karl Marx long ago pointed out that the tension between the organizational imperatives of a technology and the existing property rights was a fundamental source of conflict and change. Marx's error was that he thought that it was capitalism that was incompatible with the new technology. In fact it has been the flexibility of the political and economic institutions of the market economies that has enabled them to adjust to realize the productivity implications of the second economic revolution. And, ironically, it has been the inflexibility and rigidities of centrally planned economies that have led to their demise.

But there is still more to the issue of institutional adjustment to the second economic revolution. That adjustment entails a total societal transformation. Impersonal exchange, minute specialization and division of labor, a radical reduction in information costs, and world wide interdependence entail a complete transformation of every aspect of societal organization. Urbanization, ubiquitous externalities, the insecurity arising from interdependence, and radical alteration of the traditional functions of the most fundamental organization of all prior societies--the family--have produced and continue to produce immense modern social problems. Again it has been the flexibility of the political and economic institutions of western economies that have, very imperfectly, provided substitutes for the traditional role of the family; insured against the new insecurities affecting individuals; and dealt with the externalities, environmental as well as social, that accompany this economic transformation.

III

It is precisely in this economic and social context that the modern problems of economic development must be considered. The fundamental issue can be stated succinctly. Successful development policy entails an understanding of the dynamics of economic change if the policies pursued are to have the desired consequences. And a dynamic model of economic change entails as an integral part of that model analysis of the polity since it is the polity that specifies and enforces the formal rules.

We are still some distance from having such a model but the structure that is evolving in the new institutional economics, even though incomplete, suggests radically different development policies than those of either traditional development economists or orthodox neo-classical economists. Development economists have typically treated the state as either exogenous or as a benign actor in the development process. Neo-classical economists have implicitly assumed that institutions (economic as well as political) don't matter and that the static analysis embodied in allocative-efficiency models should be the guide to policy; that is "getting the prices right" by eliminating exchange and price controls. In fact the state can never be treated as an exogenous actor in development policy and getting the prices right only has the desired consequences when you already have in place a set of property rights and enforcement that will then produce the competitive market conditions.

Before going further it is essential to distinguish clearly institutions from organizations. Institutions are the rules of the game of a society or more formally are the humanly-devised constraints that structure human interaction. They are composed of formal rules (statute law, common law, regulations), informal constraints (conventions, norms of behavior, and self imposed codes of conduct), and the enforcement characteristics of both.

Organizations are the players: groups of individuals bound by a common purpose to achieve objectives. They include political bodies (political parties, the senate, a city council, a regulatory agency); economic bodies (firms, trade unions, family farms, co-operatives); social bodies (churches, clubs, athletic associations); and educational bodies (schools, colleges,

vocational training centres). These definitions undergird five propositions that define the essential characteristics of institutional change:

1. The continuous interaction of institutions and organizations in the economic setting of scarcity and hence competition is the key to institutional change.
2. Competition forces organizations to continually invest in skills and knowledge to survive. The kinds of skills and knowledge individuals and their organizations acquire will shape evolving perceptions about opportunities and hence choices that will incrementally alter institutions.
3. The institutional framework dictates the kinds of skills and knowledge perceived to have the maximum pay-off.
4. Perceptions are derived from the mental constructs of the players.
5. The economies of scope, complementarities, and network externalities of an institutional matrix make institutional change overwhelmingly incremental and path dependent.

Let me elaborate on these propositions. Economic change is a ubiquitous, ongoing, incremental process that is a consequence of the choices individuals and entrepreneurs of organizations are making every day. While the vast majority of these decisions are routine (Nelson and Winter, 1982) some involve altering existing "contracts" between individuals and organizations. Sometimes that recontracting can be accomplished within the existing structure of property rights and political rules; but sometimes new contracting forms require an alteration in the rules. Usually existing informal norms of behavior will guide exchanges, but sometime such norms will gradually be modified or wither away. In both instances institutions are gradually being modified. Modifications occur because individuals perceive that they could do better by restructuring exchanges (political or economic). The source of the changed perceptions may be exogenous to the economy--for instance a change in the price or quality of a competitive product in another economy that alters the perceptions of entrepreneurs in the given economy about profitable opportunities. But the fundamental source of change is learning by entrepreneurs of organizations.

While some learning is a result of idle curiosity, the rate of learning will reflect the intensity of competition amongst organizations. Competition is a ubiquitous consequence of scarcity and hence organizations in an economy will engage in learning to survive. But the degree can and does vary. If competition is muted as a result of monopoly power the incentive to learn will be reduced.

The rate of learning determines the speed of economic change, the kind of learning determines the direction of economic change. The kind of learning is a function of the expected pay-offs of different kinds of knowledge and therefore will reflect the mental models of the players and most immediately at the margin, the incentive structure embodied in the institutional matrix. As noted earlier if the institutional matrix rewards piracy (or more generally redistributive activities) more than productive activity then learning will take the form of learning to be better pirates.

Change is typically incremental, reflecting ongoing ubiquitous evolving perceptions of the entrepreneurs of organizations in the context of an institutional matrix that is characterized by network externalities, complementarities and economies of scope among the existing organizations. Moreover since the organizations owe their existence to the institutional matrix, they will be an ongoing interest group to assure the perpetuation of that institutional structure--thus assuring path dependence. Revolutions do occur, however, when organizations with different interests emerge (typically as a result of dissatisfaction with the performance of

existing organizations) and the fundamental conflict between organizations over institutional change cannot be mediated within the existing institutional framework.

IV

It is one thing to describe the characteristics of economic change; it is something else to prescribe the correct medicine to improve the performance of economies. We simply don't know how to transform ailing economies into successful ones but some fundamental characteristics of institutions suggest some clues.

1. Institutions are made up of formal rules, informal norms and the enforcement characteristics of both and it is the admixture of rules, norms, and enforcement characteristics that determines economic performance. While the formal rules can be changed overnight, the informal norms change only gradually. Since it is the norms that provide the essential "legitimacy" to any set of formal rules, revolutionary change is never as revolutionary as its supporters desire and performance will be different than anticipated. More than that societies that adopt the formal rules of another society (such as Latin American countries' adoption of constitutions like that of the United States) will have very different performance characteristics than the original country because both the informal norms and the enforcement characteristics will be different. The implication is that transferring the formal political and economic rules of successful western market economies to third world and eastern European economies is not a sufficient condition for good economic performance. Privatization is not a panacea for solving poor economic performance.

2. It is politics that shape economic performance because they define and enforce the economic rules of the game. Therefore the heart of development policy must be the creation of politics that will create and enforce efficient property rights. Unfortunately, however, research in the new political economy (the new institutional economics applied to politics) has been largely focused on the United States and other developed countries. While we know a lot about the characteristics of the politics of third world countries we have very little theory about such politics¹. We know even less about the consequences of radically altering the institutional framework of central and eastern European societies. However, the characteristics of institutions described in the foregoing sections of this paper suggest some implications:

a. Political institutions will be stable only if they are supported by organizations with an interest in their perpetuation. Therefore an essential part of political/economic reform is the creation of such organizations.

b. It is essential to change both the institutions and the belief systems for successful reform since it is the mental models of the actors that will shape choices.

c. Evolving norms of behavior that will support and legitimize new rules is a lengthy process and in the absence of such reinforcing norms politics will tend to be unstable.

d. While economic growth can occur in the short run with autocratic regimes, long run economic growth entails the development of the rule of law and the protection of civil and political freedoms.

e. Informal constraints--norms of behavior, conventions, and codes of conduct--are a necessary (but not sufficient) condition for good economic performance. Societies with norms favorable to economic growth can sometimes prosper even with unstable or adverse political rules. The key is the degree to which there is enforcement of the adverse political rules. We

¹Interest in modelling the politics of third world economies is still in its infancy. Robert Bates (1981, 1983, and 1989) has been a pioneer in applying the new political economy to African economies.

know very little about the evolution of belief systems and consequent informal constraints although religions have clearly been a basic component of belief systems.

3. It is adaptive rather than allocative efficiency which should be the guide to policy. Allocative efficiency is a static concept with a given set of institutions; the key to continuing good economic performance is a flexible institutional matrix that will adjust in the context of evolving technological and demographic changes as well as shocks to the system. It is the creation of a stable polity with complementary norms that is the essential characteristic. Successful political/economic systems have evolved such characteristics over long periods of time. We know very little about how to create such systems in the short run or indeed, whether it is even possible to create them in short periods of time. However it is doubtful if the policies that will produce allocative efficiency are always the proper medicine for ailing economies. Efficient policies that are perceived to be inequitable will engender political reactions which can stall or reverse effective reforms.

There is no greater challenge facing today's social scientist than the development of a dynamic theory of social change that will fill in many of the gaps in the foregoing analysis and give us an understanding of adaptive efficiency.

Margaret A. McKean
 Department of Political Science, Duke University
 Durham, North Carolina 27708-0204
 USA

REINVENTING THE COMMONS

We are indebted to institutional economic historians in general and Douglass North in particular for pointing out the impact of institutional structures on economic growth, and especially for making us appreciate the importance of clear specification of property rights in economic growth and in efficient use of resources. When this idea is combined with the crude (but apparently true) historical simplification that many societies used to have common property institutions and that individual private property has in many instances displaced common property, one might carelessly conclude that individual property is more efficient than common property. And that efficient resource use -- important in an era of environmental pressure -- requires that we dismantle common property and replace it with individual private property. This conclusion is, of course, at the heart of the campaign to privatize resource use around the world, and I believe that it represents a grotesque misunderstanding of North's insights.

Instead, I believe one can use North's arguments to diagnose the strengths and weaknesses of common property as well as of individual property, and to itemize circumstances in which REINVENTING the commons might be efficiency-enhancing. I would argue that common property (a human invention) can enhance the efficiency of resource use for common-pool resources (a natural physical state that humans cannot easily alter). In my comments, I will try to lay out an argument for why it might actually be reasonable for societies to move from common property (or a system of combined common and individual property) to more fully individualized private property, and back again to common property. All three transitions (the creation of common property in a pre-industrial setting, the move toward individual private property, and then a shift again toward more common property on seriously pressed resource systems) are efficiency-enhancing.

The first transition (the creation of common property) would be a way to reduce enforcement costs and to enforce conservative or sustainable resource use when substitutes for those resources were not readily available. After new technologies and, more importantly, long-distance trade makes substitutes available (more fish to supplement local fish in the diet, fish-meal fertilizer to supplement organic matter gathered from meadows as fertilizer for cultivated fields, wood from far away to supplement wood supplied by local forests), there is less need for conservative management of local resources and greater reason to contemplate the conversion of some resource systems into completely different uses. Local forests (at least those in fairly flat areas) might be cut down for cultivation or urban expansion, or local fisheries converted into industrial harbors. But when the alternatives become expensive because the resource systems from which they come are also pressed (global environmental shrinkage), or when the intensification of use through privatization produces new negative externalities among competing uses, then coordinated management among multiple resource/land users may once again become necessary for reasons of efficiency. Thus industrial economies find that they must create common property in environmental sinks (air, water, and soil) in order to maintain environmental services from those sinks. Urban areas must devise zoning and coordinated land use regulation in order to preserve diminishing public amenities. And natural resource systems yielding products for which no cheap substitutes are any longer available must once again be jointly managed in order to coordinate uses for optimal sustainable yield.

North's insight was to demonstrate that clear, specific, and exclusive property rights encourage investment and thus stimulate economic growth. It is a tragic misapplication of this principle to think that all resource systems must be sliced up into individual portions. Common-pool

resources don't slice well; and the more intensively we use resources that we thought we could slice up, the more we discover negative externalities among competing uses. In such situations, we obtain higher long-term productivity from such resource systems by coordinating our uses, through joint management. That is, by having groups of individuals share clear, specific, and exclusive property rights. Sadly, we have reached the point on this planet where resource use is often too intense to tolerate these externalities. Fortunately, we have an institutional record and a storehouse of surviving indigenous knowledge to comb to stimulate our imaginations, to help us reinvent the commons.

PART 2
ABSTRACTS

Bernt Aarseth
 NFH, University of Tromsø
 Tromsø,
 Norway

HERDING IN THE COASTAL COMMONS - THE POSSIBILITY FOR MANAGING COD AS LIVESTOCK

Norwegians have experimented with enhancement of marine fish stocks for more than 100 years in order to increase the output of the fisheries. The present effort is conducted as a transdisciplinary program, involving both policymakers as well as the research community. This paper/poster address the questions:

1. What is the design of the institutional "landscape" where cod-herding takes place?
2. What is the opportunity for the new activity to thrive in this landscape?
3. What are the alternatives, or scenarios?

The framework of future cod-herding is based on biological as well as social, political, and cultural considerations. This paper draws on different lines in contemporary research, as management of marine CPR's, production of cod fry, characterization of a coastal cod stock, and recruitment patterns and knowledge production in fishing communities. This research is in particular focused on the future role of the Fisherman's Union and other main fishery organizations, alternative regimes for regulation of the capture, and organization of the fish trade.

Mahfuzuddin Ahmed, D.Capistrano, and M.Hossain
 ICLARM,
 Makati,
 Philippines

INSTITUTIONALISATION OF FISHERIES CO-MANAGEMENT: EXPERIENCES WITH GO-NGO-FISHER PARTNERSHIP MODELS IN BANGLADESH

Failure of the Bangladesh government in the past to verify responsible fishing practices and equitable distribution of benefits under traditional leasing systems has motivated the government to work in partnership with NGOs(non-governmental organisation) and fishing communities in recent times. Several models of interactions between governmental organisations (GO), NGOs, and fishing communities have emerged out of the partnerships; a number of these are being supported technically and financially by the International Centre for Living Aquatic Resources (ICLARM) and the Ford Foundation, respectively.

The paper discusses the operational approaches that were used to identify the fishery commons and create institutions for increasing the participation of local fishers in the making and enforcing of resource use rules. The group-based empowerment strategies of NGOs; their role in securing for the beneficiaries the access rights to waterbodies used for fisheries as well as provision of credits and inputs for employment and income generation activities showed some practical evidence of the concept of the poor as managers of the fisheries resource. The paper also discusses the policy issues involving the rights held by local community members to catch fish for subsistence purposes; practices and uses that affect the physical environment. There are also issues associated with the difficulties of reconciling differing GO and NGO priorities and points of view with regard to target group identification and levels of responsibilities. The paper concludes that a non-obstructionist policy context and interests of the powerful groups as well as those dependent on the fishery resources are the critical factors for successful evolution of co-management models in the context of Bangladesh.

Janis Alcorn and Victor Toledo
 World Wildlife Fund, Biodiversity Support Program,
 Washington, DC 20037
 USA

TENURIAL SHELLS AND SUBSYSTEMS: PROPERTY RIGHTS, SOCIAL ORGANIZATION AND THE ECOLOGY OF RESOURCE MANAGEMENT IN MEXICO'S FORESTS.

In this paper, we posit that tenurial systems function as "shells" in the sense that they provide the superstructure, or inner environment, within which activities are developed and operate. We assess the hypothesis that local tenurial shells play a critical role for enabling local subsystems to persist and participate in local renewal cycles within the larger global system. The tenurial shell is a constraining and enabling structure with particular characteristics linked in very specific ways to the larger "operating system" in which the shell is embedded. The shell responds to local, cultural, ecological and social factors, including those arising from externally generated stresses or opportunities. External recognition (especially with legal protection) of local property rights regimes strengthens shells so they also function as a protective border around a system that could not remain viable in the larger, outer environment if left unprotected. We explore how management systems adapted to local ecosystems have developed and flourished within the protective enabling shells of community based tenurial systems. We also stress that the strength of those local shells, and the resource management systems within them, depends on active, intercommunity organizations and institutions that adhere to community-based ethical values and confront the resource-seeking institutions and organizations of the outer milieu that dominate the larger global system. We suggest that subsystems depend on interactions with other subsystems in order to survive today's world, while at the same time local, dynamic subsystems are essential for sustainability of the larger global system.

Juan Luis Alegret
 Dept. of Geography
 University of Girona,
 Spain

CONFLICTS: THE CASE OF THE CATALAN FISHERMEN CONFRERIES

One of the most important characteristics of the traditional fishermen organisations at the Catalan coast - the confrerries or guilds - has been their ability to solve conflicts that came up within their territorial domains. Furthermore, with the present consolidation of tourism, ecological and nature conservation movements and, above all, with the elaboration and future application of the EU Common Fishery Policy to the Mediterranean this capacity for conflict solving could become much limited. In this paper it is our intention to demonstrate in which way at the Catalan coastal area and caused by the above mentioned changes a redefinition of the fishing as common property / appropriation has been created; and besides a redefinition of the marine space and the coastal areas historically used by the Fishermen which was also seen of as communal use. Firstly, we shall give a short characterisation of some of the presently most significant conflicts which occur in connection with fishing activity in coastal Catalonia showing the different arguments that each of the parties give to defend their rights and access and see how the concepts of resources and of territories of communal appropriation / occupation have been redefined. In continuation of this we describe for each of the chosen conflicts the type of solution that turn up and who are the actors who intervene in the search for these solutions. The purpose is to demonstrate that in the themes of access to fishing resources and the associated conflicts the fishermen organisations are the losing parties in comparison with other actors connected to the fishing sector.

Barbara Allen,
Department of Political Science, Carleton College,
Northfield, MN 55057,
USA.

FEDERAL SYSTEMS AND THE COVENANTAL TRADITION: APPROACHES TO COMMON PROPERTY DILEMMAS.

Liberal political theorists and practitioners of modern democracy have occasionally observed that a liberal individualist conception of rights unduly limits the set of governing relations to a two-level system, with individuals at one level and the state at another. The extent of the problem caused by this limited vision is apparent when liberal democracies are faced with the challenges of common pool resource issues. The observations of Alexis de Tocqueville in the last century and Vincent Ostrom's at the close of the present age, show that liberalism in itself does little to remove the conceptual fetters of a theory of sovereignty that assumes that a single, absolute center of political authority must rule individuals. Tocqueville also reveals liberal theory's dangerous division of life into public and private -- a division that limits our conception of political activity to the realm of government alone and fails to recognize the importance of an authentic private sphere to the development of a vital public life. In terms of contemporary policy making and analysis, this limitation prevents us from identifying an alternative to dichotomous choices between private property and state ownership, ignoring the multiplicity of voluntary, self-organizing, and self-governing activities that address common pool resource problems.

Perhaps it is not surprising that liberalism fails to conceptualize institutional possibilities beyond this limited depiction. The early thinkers in this genre, Hobbes and Locke, each -- though in different ways -- tell us how individuals construct authority that ever-after rules them. What should surprise us is that while 17th Century liberals wrote of abstract individuals, actual people were establishing a different, although related form of government in North America. This form of self-government and self-organization was based in a covenanting tradition that provides the foundation of American federalism. Reclaiming early documents pertaining to this covenantal period, political historian Donald Lutz helps us recognize how federalism differs from liberalism and offers an alternative to individualism.

Although federalism is usually understood as an instrument that promotes the particular aims of liberalism, it is based on a method that, unlike liberalism, neither focuses solely on abstract right-and-duty-bearing individuals, nor abstracts individuals from the inevitable collective problems that they face. Rather it accounts for communities formed by persons who, thereafter, are never wholly autonomous from them. Government may promote or diminish the chance for some types of relationships, but governments, even federal governments, are structures that support antecedent communities. In this conceptual scheme, analysts must account for individuals and communities in order to understand the various institutional frameworks that address common property problems.

In this essay, I will draw on the observations of Alexis de Tocqueville, the historical work of Donald Lutz, and Vincent Ostrom's interpretation of American federalism to discuss the covenantal basis of federal systems and their potential for dealing with common pool resource problems. In addition to the American experiment in self-government, scholars who understand federalism as a reflection of a covenantal theory, may also draw on the prior example of Swiss federalism. Analysts might also learn from traditional and contemporary means for recognizing groups with distinct ways of life in nation states -- such examples range from Native peoples with sovereignty embedded in the constitutional systems of Canada and the United States, to the "Travellers" in Ireland to the Sami of Norway.

My emphasis in this essay will be on the United States, although my intention is to draw out larger principles, identifying federal instruments and the covenanting theory that they represent, and, in so doing, find an alternative to the dichotomies of liberal theory which limit our political analysis.

Kirsten Ewers Andersen
Galgebakken Sten 4-1
2620 Albertslund
Denmark

WHAT DO LOCAL/INDIGENOUS PEOPLE GET OUT OF BIODIVERSITY CONSERVATION? THE CASE OF THE HUAI KHA KHAENG - THUNG YAI NARESUAN FORESTS IN THAILAND

Description of the national and global (WB/GEF) strategies for forest biodiversity conservation in Thailand and the incapacity of international 'ready-made thinking' to incorporate the local vernacular understanding and management of the forests into this thinking. This incapacity is reflected in the project-conceived people -forest / biodiversity / buffer zone relationships.

Background.

The largest expanse which today in Thailand exhibits renowned biological diversity are the forests between Thailand and Myanmar, i.e. the Huai Kha Khaeng - Thung Yai Naresuan forests. These forests have been the habitat of Pwo Karen tribals for centuries. For the hinterlands up the Mae Khlong and Kwae Noi rivers a British colonial officer in Burma wrote in 1836 that

"The whole of this belt is clothed in dense primeval forests, and is only occasionally visited by Siamese and Burmans. It is filled with wild beasts, and the valleys formed by the interior ranges give shelter to those Karian tribes who disdain or avoid as far as they are able, any dependence on either of the nations above noticed". (Low 1835) .

These "tribes" are ones which today have become the much debated Karen enclaves inside the PA. And the "primeval forests and wild beasts" have become - in the eyes of today's society - a biodiversity of global as well as national concern.

To these concerns local people represent a threat against, - seldom custodians of - the biodiversity. However, as the expanse of protected areas in Thailand increase through decrees, inherently the number of people who find themselves inside Protected Areas will increase. Therefore, alternative ways of

thinking the man - biodiversity relationship are necessary which build on the fact that people are there and start seeing them for what they are or can become, namely custodians of the same biodiversity under an alternative tenure and property regimes.

Discussion can take place on the following. Suggestions on what to emphasise are warranted from the organiser so it fits into the session it may be put:

a) what constitutes biodiversity to the national and global community (the re-introduction of enclosure thinking); b) what is a buffer zone concept (physically, socially and economically); c) indigenous knowledge aspects; d) institutional development (induced and sponsored) aspects, match between institutions and the physical characteristics of resource; e) human rights; f) World Bank, Governments and NGOs

Raoul Andersen,
 Anthropology Department, Memorial University of Newfoundland,
 St. John's, Newfoundland,
 Canada

NEWFOUNDLAND'S SMALL CETACEAN HUNT: WHAT IT WAS AND MAY BECOME

This discussion is in three parts. The first describes the organization of small cetacean hunting in Newfoundland especially prior to 1972, when Canada declared a moratorium on commercial whaling. The adaptation was primarily commercial, one opportunistic niche in an annual east coast inshore fishing regime. In contrast to the centuries-old hunt for the same species conducted in the Faroe Islands, which also cut across boat crews, kindreds, and communities, the Newfoundland case appears to have been socially more brittle. Its rules of conduct were not tried and trusted. I will outline reasons for this.

The second examines the period since 1972 to the present. It has seen a growing awareness of human-marine species relationships in ecosystem terms, regionally and globally, and a growing social-ideological movement that would alter the cultural calculus by which species are valued. The impact of the first development is intensified in Newfoundland by the recent general collapse of its marine groundfish species and a government imposed commercial fishing moratorium that has halted most of our inshore and offshore fishing since 1992.

The third part considers the likely future in view of the province's new economic development vision and movement toward a "sustainable", diversified, economy and communities. Against this emerging future background, perhaps only one-half the pre-1992 fisheries labour force may expect to be employed in the fishing industry. The shape and resource base of that fishery yet to be remain subjects for debate. Where might small cetaceans figure in the new calculus? What do alternative solutions imply in resource management and social-cultural terms, especially where the modern regional marine resource management has been so full with failure? I will attempt to provide some speculative answers to these questions.

C. Leigh Anderson,
 School of Public Administration, Carleton University
 Ottawa, ONT K1S 5B6
 Canada

INCOME DISTRIBUTION AND PROPERTY RIGHTS ON THE ENVIRONMENT

Over twenty years ago Indira Gandhi argued that the worst form of pollution was poverty. Since then, tests of the positive relationship between per capita income and environmental quality (measured by the stock of forests or the absence of air and water pollution) have generally supported the existence of an "environmental Kuznets curve". This paper suggests that if patterns of environmental quality between countries are related to differences in their average incomes, then the distribution of income within a country should also be expected to affect environmental quality in some predictable way. Unfortunately, few empirical studies examine differences among countries' income distributions.

More recently, the theoretical link between property rights and resource use has become widely recognized. While there is considerable empirical research ongoing in this area, data constraints have limited most hypothesis testing to case studies.

Despite continuing measurement problems, opportunities for crosscountry empirical work have expanded considerably in the past few years with the availability of larger databases of environmental variables. In this paper I use some of these databases to explore the relationship between environmental quality and income distribution, and environmental quality and property rights, for a variety of environmental measures. In addition to distinguishing among different environmental variables, this paper contributes to the small number of cross-sectional studies by focusing on income distribution within a country, rather than simply average income across countries, and by including a proxy for property rights.

Jostein Angell,
Høgskolen i Bodø,
Bodø,
Norway

ON NORTHERN FORUM

The Northern Forum is an International organisation of regional leaders from Circumpolar Arctic and Northern Regions. The Forum's mission is to improve the quality of life in the North by promoting and facilitating exchanges among leaders, experts and business, and thus contribute to the economy and a sustainable development for the benefit of all Arctic peoples. The organisation has grown into a recognised and respected world organisation, represented by over 23 government leaders in the North, and should be viewed as an organisation which will significantly impact the development of Northern economies. The organisation works under the principle of consensus and by passing resolutions in order to support its collective work on priority projects. The present project portfolio consists of 15 different projects organised under the following working groups:

Transportation
*Banking and Finance
*Environmental protection
*Culture
*Sustainable Development
*Academic

Future work is aimed at developing natural resources, providing for stable and sustainable economies, recognising the dependency upon such resources, including humans, flora and fauna. Further the aim is to maintain natural habitats and to minimise environmental pollution for the protection of Northern ecosystems. Finally the aim is to maintain and enhance the unique culture, economy and way of life of indigenous people inhabiting remote northern regions.

Arild Angelsen
Chr. Michelsen Inst.,
N-5036 Fantoft,
Norway

BREAKDOWN OF COMMUNAL MANAGEMENT AND DEFORESTATION: A CASE STUDY FROM SUMATRA

The breakdown of communal management of natural resources is a widely observed phenomenon throughout the developing world. This paper reports on recent changes of the shifting cultivation system in a lowland rainforest area of Sumatra, Indonesia. The customary (adat) system makes forest communal (village) property for a number of uses (e.g., collection

of most forest products), but with individual user-rights for swidden cultivation based on the initial clearing of primary forest. The development over the past 10-15 years is typical of the situation in many areas of Southeast Asia: A sharp increase in land claims associated with Government supported projects (transmigration, logging, mining and plantations), population growth, improved accessibility by road construction, and increasing tensions between national and customary law when it comes to land ownership and compensation for land expropriation.

The farmers response to the external changes has been a sharp increase in (primary) forest clearing, increased rubber planting on the swiddens (which secures individual rights both according to customary and national law), as well as obtaining (expensive) formal land deeds. This has initiated a self-reinforcing race for land and private property rights.

The paper analyzes these changes within the theory of the demand for and supply of institutional arrangements, as found within neo- institutional economics. A basic premise of this approach is that institutions will change if existing arrangements leave potential gains uncaptured. It is argued, that the recent developments in the study area should be understood as the combination of increased land value, and the fact that this could not be captured under a communal management regime: Intensification and planting of perennials require more secure and individual rights in order to provide incentives and reduce the free rider problem. Moreover, the state does not provide protection of customary rights in conflicts with outsiders (which included the state itself). In this way, government policy influences the supply of property right arrangements, and is important in shaping the growth of private property rights, and weakening and possible breakdown of the communal management system.

Martine Antona,
CIRAD-Green, 42 Rue Scheffer,
75116 Paris
France

MARKETS AND COMMON PROPERTY REGIMES - SOME OBSERVATIONS

The interactions between ecological and social dynamics have become a major field of scientific research within the debate on sustainability. Common property regimes exhibit sustainable patterns of men-resource interactions, as shown by many field studies. We will focus here on a kind of social dynamics, the market relationships, in order to deal with their impact on common property regimes. While property rights markets are considered to be de facto incompatible with the survival of common property regimes, the issue is less adressed for the other markets. For instance, common property regimes and labor market relationships can be studied through the impact of an excess in labor supply. Moreover, the market externalities between agricultural outputs and common pool resources can be further investigated.

We will discuss wether markets, or some well-identified market characteristics, might limit, maintain, enhance commons or create new commons, with some examples of field -works.

Bustanul Arifin
 Institute for Environmental Studies University of Wisconsin-Madison
 Madison, WI 53705,
 USA

INDIGENOUS KNOWLEDGE AND SUSTAINABLE COMMONS: THE CASE OF AN INDONESIAN SUBAK

This paper analyzes how a subak water-user organization deals with religious and democratic principles of water management, how these principles are translated into an interdependence perspective that would result in fair rights and duties of the organization members, and why outsider intervention may threaten the sustainability of the whole water management system and common property resources in general. The heart of this water management system is a strong belief in the Hindu religious doctrine that water is not only common property resources but a God-owned property, a part of nature which human beings are encouraged to utilize properly. Key elements of the subak success story includes fair and clearly-stated rules and agreements, equitable rights and duties among organization members, strong enforcement of any violations and ethical, social and religious responsibilities attached to the feeling of interdependence among members. It has been able to overcome defiances by government officials and the vested interests of local and regional elites mostly due to the homogeneity in ethnic and social status of its group members.

Hernan Aubert
 School of Renewable Natural Resources, University of Arizona,
 Tucson
 USA

APPLICATION OF A NEW MEASURE OF TRAWLING EFFICIENCY IN FISHERY MANGEMENT

Traditionally, bio-economic models used in most of the world's fisheries have used a measure of relative fishing success expressed as Catch Per Unit Effort (CPUE). However, CPUE (e.g. amount of targeted species caught per hour of fishing), can be misleading economically and biologically. Traditional CPUE not only overlooks the amount of labour (hence effort) involved in sorting unwanted by-catch, but also ignores the risk involved in damaging or even loosing equipment to a large amount of accompanying fauna. Even more critical, CPUE, as currently used, does not assess the exploitation efficiency of fishing grounds and local stocks, nor does it incorporate the potential ecological damage brought about by the removal and killing of unwanted species.

The biomass of by-catch may far exceed the yield of target species in trawling operations in general, and shrimp trawling in particular. I propose a calculation of "trawling Efficiency" (TE) that can be applied to by-catch and CPUE data resulting in a more realistic measure of exploitation potential of regional stocks. TE is calculated as the ratio between CPUE calculated for the target species and CPUE for the by-catch; this ratio is expressed as a percentage. I applied this calculation to several fishing grounds within the upper Gulf of California region. The results provide support for restricting trawling in areas with low TE where unwanted species are found in large volumes or at an early stage of maturity. Identifying and restricting exploitation of fishing grounds with low TE could prove useful in protecting keystone and commercial species, increasing the likelihood of a sustainable exploitation of resources.

Laurent Auclair
ORSTOM TUNIS,
Tunis,
Tunisia

FORESTRY COMMONS IN MOROCCO ATLAS

The pre-colonial period in the Maghreb is characterised by the predominance of various different forms of community appropriation of forests and grazing lands. With the coming of the colonial period, the French forestry code reaches the Mediterranean and radically transforms the land map and the nature of forestry exploitation.

During the last century, one can notice the following major tendencies: The private appropriation of land (melkisation) continued without interruption, at the expense of the common property. At the same time, the methods of community management almost universally underwent a crisis.

The dominant idea, for state authorities as for specialists in rural development, was that common property represented an obstacle to the modernisation of agriculture and the rational exploitation of resources.

However, encouraged by international organisations in the context of structural adjustments or of Agenda 21, new forestry strategies call for popular and active participation in the agreed management of forest areas. On the question of the management of natural resources, the said approach has taken roots in the Maghreb. But if the discourse is becoming well-developed, concrete achievements are still very modest.

This state of affairs illustrates the need to identify and study forms of organisation, which are usually informal, which operate in the management of land and of resources. The task now becomes, therefore, the evaluation of their ability to intervene; and to devise the conditions which will allow their modification (in terms of codes of regulations, and development strategies) in order that they can become major factors in the agreed management of resources.

The aim of this contribution is to illustrate this approach using a test case in the valley of A-it Bou Gmez, in the Moroccan High Atlas. We wish to emphasise the following point:

Particular social and ecological conditions are able to determine the efficiency of forms of community management allowing for the renewal of forestry resources. These management systems could become the basis of an innovative forestry development, radically changing the relationship between the administration of the forest and its users.

Yildiz Aumeeruddy,
Laboratoire de Botanique, Institut de Botanique,
34 000 Montpellier,
FRANCE.

LOCAL REPRESENTATIONS AND MANAGEMENT OF BIOLOGICAL DIVERSITY IN THE KERINCI VALLEY (CENTRAL SUMATRA): LINKS WITH COMMON PROPERTY MANAGEMENT.

In the Kerinci agrarian valley, surrounded by Kerinci Seblat National Park in Central Sumatra, Indonesia, agricultural transformations since the beginning of the century and the appropriation of forest lands by the state for the purpose of nature conservation has given way to many changes in land tenure systems and access to resources.

Village territories which were managed according to a threefold zoning system including forest lands, cultivated hill lands and ricefields were reduced to cultivated hills and ricefields. The plantation of export tree crops, mostly coffee (*Coffea robusta*, Rubiaceae) and cinnamon (*Cinnamomum burmani*, Lauraceae) induced many changes in the land tenure systems, rights of access to resources and agricultural practices.

Local representations and management of bio - diversity are analysed and links between local perceptions of bio- diversity and common property management are discussed through a comparative study between three villages: the first village shows a mixed common and private land tenure system in the hill lands; trees planted by the farmer determines his right of access to land; the second village shows a private based land tenure system in the hills; however the presence of some trees transmitted from one generation to another gives a communal dimension to the land which is felt as ancestral lands. This favors the development of common property resource-based activities such as gathering, use of communal labor force and exchanging of services; in the third village, the relationship to land has evolved into an entirely private-based land and resource tenure system with many land transactions which has favoured the built-up of land stocks by rich farmers who rent their land to share-croppers. The management of biological diversity both of forest and agroforest resources shows a very low profile in this area. This paper attempts to show that socio - political and macro-economic changes which have induced changes in land use and resource use pattern have given way to a diversity of situations differing from the harsh differentiation between private and communal and also affects perception and management of bio-diversity.

Jennifer L. Bailey
University of Trondheim
7055 Dragvoll
Norway

TROUBLED INTERNATIONAL WATERS: BRINGING THE STATE BACK IN

Garrett Hardin's famous 1969 article, the Tragedy of the Commons, sought to explain the degradation of resources held in common. The simplicity the model combined with its seeming predictive success quickly made it the prevailing model among academicians, managers and users alike. In recent years, however, there has been widespread critique of the model and its applications as being historically incorrect and ideologically biased in favor private property. Attempts have accordingly been made to create more accurate models and prescribe realistic modes or resource management based on new understandings.

This paper examines fisheries in international waters and argues that the four resource management regimes identified by those working in the field of common property, State Property Regimes, Private Property Regimes, Common Property Regimes, and Open Access Regimes, fail to capture the essence of these fisheries. Furthermore, viewing the problem of international fisheries from this perspective tends to bias the consideration of solutions to the very real problems of overfishing in favor of the extension of coastal state authority. This paper further argues that the problems of the fisheries of international waters are not best solved by extending coastal state jurisdiction to these waters and that the attempt to do so raises some very serious questions of international distributive justice. Finally, it goes against current trends to argue that management of these waters can and should take place through regional fisheries organizations.

Denis Bailly
Universite de Bretagne Occidentale
Brest,
France

SHRIMP CULTURE DEVELOPMENT AND NEW COASTAL COMMONS IN INDONESIA

In few years, Indonesia became one of the leading countries in shrimp production. After other countries, it experiences the major ecological and social impact of fast extension and intensification. Indonesian local and national social structures show variable capacity in managing new coastal commons emerging with the development of aquaculture. Typical common property issues involve shared-access to natural resources among shrimp farmers themselves or in competition with other users. Some of these resources were previously under free-access regime or already under common management.

High profitability and returns to scale, through intensification, are strong incentives to speculative behaviours. Intensive production develops in a very unsustainable fashion. When assimilation and dispersion capacity of coastal marine ecosystems are saturated, self-pollution phenomena and disease appear. This has already forced to stop production in many locations in Indonesia. Other conflicts arise over water management: distribution of sea-water among farms, separation of water inflow and outflow, penetration of salted water in fresh water canals and rice fields. Sedimentation on beaches may affect future touristic development. Mangrove forests and ecosystems also suffer of this fast expansion.

Beside the market aspects, the search for a sustainable development of shrimp farming implies that these common management issues be carefully handled. The imbrication of issues, the participation of local and external investors and the present dynamism of Indonesian economy make it very complex. Comparative case studies conducted in north Central Java show high differentiation in the capability of coastal communities to control aquaculture development. The case of a location near to Jepara town illustrates the complexity of institutional aspects related to coastal common resources management under rapid shrimp aquaculture development.

Irma Baquero,
Programa Nacional de Estudios Socioeconomicos.
Santafe de Bogota,
Colombia

PROPERTY, TECHNOLOGY AND SUSTAINABILITY EVOLUTION IN NARIÑO, COLOMBIA

This paper examines a rich, but very fragile area in the southern part of Colombia, from the pre-Columbian era up to date. The historical approach makes it possible to examine different property systems and their results in terms of choice of agricultural technology and natural resources conservation. During the pre-Columbian era, under a common property system with collective action, the Indians developed an agricultural technology especially suited to prevent soil erosion. Colonial institutions; "resguardos" and latifundia, continued to be soil erosion protective. The first, was a common property system with collective action, and maintained the soil conservation technologies. The second one, was a private property system. It was also soil protective because of the low soil use intensity, a result of the demographical catastrophe caused by conquest. Nevertheless, these institutions led to share contracts, and population growth, to the overpopulation of the Republican "resguardos". During the early Republican time, most of the conservation technologies remained, but land was used intensively. It was after the agrarian reform, which consolidated private small-hold property, and the Integrated

Rural Development Program (1968 up to date), that the traditional agricultural technologies were modified, leading to a severe erosion process and to the disappearance of traditional staples and varieties in this area. Theoretical predictions on the basis of the property systems characteristics are severely affected by other factors, specifically, by collective action, population density and government's agricultural technical assistance. In the future, government must take especial care to assure that agricultural research and technological transference complement high-yielding varieties with proper soil conservation technologies and biodiversity preservation.

Alpina Begossi
NÉPAM,
Campinas,
Brazil

CULTURAL AND ECOLOGICAL RESILIENCE AMONG CAICARAS OF THE ATLANTIC FOREST COAST AND CABOCLOS OF THE AMAZON (BRAZIL)

The subsistence of native populations from tropical forests has mostly been based on natural resources. This study includes analysis of subsistence activities of caicaras, native populations living in the Atlantic forest coast, and of caboclos, represented especially by rubber tappers (seringueiros) who live in the Amazon forest. The analysis will cover aspects related to the use of natural resources by those populations, that might serve to increase their ecological resilience. Analysis of property rights and institutions of caicaras and caboclos are compared. The caicaras live in conservation units, such as the State Park of Serra do Mar, where their activities of fishing and hunting are in permanent tension with Government Environmental Agencies. Rubber tappers, on the other hand, have organised themselves in the Rubber Tapper National Council and have created the Extractive Reserves, which are recognised and legalised by Governmental Agencies. The example of the Upper Guru Extractive Reserve, created in 1990, serve to illustrate the different paths taken by Brazilian native populations from the tropical rain forests. Local management is the objective of Extractive Reserves, where local institutions and the scientific community are involved. These different patterns of caicaras and caboclos have different effects on the resilience of their systems.

Tor A. Benjaminsen
Centre for Development and the Environment, University of Oslo
Oslo
Norway

NATURAL RESOURCE MANAGEMENT AND DECENTRALISATION. TOWARDS COMANAGEMENT IN MALI?

During the last few years, there has been a considerable discussion concerning the environment in African drylands and the management of its resources. Several studies discuss what has been labelled a paradigm shift in Sahelian Natural Resource Management. Earlier, "Sahel orthodoxy's" have blamed the local people of causing natural resource degradation. Today this view is being replaced by alternative views or emerging paradigms in fields such as pastoral development, management of common property resources, fuelwood management and in development thinking (the new stress on participation and decentralisation). These new paradigms are discussed in relation to the forthcoming decentralisation reform in Mali. During the colonial period, a heavily centralised government was installed in all the French colonies. The Malian governments after independence have kept this centralised structure. However, after the overthrow of former president Moussa Traoré in March 1991, critique against the centralised state and calls for decentralisation have increasingly been heard. The new

government, which was elected in 1992, is now reviewing the structure and functioning of the administrative system of the state, especially in the context of land tenure and natural resource management. The proposals so far are to establish Communes containing a few villages or nomadic fractions. Councils will be elected to independently administrate the territorial units belonging to the Communes. The state will only be represented by an advisor in each Commune. Possible problems and potentials of the decentralisation reform in Mali related to natural resource management will be discussed referring to the co-management model, and to examples of customary local natural resource management in Mali.

Bård A. Berg,
Nordic Saami Institute,
Kautokeino,
Norway

GOVERNMENT INTERVENTION INTO SAAMI REINDEER-MANAGEMENT IN NORWAY: HAS IT PREVENTED OR PROVOKED "TRAGEDIES OF THE COMMONS"?

Looking back on the history of Government intervention into Saami reindeer pastoralism in Norway, I will in this contribution consider the development of reindeer-management - and its present critical situation in certain areas - by appliance of the Common Property Theory .

My research-project at the Saami Institute specifically concerns the changing patterns of reindeer management methods in **the Helgeland Area** in the county of Nordland. Its most general purpose, however, is to uncover the reasons for and the directions of herding-form evolution **in Norway** in the 20th Century, as exemplified by Helgeland.

Towards the end of the 19th century Saami herdsmen for the first time were restrained by particular laws and regulations concerning reindeer-management. The Norwegian government at the same time also divided their traditional pastures into "reindeer-districts", with a maximum number of reindeer set for each district.

A Saami herder had always needed to adjust his reindeer-management to that of other herders, and gradually also to Norwegian farming interests. He had, however, been relatively unbound by formal regulations. A new age had now arrived, with changing laws and regulations, and heavy area conflicts with new, expanding Norwegian interests (road- and railwaybuilding, mining, dam-building, military activities, tourism). Independently, each of these activities has created problems, but their **cumulative effect** has caused great damage to the traditional reindeer areas.

In order to meet these problems the Saami herders have continuously been urged to develop and apply new strategies. The changes in Saami reindeer-management in Norway during the 20th century are, clearly, partly direct results of Government intervention, partly results of Saami strategies in order to adjust to the new conditions and, literally speaking, survive as herdsmen.

When applying the CPT to the study of the development of Saami pastoralism some key questions must be considered: 1) Are the reindeer pastures - or have they ever been - Commons, giving free access to any herdsman? 2) Are there - or have there ever been - tragedies (in the hardinian sense) in these pastures? 3) If and when tragedies of this kind have taken place in the Saami pastures in Norway, is this because of the selfishness of each and every individual Saami herdsman, as implied by Garret Hardins theory, or is the following general statement, expressed by the Norwegian sociologist Ottar Brox more appropriate as to what has really happened: *"...most "tragedies" start to develop and are attended to when the*

"commons" are no longer accessible to the commoner, but only to the select minority that has been able to stay in the rat race for what remains of the free natural resources".

When considering the serious problems of Saami reindeer pastoralism in certain areas of Norway today, the question also arise as to **who is to blame**: The Government, allowing other interests to expand into Saami pastures, and as a consequence of this had to control reindeer-management by laws and regulations - or the Saami herdsman themselves? Another important issue is the question of what kind of knowledge is most relevant with regard to reindeer-management problems: The Governments rational, "**scientific**" knowledge - or the Saamis "**traditional**" knowledge, built on hundreds of years of experience.

Helge Berglann
Department of Biology, Division of Zoology, University of Oslo
Oslo
Norway

FLEXIBLE QUOTAS AS A DEVICE IN FISHERIES MANAGEMENT - A CONTROL SYSTEM BASED ON PROGRESSIVE TAXATION

This paper introduces a new fisheries management scheme that might give a substantial improvement in rational fishery's exploitation. We have named it the "flexible quota"-system and is based on the idea to implement an individual progressive taxation for each vessel. The purpose of this taxation is to control total catch, and to make this system acceptable for the fishermen, the tax should be paid back to the fishermen. This pay out should be formed as a cash payment independent of the actual catch for each vessel, and should come from a cash register that is common for a certain number of vessels. This cash register is a part of a system organised as a number of hierarchical levels where the higher levels control the level beneath it subject to the same principle as the lower levels. In this outline of a pay back model, it will not make any difference for the control whether the fishermen work together or not, and a culture where cheating is improper can grow up. Numerical investigations with a model that embodies a logistic function for the recruitment of fish, and a simple harvest- and cost function, shows that progressive taxation both have better static and dynamic qualities than equivalent linear taxation. The investigations show further that there are two kind of favourable choices for the degree of progressivity in the management scheme. Either the degree of progressivity should be small (but not too close to be linear), or it should be large. A small degree of progressivity generates more short-term profit, while more long-term profit can be initiated with a large degree of progressivity. Bad influence on the system from fluctuations in fish stocks, costs and prices can be avoided by omitting some medium choice of the degree of progressivity.

Fikret Berkes and Carl Folke
Natural Resources Institute, University of Manitoba
Winnipeg, Manitoba R3T 2N2
Canada

A FRAMEWORK FOR THE STUDY OF INDIGENOUS KNOWLEDGE LINKING SOCIAL AND ECOLOGICAL SYSTEMS

A considerable amount of evidence has accumulated to indicate that ecologically sensible indigenous practices have indeed existed in diverse ecosystems. Based on these findings, there is potential for improvement of resource management in environments such as northern coastal ecosystems, arid and semi-arid land ecosystems, mountain ecosystems, tropical forest ecosystems, subarctic ecosystems and island ecosystems. As compared to the rather narrow set of prescriptions of Western scientific resource management systems, some of which may

inadvertently act to reduce ecosystem resilience, indigenous management is often associated with a diversity of property rights regimes and common property institutions and locally adapted practices, and it may operate under systems of knowledge substantially different from Western knowledge systems.

The framework we propose distinguishes seven sets of variables which can be used to describe social and ecological system characteristics and linkages in any indigenous resource use case study: (1) ecosystem, (2) resource users and technology, (3) local knowledge, (4) property rights, (5) institutions, (6) pattern of interactions, and (7) outcomes. Our framework borrows from Oakerson for the analysis of common property management, and that of Ostrom for institutional analysis.

The key concept in our framework is resilience, to emphasise the importance of conditions in which disturbances (perturbations) can flip a system from one equilibrium state to another. We use Holling's definition of resilience, the magnitude of disturbance that can be absorbed before a system changes its structure by changing the variables and processes that control behaviour. We hypothesise that:

- maintaining resilience is important for both resources and social institutions, and therefore the well-being of social and ecological systems is closely linked;
- successful traditional knowledge systems will allow perturbations to enter an ecosystem on a scale which does not threaten its structure and functional performance, and the services it provides; and
- there will be evidence of co-evolution in such traditional systems, making the local community and their institutions "in tune" over time with the natural process of the particular ecosystem.

Tressa Berman
Arizona State University West
Phoenix,
USA

CULTURAL APPROPRIATION AND LAWS OF PROPERTY IN CULTURAL PROPERTY CLAIMS

Recent legislation in the United States has produced a groundswell of activity from museums (mandated to comply with the terms of the law), and by indigenous communities in the United States seeking to utilize the intent of the law to restore cultural property to aboriginal title. Related concerns emerge in international forums both within and outside of museums as to the broad applicability of notions of "cultural property" and most recently, the application of legal constructs of "intellectual property" as a means to protect indigenous knowledge. While issues of appropriation date to the initial phase of native dispossession, the context in which the law has shaped these debates brings new ways of unveiling western philosophical ideas about property, ownership, selective representation, and possessive individualism on the one hand, and the inextricable relationship of land to spirituality, cultural history and the production of cultural artifacts and knowledge on the other. This paper considers the philosophical contradictions embedded in cultural property policies, and the practical problems that can arise between communities, museums, and their power brokers. On the one hand, the federal-trust relationship between the United States and American Indian Nations acknowledges the sovereign status of tribal governments to appoint their own representatives, while at the same time retains subordinating structures of representation by 1) framing it with respect to a collectively shared identity (and assumed agenda) and 2) maintaining the balance of power in the hands of policymakers. In order to work within the frame of "collective individualism," indigenous claimants must assent to the underlying principles of possessive individualism and the language of the law that guide proprietary interests.

Alain Bertrand

CIRAD - Forêt GREEN-LESS, Antananarivo, Madagascar

El Hadji Mahamane Lawali

Projet Energie II/ Energie Domestique-Volet Offre, Niamey, Niger

Pierre Montagne

Projet Energie II/ Energie Domestique/ Volet Offre, Niamey, Niger

Didier Babin,

CIRAD-Forêt GREEN-LESS, Nogent sur Marne, France

CREATION OF NEW COMMONS AS TOOLS OF LOCAL RURAL DEVELOPMENT : RURAL MARKETS OF WOOD ENERGY IN NIGER

Since 1989, the *Energie II Project* fosters long term sustainability of tree stock for wood energy in Niger. It is thus based on reappropriation of forest stand by village residents. The regulation reform has switched renewable resource management from State to rural population. This transfer is direct, immediate, and a source of great local autonomy. Creating an institution called "rural market of wood energy" allows autonomous management of resources extraction, trading and recovery. The whole network has now a new structure based on subsidiarity. Decisions are taken at the most efficient level (local, regional or national) according to the common goal. Due to the absence of cash crops, Nigerian forest favours a potential accruing leading to local rural development. Thus, the use of the income drawn from wood energy by existing "rural markets". Rather than providing "readymade" responses to questions, the project supports the emerging "possible" ones and self organization without imposing development models. The novelty of this process is also the technical simplification of the organizational solutions leading to its implementation.

Simon Bland

Fisheries Department, Ministry of Natural Resources

Llongwe

Malawi

COMMON PROPERTY AND POVERTY- FISHERIES CO-MANAGEMENT IN MALAWI

Malawi's economy is fragile, dominated mainly by the production and export of agricultural products. National development policy concentrates on growth through poverty alleviation and the fisheries sector has a key role to play through the provision of rural employment and, more importantly, through its contribution to household food security. Per capita consumption of fish in Malawi is declining as the population grows at a rate of 3.3% per annum, pressures on natural resources are high and have led to severe environmental degradation and the potential for increased fish production is limited. The problems of chronically low incomes amongst many of the world's fishermen has received much attention, Poverty alleviation among fisher folk is a common, though often elusive, policy objective. One of the reasons for this is the general lack of understanding of the features and factors of this poverty and without such an understanding any policy is unlikely to achieve the desired results. A large body of work suggests that another reason for this persistent chronic poverty is attributed to the common property nature of capture fisheries and the associated dissipation of resource rent. Resource rent dissipation does not, in itself cause poverty but as an employer of last resort with low entry barriers and relatively high exit barriers the fisheries sector concentrates individuals with low opportunity costs. This low opportunity cost is a contributory factor as is the disequilibrium of opportunity cost due to physical and emotional immobility of the workforce. The only available method for increasing incomes thus seems to be increasing the opportunity costs by developing alternative employment opportunities. The sector has reached a critical point in the development process where emphasis is changing from one of technology led

production increases to the establishment of sustainable resource utilisation. Effective resource management must involve the fishing communities in efforts to limit access, and these changes must occur in parallel with the development of alternative, non-primary productive, income earning opportunities for lakeshore communities to raise opportunity costs and broaden the economic base. Such an approach offers the only solution, not only to common property resource management in Malawi, but more generally to halting and reversing the downward development spiral.

Anuradha Bose (Ms)

Department of Development Administration, School of Public Policy
University of Birmingham, Edgbaston B15 2TT
UK

GARBAGE AS COMMONS? THE CASE OF CALCUTTA

This paper is an enquiry into what Daniel Bromley has termed "the practice of property" in the garbage heaps and vats of Calcutta and its part of the author's doctoral thesis, *Rich Pickings? The Political Economy of Solid Waste Management in Calcutta*. Garbage, is not commonly regarded as a resource. But in Calcutta there is a thriving market for all manner of materials recuperated from the waste heaps and vats by an army of waste pickers. The pickers' entry to these markets is subject to the acquisition of exclusive rights of access to the wastes which will allow them to establish secure property rights. Once these are secured, the pickers are able to convert, what appears to be an open-access system, into a valuable income stream for themselves to the exclusion of outsiders. Therefore, institutions have developed within the picker communities for two reasons: first, to treat with the 'mazdoors' (public cleansing staff) who control the market for the rights of access and secondly, to co-ordinate strategies for exploiting the resource. These "institutional-choices", which are actually a series of contracts, are analysed for information and transaction costs incurred in their maintenance and enforcement.

Francois Bousquet
CIRAD-GREEN, 42 rue Scheffer,
75116 Paris,
France

SIMULATING THE MANAGEMENT OF A RESOURCE MOVING IN A PATCHY AND FLUCTUATING ENVIRONMENT.

Nowadays, the economic and alimentary wellbeing of most societies is related to a sustainable use of their natural environment. With the environmental changes and with increasing human needs, population growth and economic growth this interaction is often upset. Therefore there is a need to build new resource sharing rules. The sustainability of society-resource interaction is often controlled by regulating the access to space. One of the major problems concerning resources such as wild fauna or fish communities is that the resource may move or migrate among the different parts of space, following the different seasons of the year. The dynamics of this space-resource must be taken into account. Modelling and simulation may be an efficient tool to explore the consequences of diverse modes of collective appropriation. We worked out a simulator, based on multi-agents simulation system, in order to simulate the behaviour of an artificial ecosystem which is a model of the Niger inland delta fishery. We simulate the dynamics of several fish species moving in a patchy environment with climatic variability. Then we have represented artificial fishermen and we simulate various hypothesis of "space-resource" sharing rules (protected areas, open access, fishing licenses, indigenous rules). We compare and discuss the results of the simulations.

Terje Brantenberg,
 Institute for Social Sciences, University of Tromsø,
 Tromsø
 Norway.

THE PASTORAL TRAGEDY IN COURT - RIGHTS OF SAMI REINDEER HERDERS, SAMI CUSTOMARY LAW AND NORWEGIAN JURISPRUDENCE.

For more than a century, Sami herders have managed their livelihood by adjusting to Norwegian law and regulations as well as organizing land tenure according to indigenous traditions and practical considerations. In recent years, pastoral rights are being highlighted and discussed for highly different reasons, providing the livelihood with a highly ambiguous and contradictive significance in Norwegian and Sami politics: **1) The current Law for reindeer herding** provides comprehensive powers to State agencies and representative bodies. **2) In Finnmark govt. policies and modernization of the livelihood** has led to increased pressures on pastures and demands for govt. policies to counteract what has been defined as a classic case of **"the tragedy of the commons"**. **3) With herders being blamed for the "tragedy", State policies** are now enforced on an unprecedented scale. **4) In some recent court cases, herders are questioning the State's right** to regulate their traditional practices and rights as Sami pastoralists. **Sami customary law** and pastoral land tenure, however, are still largely undocumented, remaining a shared practical knowledge among Sami herders. **5) While Sami pastoral knowledge** is being challenged by environmentalists and public opinion (Sami and non-Sami), the land tenure of herders are still not without political significance. Herders traditional land use and occupancy may provide crucial arguments for substantiating Sami claims for **indigenous land rights** to Crown land in Finnmark.

The paper discusses the **judgement (November 1993) of the Lower Court in Alta, Finnmark**, where the plaintiffs - a small group of herders - challenged the herding administration's right to annul their formal right to pastures and consequently their right to herd reindeer. The case is important not only because it brings up the principal issue of the right of Sami pastoralists to their traditional indigenous livelihood, but also by being the first instance where the new regulations of the Law for reindeer herding are being enforced in court. The paper focuses on the issue of **Sami customary law** as it was discussed in the findings of the court in terms of its significance in the formal system for "co-management" in reindeer herding. The paper relates the Alta court decision to the recent report of the **Sami Rights Committee** (NOU 1993:34 "The Right to and Administration of Land and Water in Finnmark"), where the more general notion of Sami customary law was considered. In both instances -but for very different reasons - Sami customary law was not considered necessary to document. These two cases provide a basis for discussing how Norwegian jurisprudence and ideals of participatory democracy in the modern Welfare State constitute specific **cultural codes and practices** where customary law of Sami pastoralists, their land tenure and cultural knowledge have an ambiguous significance,- where herders' practical knowledge remains implicit, contested, sometimes ignored and silenced.

Katrina Brown,
 School of Development Studies./ CSERGE, University of East Anglia,
 Norwich NR4 7TJ,
 UK

PLAIN TALES FROM THE GRASSLANDS: THE UTILISATION OF NATURAL RESOURCES IN ROYAL BARDIA NATIONAL PARK, NEPAL

This paper examines the use of grassland products from the Royal Bardia National Park in the Western Terai of Nepal. This area has been taken over as state property from being areas of agricultural use less than two decades ago. However, the management of the area for nature conservation relies on human disturbance in the form of grass cutting. This is currently carried out through permitted extraction of resources for a ten day period each year. The extent of the extraction of different grass species and their uses is outlined, and the importance of the various products to local households is discussed. Prospects for the sustainable utilisation of the grasslands, optimising the benefits of biodiversity conservation, tourism, and the livelihoods of local people are explored. The paper is based on recent fieldwork undertaken as part of the UEA Tall Grasslands Research Project. This project aims to combine ecological experiments and socio-economic research to investigate the management options for the conservation and sustainable utilisation of biodiversity in the protected areas in Nepalís Terai. The theoretical framework adopted has been one of political ecology, focusing on the role of natural resources from the protected areas in local peopleís livelihood strategies involving a synthesis of ecological and environmental economics. The paper will discuss conceptual and methodological issues concerning the evolution of an interdisciplinary approach as well as present some preliminary results and tentative conclusions on natural resource management in these unique tall grassland habitats. I am very keen to attend the conference and would like to present a paper. I hope you feel that this paper would merit inclusion in the programme. Perhaps you could kindly let me know as soon as possible so I can register.

Hans Olav Bråtå,
 Norwegian Institute for Urban and Regional Research (NIBR).
 Oslo,
 Norway

WILD REINDEER AND PLANNING IN THE RONDANE REGION

The Rondane region in the southern part of Norway is one of the most popular regions for out-door recreation in Norway. There are 4500 wild reindeer in this region. They are some of the few remnants of the original wild european mountain reindeer and are genetically unique. They are a common property resource, managed by several local institutions, some especially designed for reindeer management.

Under natural conditions reindeer use different parts of Rondane throughout the year. These areas are situated in 11 municipalities and 2 counties. But out-door recreation, tourism and other impacts have disturbed the reindeer so much that they have abandoned parts of the region in certain seasons.

This conflict reached a peak when a plan to develop an area with a ski-lift and many cabins was proposed. This plan was met with objection from the County Governor i Hedmark and put before the Ministry of Environment for a decision. The Ministry rejected the plan, but decided that there should be a County Plan for the Rondane region in the counties of Hedmark and Oppland. The main purpose was to protect the areas where the reindeer live.

In my paper I emphasize the reason that the Ministry choose a County Plan instead of for example "national objectives for planning in the Rondane region", which would give stronger guidelines for planning. I will analyse the County Plan in relation to how much it protects the areas of interest for the reindeer, and I will analyze the process when establishing the County Plan. Planning at the municipal level will be analyzed with regard to the follow-up of the plan.

This County Plan is of special interest because it is the first Norwegian attempt to protect the areas of interest for wild reindeer through a coordinated political process on the county and municipality levels.

Susan J. Buck
Department of Political Science, University of North Carolina-Greensboro
Greensboro, NC 27412
USA

BIOLOGICAL DIVERSITY AND THE STATES: IMPLEMENTING THE BIODIVERSITY CONVENTION IN THE USA

The protection of species and their ecosystems has become an issue of international importance. Although several other treaties (for example, CITES) address issues of wildlife management in a piecemeal fashion, the Biodiversity Convention, opened for signature at UNCED, is the first to establish substantial expectations that signatory nations will protect species diversity regardless of species rarity or economic value. The institutional and ecological implications of managing wildlife as a common pool resource has finally reached the national and international policy agendas. United States' policy is that treaty obligations are implemented primarily through federal legislation. However, under the U. S. Constitution, some policy issues (such as wildlife management) are within the constitutional purview of the states rather than the national government, and treaties which address such issues generate legal and constitutional difficulties during implementation. This problem was raised most recently by the Biodiversity Convention which President Bush refused to sign, in part because of its intergovernmental implications. However, in April 1993, President Clinton signed the Convention. Implementation of this treaty, if it is ratified, may require substantial revision of the institutional relationships between federal and state wildlife management systems.

While the powers of the federal government over wildlife are considerable, in practice the states have been allowed a great deal of latitude in regulating wildlife. Several factors affect the rate and effectiveness of state implementation strategies: the compliance mechanisms chosen by the federal government; the institutional relationships already in place for intergovernmental cooperation; and the organizational structures of the states' wildlife management systems. This paper analyzes the cooperative strategies for wildlife management which have evolved between American federal and state governments and examines the state-level institutional change required to respond to the demands of new federal environmental treaty obligations under the Biodiversity Convention.

Tom Buoye
 Department of History, University of Tulsa
 Tulsa, Oklahoma 74104-3189
 USA

AS USUAL EACH MANAGE YOUR OWN PROPERTY:THE STATE, PROPERTY, AND SOCIAL CONFLICT IN EIGHTEENTH CENTURY CHINA

During the eighteenth century the population of China tripled reaching 300 million by 1800 while the level of technology of China's overwhelmingly agrarian economy remained unchanged. Economically, this unprecedented level of population growth increased the relative value of land and created incentives for more stringent enforcement of property rights in land. Psychologically, historic notions of property and land were profoundly challenged as the concept of land as alienable commodity supplanted the long-standing concepts of land as inalienable patrimony. Socially, the pressure to alter property rights triggered a spurt of violent conflict over property rights which ultimately subsided with the development of new institutional arrangements.

This paper is based on 260 violent disputes over property rights that occurred in Guangdong, Sichuan, and Shandong provinces for two time series 1750-53 and 1774-75. The three provinces differed greatly in their levels of economic development and type of agriculture, and the overall pattern and level of violence. The source material for these disputes are routine reports of homicides to the central government. Strict rules and regulation governed the reporting of capital crimes nationwide reducing the danger of regional bias in the data.

Although the state was quick to deal with violent conflict, Chinese officials did little to resolve the underlying causes of the violence. Peasants and landlords displayed a variety of innovative responses to changing economic circumstances. Interestingly, the role of the Chinese state was largely reactive. A frequent response to conflicts over land was: As usual, each manage your own property. In the absence of state intervention, a variety of local solutions gradually evolved but, throughout China there was an erosion of common property rights and a growing acceptance of land as an alienable commodity. This paper not only serves to elucidate an important period in the historical development of property rights but, also provides an important historical reference point to China's current reform of property rights in land.

Joao S. Campari
 Department of Economics, The University of Texas at Austin
 Austin, Texas 78712-1173
 USA

FRONTIER EXPANSION AND DEFORESTATION IN THE BRAZILIAN AMAZON

The efforts made by the Brazilian government to occupy the Amazon in the 1970s, regressed common property into unsustainable colonization schemes. As the frontier expanded during the decade, incipient markets emerged, but the the Amazon continued to be mostly an agricultural frontier. In the 1980s, however, the Amazon suffered a rapid process of urbanization and was inserted into a new economic context. The development of interlinked markets came to replace the isolation of pioneer fronts. By the time that the federal government--in response to the national economic crisis--pulled out incentives to Amazon occupation during the 1980s, the local economy was already established and was generating incomes that compensated for the loss in subsidies and other federal government incentives.

During the 1980s, the capital gains from speculation in the frontier land market came to compete with the agricultural potential of soils. Speculative demand for land by an emergent urban elite became one of the most important forces impelling growing number of small farmers to sell their plots and move on to temporarily settle and deforest further inland. The Brazilian frontier, therefore, followed an unsustainable gradient of land occupation, common property being quickly regressed into consolidated private schemes as the frontier expanded. Today, this puts at stake most forms of resource management, as migrants move into the fringes of ertswhile open access forest, clear it for low productivity crop production, and then move on as more market-based activities develop. The paper argues that in order to reduce deforestation in the Brazilian Amazon, it is necessary to curb intra-regional migration flows of small farmers from consolidated to new frontiers.

Lars Carlsson,
 Division of Political Science, Luleå University
 971 87 Luleå
 Sweden

HOW TO KEEP AWAY FROM THE LEVIATHAN - THE CASE OF THE SWEDISH COMMON FORESTS.

Approximately 730 000 hectares of the Swedish forests are common forest lands owned by 21 000 individual joint-owners. For more than one hundred years the commons have been regulated by a special law. The aim of the law is to secure the sustainability of the natural resource for the purpose of strengthening and developing the local economy. Nevertheless it has been possible to run the 24 forest units in different ways, divergent both compared to each other and over a period of a hundred years. They have obviously served different purposes. In some periods they have contributed the funds needed for local municipalities, in others they have supported modernization of agriculture, etc. Today they still play an important role, although not primarily in the local economy. To summarize, although the commons are regulated by the same law, stipulating specific outcomes, they have developed different policies during different historical periods and between different local settings.

The paper discusses the policies of the Swedish common forests, to what extent they have developed different local strategies in terms of institutional arrangements, management and principals for their contribution to local economic development.

Richard A. Caulfield and Mary C. Pete,
 Department of Rural Development,
 University of Alaska Fairbanks USA

INDIGENOUS PEOPLES AND COMMUNITY DEVELOPMENT QUOTAS IN ALASKA'S BERING SEA POLLOCK FISHERY: OPPORTUNITIES AND CONTRADICTIONS

Until recently, indigenous communities along Alaska's remote Bering Sea coastline had little access to the lucrative world-class pollock fishery taking place just offshore. However, in 1992 the North Pacific Fisheries Management Council, established pursuant to the Magnuson Act of 1976, allocated 7.5 percent of the total allowable catch in the form of community development quotas (CDQs) to eligible Alaska Native communities. The CDQ program is designed to create jobs, diversify local economies, and to provide access to highly-capitalized Bering Sea fisheries. To receive a CDQ, communities must form a joint-venture partnership with an established bottomfish trawl company and must obtain a quota from state and federal authorities. While potentially lucrative for local communities, the CDQ program is highly

controversial. Some established fishermen, many of whom live outside of Alaska, object to a special allocation for remote indigenous communities. At the same time, some indigenous people wonder about tradeoffs involved in becoming too closely tied to a massive industrialized fishery with an uncertain future. This paper presents results of research conducted in seven Bering Sea communities in 1994. It explores the opportunities and the contradictions facing indigenous communities seeking to expand their stake in a commons under stress.

Minoti Chakravarty-Kaul,
Department of Environmental Science, Policy and Management,
University of California, Berkeley, CA 94720
USA

UPHEAVAL IN THE NOMAD'S TRAIL. SURVIVAL IN THE FOREST COMMONS OF NORTHERN INDIA.

The Gaddi shepherds of the alpine tracts are in the eye of a storm brewing in the foothills of the Himalayas. Dams, National Parks and expanding infra-structure are changing the nature of nomadic trails. At stake is the survival of both the managers and their self-governing systems of "property rights" in natural resources. The paper attempts to establish that transhumance has been an occupational technique to make possible the optimal use of the geo-morphological relation of the Himalayan range to the riverine plains of north India. Such has been the character of nomadic pastoralism practised by two distinct people -- the Gujars and the Gaddis.

History traces the origin of the Gujars to Central Asia, while the Gaddis claim to belong to the ancient Himalayan kingdom of Chamba. Nomadism enabled them to minimise uncertainty and share risk with others on the Himalayan commons. They could vote with their feet against any political danger; and in case of the seasonal uncertainties it enabled them to adjust spatially and temporally. They could do this because the other actors in the northern plains - the cultivators - agreed to share the pastoral commons. Such symbiosis was possible because the nomad's scale of operations complemented those of the cultivators. This in its turn was feasible because the pattern of property rights provided incentives to reciprocate. The situation in the last one hundred years has changed radically. A new actor entered - the interventionist State Forest Department of a modern Government and the whole issue is not just one of survival of the Commons but that of nomadism itself.

Piotr Chmielewski,
Institute of Sociology, Warsaw University
Warsaw
Poland

MOUNTAIN COMMONS IN TATRA

The paper examines common property resources (forestry) in the western Polish Tatra mountains. It opens with a discussion of the ecological, cultural, and sociological aspects of the region. Next, a history of one hundred seventy five dramatic years of community forestry is presented. It is a record of community efforts to maintain acquired property rights against diverse and changing external arrangements. The new institutional approach is used by the author to investigate major rules binding individual members of the community (operational and collective choice levels) and identify possible institutional tensions and frictions with rules imposed by external arrangements. The paper closes with a list of research problems and questions to be discussed before the author's intended fieldwork project reaches its final design.

Serge Collet
 UPR.191.CNRS. Techniques et culture.
 Hamburg,
 Germany

REJUVENATE AN OLD HALIEUTICAL WISDOM OR HOW TO RECONSTRUCT THE PARADIGM OF THE ARCHITECT OF THE SEA.

The analysis of Mediterranean historical forms of halieutical modes of appropriation based on common property's regime - *res communes* - reveals that some of them were founded on ingenious institutional arrangements, where the cooperation of the appropriators made possible in a resilient way a wise use of the halieutical resources, generally unintentional, as the enlarged reproduction of social unit, appropriating these resources.

Is the framing of the European Common Fishery policy in Mediterranean Sea today able to take into account the social and ecological efficiency of these institutional arrangements just when the market - internationalization of the sea products, the concentration of the retail trade in the hands of large multinational chains, the collapse of the production prices threaten deeply the existence of fishing communities in the world?

What can be the validity of an industrialist market oriented halieutical mode of appropriation, who has performed with success, without or with some regulations (licences, TAC, quotas, ITQ) to deplete the fish resources and drastically to reduce the fishing communities, that means to destroy marine nature as fishing cultures with dramatical social costs?

These costs call for the implementation of an halieutical reform sustainable redevelopment.

The existence of institutions like spanish brotherhood, the french prud' homies, the sea tenure in the Strait of Messina with rotation and drawing lots are robust democratic differentiated tools of halieutical resources governing. They have made the proof of their social-historical viability as, by example, the japanese IRIAI system.

In their rejuvenation - enrichment coming to modernise, what we call the old paradigm of the Architect of the Sea, who was an axiomatic halieutical principle: able to cope with the terrible challenge of the savage extension of the "halieutical liberalism"?

Parzival Copes
 Department of Economics and Institute of Fisheries Analysis, Simon Fraser University
 Burnaby, B.C.. V5A 1S6
 Canada

THE PROFITS OF JUSTICE: RESTORING ABORIGINAL RIVER FISHERIES IN BRITISH COLUMBIA

In the 1870s a large salmon canning industry was established in British Columbia, drawing on fish caught in commercial salt-water fisheries. In support of the industry the Canadian government imposed stringent restrictions on the pre-existing salmon fisheries of native Indian communities that were competing for the same resources. Particularly hard hit were the tribes in the Fraser and Skeena River watersheds, fishing salmon during their annual up-river spawning migration. They were prohibited from using their highly efficient traps and weirs, which were destroyed. They were restricted to catching salmon only for domestic needs. Being denied the right to sell fish, they lost their traditional trade of surplus salmon and with it an important source of income. This contributed to the impoverishment of their communities, many of which descended into social dissolution and despair.

Pressed by court decisions upholding aboriginal rights to a greater share of fish resources, the Canadian government announced an Aboriginal Fisheries Strategy in June 1992. It was designed to secure greater opportunities for aboriginal peoples to participate in the fisheries sector. The Fraser and Skeena tribes appear to be among the principal beneficiaries.

This paper explores the resource management options and equity implications of the Aboriginal Fisheries Strategy, involving a shift designed to restore in part the traditional community-based aboriginal salmon fisheries of the Fraser and Skeena River systems, in which most of the province's salmon originate. It arrives at the important conclusion that, if appropriately managed, such river fisheries could contribute greatly to increased stock productivity, because of their superior capacity to fish selectively and live-release fish. This could help greatly to fine-tune the spawning escapement of hundreds of unique breeding stocks in the pursuit of optimal salmon reproduction, leading to long-run catch maximisation. The potential is there for a considerably larger sustainable salmon fishery. This might allow for a substantial restoration of aboriginal fishing rights without necessarily reducing--and possibly increasing--the long-run commercial salt-water catch. Conceding justice to aboriginal peoples may thus be rewarded with profits to many and losses to none.

Marie-Christine Cormier-Salem
Centre ORSTOM. LEA
34032 Montpellier cedex 1
France

WEST-AFRICAN COASTAL SOCIETIES AND FISHERY SPACES

The West-African small-scale fishing dynamic and adaptability are based on fishermen mobility and multiple strategies of resource uses. From a certain point of view, open property resource and predator behaviour of migratory fishermen are considered as the conditions of this dynamic. Fishery resources over-exploitation and/or conflicts between fishermen communities (outsiders vs indigenous, migratory vs sedentary, inland vs maritime fishermen etc.) could be seen as the lonely issues. However, without denying these risks, most of the studies about West-African small-scale fishing, emphasize the efficiency of community-based management and control of resources. So, the purpose of this paper is to show the complexity of resources regulation and spaces appropriation among "Rivieres du Sud" societies (along the West-African coast from Senegal to Sierra Leone). The authors focus their attention on methodological and conceptual problems. They suggest to take into account the different levels of fishing space representations. The multiple combination between fishing resources, techniques and actors leads to construct diverse "fishing spaces" and reveals contrasted strategies among coastal communities. Finally, the notion of fishing territory is discussed.

Robert Costanza,
Maryland International Institute for Ecological Economics, University of Maryland
Solomons, MD 20688-0038
USA

INTEGRATED ECOLOGICAL ECONOMIC MODELING AND ADAPTIVE MANAGEMENT OF COMPLEX SYSTEMS

Understanding, modeling, and adaptive management of linked ecological and economic systems, ranging in size from the biosphere as a whole to regional landscapes to local agroecosystems, is critical for designing a sustainable future. But integrated ecological economic systems have so far received only very limited direct attention. Several current

approaches may be relevant to this problem and a new, cooperative synthesis among ecologists, economists, policy makers and many others is essential. Thanks to recent developments in data acquisition and large scale computing and modeling, it is now becoming possible to build multiscale, data-rich computer simulation models that can capture the salient features of linked economies and ecosystems, and the major interactions between them at local, regional and global scales. These integrated models can allow quantitative representations and projections of the principal stocks (natural, human and manufactured capital) and flows (economic and ecological services) within the system, and help illuminate the range of possible futures that might result from alternative property rights regimes and management policies, the degree of uncertainty about those futures and the value of ecosystem goods and services to the economic part of the system. They can provide a framework to allow communication and collaboration among a wide range of researchers from many disciplines. But complex ecological economic systems are of limited predictability and will require an adaptive approach to management that recognizes their inherent uncertainty. It must: (1) treat each policy as an experiment and focus on monitoring and adaptation; (2) develop a research agenda that is policy relevant but not policy driven; (3) adopt a precautionary stance when critical resources are at stake; and (4) employ modeling as a necessary component in an ongoing, democratic consensus building process.

Christopher Dahl
Sea Grant Extension Service, University of Hawaii
Honolulu, HI 96822
USA

COMMUNITY -BASED WATERSHED PLANNING AND MANAGEMENT ON THE ISLAND OF POHNPEI, FEDERATED STATES OF MICRONESIA

Pohnpei is a volcanic island located in the Western tropical Pacific. (land area 129 sq. mi.). The island is surrounded by an extensive barrier reef and coastal areas are bordered by mangrove forest. The mountainous interior is heavily forested with the main overstorey trees being *Camposperma brevipetiolata* and *Eleocarpus carolinensis*. Large almost pure stands of the endemic palm *Clinostigma ponapensis* are also found at higher elevations. In 1987 the Pohnpei state government designated a watershed reserve covering 5100 ha of upland forest and 5525 ha. of mangrove. Early on there was considerable resistance by communities and resources users to state 'enclosure' of upland areas as reserve where access and use of resources would be regulated. This led to the formation in 1990 of an inter-agency Watershed Steering Committee which began developing a community based approach. With some external assistance the Committee initiated a community based education program that visited all villages on the island and worked with traditional leaders to develop consensus for the need for forest resource conservation. Some community based organizations, watershed area management committees, were formed during this process and the formation of additional organizations to cover all communities on the island is being encouraged. Clearing of forest to plant kava (*Piper methysticum*), a traditionally important and increasingly commercial crop, emerged as a major issue in terms of forest loss. As of 1994, with substantial assistance from the Asian Development Bank and the U.S. based private non-profit organization The Nature Conservancy, a program of community-based watershed management planning is being initiated. A team from the State Division of Forestry will work with Watershed Area Management Committees to develop management plans for local watersheds using a participatory planning approach. It is expected that local Committees will also be substantially involved in management and enforcement once the planning phase is complete. This paper reports on the progress and results of this process to date.

Tove Degnbol
Roskilde University,
Denmark

**THE ROLE OF THE SAHELIAN STATE VIS-A-VIS LOCAL-LEVEL
NATURAL RESOURCE MANAGEMENT - THE MALIAN EXPERIENCE.**

In recent years the "terroir approach" to natural resource management has become increasingly popular in Sahelian countries. In the paper the Malian experience is used to question some of the underlying assumptions about the "terroir approach" as a means to support decentralisation processes. Based on the example of a "test zone" programme in the Sikasso region, it is argued that although in this and similar programmes limited attention is paid to the role of the state, this is actually where the real challenges lie. A reversal of the role of the state from its past repressive and interventionist role to the much praised "enabling state" is not automatically ensured by the invention of a new concept that theoretically implies the transfer of responsibility from government structures to local populations. On the contrary, the lack of real changes in the relationship between the state and the civil society is a serious threat to all initiatives to support the management of local resources by local populations. A new role of the state is conditioned upon the (re)establishment of the legitimacy of the state in the eyes of the population, which again implies a number of fundamental institutional changes, including a change of the technical, sectoral and hierarchial approach of government services. Just as important, however, is the political and cultural aspects of the relationship between the state and local populations.

Antonio Carlos Diegues,
NUPAUB, University of Sao Paulo
Brazil

**RETHINKING AND RECREATING COMMON RESOURCES
APPROPRIATION REGIMES IN BRAZIL**

Traditional systems based on communal forms of access to natural resources should not be seen as issues of the past. In Brazil, some of them are in a process of desorganization, but many of them are being recreated by the commoners. The recreation of commons is, generally, the result of a social reaction vis-a-vis processes that threaten livelihood of traditional communities such as Amazonian rubber-tappers, small-scale fishermen and forest dwellers. One of the classical examples of creation of new commons is the recent establishment of "extractive reserves" by the rubber-tappers in Amazonia, as their livelihood is threatened by the new capitalist entrepreneurs of southern Brazil who buy the land in which traditional communities live out of the extraction of rubber and harvest of Brazilian nuts. Riverine populations also are creating new commons in the Amazonian lakes as their traditional fishing is threatened by commercial boats coming from urban areas. Another example is the creation of commons by traditional dwellers in areas where environmental protected areas are established. The paper argues that collective actions can be more successful when they are supported by strong social movements at national basis, as it is the case of the National Movement of Rubber-Tappers which provides wide social mobilization and ideological support. In this paper three types of "new commons" are analysed:

- 1) New commons supported by a national movement of commoners, as it is the case of the extractive reserves of rubber-tappers in Amazonia.
- 2) Autonomous new commons established without a national movement, as it is the case of the extractive reserves to fisheries proposed by small-scale fishermen in the Amazonian lakes.
- 3) New commons, created without a national movement but with support of NGO's such as the one established in the Ecological Protected Station, in Mamirauá, State of Amazonas.

Nancy C. Doubleday,
 Department of Geography/Institute of Interdisciplinary Studies,
 Carleton University, Ottawa, Ontario K1S 5B6,
 Canada

GLOBAL ISSUES, LOCAL NEEDS: THE CHALLENGES AHEAD FOR MARINE MAMMAL HARVESTING COMMUNITIES

In the past 15 years, Inuit communities in the circumpolar Arctic which rely on the harvesting of renewable resources including marine mammals, have been under attack by anti-harvesting interests. Much energy has been devoted to countering these threats to renewable resource economies, with some success. There are other global issues, however, which are also of concern to communities which depend upon marine mammals in the Arctic, including the presence of contaminants in the arctic marine foodchain, and the effects on consumption; global change and the long-term implications for renewable resource economies; and the way in which sustainability is defined and approached. The need for an integrated strategic approach which addresses environmental considerations as well as harvesting rights is discussed and relevant examples are presented.

Jens E. Dybro
 c/o COWICONULT
 Ruwi
 Sultanat of Oman

ISLAMIC LAW AND THE DEVELOPMENT RURAL SETTLEMENT IN OMAN: ON THE QUESTION OF TRADITION AND DEVELOPMENT

With the coming of Islam the codification of traditional forms of organization and practice was developed and both Islamic religion and Islamic law (sharia) became perfectly suited to the prevailing bedouin ideology and tribal organization of life. (Carter, Hodgson, Hourani, Haarmann, Lapidus, Wilkinson 1977 and 1987). However, law was still primarily related to settlement, and to some (e.g. Carter 1982:103), law was the significant difference between traditional 'bedu' and 'hader' organization. In relation to the development of agricultural settlements in Oman, adhering to Islamic law (sharia) was not only exercising a strict will to order, of "going by the book", but also flexibility and co-operation. When necessary in dealing with complicated matters of social interaction, in cases where Islamic rulings were not clearly prescribed, customary law, what was prescribed by tradition (áda), could be used together with analogy (qiyas) by those qualified, men of learning (ulema), to perform Islamic reasoning (ijtihad) in order to reach consensus rulings (ijtma'). This complex jurisdiction was instrumental in generating productive agricultural development in the old settlements and the strategy could be defined as the **constructive assimilation of tradition**.

Matters related to irrigation is a typical example. The 'aflaj' irrigation systems were introduced before Islam and formed the basis of agriculture and rural settlement. The operation and maintenance of these water management systems is both demanding on resources and require quite complicated forms of organization. They often have several kilometres of underground channels tapping one or more mother wells and they are one-source/multiple-users systems. Distribution of water and water rights is a key issue and it is therefore most appropriate to use the term 'falaj' as it is derived from the ancient Semitic root 'plg' which has to do with divisions - to divide. There are records of collected Islamic rulings (Jámi'), dating back to the First Imamate, dealing with irrigation affairs; ownership of land, water rights, shares, 'falaj' access, re-excavation (hafr) of damaged low-flow 'aflaj' and other subjects (Wilkinson 1977:258-65). (1.)

The objective is always to define responsibilities and limiting potential personal and communal disputes.

Islamic law was confronted with traditions - established practice- -but conflicts were avoided by assimilating traditions when ever possible. In the case of 'aflaj' systems and irrigation it has even been noted that: "The decisions reached nearly always derive from custom rather than from the fundamental rulings of Islamic law (usul al-fiqh) ." (Wilkinson 1977:121)

The order established by the balance between Islamic and customary law was constructive as well as comprehensive in terms of coverage of personal and communal conflicts that could appear in everyday life. However, it is also possible to demonstrate less constructive effects of law application, but then again how other spheres of everyday life, other practices, exert their influence in creating stability and order through mediation. One example is the fragmenting effect that the Islamic laws of inheritance would have on the size of holdings if only law was to regulate the passing on of property. Fieldwork data indicate that small holdings tend to be sold off in favour of more appropriate ones if the owner feels too dependent, if a proper balance between family coherence and individual freedom is not achieved. The extended family network is a strong unity in rural settlements, but this does not necessarily mean that such units are corporative working units when it comes to farmwork. If the family is corporative, joint holdings by close relatives would be the ideal.

Based on data from anthropological fieldwork in rural settlements the paper will demonstrate how everyday life is regulated by systems, systems of Islamic or customary law for instance, and how the actual working of the systems are mediated and influenced by every day life. The paper will try to demonstrate the particular kind of constructivism involved whereby development can take place on traditional terms. A process by which neither tradition or development (the new), stay the same.

Notes

1. The principal Arabic sources on early Islamic jurisprudence (fiqh) concerning 'aflaj' are Jāmi' (collected rulings). They are nearly all pre mid-sixth/twelfth century (Wilkinson 1977:249 ff. and 258)

References:

- Carter, J.R.L. (1982): Tribes in Oman, London.
 Haarmann (red.) (1987) : Geschichte der Arabischen Welt., Munchen.
 Hodgson, M.G.S (1974): The Venture of Islam., Chicago.
 Hourani, Albert (1991) A History of the Arab People., London.
 Lapidus, I.M. (1988): A History of Muslim Societies., Cambridge.
 Wilkinson, John C. (1977): Water and Tribal Settlement In South East Asia, A Study of the 'Aflaj' of Oman. Oxford.
 Wilkinson, John C. (1987) The Imamate tradition of Oman. London.

Victoria Edwards
 Department of Land and Construction Management, University of Portsmouth
 Portsmouth, Hampshire, PO1 2LF
 UK

**THE NEW FOREST COMMONS, ENGLAND: HORSE-RIDERS
 BIKE-RIDERS, FREE-RIDERS.**

The New Forest Commons in England are neither new nor entirely forested. Established in 1079 by William the Conqueror, the New Forest Commons cover around 38,000 hectares of unenclosed ancient woodlands, timber enclosures, open grasslands, heather moorland, valley mires and settlements. The land is owned by the Crown but has been subject to rights of common users for over a thousand years. The predominant right is that of grazing ponies, cattle and donkeys; although rights for the collection of timber and turf still exist. The New Forest has a complex institutional arrangement, with management input from national and local statutory bodies. The Verderers Court', with representatives from government agencies and elected representatives of some 500 'commoners' of the New Forest, is the principal agent for the operation of commoning rights and the management of the common. In the last few decades, recreational and amenity pressures on the New Forest have increased: horse-riding, mountain-biking, picnicking, walking, wildlife watching and conservation. Such activities, which are potentially incompatible with the grazing use of the commons, pose one of the greatest threats to the commons' future. Whilst few of the participant groups have any property right to the commons, they all seek increased involvement in the management of the New Forest. This paper questions whether the existing institutional arrangements for managing the New Forest commons are sufficient to cope with such pressures.

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

**"FLEXIBILITY WHEN SPECIALISATION IS FEASIBLE" THE
 HARVESTING PATTERN IN NORTH NORWEGIAN COASTAL FISHING
 STUDIED FROM A "CHAOS PERSPECTIVE".**

The paper sheds light on the use of flexible harvesting strategies in North Norwegian coastal fishing. The fishing is based on some of the world's richest stocks of fish. "Normal" ecological conditions would allow selective fishing, that is to say, fishing of just one species at a time. Nevertheless, both the fishermen and the processing industry choose to harvest several species rather than carry out selective fishing. The author discusses the reasons for choosing this harvesting strategy. The paper is based on case analyses from a sample of fishing communities along the coast of Finnmark, the northernmost country in Norway. Choosing to harvest several species instead of a single species reflects a way of handling the costs of the fishing. From a "chaos perspective", weight is often attached to the cost of discovering the location of the fish stocks. In the Barents Sea we find that the factors that promote flexibility rather than selective fishing, which is dependent, for example, on extensive geographical mobility, are technology, the relation between the fisherman and his family, features of management, and ecological fluctuations. The author also considers how the management promotes some types of flexibility, and hinders others. The paper concludes with a discussion of the relationship between flexible patterns of harvesting and sustainable management of the fish stocks in the Barents Sea. The objective of the management must be to prevent the harvesting of declining species. Using empirical examples, the author discusses how modern management by the national authorities, and "popular" management at local level, help to prevent the harvesting of species that should not be harvested.

Niels Einarsson,
 Department of Fisheries Science, University of Akureyri,
 IS-600 Akureyri,
 Iceland

CULTURE AND THE KILLING OF ANIMALS: SOME THOUGHTS ON THE MANAGEMENT OF MARINE MAMMALS

When the way people treat animals, at least marine mammals, is taken as a baseline for a culture's morality, what is seen as inhumane hunting raises among animal welfare groups questions about the humanity of those who kill them. In the whaling controversy the anthropologist easily finds him- or herself in the business of re-humanising people who have been de-humanised. Ironically, this in many ways parallels what whale conservationists are up to in their anthropomorphising of animal species in the attempt to engage people for their welfare and survival. Humans, however, are unique in that they have culture and anthropologists find themselves supplying "their" people with appropriate cultural arguments against the onslaught of outside forces. The construction or invention of culture and tradition in the text of the anthropologist becomes in such cases more than a purely academic issue as it directly contributes to a rhetorical discourse of political importance. This paper discusses the problematic role of anthropologists with special reference to the author's research on fishermen and environmentalists in Iceland and Britain.

Mogens Eskesen
 Dept. of Ethnography and Social Anthropology
 Aarhus University,
 Denmark

DANISH SEINE AND GILL NET FISHERY: FORMS OF CO-OPERATION AND THE POTENTIAL OF CONFLICTS

All kinds of regulations will favour some users' access to the resources. The chosen regulation will inevitably contain elements of allocation policy. Either as a direct and intended redistribution of income, or as an unintended consequence. This is due to the existing differences between the fishermen's gear, the capacity of the vessels, use of fishing grounds, main season, and target species.

In the debate on fisheries policy, several sides want to set an 'ecological' view on the agenda. One notices how environmental organisations take part in the debate on allocation of resources with viewpoints on a sustainable fishery. People debate these issues on the basis of quite different kinds of knowledge, where the extremes consist of economic / biological models and scientific analysis on one side and the often emotional attitude of the environmentalist, on the other. In contrast stand the fishermen's experience with and understanding of the ecology of the sea, and their understanding of their place in the social context.

I will present preliminary results from my case study on Danish Seine and Gill Net Fishery: The case study consists partly in interviews and partly in participation in fishery in two communities: Thyboroen and Hvide Sande, both situated on the West coast of Jutland, Denmark. Which ideas do fishermen have about their own gear and its impact on environment? and about other fishermen's gear? And how are the conditions for interchange between fishermen's knowledge versus the knowledge of scientists, like e.g. biologists?

Einar Eythorsson
Finnmark College,
Alta,
Norway

WHO SHOULD HAVE A VOICE IN MANAGEMENT OF LOCAL MARINE RESOURCES?

Formalized self-management of the cod-fisheries in Lofoten was established by law in 1897, along with some local regulations in the North-Norwegian fjords. In 1959, the fjord regulations were delegated to the regional branches of the Fishers Union.

Today, it is no longer self-evident that local management should be an exclusive domain of the Fisheries Department and the Fishers Union. Traditional fjord fishing, which used to be the main component of the economical adaptation of coast-sami communities, is in decline. At the same time, the discourse on local management is changing, partly as a result of modernization processes in rural communities, growth of aquaculture and recreational fishing. Salmon farming, and domestication of marine species demands appropriation of common sea-space. Moreover, ethnic mobilization among the Coast Sami has changed the agenda, as the Sami Parliament claims native rights on behalf of Sami fjord fishers.

The scientific discourse is also changing, as the Fisheries Research Institute in Tromsø has made research on fjord ecosystems a priority. Marine biologists have come to believe that cod and haddock in these areas belong to local spawning stocks, which could be managed separately. Environmental conservation is becoming an issue in local fisheries management. A task force has forwarded a conservation plan for marine areas, in order to protect vital biotopes in fjord-ecosystems. Management is thus becoming increasingly complex, with new lines of conflict and disparate interest-groups. The challenge is how to integrate the concerns of conservation, ethnopolitics, aquaculture, recreation and commercial fishing. However, lessons from existing management practices should be useful in a process of designing a new co-management system for the fjords.

Einar Eythorsson
Finnmark College
Alta,
Norway

FROM COMMON PROPERTY TO PRIVATE PROPERTY - ICELAND'S EXPERIENCE WITH A MARKET SOLUTION TO THE "TRAGEDY OF COMMONS" IN THE FISHERIES.

Until lately, the studies of Individual transferable quotas (ITQ's) in fisheries management have been purely theoretical. However, New Zealand and Iceland, have adopted ITQs as an overall fisheries management system on a national level. The paper examines some of the theoretical assumptions about ITQ's against empirical data from the Icelandic fisheries. In Iceland, fish quotas were made transferable within a set of limitations in 1984, but since 1991, quotas have been freely transferable and divisible. The gradual transformation of common property rights into private property rights under the ITQ regime, is basically consistent with the economic theory of ITQ's, though this aspect of the theory is often undercommunicated in the political/economic rethorics. In the Icelandic case, the assumption that a ITQ-regime would discourage overinvestment in the fishing fleet seems questionable. Transferability transforms fishing rights into a sort of currency or capital bonds. Thus, the ITQ-regime as such seems to represent a major input of "new" capital into the fisheries, which in turn generates an incentive for tax-reducing investment for companies with large quota holdings.

In Iceland, the supply and demand for quotas seems to be influenced by a number of social factors, such as unemployment and lack of alternative sources of income for fishermen. There appears to be an interdependency between the quota market and the labour market, which in the Icelandic case is gradually creating a market price of fishermen's labour. This process, along with a concentration of quota ownership is increasing the level of social differences and social conflict within the Icelandic community, and is threatening the credibility of Icelandic fisheries management.

Segun Famoriyo
Department of Farm Management and Agricultural Extension
Federal University of Technology,
Akure,
Nigeria

LEGALIZING THE COMMONS-REVISITING NIGERIA'S LAND USE ACT

Nigeria with a population of at least 88 million has vast areas of land much of which apparently could be put into production to sustain her agricultural development. But for decades now, sub-optimal use of land has characterised agriculture. One of the main reasons for this has been the relative inability to obtain and acquire access to what appears to be 'free' land in Nigeria. The land use act was a bold attempt to tackle this problem through a legalization of the common property resources in form of family and community owned lands in Nigeria.

This paper argues the rationale for conceiving and producing the Act. Through research findings, it annotates the problems that ensued as a direct result of implementing the Act. These problems relate to actual and intended beneficiaries, to the State Governments and the bureaucracy as well as to traditional authorities and local governments in Nigeria. Research findings show that these problems are both socio-economic and political in complexion. They also indicate the nature of basic contradictions in the Nigerian society when the ruling elite fails to implement boldly and unequivocally a program that is laden with values that could promote both equity and welfare of the majority of Nigerians. The paper therefore answers the questions: what is wrong with the land use act? what has been done to improve the situation and what more needs to be done in order to make the act more effective so that more of Nigeria's lands may come into use? The areas at the cutting edge of change are therefore identified in this context, while necessary implications are drawn. The paper concludes with suggestions for achieving even further improvement in implementing and operationalising the provisions of the land use act. This may facilitate unfettered access to Nigeria's land resources.

Paul Fingleton
Environmental Impact Services
Dublin,
Ireland

EVALUATION OF THE POTENTIAL FOR INTEGRATED COASTAL MANAGEMENT WITH PARTICULAR REFERENCE TO THE IRISH COASTAL AREA.

This study is investigating the potential for sustainable development of the coastal zone through sectoral integration. A fundamental part of this investigation involves the examination of policies and attitudes which govern the exploitation of the resource, from local to international levels. Whilst once case study examines these factors as they relate to one specific coastal area,

of more particular relevance to this conference is the second case study which looks at one specific species of fish, the Atlantic Salmon.

This fish has previously been exploited at every opportunity from its feeding grounds to the spawning rivers. Mounting pressures have in recent years caused many fisheries to cease to intercept these migratory fish. In Ireland the practice continues and it is now the home drift net fishery which presents the biggest obstacle to returning fish. This fishery receives significant funding from EU sources. Other less obvious factors which adversely affect the species such as water pollution and sedimentation arise as a result of land based development - often financially assisted by the EU. It is this kind of conflict which this study is identifying with the aim of finding means by which they may be resolved.

Mathias Finsveen,
Norsk Almenningsforbund, Brøttum Almenning
2610 Mesnali,
Norway
Fax +47 6236 3266

Asbjørn Næss,
Landbruksdepartementet, Skogavd., Pb 8007 Dep,
0030 Oslo
Norway
Fax +47 2234 2754

THE BYGDE-COMMONS IN NORWAY ¹

The bygde-commons came into being through the sale of royal commons, through the subdivision of private commons, or from land which has, from ancient times, been recognised as bygde-common land. In Norway there are 52 bygde-commons and 7 state commons which are run as bygde-commons. Their total area is 0.75 million ha., of which 0.2 is productive forest. This is approximately 3% of Norway's productive forest. The annual timber production is approx. 0.4 million m³ or approx. 4% of Norway's total production.

The bygde-commons are owned by the farms which have the right to use them. The right of use includes access to raw materials to meet agricultural needs, grazing for those animals which can be fed on the property through the winter and the right to fish and to hunt small game. Approx. 14,500 farms have the right to use the commons.

Many commons run businesses which include sawmilling, sale of building materials, sale of fishing and hunting licenses, leasing of land for holiday homes, and other tourist-based operations.

The profits of the commons must first be used to secure and improve the commons to provide for the future requirements of the commoners, and then to develop secondary industries, allow discounts and subsidies for the commoners, and to carry out work for their mutual benefit, etc.

The commoners' rights are, along with allodial rights, the oldest legal institution we know of. A bygde-common cannot be sold or mortgaged. A commoner's rights cannot be sold nor be in any other way separated from the estate to which it belongs.

¹Translated from the original Norwegian by Michael Barclay

A new Act of Parliament concerning the bygde-commons was passed in 1992. The Act regulates the election of the board and the board's duties, accounting and auditing procedure, election procedure, and the AGM agenda. It requires a forestry plan and a qualified forestry manager, as well as rules governing use, etc.

The bygde-commons are regarded as an effective management and ownership model which, by a multiplier effect, brings disproportionately great benefits to their local communities compared to the resource value of the commons themselves.

David Fluharty
School of Marine Affairs, University of Washington
Seattle,
USA

EVOLUTION OF FISHERIES ENFORCEMENT ISSUES IN NORTH PACIFIC

The international compliance issues in the North Pacific and bilateral measures to induce compliance is discussed, especially problems concerning the doughnut hole. Current enforcement issues in the attempt to develop a domestic fishery and the transition to IFQ arrangements will also be discussed.

Carl Folke and Fikret Berkes
Beijer International Institute of Ecological Economics
The Royal Swedish Academy of Sciences
S-104 05 Stockholm
Sweden

RESILIENCE AND THE CO-EVOLUTION OF ECOSYSTEMS AND INSTITUTIONS

Resilience is the ability of a system to cope with change without collapsing. It is the capacity to absorb external perturbations, by actively adapting to an ever changing environment. Reduction in resilience means that vulnerability increases with the risk that the whole system flips from one equilibrium state to another. Such flips are often the consequence of the misuse of the environment and the inertia of institutions to change. Smaller predictable perturbations that previously could be handled turn into major crises when extreme events intersect with internally generated vulnerability due to loss of resilience. To avoid such situations there is a need for institutions with the ability to respond to and manage environmental feedbacks, institutions that can cope with unpredictable perturbations before they can accumulate and challenge the existence of the whole social-ecological system. This implies that it is not enough to only understand the institution in question. The dynamics of the ecosystems that form the biophysical precondition for the existence of the institution need to be taken into account as well. This study focuses on the linked social- ecological system, and its dynamic interrelationships. We regard it as one system with its social and ecological components co-evolving over time. It is in this context that we study the traditional and newly-emergent social-ecological systems. We are analyzing 1) how the local social system has adapted to and developed a knowledge system for dealing with the dynamics of the ecosystem(s) including the resources and services that it generates; 2) specifically, how the local system maintains ecosystem resilience in the face of perturbations; and 3) those combinations of property rights arrangements, institutions and knowledge systems which accomplish the above successfully. Examples will be presented from the Cree Indians of the Canadian Eastern subarctic and their resource management, and pastoral herders and rangeland management in semi-arid Africa.

Guy R. Fontenelle

Dept Environnement & Exploitation des Ressources Naturelles Ecole Nationale Supérieure
Agronomique, Rennes,
France

Anne R. Kapuscinski

Department of Fisheries and Wildlife, University of Minnesota,
St. Paul, MN 55108,
USA

CAN A CO-MANAGEMENT ARRANGEMENT BE DEVELOPED FOR WILLAPA BAY WATERSHED, WA, USA?

The Willapa Bay watershed is still a biologically productive area but current uses and management of terrestrial and aquatic resources are demonstrably unsustainable. This watershed exemplifies contemporary dilemmas posed by mixtures of public and private, local and regional, urban and rural, open and limited access regimes for natural resources. Resource management efforts by local, state, and federal agencies are fragmented. Several recent initiatives began to join different groups interested in the watershed's resources. One is an Alliance of local and outside parties seeking to foster environmental education, research, and economic sustainable development in this economically depressed area. These efforts were compared to theoretical literature on and case examples, from other regions, of co-management approaches. Our preliminary analysis suggests that institutional arrangements of these efforts seem inadequate to foster effective cooperation among local groups currently split by competing extraction goals and strongly self-interested behavior. Yet, the literature on co-management shows that appropriate arrangements make it possible to bridge these types of differences.

Nadia Forni

Rome
Italy

THE EVOLUTION OF COMMON PROPERTY RESOURCE MANAGEMENT (CPRM) IN CENTRAL ITALIAN PASTORAL AREAS. CONTINUITY WITH CHANGE.

An example from pastoral common property regimes in Central Italy. The paper will highlight continuity over millennia coupled with adaptation. Pastoral common property regimes within an advanced capitalist society: the role of the state, of the individual, of the right holders group. Starting from a historical analysis the current relevance of common property regimes in pastoral areas will be reviewed. Common property resource regimes as efficient managers of ecologically marginal areas. Their relation to capital, labour and land markets in an open economy with emphasis on private access to resources. Is CPRM essentially conservative or is it an instrument for grassroots democracy and planning from below. Has equity been a consistent feature of pastoral CPRM. Who are the current right holders and how do they relate to mainstream society. The Italian state's and the European Union's agricultural policies, direct and indirect effects on pastoral CPRM.

Katia Frangoudes
 OIKOS Environnement-Ressources
 Rennes,
 France

CHANGING FISHERIES MANAGEMENT INSTITUTIONS IN THE FRENCH MEDITERRANEAN

In the French Mediterranean, local institutions devoted to fisheries management exist since the 14th century. They are called *Prud'homies*. Originally, they received from the king the power to design and enforce regulation for the sake of fisheries management over a territory, including the possibility to stand as a court. One of their duties was to ensure "equal access to the resources for their members". There is one *Prud'homie* for each fishing port and its leader, the *Prud'homme*, is elected by the fishermen assembly.

This continued until 1945, when the state created a new type of fishermen organisation. This is a pyramidal non elective system with local fisheries committees (CLP) and a central committee of marine fisheries (CCPM). In the Mediterranean, the local committees took over part of the *Prud'homie s'* authority with the mandate of "resource management", the implementation power being transferred to the administration. In practice, fisheries management and dispute settlement used mainly the *Prud'homie s'*. The transition from a local guild-type of representation to an administrative representation failed and until 1993 the CLP played a minor role in decision-making.

In 1992, a reform of the national system gave more legitimacy to local committees by making them elective and extended their competence. Crew and skippers now vote for their local representatives both in local committees and *Prud'homie s'*. Although the respective roles are clearly defined by the law, many legitimacy and competence conflicts arise today. The CLP proposes regulations, the administration implements them and the *Prud'homie* has a conciliation function. The *Prud'homie* went to the court to dispute the election of local committee members. The paper seeks to analyse this conflicting situation between the two institutions. This project is part of the European Union Commission funded research project "Management of Renewable Resources: institutions, regional difference and conflict avoidance related to environmental policies and illustrated by marine resource management".

Milton M.R. Freeman,
 Department of Anthropology, University of Alberta,
 Edmonton, Alberta T6G 2H4,
 Canada

ADAPTIVE MANAGEMENT OF MARINE MAMMALS: ACCENTUATING THE POSITIVE

The recent history of marine mammal management regimes suggests that this is one particular area of fishery and wildlife management where conflict and failure are both especially prevalent. One cause of these conflicts and failures appears to be the increasing tendency toward globalizing (or progressively delocalizing) the management regimes with a resulting tendency for more and more actors to seek inclusion in management deliberations. Many such actors have ideological and financial agendas that increasingly politicize the management process without necessarily improving the sustainability of the resource user-resource interdependency. On the other hand, much of this political action has caused a marked destabilization of the management process by marginalizing both professional managers and knowledgeable and influential members of the local resource user community. This shift away from knowledge-based management results in ecosystem imbalances and resource collapses,

both of which are used to encourage further political involvement on the part of those causing the initial problem.

This paper examines approaches to marine mammal management problems that recognizes the legitimacy of local-level involvement in management, and the existence of community-based (as well as state-level) solutions to questions of sustainable resource use. It urges a return to those management approaches where appropriate, and suggests that issues of sustainability, equity and community viability are inextricably linked.

Mark Schoonmaker Freudenberger, Judith Carney and Aiah Lebbie
World Wildlife Fund,
Washington D.C.
USA

THE EMERGENCE OF COMMON PROPERTY REGIMES IN THE WEST AFRICAN SAHEL: A COMPARATIVE STUDY OF THE GAMBIA AND SENEGAL

The commons in the West African Sahel are valuable though often ecologically threatened sources of food and fiber products for rural and urban populations. Rural communities in many parts of the Sahel create new rules and conventions to define rights of access and sustainable uses to particularly valuable resources found within the commons. Often these communities construct these covenants on the foundations of traditional common property regimes. This case study describes the flexible and constantly evolving "tongo" common property regime recently studied in field research in western Senegambia, Upper and Middle Guinea, and coastal Sierra Leone.

Sixteenth century Portuguese explorers and English colonial administrators describe in considerable detail the "tongo" restrictions and sanctions, yet until recently, few development practitioners recognized the existence of this regime in West Africa. Known as the "sawei" in Mende societies of Sierra Leone, the "tongo" is a set of prohibitions devised and enforced by community institutions to regulate access at certain times of the year to particularly valuable resources found both within the commons and on individually appropriated lands. The restrictions often determine the dates and conditions of access by the community-at-large to specific tree species, fishing grounds, grazing lands, sacred forests, and thatch collecting areas. This paper suggests that development projects seeking to construct new forms of collective resource use arrangements can incorporate into project design many of the features of the "tongo" by paying particular attention to the way in which community institutions define and enforce rules of access. These lessons can be usefully employed by project personnel and policy makers to facilitate the emergence of new forms of community controlled protected areas.

Peter H. Fricke,
Office of Fisheries Conservation and Management, National Marine Fisheries Service
Silver Spring, MD 20910
USA

CO-MANAGEMENT IN UNITED STATES' MARINE FISHERIES: REFLECTIONS ON THE SHARING OF GOVERNANCE

Management of marine fisheries in the United States is undertaken by an uneasy partnership of eight Regional Fishery Management Councils (Councils) and the National Marine Fisheries Service (NMFS) pursuant to the Magnuson Fishery Conservation and Management Act (1976,

as amended). This pattern of governance has been described as a form of co-management; that is, the devolution of power from central government to citizen-representative natural resource management entities. The paper looks critically at the patterns of power-sharing between the Councils and NMFS, and then examines three cases in which power has further devolved to fishermen in the development of fishery management plans. The cases are the spiny-lobster fishery of Florida; the dory fleet of Newport, California; and the management of the Columbia River salmon fishery. In our conclusions it is suggested that the Councils can be effective vehicles for the development of regional management for single-species specialised fisheries. Fisheries which are localised, or multispecies inshore fisheries, benefit from development of management plans by local bodies.

M. G. Ghosh
International Development Research Centre (Canada),
Santiniketan, West Bengal
India

COMMON PROPERTY RESOURCE USE BY POOR IN WEST BENGAL

Significance of Common Property Resource (CPR) is getting increasingly recognized for tackling rural poverty. Both in terms of existing practice and use potential, these are of major significance for the livelihood and wellbeing of rural poor. The poor also enjoy certain informal rights of access to the fruits of private property resources (PPR). What seems significant is that with increasing population pressure, greater commercialisation, technological change and certain public policies, there have come about over the years an erosion of the size and status of CPRs and rights of access hitherto enjoyed by the poor.

The study is concerned with rural people's use of CPRs and how these contribute to their ability to improve their quality of life. The study is based on surveys conducted in one village each in the districts of Purulia and Bardhaman, representing the Plateau Region and Gangetic Plains of West Bengal. The Purulia village is backward and it has a high proportion of non-arable land, while the Bardhaman village is prosperous and which meant rapid depletion of CPRs.

The study reveals that CPRs are of vital importance to the poor as sources of income, employment and physical supplies of both food and non-food articles. This phenomenon is more pronounced in the Purulia village. The greater dependence of CPRs, however, reflects the precariousness of the poor for their survival.

Efforts are underway to develop CPRs and give greater access to the rural poor. In the Purulia village the poor have been taken in Joint Forest Management Committee and given usufruct right to certain forest products. In the Bardhaman village the potential for development has been sought through the exploitation of ground water. The results show that its beneficial effect has been iniquitous. The big farmers who also own irrigation equipment hold monopoly control over the water and enjoy a lion's share of its benefits. Effective interventions are, therefore, needed to control the water use for sustaining growth of ground water and improving its equity impact.

Jay J. C. Ginter

National Marine Fisheries Service, NOAA, U. S . Department of Commerce,
Juneau, Alaska 99802-1668
USA

THE ALASKA COMMUNITY DEVELOPMENT QUOTA PROGRAM

In December 1992, a new fishery allocation regime came into effect ,for a trial period in the Bering sea and Aleutian Islands (BSAI) area adjacent to Alaska. Known as the Community Development Quota (CDQ) program, this new regime reserved 7.5 percent of the annual total allowable catch (TAC) of walleye pollock (*Theragra chalcogramma*) in the BSAI area for the exclusive use of certain communities in Western Alaska. This has resulted in an average CDQ reserve of about 100,000 metric tons of pollock annually worth roughly \$20 million. The primary beneficiaries of this program are rural Alaskan communities on the west, or Bering Sea, coast of Alaska and t n the Aleutian Islands. These communities are not connected by road to urban areas. With high unemployment rates and limited economic development potential, they exist primarily on marine and terrestrial natural resources and government subsidy. The CDQ program was proposed as a means of developing a commercial fisheries infrastructure in these coastal communities.

This paper provides an overview of the CDQ program from the perspective of a US. federal government fisheries manager. The goals and regulatory background of the program are briefly reviewed. The procedure by which eligible communities may apply for a CDQ allocation of pollock is reviewed, and management constraints are explained. The monitoring and oversight roles of federal and state governments are reviewed, A summary c) of the federal experience in administering the CDQ program includes aggregated catch and bycatch data . The development objectives of each community organisation granted a CDQ allocation is briefly reviewed, however, an analysis of the social and economic effects of the program are beyond the scope of this paper. The paper concludes with a review of pros and cons of future expansion of the CDQ program to other fisheries, and the potential of CDQ-type variants as alternatives to open access and other limited access management systems.

Pieter Glasbergen and Tanja Verbeeten
Department of Environmental Studies
University of Utrecht
The Netherlands

MANAGING COMMON GROUNDWATER RESOURCES: THE CASE OF THE NETHERLANDS

The Netherlands are abundant of water. Water shortages seems to be non-existent. However, this is not the case. In many places the groundwater level is dropping. This phenomenon has occurred for decennia now. This results in a process of dehydration, which affects nature conservation areas.

In the higher parts of the Netherlands the groundwater level has been dropped by 20 centimetres or more in the period between 1950 and 1990. Locally, for example where groundwater is being pumped up, the level has dropped as much as one meter or more.

This is a structural decrease of groundwater, caused by human intervention. The backgrounds to this decrease are: a) the improvement of drainage for agricultural purposes; b) the increasing demand for cooling-water and drinking-water from industries and households; c) increasing urbanization, construction of roads and industrial areas.

The greatest demand for groundwater results from the need for drinking-water. In many places the surface water is too much polluted to provide for this need.

Dehydration of nature conservation areas as a consequence of the use of groundwater for productive and consumptional activities has evolved into a serious problem. For example, of the 1400 plant species occurring in the Netherlands, over 400 species have disappeared or dramatically reduced in numbers.

In the past decennia a system has been developed for more efficient management of the common pool resource 'groundwater'. This system intends to manage the resource in such a way that degradation of natural areas will be restored.

The resource is governed by a system of property rights, use rights and management rights. All groundwater in the Netherlands is owned by the state. However, if this groundwater is being pumped up by a landowner, he or she has the right to use the water. Management rights are exercised by the state. Therefore the Dutch government can in principal make rules to reduce groundwater use. Use rights are defined by means of management rights.

At the moment use rights are regulated by law. Every withdrawal of groundwater has to be reported and all of these withdrawals are registered. For huge withdrawals a license is needed. Licences are granted by the regional government that determines the amount of water and the period in which it is allowed to withdraw groundwater.

In principal the system of rules provides for an adequate approach to the problem of dehydration. However, in practice the intended results are not being achieved. The main reason for this is that the backgrounds of the demand for groundwater - especially the need for drinking-water - and other regional causes of dehydration (for example agricultural developments) cannot be influenced by the system of rules.

This case contains the lesson that a system of rules for the management of natural resources cannot be effective if it only solves the allocation problem - the allocation of rights to withdraw groundwater. The system also needs to provide for measures aimed at managing the demand for the resource, and measures aimed at preservation of the resource. Management of the demand for the resource requires incentives that reduce water use. Measures aimed at preservation of the resource require a regional approach, i.a. directed towards restoration by infrastructural adaptations.

Vsevolode Gousseff
Ukrainian Institute of Agro-economics,
Ukrainian Academy of Agrarian Sciences
Kiev, 252127
Ukraine

INSTALLATION AND ALLOTMENT OF HOMESTEADS TO RUSSIAN REFUGEES IN THE RIAZAN OBLAST

An ever growing number of ethnic Russian refugees comes back to Russia from now independent Asiatic states. Their installation depends before all on available space. The Oblast of Riazan (ca 200 km SE of Moscow) had 2,6 M inhabitants in 1960, but now only 1,3 M remain. These are either elderly or are not qualified to work in a city factory. Drunkenness a regular feature among males. Social problems are ever present. Oblast Authorities are thus willing to accept newcomers to stop desertification.

A successful installation can be achieved only if the following criteria are met

- 1/ goodwill from the local Authorities (Oblast & Rayon);
- 2/ available land for settlement, whatever form of property or right to use (granted for use, given with a title, individual or collective ownership, i. e. to an association; a limited company, a cooperative, etc);
- 3/ no problem of "nationality" (ethnic: migrants can only insert themselves if they are ethnic Russians, as the local population, for instance would not accept Armenians, or other non Slav people;
- 4/ necessary energy with a sense of initiative allowing to create small and medium enterprises with a parallel creation of jobs;
- 5/ last but not least, have a minimum of financial means (own or loans)

The example studied shows a relatively successful reintegration of refugees from Kirguizstan in the Oblast of Riazan, district of Pronsk, village of Pogorelovo 250 families were settled, after obtaining from the local Authorities free housing which had to be entirely rebuilt. The refugee association then created a series of workshops (furniture, felt pencils, wire mesh, building materials, etc.) Employment was also given to the local population which removed bad feelings

In the present second stage, land plots were given for homestead in the nearby village of Aliabino, where settlers started to build cowsheds, barns, and ultimately houses and plowed in their plots. The industrial activity is leading the agricultural one. From now on, also a bankrupt Sovkhoze has been offered for management to the refugee Association "Youg"

Guangjing Ma, He Shang, Baizhong Li, Ping Zhang, and Jingshen Liang
 Institute of Forest Ecology and Environmental Protection, Chinese Academy of Forestry,
 Beijing 100091,
 P.R. of China

FOREST, ENVIRONMENT, SUSTAINABLE DEVELOPMENT

China is trying to make a great contribution to sustainable development. In China, environmental protection has been considered as a basic policy in the development of national economy, and therefore strategies for economic, city-rural and environment construction with the integration of economic, social, environmental effects were stipulated, i.e. synchronous planning, carrying out and developing; And the three major policies were carried out, putting prevention first, pollution will be treated by a person who creates it, and strengthening environmental management; Additionally, China is trying to develop shelter forest systems in coastal and river regions, and areas where suffer from frequent disturbance of winds and sands; In northern China, the shelter forest system extending 4480 Km has become "Green Great Wall" for wind-sand control; At present, more than 600 nature reserves covering 400,000 Km² within China have been set up, and many precious animal and plant species have been protected. The family planning policy has been carried out all the time in order to mitigate pressure of population increment on eco-environment. After more than 10 years of system-reforming and open to outside, the gross national product(GNP) has been double, while environmental quality has also remained stable.

<<China's Agenda 21>> is being formulated. After UNCED, China took an immediate action to organise related departments under the co-ordination of National economic planning committee and State Scientific and Technological Committee to formulate <<China's Agenda 21>>, i.e. the country's strategy for China sustainable development.

The special role of forests in sustainable development. "The subject of forests is related to the entire range of environmental and development issues and opportunities, including the right to

social-economic development on a sustainable basis" was indicated in <<Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests>> issued in UNCED. In China, increasing forest resource, expanding reforestation and improving eco-environment have been referred as a basic country's policy. Compared to 1981, forested area has increased by 12 millions ha with the total of 131 millions ha, while living standing volume increased by 202 millions m³ with the total of 1.09 billions m³, forest coverage has increased by 1.27 percent with the total of 13.63%. As a result, forest resource in China is increasing while decrease in many other countries. The increased forests in China has made a great contribution to improvement of eco-environment in China and the global, and will continue to develop its unique effects on the future sustainable development.

For sustainable development, the great concern of all governments in the world is needed, and extensive education and the role of propaganda media should be addressed, which will stimulate popular participation. Therefore, the role of Non-Government Organisations(NGO), and every individuals concerning about sustainable development along with activities and suggestions for the promotion of popular participation should be paid more attention and be encouraged.

Ma Guangjing
The Chinese Academy of Forestry
Wan Shou Shan, Beijing 100091
P.R.China

COMMON FOREST RESOURCES SUSTAINABILITY AND LEGALISATION OF PROPERTY RIGHTS IN CHINA

From 1958 to 1980, there were three forest deforestations in China, which were the disasters during the Changing process of China's forest resources. In 1976, the forest coverage in China was only 12.7%. Basic causes for the three forest deforestations were no perfect legal system, the property right of forest was no steady, the legalisation of property right was neglected. After reviewing the history of forest development in China, we found that though the historic background was different, and there was a variety of causes, one of the causes was the same, i.e., the property right of forest, trees and forest land was not steady and the Laws couldn't effectively protect the legal benefit of the owner or user. After the approval of the Standing Committee of the National People's Congress, the "Forest Constitution" was adopted and executed from Jan. 1, 1985, and it put an end to the forest deforestation. The third issue of the "Forest Constitution" stipulates that the forest, trees and forest land belonging to state, collective or individual should be registered and checked by the government above the county level and certificate be dispatched, ownership and right of the user be confirmed: the legal right and benefit of the owner and user of the forest, trees and forest land are protected by the law, which can't be encroached by any organisation or individual. Managing the forest according to the law, which made the Chinese forest resources get rid of the deforestation and begin to enter a period of steady development. According to the statistics of the national forest inventory made in 1988, the national forest coverage increased to 12.98%, while it was 12.7% in 1976. Especially, the prominent achievements obtained in the tree-planting movement in recent years, meant that China has got rid of the forest deforestation and entered into a developing and protective period. In 1992, China's forest coverage increased to 13.4%, while it was 12.98% in 1988.

Philippe Guizol
 CIRAD-Forêt Green-Less, Nogent Sur Marne
 France

LINEAL EROSION IN BURUNDI

In Burundi, State action for soil conservation is focused on farming plots - which are known as a system - by draining runoff water surplus. The gathering of runoff water on very steep lands outside private fields causes extensive runoff on paths and furrows between plots. Those furrows then grow into gullies causing damages to adjoining or downstream plots. The furrows and gullies network form a growing space between the plots with the features of a free access common space. It can be used by all residents, and allows each farmer to solve water surplus problems at his level. But no person, nor any current institution, wishes to be in charge of the maintenance of these spaces in order to reduce their effects.

Which is the most appropriate analysis for the issue of soil erosion in Burundi? Should the analysis focus on cropping patterns and external effects or on common spaces and their relating institutions?

Frode Gundersen,
 Department of Economics and Social Sciences,
 Agricultural University of Norway,
 Ås,
 Norway

LOCAL INSTITUTIONS AND THE MANAGEMENT OF COMMON PROPERTY

The responsibility for management of common property resources in mountain areas in Norway are divided between municipalities and different state authorities. The different authorities are using different laws and implementing different policies and supporting different local interest resulting a fragmentation of the public policy.

The local institution Fjellstyret (the municipal mountain council) have the responsibility for the management of large state property. The goal is both wise management for the environmental resources and exploitation of the resources in the purpose to make profit and to take consideration to local economic interests and culture. The members of Fjellstyret are local representatives and they have a difficult job to balance between the different interest. The representatives in different types of environmental committees in the municipalities are in a similar situation like the members of Fjellstyret.

From the end of the 80' there have been a decentralization of authority from state and regional environmental authorities to the local institution. At the same time there have been initiatives to develop the exploitation of the natural resources specially to develop new types of tourism.

The main purpose of this paper is to examine how members of local institutions with responsibility for the management of mountain areas behave when they are under pressure from both environmental authorities to implement national environmental objectives and from different local economic actors to develop the agriculture or the local tourism.

Satyawati Hadi
Agency for Forestry Research and Development
Bogor
Indonesia

FOREST LAND RESOURCE IN INDONESIA: COMMON PROPERTY RESOURCE AND A QUEST FOR SURVIVAL

Forest land had been historically recognised as a common property resource on islands outside Java. The common forest land property right is known to form one of the components of the traditional law of the indigenous people in 19 different parts of Indonesia.

The right to utilise the forest and the vegetation on that land (covering the extraction of the wood and non-wood forest products) is attached to the household or to the clan. The status of the common property right varies with the ethnic group concerned and thus with the location. It is also determined by the characteristic of the process; and the course of the development during and after the termination of the Dutch administration .

It was in 1960 that the Government of Indonesia passed the Agrarian Law in which the requirements for the forest land's Common Property Rights were specified. The Philosophy of the Agrarian Law is essentially based on the principle adopted in the traditional law. In the Agrarian Law of 1960, it is formulated that "the State" instead of the village, the hamlet, the clan, or the household which have the right to manage the land, unless such right had been officially declared by the State.

As most of the common property land resources are covered by forest, some problems in the implementation of the Agrarian Law are associated with the development of forestry. During the last 5 years there is a growing demand by the local people inhabiting areas in and around the forest to have the right to manage the respective forest land as their Common Forest Land Resource.

In this paper alternatives are proposed to overcome the problems by taking into consideration the stage of the forestry development, the heterogeneity of the culture of different ethnic groups, the fund resource available in the local community, the national demand of the wood and non-wood forest products for domestic consumption as well as for export, the sustainable production of the forest, and the distribution of responsibility in the management of the forest to the local community, to the private sector and to the Government.

Key-words:

Forest land, Indigenous people, Traditional law, Agrarian law

Abraham Hallenstvedt
Norwegian College of Fishery Science, University of Tromsø,
Tromsø,
Norway

INFORMATION AS A CRITICAL FACTOR IN MANAGEMENT AND MONITORING

The management systems that have been established over the last two decades can be seen as a search for rational decision making. The decision making bodies are dependent on information from a broad specter of sources involving large numbers of independent actors. As the system of regulations of the fisheries has been directed more and more towards the individual actors e.g. individual vessel quotas, the decision making has become increasingly complex.

Management decision making are operating with information involving a high degree of uncertainty. Control and monitoring are mechanisms for getting information that is regarded reliable by the decision makers. Information is not only input for management decisions, but also for behaviour of the individual actors.

This paper starts out by presenting the development of decision making systems for fishery management. The role of control and monitoring as systems of information will be discussed. The quality of information and its aggregates to fishery statistics is a theme in the paper, and so is also the relation between quota systems and fishery statistics. A discussion of actor mobility across different decision making systems concludes the paper.

Abraham Hallenstvedt
Norwegian College of Fishery Science, University of Tromsø,
Tromsø,
Norway

REGULATIONS, CONTROL AND ENFORCEMENT: THE WEST-NORDIC COUNTRIES

The paper will give an overview of the regulations and enforcement principles in the West-Nordic countries e.g. Faeroe Island, Greenland, Iceland and Norway. It will be illustrated how the different structures of the fisheries is reflected in the management regimes and also in the systems of control and enforcement. The organization of the enforcement system will be presented, including the main bodies and their responsibilities. The purpose of the enforcement systems and the means and resources applied, will be discussed. The combined expenses of management and enforcement of modern fisheries are substantial and has to be related to its achievements. Over the years the focus of control and enforcement has gradually shifted from concentrating on technicalities like mesh size and over to a focus on measures like closure of areas and discard ban. The reasoning behind this change of focus will be outlined. The role of sanctions against violations of the rules is an important question that will be treated in the paper.

The enforcement and control systems should also be seen from the fishermen's point of view. What role, if any should be given to the fishermen in control and enforcement matters? Is there a role for the fishermen's organizations in control matters? These questions will be answered in the paper. Finally, by comparing the Nordic countries the paper presents some general conclusions and policy recommendations.

Monica Hammer
Natural Resources Management Institute, Department of Systems Ecology, Stockholm
University, S 106 91 Stockholm,
Sweden

RESOURCE MANAGEMENT AND ECOSYSTEM RESILIENCE: A CASE STUDY OF THE BALTIC SEA FISHERIES

This case study focuses on the links between ecological and social systems in Baltic Sea fisheries. By defining privileges and duties in the use of natural resources, property rights systems act as a coordinating mechanism between humans and the natural environment. Further, ecosystem resilience has been suggested as a useful concept for environmental sustainability. Thus an important aspect of future fisheries is the degree to which the fisheries management can build property rights systems that reflect the ecological and socio-economic context and sustain or improve the resilience of the life-supporting ecosystems. The Baltic Sea

hosts a significant offshore commercial fishery as well as different local fisheries acting in nested institutional settings and in different ecosystem environments. This study on Baltic fisheries investigates selected indicators of resilience seeking to identify new principles for sustainable resource use. The Baltic commercial offshore fisheries are dominated by a few species that are regulated mainly by total allowable catch quotas divided between the nine different coastal states. However, a combination of ecological and socio-economic factors such as increased environmental degradation, increasing fishing pressure, and overcapitalization of fishing fleets around the Baltic Sea have resulted in serious difficulties for the Baltic fisheries. This current dominating management system blocking out ecosystem feedbacks has led to unsustainable use. The importance of learning how potential new principles derived from local studies can be used to determine whether degraded ecosystems can be restored to generate a sustainable flow of ecological services is discussed in the context of Baltic fisheries.

Susan S. Hanna

Department of Agricultural and Resource Economics, Oregon State University
Corvallis, OR 97331-3601
USA

BUILDING FISHERIES STEWARDSHIP THROUGH INDUSTRY PARTICIPATION IN MANAGEMENT

Throughout its history, the Pacific Fishery Management Council, one of the eight regional fishery management councils in the US federal marine fisheries management system, has used a process for developing regulations that is based on strong industry participation. The Council has had multiple objectives for the active inclusion of industry in regulatory development: equity for all users, creation of a stewardship ethic, and the implementation of control systems which are resilient to changing conditions. The process of regulatory development through industry is analyzed in this paper for three different programs in the West Coast groundfish fishery. The development process and outcomes of the three programs are analyzed for the extent to which they promote the objectives of equity, stewardship and resilience. Components of the three programs are compared, and efficiency considerations of user participation are discussed.

Bente Vibeke Hansen,
Sudergade 7B, DK-3000 Elingnore,
Denmark

CHANGING PROPERTY RIGHT REGIMES IN GREENLAND - AFFECTS ON MANAGEMENT ISSUES

Hunting marine mammals (seals and to a lesser extent whales) in Southern Greenland is not the main occupation for people living there. However, hunting is still important for many families both for income generating purposes and for sustenance. Management of marine mammals has developed dramatically in the last 50 years. From a more or less community oriented scenario for regulation, the Danish state and later on the Home Rule of Greenland have introduced management systems which give the central authorities the control over access to the resources. Furthermore, the internationalisation of management has moved the control over access to resources to countries -- and peoples -- far away. This raises the question: How do local hunters in Southern Greenland respond to their decreasing control over utilisation of the resources as a result of the shifts in property rights regimes, and does it affect the sustainability in the hunting of marine mammals? These are the questions, which the paper wants to give an answer to.

Lars Ivar Hansen
 Department of History, Institute of Social Science, University of Tromsø,
 Tromsø,
 Norway

THE HISTORY OF THE COMMONS OF NORTHERN FENNOSCANDIA IN AN INTER-ETHNIC PERSPECTIVE.

The paper discusses the occurrence, the origins and the contents of the (reciprocal) rights to resource exploitation in the commons in northern Fennoscandia, primarily on the basis of evidence from Norwegian side. After a short deliberation on the institution of the commons ("almenning"), as it had been developed in Southern Scandinavia, the relevant written evidence from the middle ages is cited. The primary actors in older times are also identified: The collectivity of holders of certain exploitative rights in the local Norwegian communities - the Sami communities - local and regional elites, like the North-Norwegian chieftains of the early middle ages - and eventually the central state authorities. The question about how far the institutionalization of 'commons' had come during the middle ages, is then addressed on the basis of new evidence, throwing light upon the use of the landscape from different cultural positions, and consisting of place-names, archeological evidence and land ownership structures from later times. Finally, the institutionalization of 'commons' is discussed in relation to other possible, and culturally prescribed ways of regulating the exploitation of resources in "outlying fields", forests and mountains. This is illustrated by historical examples of coexistence, differences and contradictions in the exploitation of resources, from the point of view of the Norwegian and Sami population, respectively.

Frederick Thomas Hendricks
 Department of Sociology, University of the Western Cape
 Belleville, 7535,
 South Africa

ANTINOMIES OF ACCESS: SOCIAL DIFFERENTIATION AND COMMUNAL LAND IN A NAMAQUALAND RESERVE, SOUTH AFRICA.

This article provides some perspective on the consequences and specific nature of colonial expansion in the remote North Western corner of South Africa forming the border with Namibia, called the Richtersveld reserve in the region of Namaqualand. It attempts to contribute to the ongoing discussion about the future of these semi-arid rural areas reserved for the so-called coloured people by examining the origins of these reserves and engaging in the argument about the results of the reserve policy for the residents of the Richtersveld. The article also compares the marginal (isolated) North Cape reserves with the much larger and more significant bantustans. Finally, it discusses the failed implementation of the policy of economic farming units in relation to conceptualisations of the merits and demerits of communal and individual land tenure. The article moves from a historical and comparative perspective of reserve policies in South Africa as a whole to the local conditions in one village of the Richtersveld reserve, Lekkersing, and finally to the experiences of one stock-farmer in Lekkersing, Joseph Cloete. The problem of efficient resource management in the former coloured rural reserves is complicated by the diversity, even opposition, of interest groups within the reserves. It is a problem that cannot be adequately addressed without an understanding of the peculiar processes of colonial dispossession and state intervention in the North Western Cape reserves. This article attempts to demonstrate exactly how the pre-existing form of land-holding was undermined and distorted, not only by the abortive attempt at individualisation in the 1980's, but by nearly one and half centuries of colonial rule.

Increasingly, the lack of respect for one's grazing area, which stock-holders these days complain of, indicates the advanced stage of the destruction of the local grazing regulation and control. In all probability, this lack of respect is caused by a vigorous assertion of the small-stock holders of their rights to the grazing commonage. It is a point of friction which is virtually impossible to regulate without undermining the communal rights of each to the grazing area. The social differentiation of the reserves lies at the heart of the problem. The communal system was premised on a relatively egalitarian social structure. Under conditions of gross disparities of wealth and poverty where the large livestock owners are also the teachers, small businessmen, shop-keepers, government bureaucrats, the small stock owners are also workers in the neighbouring mines, farms and fishing industry, and where a tiny minority of the population regard themselves full-time farmers eking out an existence from the sale of stock, the perpetuation of the system is, in the long term, not beneficial to the environment nor to the farmers.

Dominique Herve,
ORSTOM Bolivia, La Paz, Bolivia

Gilles Riviere,
CERMA-EHESS, Paris, France

Luz Pacheco
La Paz, Bolivia

COMMUNITIES AND COLLECTIVE USAGE OF LAND RESOURCES IN THE ANDES

In many Andean communities the area of land under communal control has steadily diminished over the past decades as more and more land is allocated to private family managed plots. In those Aymaran communities of the high Bolivian plateau under study, no communal grazing land has existed for several years and the most important question currently affecting the farmers is the appropriation of interculture such as crop residues, stubble and vegetal biomass resulting from land currently lying fallow. However, in the absence of any form of fencing, agreement between groups of individual farmers over access to the soil does occur.

In cases where there are close ties between agriculture and cattle breeding, the use of fallow land and the resources they provide remains collective but their management is subject to negotiation between parties whose interests are drawing further apart. We have attempted to analyse this process of negotiation between the respective parties. In addition, over the last forty years a clear strategy of spatial concentration of land has emerged. Such a concentration goes totally against long established Andean tradition which favoured a wide spatial spread of plots in order to minimise the risks posed by the climate (frosts, hailstorms, droughts, etc.) and also dispenses with the long-cycle crop rotation system which enabled the land to regain its fertility and limited the occurrence of pathogenic agents.

The aim of this multidisciplinary research is to attempt to analyse the causes and effects of these changes in the short to medium term. An historical approach placing the "community" in a wider political and socio-economic context enables us to analyse the most important stages in the allocation of local lands, the social and economic differences within the community and the evolution of landowning tenures that are a juxtaposition of "communal" (usufruct) and "private" land holding rights (although these "private" rights are not tantamount to the accepted European meaning). In fact, the use of communal land, grass, cultivated or non-cultivated soil products and all goods that have a recognised social value must be perceived not simply as a series of socially determined rights (as well as restrictions) bestowed by the community as a whole, but also as a form of reciprocity. As it's part of the reciprocal bargain, each individual

family is obliged, over the course of its members active life span, to take on a series of responsibilities (civil or politico religious) governed by a hierarchical cycle and to pay a land tax to the state (at least up until the end of the 1980's).

This attempt at describing decision-making processes could quite possibly be applied to other "resources" other than fallow land and its products. The research deals with aspects that are current events in a contemporary Bolivian context.

Charlotte Hess
Workshop in Political Theory and Policy Analysis
Bloomington, IN 47408
USA

THE VIRTUAL CPR: THE INTERNET AS A LOCAL AND GLOBAL COMMON POOL RESOURCE

The Internet, an international network of computer networks, is recognized more and more often as a common pool resource. A shared resource, it is both public and private, while no single authority is responsible for its governance. This "virtual" commons, which has grown exponentially since its inception in 1968, is already displaying many of the classic problems inherent to those found in the sharing and maintaining of natural resources where access is left open, such as overuse, congestion, and free riding. Further, over time the resource base itself may be depleted. This paper outlines a new research agenda to study the Internet as an intricate and complex common pool resource, both on the local and global level. It identifies four different and, at times, overlapping types of commons within the Internet, each of which have distinctive properties and require different institutional arrangements: a social commons, an information commons, a budget commons and a technical infrastructure commons. Several conditions are contributing to the growing competition for this resource: every member is able to be an information provider (publisher); the number of users is rapidly increasing; many newcomers do not know or understand the rules; there is increasing competition for supporting funds of new information technologies; the technical infrastructure is not growing at the same pace as the growth in use; the introduction of resource-demanding applications (like the graphic images and hypertext linkages of the World Wide Web) is growing rapidly; and there is poor communication and ill-defined roles among network operators, corporate owners, governing bodies and the different types of users. Indeed, the rise of these dilemmas illustrates the need for closer examination of the connections between the physical arrangements, the community of users, and the rules in use which contribute to the issues of speed and access. By studying the Internet as a common pool resource it may be possible to understand the problems more clearly in order to arrive at sustainable solutions.

Therese Gladys Hingco,
Philippines

AN ASSESSMENT OF PHILIPPINE EXPERIENCES IN IMPLEMENTING THE COMMUNITY-BASED APPROACH TO COASTAL RESOURCES MANAGEMENT

Four case studies on implementation of the community-based approach to coastal resource management were assessed using the following parameters: level of community participation; women's involvement; sustainable use and management of coastal resources; conflict resolution; capability to address legal, policy and equity issues.

The assessment has shown that this approach has successfully promoted the sustainable use and inexpensive management of coastal resources. Community-based resource management has led to a decline in destructive and illegal fishing activities, the implementation of resource rehabilitation measures and the establishment of marine protected areas. Effective community-based enforcement of regulations of the protected areas has led to significant and quantifiable changes in the quality of reef resources.

The empowerment of fisherfolk organisations was instrumental in the success of community initiatives in coastal resource management. The knowledge, skills and capabilities of fisherfolk to manage coastal resources were developed or enhanced through the community organising process. Fisherfolk organisations were also able to devise mechanisms which promote more equitable income distribution in their communities. However, the meaningful involvement of women has yet to be integrated into the framework of community-based coastal resource management.

Community-based resource management experiences have had limited success in resolving conflicts arising from incompatible activities in the coastal zone. Fisherfolk organisations have limited jurisdiction over many coastal zone activities which affects the status of coastal resources. Government authorities have control over the management of coastal zone activities and resources. The success of the community-based approach to coastal resource management depends upon the extent of powers and jurisdiction fisherfolk organisations have as well as the acceptability of the management schemes they implement.

Petter Holm
Norwegian College of Fishery Science, University of Tromsø
Tromsø,
Norway

FISHERIES MANAGEMENT AND THE DOMESTICATION OF NATURE

The paper discusses fisheries management as part of the modern project. At the core of this project lies the idea of nature as external environment; as a storage of resources available for human utilization. Reflecting the modernist conception of nature in general, fisheries management is about the control over and domestication of nature. This happens by way of industrial organization, science and bureaucracy. In the first half of the paper, this perspective on resource management is explicated in the context of Norwegian fisheries management. The major stages in the modernization project within the fisheries are described. I will in particular focus on the shift that occurred during the 1970s, when the ocean and its resources were redefined from an open to a closed system. In the second half of the paper, the limits to the modernist project within the fisheries are discussed. The ocean is last remaining wilderness. What are the dilemmas of its domestication? Three topics are discussed. The first is the technical problem of control (chaos and all that). The second is the problem of resource management as social change (closing the commons and the destruction of non-modern social forms). The third is the problem of the modern projects' non-generalizability (extending the modern project destroys the possibilities of externalization on which it relies).

Geir B. Hønneland
NORUT Social Science Research Ltd., Tromsø,
Norway

ENFORCEMENT AND CONTROL IN THE RUSSIAN ZONE OF THE BARENTS SEA

This paper presents a descriptive overview of the Russian fisheries compliance control in the Barents Sea. The central body responsible for the enforcement of fisheries regulation in Russia is Rosrybvod, a department of the Fisheries Committee in Moscow. Its regional branch on the Kola peninsula is Murmanrybvod. The organization is primarily oriented towards freshwater fisheries; only 10% of its approx. 500 employees are engaged in surveillance of the fisheries in the Barents Sea. Of this share, no more than 20 persons have status as inspectors, and inspection tasks both on shore and at sea are assigned to them. Murmanrybvod has four inspection vessels at its disposal. The new Boundary Law 1993 allows the Military Boundary Control to conduct inspections in the Russian EEZ, and there is a growing cooperation between this organization and Murmanrybvod. Quota control is performed on the basis of catch information submitted directly from each vessel to Murmanrybvod. Corresponding information from vessel owners and a special "head of fleet" at sea are used as correctives to the direct reports. This control system proved insufficient when Russian fishing vessels in 1991-92 started to deliver their catches abroad. This change in the fishermen's incentive structure - combined with the possibility to misreport catches - resulted in a considerable Russian overfishing of quotas in 1992. Subsequently, Russian and Norwegian fishery authorities took steps to coordinate their control efforts in the Barents Sea, establishing a formalized cooperation which provides Murmanrybvod with all data on Russian landings in Norway.

Geir B. Hønneland
NORUT Social Science Reserarch Ltd, Tromsø,
Norway

THE ROLE OF THE NORWEGIAN COAST GUARD IN CONTROL MANAGEMENT: DISCOURSE OR GUNS?

Traditionally, controlling the harvesting of natural resources has been viewed solely as an element of power utilization. Authorities survey the observance of regulations in order to punish violators. This paper includes another aspect of enforcement in fisheries. In the management of marine resources, control bodies may reach their goal of preserving the resource basis by seeking to increase the legitimacy of fishery regulations among fishermen. As for the Barents Sea, statistics show few differences in violations frequency between the Norwegian Economic Zone and the Fishery Protection Zone around Spitzbergen, although power has until now been utilized only in the former. Reports from the Norwegian Coast Guard indicate that a communication process between inspectors and fishermen contributes to adjusting fisherman behaviour to established standards. Thus, the threat of punishment does not seem to be the only plausible means for making fishermen comply with the rules. In the Spitzbergen area of the Barents Sea, different conditions related to the legitimacy aspect of control bodies may explain why the regime has succeeded in preserving the fish stocks around Spitzbergen despite an unclear jurisdiction in these waters. Firstly, inspectors' arguments lead to compliance by serving to maintain traditional resource-preserving norms among fisherment and convincing them of their rightfulness, Secondly, the Coast Guard - by means of its numerous auxiliary functions - in itself seems to enjoy a legitimacy from the fishermen's part that contributes to an observance of rules despite the absent threat of punishment in the event of violation.

Even Høydahl and Asbjørn Karlsen,
Nordlandsforskning,
Bodø,
Norway

PROPERTY RIGHTS TO HYDRO POWER IN A DEREGULATED MARKET

The topography and climate have given Norway a great potential for production of hydro-electric power. The modernization of the nation in this century corresponds to the development and utilization of hydro power. The structure of the property rights to waterfalls is partly a heritage from a time when electricity was unknown and partly a result of transactions aimed at development of this resource.

At the turn of this century industrialists and speculators bought property rights to waterfalls from farmers, either to produce electricity themselves or to sell the rights to foreign industrial companies. As the central authorities considered this development as a threat, they soon made legislative steps to keep the property rights on Norwegian hands and secure hydro power in the interests of the public. During the period 1906-17 the regulation of this sector expanded considerably.

The Norwegian electricity market is divided in two segments. The state and the industry itself have supplied the energy intensive industry, while counties and municipalities have supplied households, service industries and other manufacturing industries. Compared with other western countries, there is a decentralized structure in the electricity production and distribution in Norway.

Especially in the province of Nordland, the state historically has owned much land. Here the industrialization took off only after the last war when the State became vital in regional development. The state provided the industry huge quantities of cheap electricity. As energy rich regions got industrial employment and different financial compensations, state ownership was perceived as legitimate.

During the first half of this century transfer of electricity was constrained by technology and infrastructure. Later it was rather constrained by institutional arrangements. The thorough legal regulation of this sector has been firm until recently. Deregulation of this sector from the early nineties, has given actors more freedom to engage in the market. Owners of hydro power plants may find more profits in sale of electricity in a wider market. Electricity has come to be looked upon as a commodity rather than infrastructure.

Our hypothesis is that there will be a new focus on the property rights to the waterfalls. We expect tension between local and central government and between local industrial agents and national and international companies. In this paper we want to analyse how conflicting interests are articulated and worked out politically.

Hsain Ilahiane
Rabat,
Morocco

COMMON PROPERTY, ETHNICITY, AND SOCIAL EXPLOITATION IN THE ZIZ VALLEY, SOUTHEAST MOROCCO

Contrary to much of the accumulated scholarship on indigenous resource management institutions in various parts of the developing world, this paper argues that common resources or property management in the small-scale irrigation communities of the Ziz Valley paints a

complex historical situation where ethnicity, power and religious ideology are employed to exploit the lower social classes. One of the essential claims of this paper is that sustainable and robust long enduring common property institutions can also exist in conflict-ridden and exploitative based communities, and that just rules or the concept of law as understood in the West can not be applied to understand some components of common property management in the developing world.

Nalin Ranjan Jena
PRIA, New Delhi-110062
India

STATE, PASTORAL NOMADS AND THE COMMONS: A STUDY OF THE MUSLIM GUJJAR TRIBE IN NORTH INDIA.

Pastoralism, more so nomadic pastoralism dependent on the Commons for survival is facing severe crisis all over the World, today What threaten such "way of life" are modern Nation-State and their development strategies, on the one hand; and the "tragedy of commons", on the other. The planners and policy makers in the Third World see nomadic communities as examples of "static" and "traditional" societies, rejecting change and forms of state control. They have been seen as "irrational" because their attitude towards production and herd-management was seen as non-economic. As a result, nomadic groups in the Third World have hitherto most often been completely eradicated by the so called development process.

While the Commons are in a tragic condition because of a variety of modern forces and activities, pastoral way of life is considered destructive to the common resources. Hence, states have been making persistent conscious efforts to discourage pastoral survival strategies by abrogating their traditional rights directly or indirectly, and undermining their indigenous knowledge for management of common resources.

This is a situation in which pastoralism is caught. The Gujjars, a Muslim pastoral nomadic tribe living in the foothills of Himalayas in Northern India, are also facing the same crisis today. They are one of the few Muslim tribal groups in India. They are also one of the diminishing number of nomadic groups who have been able to survive as nomads up to the present. While the Gujjars have resisted to give up pastoralism and nomadism, they have maintained their cultural uniqueness, and are still living in isolation in the forest. The only economic activity, the Gujjars have been traditionally engaged in, is animal husbandry. Till today their animal husbandry is based on their own traditional knowledge and practices and is forest oriented

Over the years, their subsistence economy has changed into urban oriented market economy. Their milk production and milk products enter to the urban market.

While this change has unleashed a process of exploitation for the Gujjars in various ways, the state control over forest has exposed them to rampant corruption and subject them to a process of alienation. More recently, the forest area resided by the Gujjars has been declared as a National Park. And according to the legal provisions of national park, human habitation is not desirable inside the forest. Hence, efforts are afoot by the government to displace the Gujjars and settle them as peasants.

This paper analyses the survival strategies adopted by the Gujjars in the face of many threats and pressures, and highlights the linkages between indigenous knowledge and the Commons.

Svein Jentoft,
Department of Social Science, University of Tromsø,
Norway

Boguslaw Marciniak,
Institute of Sociology and Philosophy, University of Gdansk,
Poland

FISHERIES MANAGEMENT IN POST-COMMUNIST POLAND: PROSPECTS OF USER-GROUP PARTICIPATION

In the wake of the transition from communism to capitalism, the structure of the Polish fishing industry radically changed. The heavy-weight state fisheries sector is dismantled and privatized. Privatization also left the co-operative sector isolated and vulnerable. Without government support and with their confederative institutions abolished, their role as co-manager was severely limited relative to the situation that prevailed under communist rule. The small scale private sector, while obtaining more freedom under the new regime, still suffers from minimal fish-quotas and lack of government assistance.

To become influential in fisheries management Polish fishermen are in need of collective organizations that can broker their concerns and interests vis-avis government, and they have experiences from traditional institutions to draw upon. In some communities along the Baltic coast, the traditional (pre World-War 2) forms of co-management institutions - the so-called "maschoperias" - still exists. What are the prospects of revitalization of these traditional management institutions now that the state sector has vanished and the co-operative sector is near to collapsing? What conditions, external as well as internal to their communities, may enhance the role "maschoperias" in Polish fisheries management? The data presented in this paper is gathered from fishing communities and "machoperias" in Kashubian region of Baltic Poland.

N. S. Jodha
Environment Department, The World Bank
Washington DC 20433
USA

FUTURE OF COMMON PROPERTY RESOURCES. WHY CONCERNS DONOT CONVERT INTO ACTION?

Despite some inter-regional differences, the empirical work on (land-based) CPRs in the developing countries suggests some common inferences, which show strong convergence with the development concerns of both the national governments and donor agencies. Yet, one rarely finds any pro-active CPR policies and programs on the part of these agencies.

To elaborate, we can refer to the following. CPRs' contribution to the sustenance of rural poor can make them a useful component of the anti-poverty interventions; designation and use of largely fragile and sub-marginal lands as CPRs, qualify the latter for (investment and management wise) special treatment under environment or resource protection programs; CPR-PPR complementarity, an unrecognized source of enhanced agricultural productivity continues to be ignored by agricultural R&D; CPRs offer a ready made field for initiating participatory developmental activities and local capacity building initiatives for natural resource management. Despite all the above mentioned possibilities, agency after agency continue to ignore CPRs and many of them tacitly encourage their decline. Thus leaving the CPRs' cause to be attended by scattered NGOs or the researchers with little resources and orientation to promote field activities involving CPRs.

A few possible explanations for the above situation could include the following. Firstly, (i) the greater visibility and noise-cum-scarce potential of the competing concerns such as scarcity-driven land hunger (that cuts into CPR area); (ii) global focus on privatization, social modernization processes that disfavour the culture of group action and hence cause of CPRs. Both (i) and (ii) do influence the psychology of development agencies.

Secondly, the policy-makers' awareness about CPRs' potential role in simultaneously addressing the poverty-environment-productivity related problems is very limited. Moreover, the bulk of the CPR-information is too much in qualitative terms to fit to the lending culture and procedures of the aid agencies. Equally important is the fact that CPR-development/management is more of a process rather than a one-shot product, which most of the development agencies focus. The former (i.e., process) needs different norms and yardsticks for planning, implementation and evaluation than the tool available and used by development agencies.

Finally, CPRs lack a stakeholders' lobby, partly because of the poverty and ignorance of the primary stakeholders and partly because of the changing nature of the stakes of people in CPRs.

Under such circumstance, CPRs have some future under the situations where (i) the communities are still not influenced by the above mentioned developments, and (ii) where CPR arrangement proves to be the last resort to have sustainable and effective natural resource management.

Yogesh C. Joshi
Sardar Patel University,
Vallabh, Vidyanagar,
India

MANAGEMENT OF COMMONS IN ARID AREAS OF INDIA AND ROLE OF LOCAL GOVERNMENTS

The state of Rajasthan situated in North-Western India, is the second largest Indian state geographically. It accounts for more than 60 percent (3,17,710 sq. kms.) of hot desert in India. The Aravali hill ranges stretch diagonally across the state in the South-West to North-East direction. The desert wastes of the Thar lie to the west of the Aravali ranges. Climatically, it is the driest part in India receiving an average annual rainfall of less than 25 to 30 cms. The peculiar physical features of the region combined with the old feudal ways of exploiting resources has put regional resource endowments under severe strain. Due to poor and uncertain crop production the inhabitants depend heavily on livestock enterprise for their survival and livelihood. The livestock enterprise contributes significantly in terms of contribution to household income, crucial nutrients to diet, productive employment generation and substantial linkages to crop enterprise in the rural economy. The dependence of rural households on livestock enterprise is almost complete during drought and poor rainfall years for their sustenance. Thus, for the rural economy of these arid lands in India the importance of livestock enterprise is unsurmountable and unquestionable.

Over the years commons have been a main source of feed and fodder to the livestock population in the region. Factors like increase in livestock population leading to increased grazing, larger areas brought under cultivation, increase in human population, greater commercial exploitation of commons, little or no planned efforts on parts of community and local governments to conserve and regenerate commons and non-implementation of laws to protect and conserve the commons are mainly responsible for shrinking area and depletion of

productivity of commons. The harm caused to commons due to these factors got accentuated in the absence of traditional and informal checks prevalent in societies before independence. However, the traditional checks have been eroded since independence and are chiefly responsible for the continuing "Tragedy of Commons" As a result of pressure from both demand and supply side the grazing area per livestock in Rajasthan has decreased from 0.20 hectares in 1972 to 0.16 hectares in 1983. The ratio is expected to decline further due to increased pressure from all factors affecting commons.

As a part of scarcity management strategy the rural households in the region even resort to migration along with their herds to greener pastures during dry periods of the year. This migration invariably involves monetary and physical hardships and casualty of livestock for the households. With shrinking area under commons and their decreasing productivity, it is likely, that livestock enterprise will lose its traditional economic edge over other vocations.

In such a scenario, the role of local governments in managing commons and sustaining livestock enterprise and arid economy is of considerable importance. In spite of constraints in terms of availability of resources and lack of expertise they can play a decisive role in this regard. The local governments need to reestablish village level checks existing in traditional system against over-exploitation through motivation, education and strict implementation of laws, involve peoples' participation, governmental and non-governmental institutions and state governments in regeneration of commons. This entails using latest techniques, agricultural research and findings for increasing productivity of commons. The state government on its part needs to provide incentives to the local governments at all levels and oversee and facilitate the operations for better management of commons.

Arne Kalland,
Centre for Development and the Environment, University of Oslo,
Oslo
Norway

IKI ISLAND AND THE DOLPHIN TRAUMA

In the 1970s large schools of dolphins preyed upon the fish outside Iki Island in Japan, causing considerable inconveniences to the local fishermen. The authorities therefore decided to embark on a culling programme, a decision which sparked a storm of protests in the Anglo-American world. The protests culminated with an American activist cutting open nets and thereby releasing a large number of animals waiting to be slaughtered.

Based on fieldwork conducted in 1992 this paper discusses how the community has coped with this traumatic experience. By analysing the steps taken by the municipal authorities to solve the "dolphin problem" by establishing a "dolphin park", it will be possible to uncover the large gap that exists in perceptions of nature between local residents and some major western environmental and animal welfare organizations.

Johan Klemet Hætta Kalstad,
 College of Sami Studies
 N-9520 Guovdageaidnu
 Norway

PASTORALISM AND MANAGEMENT OF COMMON LAND IN FINNMARK

Key words: reindeer, pasture, district, overgrazing, pastoralism, land use, co-management, Sami people, Inuvialuit

Some of the Sami people keep reindeer as semi-domestic animals in the northern Fennoscandia, and ownership of the animals is individual. The owners keep their animals together in herds in common pastures. It is commonly assumed that such a situation leads to overgrazing and thus, to the "tragedy of the commons", because every single herder will try to maximize his/her individual gain by putting more animals on the pastures. Accordingly, the management of common land is seen as a question of government restrictions on herder's behavior.

The herders move around with the herd between the inland and the coast according to the seasonal grazing conditions. The summer pasture is divided in orohat(reindeer district). A district is a geographical area in which some herders have exclusive grazing rights. Now the Reindrifstadministrasjon is about to make only a few districts in Finnmark. Each district shall include both summer and winter pastures. At the same time the districts shall be responsible for the management of their pastures.

The purpose is to make reindeer husbandry more profitable and avoid overgrazing by reducing A) the number of animals and B) the number of herders. These reductions has been supposed to increase 1)the weight of the animals and thus, 2)the income of the remaining herders).

The proposal means that the boards of the districts shall plan land use, and their main tool is the number of animals the herders keep. Does the proposal mean empowering the Sami herder population? In this paper I will outline some problematic dilemmas in management of the reindeer pastures. I emphasize the pastoralism and the management of the land use in Finnmark and North-Troms. I also look to an international experience in respects of management of common land.

Geir Runar Karlsen,
 Department of Social Science, University of Tromsø.
 Tromsø,
 Norway

ETHNICITY AS A MANAGEMENT STRATEGY IN FISHERIES

Lately, saami politicians in Norway have become involved in the public debate concerning fisheries management in coastal districts, claiming exclusive territorial rights based on their ethnicity. However, such claims contradict the interests of two other ethnic groups residing in the area: Norwegians and naturalised Finns, called Kvën. Thus, fisheries management has become a subject of ethnic rivalry, capitalising latent conflicts between ethnic groups over use-rights to both land and water.

The paper discusses the role of ethnicity on fisheries management in North-Norway. I argue that ethnic rivalry is partly caused by the hierarchical structure of Norwegian fisheries management, where none of the fishermen concerned are consulted in the formation of management practices. Thus, the only way of input in management decisions is through ethnic

interest groups representing fishermen. This causes conflict with other interest groups, representing other fishermen. Besides, this makes ethnic identification economically important, since some ethnic groups may get advantages over other ethnic groups. In conclusion, the paper discusses how latent ethnic conflicts become manifest as a consequence of present management practices, arguing that these conflicts to some extent could have been avoided by involving fishermen in an earlier stage of the management process.

Alain Karsenty
CIRAD - Forêt Green-Less,
Nogent Sur Marne,
France

THE CREATION OF COLLECTIVE LANDS IN MOROCCO

At the beginning of the French Protectorate in Morocco, jurists thought they had discovered farming groups bearing the same archaic features of what they thought to be collective property. They elaborated a new legal creation, a distinct land category endowed with a special legal statute, named "Collective Land".

There were three phases in the creating of that standard legal and sociological ideal :

- The wording of the organizational "pattern" of collective lands combining the main archaic features of exotic societies according to social sciences at that time.
- Legal protection effective through land statutes that made lands inalienable.
- An attempt to make these communities traditional through a "Sharing regulation" which gave uniform and equal access to the land.

This process of institutional creation illustrates what Bourdieu calls "juridism", i.e. an analysis pattern confusing norms and habitus. Thus, the bled jmâa farmers had a great variety of farming practices and there were various levels of legitimacy. It is clearly an example of "anthropological objectivism", i.e. crediting reality with assumptions which belong to a pattern initially built to describe reality.

The consequences of such a creation were that :

- Community lands were rather well protected, at least against private occupation;
- the demarcation and marking of Community land boundaries prevented a regulation of the system based on man/land balance;
- the will to maintain "traditional institutions" within communities previously able to evolve and adapt led them to crystallization and crisis;
- today, these farmers are very individualistic and they clearly long for private property.

This example should be reflected in order to avoid locking agents into supposed rules, to be able to offer them an open cooperation and to allow them to keep their full adaptation abilities.

Anita Kendrick
Cornell University

UNEQUAL ACCESS TO COASTAL RESOURCES: CAPITALIZATION AND SOCIAL STRATIFICATION IN AN INDONESIAN FISHERY

There is a pervasive tendency throughout much of the literature on common property and fisheries in Southeast Asia to view poor fishers as a homogenous group made up of small-scale fishers using 'traditional' gears. Increasingly, a large number of the poor in fishing villages do not use "traditional" fishing methods but are indeed part of the "modern" fishing sector, working as crew members on medium and large fishing boats. This paper will draw upon a case study of one fishing community on the south coast of Java to examine social relations in fishing and how these affect common property resource use.

News innovations in fishing technology have been introduced by temporary and permanent immigrants into the community over the past sixty years. While many of these innovations have been adopted by local people, increasingly their ability to participate in fishing activities using these new technologies has been as crew members working for a share of the catch. The process of increasing social stratification in this Javanese fishing community will be analysed from an historical perspective. Finally, the paper will examine the implications of these changing production relations for the prospects of co-management of fisheries resources and other issues of local control in Indonesia as well as other settings.

Paul Kenkmann
Tartu University
Estonia

PRIVATIZATION IN ESTONIA

--

K. K. Khakhar,
Department of Economics, Saurashtra University
Rajkot-360 005, Gujarat,
India

STAGING DIVINE COMEDY ON THE WATERS : 'SWADHYAYA' - EXPERIMENT IN INDIAN FISHERIES

Privatisation and government and institutional intervention, more of the 'external' nature, have not only aggravated but often- caused tragedies in the use of common property resource. This has necessitated emergence of alternative forms of institutional intervention. 'Swadhyaya' (enlightened self-knowledge) movement, currently sweeping the upper western coastal belt of India, is an institution more of the 'internal' nature. This movement is based on relationships and altruism to which judgements of individuals are inwardly subscribed without constraints imposed from outside.

This paper discusses the 'Matsyagandha' (floating temples) experiment initiated under Swadhyaya movement on the west-coast. Analysis of the working of 32 fishing boats, covered under this experiment, demonstrates how they produce 'impersonal wealth' - as described by Rev. Pandurang Shastri who has launched the Swadhyaya movement. This wealth is distributed among the needy fishermen and/ or reinvested for producing more impersonal wealth.

This, romantic looking experiment is a curious new version of the concept of 'universalised brotherhood' of the Medieval Church or of the 'global family' concept of ancient Indian 'Vedic' tradition. It unfolds the potential of human nature which is capable of staging 'divine comedy' as against 'tragedy of commons' of Hardinian type. This experiment is analysed in light of the typical issues of common property resource management, such as free riding, contributor's dilemma and assurance problem.

'Matsyagandha' (floating temples) are crewed by fishermen on rotation basis. This paper also examines influence of the above experiment on the participant fishermen when they return to their individual boats and do fishing for their own benefit.

Raouf F. Khouzam
 Department of Economics, The American University in Cairo,
 Cairo,
 Egypt

REINVENTING THE MANAGEMENT OF IRRIGATION COMMON POOL RESOURCES: A CASE STUDY FROM EGYPT

Over the past two decades, Egypt has been witnessing a massive change from a centralised economy where resources were generally run by the State, to a liberal economy where the private sector is resuming its natural principal role in economic growth. The government of Egypt is giving the private sector the leading role in input, output, and financial markets, and in the day-to-day investment and management decisions. Noteworthy, the Egyptian government has been reinventing new approaches to manage the most important common resource in Egypt: irrigation water. The availability of adequate irrigation water at the right time is a main constraint on the efforts being made to boost agriculture production whether through vertical or horizontal expansion. To relax this constraint, the Ministry of Public Works and Water Resources (MPWWR) have adopted four main approaches: structural works, enforce rationing, cost recovery, and management transfer (MT). The last policy tool is the focus of this paper. MT is broadly defined as the turning over of the management of an irrigation system or a component thereof to its users. This transfer implies replacing state property rights by a collective or a private property rights. As a consequence, the government is relieved from the problems and financial burden associated with the management of the transferred irrigation component which is run by its users in accord with their best interest.

This paper analyses two MT models that have been applied in one of the Egyptian regions for the purpose of understanding how the change benefit the community, and identify the factors that secure a successful transfer. Farmers attitudes towards the adopted transfer model are investigated and analysed. Lessons are derived. Qualifications that minimise MT failure are proposed, subsequently.

Are J. Knudsen,
 Chr. Michelsens Institute,
 Bergen,
 Norway

"REINVENTING" THE COMMONS: NEW METAPHOR OR NEW METHODOLOGY?

Since the mid-1980s there has been a rapid growth in studies concerned with common property management. It is argued that despite a hectic research activity, there is a tendency to refine and reuse familiar, and well-worn arguments instead of questioning them. To move ahead, the study of common property regimes must proceed beyond rebutting or rephrasing Hardin's "tragedy of the commons" parable.

Instead of a further refinement along existing lines of scholarship, we need to ask ourselves what the object of study is? More than a conceptual confusion, "common property" as an object of study is blurred: is it (a) primarily a behavioural relation between men; (b) a question of agents and choice which can be solved through balancing incentives; (c) a problem of markets and a question of "getting the prices right"; or is it, finally, (d) a question of institutions and how institutions structure human action?

It is argued that there is a need for "rethinking the commons", and to recast old questions, reformulate research designs and add to this novel empirical studies which so far have been left

out in our effort at theory building. Especially there is a need for a clearer analytical precision in the use of the terms "institution" and "institutional" as well as theories of institutional change. Moreover, key-concepts such as "traditional", "customary" and "communal" which are often used in conjunction with the commons, should be scrutinized and critically reflected upon and not embraced without questioning

Ståle Knudsen
Høgskolen i Agder
N-4604 Kristiansand
Norway

AQUACULTURE ALONG TURKEY'S BLACK SEA COAST. KNOWLEDGE AND CAPITAL.

In a context of rapidly declining fish-stocks, the nascent aquaculture development in the beginning of the 90s was seen as a promising field for expansion. But the expectations were not met. Aquaculture is now limited to some small scale experiments with trout and a couple of big operators rearing salmon. The evolving management regime is yet undefined, but seems to be "state property leased to private capital control". Due to the limited scale of aquaculture, small-boat fishermen's informal management of coastal waters has not yet been put under heavy pressure.

There is thus little competition between aquaculture and small-scale fishing for sea space. The critical aspect of the adaptation is rather knowledge. The market for portion sized trout is very limited, and one depends on the difficult year-round operation in sea to succeed in producing 2-4 kg salmon which is more in demand. There is no local knowledge in fish farming, and the regional Turkish research institutions have not been provided by the means to develop competence in this field. Consequently, salmon aquaculture is dominated by a few big companies, mainly with Istanbul/Norwegian capital. They depend on foreign knowledge and technology and produce for the Istanbul and international markets.

Compared to the previous development in the fisheries, the state seems less influential. It is rather big companies, operating in the national and international sphere, who, together with the WB, take the lead in aquaculture developments. Since success depends on capital, there is little room left for evolving local knowledge on salmon aquaculture. Therefore, the development of communal management systems in aquaculture is improbable. The big corporations also will - in case of success and expansion - effectively override small-boat fishermen's claims to good fishing spots.

Gary P. Kofinas,
Resource Management and Environmental Studies,
University of British Columbia
Canada

WAYS OF KNOWING CARIBOU: COMMUNITY DILEMMAS AND POWER DYNAMICS IN CO-MANAGEMENT DECISION MAKING.

As a result of twenty five years of gas and oil development proposals, Porcupine caribou is the most studied northern herd in the world, and is the basis of both a Canadian co-management arrangement and a US-Canadian international conservation agreement. Porcupine caribou is also a critical common pool resource for several US and Canadian aboriginal communities and the focus of an on-going oil development conflict.

This paper is based on research conducted in three Canadian caribou user communities. Examined are internal/external caribou research and management issues that create dilemmas for communities. A critical incident analysis and interview data underscore the significance of related community costs and benefits and the importance of communication in the co-management process. Findings suggest that northern co-management arrangements that become overly dependent upon board-level activities have the potential of ignoring community styles of decision making, eroding traditional authority systems, and limiting opportunities for collective learning. The success of a co-management arrangement in advancing development of community-government partnerships is related to communication linkages and accountability between management boards, communities and agencies. Presented are two approaches to co-management communication and learning.

Misael Kokwe
German Development Service
Lusaka,
Zambia

RURAL LIVELIHOOD STRATEGIES EFFECTS ON THE ECOLOGY OF ZAMBIAN WETLANDS: POLICY AND INSTITUTIONAL MANAGEMENT IMPLICATIONS

This paper presents an analysis of the linkages between the livelihood strategies of the rural communities and their environmental impact on the wetlands (common property) of Zambia. The biophysical and functional classification of specific wetland types is presented in a livelihood framework to illustrate their importance.

An analysis of the policy, institutional management implications for achieving sustainable livelihoods that do not undermine the ecological and social stability is presented. The focus of the policy analysis is on the environmental implication of the land tenure system, (where wetlands are mostly common property), legislation on natural resource utilization and the economic reform programme being pursued by the Zambian government. These policy implications are analysed in the context of their negative environmental effects and suggestions for re-dressing this situation are made.

In the final analysis, the paper explores the actual and perceived roles of a hierarchy of management institutions related to the development of sustainable livelihoods bound to wetland ecology.

The community's role in the wise use of wetlands has been neglected and suggestions for incorporation of people's participation in integrated natural resource management are outlined. The role of the traditional authorities as an effective tool for monitoring and addressing issues of livelihoods and the environment is discussed. The weak public service research and extension service for the development and dissemination of appropriate technologies are discussed in the context of the promotion of holistic and client driven services. The development aid is examined and suggestions for redressing their latent contribution to wetland degradation is presented.

A. Kontogianni and M.S.Skourtos
Department of Environmental Studies, University of the Aegean
Mytilini
Greece

MONITORING AND ENFORCING THE USE OF LOCAL COMMONS: MARINE RESOURCES IN THE AEGEAN ARCHIPELAGO

The paper deals with the management of fishery stocks by in-shore fishermen in the islands of the East Aegean Archipelago. The problem setting is one of managing collectively a common pool of resources under social heterogeneity of the parties involved, loose formal agreements to cooperate and strong incentives to break the rules.

The explicit targets of the paper include the modelling of the strategic interaction between in-shore and off-shore fishermen in depleting the fish stocks, a comparison of the results with similar work in the coast of Turkey and the derivation of operational rules for cooperation.

Firstly, a description is presented of the traditional organization of fishery activities on the main islands of East Aegean Archipelago, i.e. Lesbos, Chios, Samos, Rhodos, with emphasis on the interaction of formal (market) incentives and non-formal, local cooperative structures. The role of formal incentives such as production quotas, zoning for exclusive fishing and seasonal constraints are examined and contrasted to the role of informal incentives such as retaliation practices, the establishment of credible threats and the cost of monitoring.

Secondly, the modelling of the relevant parameters mentioned above is based on the central role which the conflict between off-shore and in-shore fishermen plays in determining the possibilities for cooperative action. The players, in a game theoretic framework, are characterized by differing capital outlays, internal organization, access to markets and social status. These asymmetries among participants can present substantial barriers to cooperative behaviour if their long-run mutual dependencies is not recognized and respected.

It is shown that the establishment of viable local-level management regimes is handicapped by a strong presence of outer user despite the strong willingness of local groups to commit themselves to sustainable fishing. In some islands (i.e. the island of Kalymnos) there has been a strong tradition for managing stocks of sea sponges and in some other (i.e. Alonissos) a new successful policy of compensation measures to protect fisheries and marine biodiversity has been set up. The prospective though for the stocks of East Aegean is not positive if the structural policy of EU continues to subsidize overcapitalization in the area.

Malgorzata Korzycka-Iwanow
 Department of Agricultural Law, Warsaw University
 Warsaw
 Poland

OWNERSHIP TRANSFORMATIONS IN POLISH AGRICULTURE

- I. Introduction
- II. Privatisation of State-owned Agricultural Enterprises
- III. Disposing with the agricultural property resources of the State Treasury
- IV. Opinions of farmers relating to ownership transformations in State-owned agriculture
 (based on research results)

I. In the period of communist power, Polish agriculture maintained a domination of private land ownership which covered 3/4-ths of all arable land. The remainder was used mostly by State-owned farms and to a lesser extend by agricultural cooperatives.

Intervening policy applied within transformation efforts is employing market instruments, as well as other methods which are to improve structure of the agricultural sector.

II. Because of the special features of State-owned agricultural enterprises privatisation efforts within the State-owned sector have been vested with a specially established State agency (Agricultural Property Agency of the State Treasury). The purpose of privatisation is to alter the ownership structure by creating a dealing market for rural real property and establishing privately owned farmsteads on land of the former State-owned farms.

The factual consequences of implementing privatisation efforts are reflected in the manner in which the property resources of the Agricultural Property Agency are being utilised. Selection of appropriate legal forms depends mainly on economic issues. Thus, the share of sale transactions in the utilising of such property is comparatively small; the main barrier posed particularly by the limited financial resources of potential buyers and by the reprivatization claims of former owners. Thus, redistribution of property is based mainly on lease agreements, with the legal structure of the lease model not taking into full consideration interests of the lessee's farming business.

It is hoped that a framework will be created in the future to widen the conversion of farmland properties of the State Treasury into private farmsteads.

IV. Alas, the expectation that the fund of agricultural real properties taken over by the Agency will be used to widen (or establish new) private farmsteads is not materialising. Farmers show interest in land of former State-owned farms only when it borders directly with their own farms. The situation is aggravated by the lack of credits at preferred rates for purchase of land, or assets when whole farms are leased. The route of liquidating State-owned farms by privatisation through bankruptcy is viewed negatively, as leading to sale of assets below their market value. Former workers on State-owned farms are made redundant and unemployment institutes nostalgia for the old times and assured full time employment.

Charles Lane,
International Institute for Environment and Development,
London WC1H 0DD,
UK

CONTROL OF THE COMMONS: DRAWING LESSONS FROM THE BARABAIG CASE FOR LAND POLICY IN TANZANIA

Barabaig pastoralists in Tanzania, traditionally make use of range resources with a seasonal migratory land use pattern. In the past they effectively controlled access to those resources through a customary communal land tenure system. Today, the Barabaig have lost access to many of their most productive resources and found their movements are becoming increasingly restricted. This paper will provide a description of the Barabaig resource tenure system, and examine the factors that have impinged on its ability to manage resource use effectively. It will argue that the state has created conditions for the collapse of communal land tenure by passing laws and making administrative provisions that undermine local land management without replacing it with an effective alternative. In the context of current efforts to formulate a national land policy, the paper will analyse the recommendations of the land commission, and the potential impacts of policies for village titling and formal land use planning on the future of pastoral commons.

Guillaume Lescuyer
CIRAD-GREEN
Paris
France

EMPIRICAL AND THEORETICAL LIMITS OF CVM: LESSONS FROM AN EXPERIENCE IN A CAMEROONIAN FOREST

For few months, Contingent Valuation Method (CVM) have been hardly criticised especially by American economists. These critics question the technical aspects of this valuation method: they debate on experiences realised in modern economies so as to find new ways of proceedings.

First, I will try to make a more fundamental critic of the CVM: the nearly complete failure of that valuation technique in societies where market mechanisms are not dominant does not come from an inadequate use of the method. It can be though that, in some cases, economic valuation theory, as it is presented in handbooks, is not compatible with reality. For example, we can insist on the hardship for local people to express monetary values of the ecosystem they depend on, while they give it a great cultural Value. Second, I will list the different attempts of CVM in LDCs, notably in Africa. I will try to bring to light the empirical limits of the experiences. Lastly, I will present the first results of a CVM made at Dimako (East Cameroon) on the value of a tropical rain forest. My personal experience would give me the ability to announce some hard limits of CVM implementation in LDCs.

Patrice Levang, G. Michon, and H. de Foresta,
 ORSTOM/ICRAF, Jln Gunung Batu 5,
 Bogor 16001,
 Indonesia

**NEW FACE FOR ANCIENT COMMONS IN TROPICAL FOREST AREAS?
 THE "AGROFOREST STRATEGY" OF INDONESIAN FARMERS**

In Indonesia, conflicts between the State and local communities concerning utilization and control of forest resources are increasing. As a result of existing legislation, market regulations and financial policies, dispossession of local communities and deregulation of traditional common property systems are becoming common cases all over the archipelago. But, parallel to the present dilapidation of misappropriated common property resources in natural forests, there is, sometimes for more than a century, a movement towards restitution of these resources in farming systems. In many areas, forest resources have been appropriated by local communities through special management systems which transfer them to agricultural lands and into agricultural systems but do not look like agricultural management. As pure forest reconstruction enterprises, these remarkable "agroforest" systems associate the ancient forest management systems with a logic of commercial agriculture. They overall allow farmers to escape the contradiction existing between a national institutional framework which sharply limits access to natural forests and an economic reality which pushes towards intensive utilization of their resources. Through the history of an agroforest in Sumatra, through the analysis of interrelations between natural and social processes which shaped and sustain it, we shall discuss how this "agroforest" concept can contribute to debates on use and dynamics of common property resources in forest areas, emphasizing biological and human aspects which allowed more than the conservation of one or another forest resource, the restoration of the forest resource itself in all its biological and economic diversity, we shall discuss the validity of this "agroforest strategy" for re-appropriation of the ancient forest commons in a context particularly unfavorable to their maintenance in present resource management systems. Accent will be put on the special socio-cultural aspects -perception of forest resources, representation of the agroforest vs. representation of the forest- and local institutional characteristics -modes of access, control and transfer for different types of agroforest resources-, which make the originality of the agroforest management mode. Discussion will follow on the perspectives offered by the agroforest model for future negotiations between national government and local communities on the use of forest lands and resources.

Tatiana Levina,
 State University of Land Use Planning,
 127572, Moscow,
 Russia

COMMON LAND RENEWAL IN RUSSIA: PROBLEMS AND APPROACHES.

Political changes in Russia have resulted in the liquidation of state monopoly over land, and the development of multi- structural farming as well as different forms of landownership, land use patterns and land management. The efforts to transfer the responsibilities of land resources management from upper levels of the state power to the local authorities and owners, have led to the manifestation of complicated combinations of legal, technical, social and environmental problems.

In the case of common land resource management the situation intensifies, as it is a question of the restoration of common land ownership after a long period of usurpation by the State. The abeyance in common land management increases, due to absence of proper legislative framework, which is a crucial prerequisite for successful decision-making. Recent Land Code

has almost expired, and new Land Code project is examined in the Duma now. The latter stipulates the institution of common land possession for purposes of agriculture, deer-breeding, fur-farming, hunting and fishery, with the appreciation of the traditions and customs of the aboriginal populations. Under the Land Code project the Subjects of the Russian Federation, i.e. republican, regional (oblast), territorial (krai) and other bodies, which subordinate to the State, will be furnished with the power to define certain regimes of common land ownership / or possession / or use in the process of the land allotment among the tribal, Cossacks, religious and other communities and societies for their renewal. This paper analyses hypothetically the new Land Code, and discuss the problems which land use planning, as a main mechanism of land resources management, is faced. Particular attention is paid to common land management, and certain actual materials are considered.

Bobbi Low
 School of Natural Resources and Environment
 The University of Michigan
 Ann Arbor, MI 48109-115
 USA

A REVIEW OF FIVE STUDENT PAPERS

1.

Dulcey L. Simpkins

Land Trusts: Common Pool Resources Face A Capitalist Context

Common pool resource (CPR) studies do not accommodate the pressures of capitalism particularly well; in most cases pressures for conversion or external marketing of a common resource destroy the commons organization. Privatization and the modern state, hallmarks of capitalism, tend to erode alternatives in resource management. Yet local land trusts represent a translation of commons regimes into a private property context. The similarities between trust activities and CPR institutions are obfuscated by trust dependence on private property and state/federal law for enforcement of rules. Yet the intergenerational nature of the trust's activities, as well as the "institutions" other than enforcement, are determined through collective cooperation for conservation.

Land trusts are charities according to US IRS tax code 501(c)(3). As such, they are eligible to receive charitable donations of land or of easements controlling the use of land in perpetuity. Groups of local individuals organizing to prevent random development, or land conversion in their communities can incorporate as a trust. Doing so they offer tax benefits to land/easement contributors, and simultaneously preserve resources from degradation. These "common resources" (some are rival, some are almost non-rival that is more collective, but all are difficult to exclude others from) range from tangible endangered habitats and species to community character, views, and open space. But what they all have in common is their rival nature with development conversion, and the intergenerational concerns about them on the part of trust members. What each local trust does, which values or "resources" will be the goal of the trust's protection efforts, result from negotiation. Local level land trusts form through collective action and are managed through negotiations of the "stakeholders in the resource." Beneficiaries of a trust's activities are indeed larger than the trust members, but there is still collective action toward enduring use of resources beyond a single generation, and the course of protecting and managing the resources is still negotiated by the trust in a manner akin to a CPR. Larger trusts, such as the Nature Conservancy, do not fall into this CPR analysis due to their bureaucratic nature, but they can contribute resources to the activities of local trusts and are therefore a significant actor in their environment, as is the state.

Larger trusts, such as the Nature Conservancy, do not fall into this CPR analysis due to their bureaucratic nature, but they can contribute resources to the activities of local trusts and are

therefore a significant actor in their environment, as is the state. A significant difference between trusts and CPR lies in trust dependence on external formal laws for enforcement of exclusion on trust lands. But therein lies hope for private property conservation efforts as well. Private property, vital to industry and capital accumulation, is relatively inviolable: the trust is thus ensured a reliable enforcement mechanism and continued legitimacy with state jurisdictions. CPRs, due to their informal customary tenure, are often undermined by developmental states and cannot prevent trespass by those not in the CPR. If a trust can solicit neighbors to monitor their plots, and can muster staff or volunteer energy to occasionally scope lands, they can rely on the state for enforcing exclusion once it is detected.

The state actually aids trust conservation efforts, rather than undermining them. Although nested in private property law, reliant on private property, and subject to differential class access due to the need for fundraising, land trusts represent a way of integrating feedback about environmental degradation and dwindling natural or community values back into an industrial economy--they exclude capital accumulation through privatization, and manage "undevelopedness" for the future.

2

Melinda L. Graham

The Farmers Market Of Ann Arbor, Michigan: A Contemporary Urban Common Property Regime.

The case study presented, that of the Ann Arbor, Michigan, Farmers Market, applies and expands upon previous Common Pool Resource (CPR) research as it relates to contemporary urban settings. The Farmers Market represents a unique CPR regime in which the appropriators have devised a complex resource system, the Market system, to create and benefit from the resulting consumer interest. The system includes physical and temporal characteristics, as well as less tangible attributes such as reputation. In addition, the Market is nested within a larger city government structure, allowing for exploration of nested enterprises and external arrangements.

Established CPR principles directly applied to the Farmers Market include issues of scale, resource assessment, group size, and homogeneity of the appropriators, as well as decision-making processes such as the formation of operational and constitutional rules. Additional issues relevant to contemporary CPR regimes are also addressed. These issues include: 1) Redefining "natural resource"; 2) Dealing with rapid change 3) Nesting CPRs within other systems; 4) The role of leadership; 5) The role of shared values; 6) Redefining success.

This case study concludes with recommendations for strengthening the Market's CPR regime. The Market must address issues of perceived inequity, establish more effective conflict resolution and work to clarify the appropriators' rights of ownership. The establishment of a common vision with regard to the Market's long-term success would also contribute to the sustainability of this contemporary urban CPR. This case study also points to four avenues for future CPR research: 1) Inclusion of contemporary urban CPRs within continuing research efforts; 2) Creation of larger governance frameworks which nurture the formation of CPR strategies within them; 3) Exploration of the potential role of leadership within CPRs, and 4) Examining the role of shared values and their potential for overcoming appropriator heterogeneity.

3

Christopher E. Morrow and Rebecca Watts Hull

Cofyal: The Rise And Fall Of An Indigenous Forestry Cooperative

Recently, several authors have drawn on case studies of successful, and less successful, common pool resource (CPR) institutions to develop principles for predicting when a CPR regime will form and the likelihood of its success once created. Most of the case studies used by Ostrom to develop CPR principles are small-scale, isolated, self-organized institutions.

However, many modern attempts to manage CPRs involve multiple stakeholders with differing interests, dependence on external markets, and threats from outsiders. In developing countries, three critical issues often complicate the context in which institutions for collective action are developed: 1) dependence on outside organizations for financial and technical assistance; 2) dependence on markets for resource utilization; and 3) vulnerability to the larger political economy in which they operate.

This paper examines the development and dissolution of the Yanesha Forestry Cooperative (COFYAL) in the Palcazu Valley of Central Peru to test the relevance of Ostrom's CPR institution design principles to indigenous forest management regimes involving multi-institutional project assistance and a complex set of external influences. For several of these principles we suggest ways in which they can be expanded to make them more relevant to the variables affecting this particular case. We then use this expanded CPR framework to suggest ways in which external agencies can assist more effectively in the development of durable common pool resource institutions.

4

Mary Mitsos

The Breakdown Of The Commons And The Loss Of Saami Culture

For the Saami there exists a close connection between their resource management system, reindeer herding, and their culture. For the past thirty years, the Saami people in Scandinavia have been under almost continuous pressure from rapid, mostly exogenous change. Many aspects of their cultural life and their resource management system are beginning to break down. Additionally, for at least the past decade, they have been under pressure from the government and environmentalists with the accusation that there is severe overgrazing on the tundra due to the herding practices of the Saami. The historical context of this case is described within a common property framework. Discussions of the dismantling of their common property regime (CPR) show that both the accusation of overgrazing and the breakdown of their culture can be attributed to the dissolution of their CPR.

Globally, the breakdown of many enduring CPR's has been provoked by four primary reasons: 1) increasing population pressure; 2) the introduction of more efficient technology; 3) immersion in a capitalistic market system; and 4) exogenous government intrusion. In this case, government policies appear to be the single, most important reason for the breakdown. By implementing rules that do not mesh with the local environment and by limiting the flexibility of the herding system, governmental policies have been detrimental. If, in fact, these policies are the fundamental reason, there is hope that the commons can be restored, thereby averting the "tragedy" (i.e., overgrazing) and hopefully saving Saami culture and their knowledge of reindeer and reindeer herding. Possible improvements explored are a) comanagement, where both indigenous users and scientific "experts" are involved in the management of the reindeer and b) milk production, which allows the Saami to restore one of the most immediate feedback loops on the state of the pastures. Future research is recommended.

5

William D. Leach

Applying Common Property Theory To Suburban Resource Systems

Common property research has focused primarily on subtractible, renewable resources and on informal or isolated appropriator organizations. Although this focus has facilitated the development of theory, the field may now be sufficiently mature that extending research to other settings will prove fruitful. This paper critically reviews the traditional bounds of the research, followed by an exploratory test of common property hypotheses using nontraditional resources in suburban settings. Specifically, it is suggested that (1) autonomous local governments can properly be considered common-property regimes, that (2) common-property regimes routinely manage not only subtractible, but also nonsubtractible resources, and that (3)

common-property regimes must not only ensure sustainable use of renewable resources, but must also choose the mix of renewable resource systems that will be maintained. These three expanded applications of common property theory are explored through a post-hoc analysis of growth management regulations from 386 municipalities and 57 counties in California through 1989. Logistic regression is used to relate the incidence of growth management rules in each jurisdiction to local socioeconomic factors. This work expands the original analysis of the data by Glickfeld and Levine (1992) primarily by adding two independent variables: community stability and homogeneity. For municipalities, significant relationships are found for measures of homogeneity of educational attainment, homogeneity of language spoken at home, and community stability. However, the effect is opposite the direction predicted by common property theory: heterogeneous and unstable communities are more likely to regulate appropriation of shared resources.

Søren Lund
Institute of Environment, Technology and Social Studies,
University of Roskilde,
Denmark

RATIONAL INSTITUTIONAL CHOICE THEORY AND THE DESIGN OF APPROPRIATE INSTITUTIONAL ARRANGEMENTS FOR NATURAL RESOURCE MANAGEMENT: THE CASE OF SAND DUNE FIXATION IN MAURITANIA 1983-1990.

The paper is a presentation of the results of a quasi-experimental exercise undertaken with the purpose of applying and validating Rational Institutional Choice (RIC) Theory on a specific development task: the provision and production of sand dune fixation installations in Mauritania.

As a first step, the analysis undertaken concludes that sand dune fixation is a economic task which is basically to be organized on a **local scale**, having a composite economic nature, and yielding a range of differing types of economic goods. The specific set of theoretically identified appropriate institutional arrangements therefore is also a combination of several types of (mainly) decentralized arrangements: public sector, common property, and private.

The paper then proceeds to explore the external validity of the RIC-theory by considering the institutional arrangements actually applied during the planning and implementation of the sand dune fixation project in Mauritania. The outcome is measured in terms of relative frequency of reported transaction costs observed in each case.

The field data presented corroborate the theoretically expected outcome. The decentralized contractual management arrangements used in two cases yielded relatively lower frequencies of reported transaction costs than the centralized state management applied in the third case.

Finally, the paper suggests that the successful institutional rearrangement achieved during the implementation of the Mauritanian Sand Dune Fixation Project, where management and ownership rights and responsibilities to a large extent have been transferred from a centralized government agency to a local governance organization in fact can be said to constitute an example of a **successful reinvention of the commons** governed by formalized common property regimes.

Owen Lynch and Kirk Talbott
World Resources Institute
Washington, DC 20006
USA

SECURING THE BALANCE: NATIONAL LAWS AND COMMUNITY-BASED FOREST MANAGEMENT IN SEVEN ASIAN AND PACIFIC COUNTRIES

The ongoing depletion of South and Southeast Asia's forest resources raises serious doubts about the viability of statemanagement paradigms -- doubts that have made themselves felt in even the most entrenched and centralized of national governments. In many locales, once vast forest resources are simply no longer available to satisfy profit-oriented extractive and commercial industries, much less the survival needs of millions of forest dependent people.

During the late 1970s, more sophisticated and nuanced understandings of the sustainability of local resource usages began to emerge. In India, where the subsistence needs of tens of millions of land-poor peasants were not being met, state governments began experimenting with community-based forest management practices -- with marked success. Similar pilot programs followed in other South and Southeast Asian countries as governments came to the belated realization that expansive claims of state ownership and control were actually contributing to the demise of remaining forest resources. These perceptions were bolstered by insights from Pacific Island countries where traditional community-based property rights are recognized by national governments and local people are meaningfully involved in planning and management.

Despite the increasing attention that is being given to community-based forest management, however, real forward momentum is still lacking throughout Asia. Data and analysis emerging from the seven countries included in phase one of WRI's tenure project (i.e., India, Nepal, Sri Lanka, Thailand, the Philippines, Indonesia, and Papua New Guinea) indicate that appropriate and effective government incentives for sustainable community-based management of forest resources are far too modest in both scope and momentum. Because many -- if not most -- local communities lack the legal leverage necessary to negotiate innovative, equitable and sustainable management strategies with government and outside entrepreneurs, they are essentially forced to take what is offered, which is usually little more than short-term, renewable contract reforestation initiatives.

Given these circumstances, national governments would be well advised to expedite the transition process and begin to establish a more comprehensive and fair negotiating process -- one that will facilitate the legal establishment of authentic partnerships and the recognition of local rights that cannot be revoked at the whim of short-sighted government officials.

Dr. Theodore Macdonald
Cultural Survival
Cambridge, MA 02138
USA

LAND TENURE, LAND USE AND INTER-ETHNIC POLITICS: AMAZONIAN INDIANS IN THE 1990S

Drawing on cases from Lowland South America, the paper first reviews the relationship between land tenure and recent indigenous initiatives in resource management in Amazonia. It indicates a logical link between secure land tenure and incentives to undertake sustainable land-use systems.

However, the paper then opens the focus to illustrate an enlarged political arena in which Indian organizations now play an increasingly visible and prominent role. Previous links between native peoples and agents of the dominant national society were guided by a "moral economy" characteristic of many patron-client relations. But recent colonization and the expansion of the State, and the subsequent proliferation of indigenous organizations now require restructuring of that "moral economy." A new equilibrium has not yet been established. Consequently, present inter-ethnic relations are characterized by mutual efforts to secure strong positions within a changing political arena, and struggles to establish a new political balance often takes precedence over land use programs.

The process is illustrated clearly by the current emphasis of Indian organizations in several countries to obtain broad ethnic "territories." Criteria invoked for establishing the size and rights of these territories varies enormously. The paper suggests that goals are better understood by analysis of changing political relations between Indian organizations and the State rather than through evaluation of local economic needs or "traditional" claims and rights to common property. Similarly, several recent indigenous resource management programs are shown to be means for obtaining political capital while restructuring the moral economy, rather than endeavors motivated purely by economics or conservation. The paper, therefore, acknowledges native peoples' primary concern with land and land rights. However, it suggests an analytical approach to the study of their common property disputes which includes changing political relationships, guided by an underlying set of norms and values, and by related rules of reciprocity.

Daniel W. MacInnes and Anthony Davis
St. Francis Xavier University,
Antigonish, Nova Scotia,
Canada

ACADIAN VERSUS HIGHLAND SCOTTISH SELF IDENTIFICATION AS FISHERS.

Acadian and Highland Scottish people of Eastern Nova Scotia occupy marginal agricultural lands. Their communities, while relatively homogeneous, are located quite close to one another and at times even overlap one another. Variations in the act of identifying oneself as a fisher depend upon respective ethnic histories. Acadians are more likely than Highland Scots to declare themselves as fishermen in official documents. It would appear that this self identification has consequences for collective action. The current conflict over inshore access to fish stocks may be served by an appeal to its history of common property utilization in the respective communities.

Fiona Mackenzie,
Department of Geography, Carleton University
Ottawa K1S 5B6
Canada

CONFLICTING CLAIMS TO 'CUSTOM' IN THE STRUGGLE OVER LAND AND ENVIRONMENT, KENYA.

The objective of the paper is to examine the intersection between discourses of land and environment in the struggle over land in colonial and contemporary Kenya. Oral agricultural histories collected in the mid-1980s in an area of smallholdings in Central Province are used to interrogate colonial texts in analyzing how people, differentiated by race, class and gender,

sought to define 'custom' in conflicts over land and over the construction of environmental/agricultural knowledge.

Environmental degradation became a major political issue between 1930 and 1950. A soil conservation campaign in African reserves was intimately connected to the struggle over land between settler and African, soil erosion acting as the fulcrum around which the crisis over land was politicized. An environmental discourse was created as a weapon by the settler to legitimate their occupation of the land and to persuade the colonial state to continue its support of settler agriculture. Within the reserves, the struggle over land took the form of a struggle over 'custom', a legal resource to which there was differential class and gender access. I argue that, in a complex situation of legal plurality in contemporary Kenya, where land rights are legitimated through customary and statutory law, 'custom' continues to be the site of both power and resistance in the definition of rights to land and claims to control its product. In turn, this has implications for long-term land use and the environment.

Stig Toft Madsen
Department of Sociology, Lund University
Sweden

SINS OF OMISSION AND SINS OF COMMISSION: RECENT CHANGES IN INDIA'S FOREST POLICY.

It is possible to discern three recurring elements in the debate on forests rights in India:

1. Forest Department's sin of commission
2. Forest Department's sin of omission and
3. The myth of people's prudence

The first element postulates that the Forest Department (FD) alienated the people from the forests. The second holds that the FD has failed in its duty to protect the forests and that deforestation has caused a general environmental crisis. Finally, what Roger Jeffery has called the "standard environmental narrative" embraces a myth of people's prudence positing that if the state would hand back the forests (CPR) to the people (forest dwellers or tribals), the forests would be restored and the environmental crisis would wane.

In this paper I sketch the process of reform which has actually taken place. Most forests are still state property and it is unlikely that this is going to change, but the National Forest Policy has been influenced by the above narrative. In terms of investment and foreign collaboration, the stress has been on social forestry which operates on an economic logic. An attempt to reconcile the divergent trends of reform has resulted in the concept of Joint Forest Management which acknowledges people's right to influence, but tries to steer such demands into economically profitable and ecologically acceptable joint ventures between the FD and local organizations.

The paper concludes that top politicians, top civil servants, NGOS, the judiciary and the media have been the important players in the policy formulation process, and that larger interest organizations and political parties have been marginal.

Elias Madzudzo
Centre for Applied Social Sciences, University of Zimbabwe
Harare
Zimbabwe

CATTLE, GRAZING AND RANGELAND TENURE IN BULILIMAMANGWE

Tenure systems represents a 'bundle of rights' defining 'who is permitted to exploit what resources under which conditions: the issues of ownership of, control over, and access to the means of production.'. Tenure systems depend on the existence of recognised social and physical boundaries for their efficiency. These boundaries help in defining leaders, users, and monitoring. This study cites an example of an area where existing boundaries complicate attempts at brining about a common property management regime. It is argued that in such cases it is best to incorporate immediate outsiders like the Rural District Council in the management regime.

R.C. Maheshwari
Indian Council of Agricultural Research
New Delhi,
India

UTILIZATION OF COMMON PROPERTY RESOURCES FOR MAKING A VILLAGE SELF- RELIANT -- A CASE STUDY

The increased population pressure has resulted in an increasing need for timber, fuel and fodder which has caused degradation of forest land by excessive tree lopping and overgrazing. An integrated approach has been made to develop a hillock wasteland falling under classes IIIes and Vies of land capability classification in watershed management plan, for achieving fuel and fodder security in an adopted village Islamnagar under Operational Research Project On Integrated Energy and Nutrient Supply System. An Energy Census and Resource Assessment Survey of this village (Maheshwari, et al, 1981) showed that village was in deficit of fuelwood by 98.8 tonnes (20.8%) and cattlefeed by 812 tonnes (30%).

The total area of the village is about 717.04ha out of which 61.6ha is forest land, more than half of the forest land comprised hilly terrain and completely denuded of its trees, the rootstocks of which still existed. In order to meet fuelwood and fodder demand of the village, 38 ha appropriate land identified on the basis of land use planning, has been brought under silvipastural development with early growing tree species and high yielding varieties of the grasses. The soil and water conservation measures taken include contour survey, cut off trenches along the contour at 5-10 m vertical interval, vegetative waterways, drainage ditches, cattle protection trenches and kachha service road along the boundary of the area, temporary erosion control structures and micro-catchment water harvesting for in situ water conservation. In addition to meeting fuelwood and fodder demand and other intangible benefits, the silvipastural development of identified wasteland would generatee 115421 man-days work during a life span of five years.

Kollegal R Maitreyi

Department of Environmental Sciences Policy and Management, University of Berkeley
Berkeley
USA

SUSTAINABILITY OF EXTERNALLY INITIATED NEW COMMON PROPERTY REGIMES: THE JOINT FOREST MANAGEMENT PROGRAMME IN INDIA

Joint forest management (JFM) is a programme initiated by the Government in many states of India, to implement a policy of community management of forests near the villages. However, the "creation" of new commons through external intervention can generate problems that are not adequately addressed in the existing literature on common property resources (CPR). Studies on CPRs so far have largely been based on enduring, old institutions that govern many CPRs. In this paper, I explicitly address issues of external intervention and sustainability of nascent institutions.

It is not the fact of the external intervention in creating new commons but the nature of it that helps or hinders the sustainability of the institutions governing the new commons. The role played by the external body in the development of the institution is an important factor.

Government initiation helps by legitimizing the new commons and reducing uncertainty about the future of the venture. But external intervention can hinder the natural evolution of the common property regime in response to local conditions by imposing conditionalities and regulations that may not be appropriate to local conditions. The design principles that have been observed to govern successful CPRs, like an appropriate fit between the institution and the local conditions, monitors accountable to the users, collective choice arrangements, graduated sanctions, conflict resolution mechanisms, recognition of rights to organize etc., evolve organically over a period of time and need a facilitating environment. Using the 'Joint Forest Management' initiatives by the Government of India, I illustrate some of the issues that can arise, and discuss the conditions under which such external interventions inhibit or facilitate the growth of sustainable, local CPR institutions.

Peter Manning,
Namibia

MANAGING NAMIBIA'S FISHERIES: A COMMON PROPERTY RESOURCE OR CANDIDATE FOR TRADABLE PROPERTY RIGHT?

Marine fisheries resources, like many other common property resources, have been subject to the pressures of privatisation as a means of resolving the problem of externalities associated with the exploitation of common property resources.

The Namibian fisheries sector has been managed, since independence in 1990, under an evolving system based on TACs and quotas, licences and recovery of resource rent through quota fees. The system has been designed with the intention of spreading the benefit of the resource more widely, particularly among previously disadvantaged groups in Namibian society, and of rebuilding fish stocks. Quotas are not ordinarily transferable in order to discourage concentration in the hands of a few well established and more powerful companies. Quota fee rebates are granted to encourage Namibianisation of the industry and land based processing which is associated with more stable investment and greater job creation.

Namibia considered, but decided against, a system of individual transferable quotas (ITQs) principle because of the question of equity. Some evidence exists that ITQs leads to greater

concentration of the resource in the hands of a few companies who then act as a monopoly. There is evidence that a concentration of power in the industry is currently taking place in the Namibian industry thus threatening the development objectives of Government.

The paper assesses the progress that has been made in the implementation of Namibia's management system and examines its advantages and shortcomings. The degree of incompatibility between an ITQ system of management and questions of equity and development is assessed.

Paul Mathieu,
Institut d'Etudes du Développement, Université de Louvain,
1348 Louvain-la-Neuve,
Belgique

PROJECT CONDITIONALITY AND INSTITUTIONAL UNSUSTAINABILITY: THE CASE OF WATER USERS' ASSOCIATIONS IN MADAGASCAR

The Project "rehabilitation of small irrigated perimeters" in Madagascar established a strong linkage (or conditionality) between the physical rehabilitation of irrigation schemes (funded by external aid and implemented by national technicians), and the formal organization of Water Users' Associations intended to manage the schemes and care for operation and maintenance. Farmers were also supposed to participate in the design of the rehabilitation. The project can be understood as an attempt to define a "new common" (the rehabilitated scheme) to be managed by the new Water Users' Associations.

To date, these ambitious objectives have been completed to a very limited extent during the first six years (1986-1992) of the project. The disappointing results can be related to the following causes: - conditionality and distrust have prevented any substantial communication between the project (engineers and technicians) and the population. As a consequence of this, the quality of information and understanding that each of those two actors could get from the other has been rather bad; - the superficial and opportunistic commitment of many project technicians to the discourse of peasant participation have prevented them to perform the concrete actions that would have been necessary in order to "evoke trust and avoid prisoner's dilemma" on the part of the peasants; - many of the Water Users' Association were too big and heterogenous to allow sufficient homogeneity and congruence of interests, and the degree of legitimate authority necessary to enforce the rules of the Water Users' Associations. - frequent heterogeneity between the space of the technical units of operation of the irrigated scheme, and the social space of the new Water Users' Associations in charge of operation and management prevented the emergence of strong institutions and leadership to manage the Water Users' Associations. - wishful thinking by the technicians and lack of realistic assessment of the social investments and the difficulties of implementing a common property regime and the necessary institutions have led to build technical infrastructures much too complex and costly to manage by the new peasant institutions.

Mitchell L. Mathis
Austin, Texas 78751
U.S.A.

THE EFFECT OF SUNK CAPITAL ON THE OPTIMAL MANAGEMENT OF COMMON STOCK SEARCH FISHERIES

Fish in the sea are a frequently studied example of a common property resource, and the problem of over-fishing in the fishing industry is well known. Government has at its disposal two basic policy tools that it can employ to attempt to correct the sub-optimal market outcome caused by the common property aspects of fish reserves: taxes and quotas. These policies seek to move the market from inefficient over-fishing to the optimal, efficient outcome of a lower rate of harvesting and higher reserves of fish. If these policies are effective, the reduction of inefficiency results in an improvement of social welfare. Although much research has been conducted with regard to the advantages and disadvantages of these two general tools, an aspect of the fishing industry rarely considered in these analyses is the presence of sunk capital. Capital is considered sunk when little of its original cost can be recouped once it has been purchased. New fishing boats, for example, lose a substantial portion of their value after the initial sale, much in the same way as a new automobile.

This paper seeks to improve upon previous economic models by allowing for the significant amounts of sunk capital in the fishing industry. In particular, the paper explores, using mathematical models, what effects the presence of sunk capital in the fishing industry might have on policy aimed at correcting the inefficient outcome of the competitive market. The incorporation of sunk capital into this analysis yields new and interesting results that are a marked departure the results of standard models. These results may have important implications regarding policy for optimally managing the fishing industry. The paper's final conclusion is that the presence of sunk capital will generally reduce the effectiveness of policies derived from standard analyses (which do not account for sunk capital in their models). Policies designed to reduce the rate at which fish are harvested and to increase the common reserves of fish may improve the market outcome, but will likely not move the market to the best possible outcome. Thus, these policies are likely to fall short in their objective of achieving the level of reserves of fish at which optimal harvests can be realized year after year. The effect on the whole of society is only a partial reduction in social cost. Although inefficiency in the fishing industry is reduced, the inefficiency that remains continues to exact a cost on the welfare of society.

Stein R. Mathisen,
Finnmark College,
N-9500 Alta,
Norway

WHALING AND CULTURAL IDENTITY IN NORWAY

Taking the local tradition of a small whaling community in Norway as its point of departure, the paper will discuss the interconnection between local identities, national identity, and the perspectives of the global environmental movement. Whaling and the activities connected to it, creates meaning both in a local community, on a national level, and in the international, political debate. This can be analysed as a complicated discourse, where identical elements of nature or culture are used as symbols, but often with completely different meaning on different levels. The local cultural identity of a whaling community is constituted not only with reference to local relations, but also in relation to European or international relations. In this process central cultural symbols get their meaning at the same time from a local and an international discourse.

Joseph Z.Z. Matowayika,
IUCN-The World Conservation Union and University of Zimbabwe,
Harare,
Zimbabwe

THE CHANGING FORMS OF COMMON PROPERTY ARRANGEMENTS IN ZIMBABWE OVER THE LAST CENTURY

Land use in Zimbabwe has had tremendous changes over the last century because of the changing interests on land and the process of land alienation from the African population for European occupation. A number of policies on land use were put in place as a result. The majority of the indigenous population had to move at some stage as a consequence. This paper analyses the impact of the changes on the use of the commons by the indigenous population. It also examines the changing management institutions responsible for the management of the commons over the century. The paper suggests that an understanding of this process should help in a better understanding of the current policies on the commons in Zimbabwe.

Anita Maurstad
Norwegian College of Fishery Science, University of Tromsø
Tromsø,
Norway

FISHERMENS' CUSTOMARY TENURE AND STATUTORY LAW CONCERNING THE COD-FISHERY IN NORTH NORWEGIAN WATERS.

The world-wide historical repetition of introducing formal regulations on who is allowed to fish, on top of informal systems of management, has created regimes that contains both formal and informal systems of marine resource rights. In many resource systems, customary law is not recognised before the introduction of statutory law. Lack of recognition may be due to the fact informal rights are not documented.

Untill 1990, Norwegian state laws had minor influence on the practice of small scale fishermen; i.e. a formal and informal system of management co-existed. However, due to resource scarcity, the state materialised its ownership to cod this year by introducing new formal regulations, implying a strengthening of the formal system. In Norway informal systems of rights are not documented, and the state acts accordingly, as if there were only one system. This is expressed in recent court cases, and the passing of new regulations.

The paper discusses aspects of small scale fishermen's informal system of management - that is fishermen's practice, or customary tenure - in Northern Norway; how access to sites is distributed among a group of fishermen who originate from different geographical areas, yet use the same geographical sea space in their fishing. The dynamic process of creating, maintaining and changing the distribution of sites - that is getting access and loosing it - is highlighted.

Bonnie J. McCay
 Department of Human Ecology, Cook College, Rutgers University
 New Brunswick, NJ 08903
 USA

**"THAT'S NOT RIGHT:" RESISTANCE TO ENCLOSURE IN
 NEWFOUNDLAND FISHERIES**

The option of quasi-privatization of fisheries, or fish quotas, is one case among many involving the use of market mechanisms to help manage common pool resources. As a Beijer Institute working group has emphasized, the development of such systems that not only achieve economic goals such as efficiency but also deal with distributional equity in ways that help foster resource stewardship is very challenging. This paper reports on recent field research among Newfoundland fishers who are on the verge of adopting privatized fishing quotas but are resisting as well as those who have adopted such a system but with stringent limitations. It attempts to identify the role of "community" and related social and cultural factors in such resistance to enclosure of the commons.

Thomas R. McGuire, Ph.D.
 Bureau of Applied Research in Anthropology, University of Arizona
 Tucson, Arizona 85721
 USA

**SUSTAINABLE DEVELOPMENT IN A MARINE RESERVE: PROBLEMS,
 POLITIS, AND PROSPECTS**

In response to international pressure from conservation groups, the Mexican government established a biosphere reserve in the Upper Gulf of California and the delta region of the Colorado River in 1993. The management plan for the reserve imposes restriction on an already beleaguered fishery, restrictions which are designed to foster the recovery of two endangered and endemic marine species in the Gulf -- a large and popular sport fish and a small cetacean, the "vaquita." The declaration of the reserve has stimulated local efforts to restrict access to the reserved areas by fishermen living outside the reserve, thus closing what had been an open access fishery. The potential gains of local control, however, may be lost by regulatory controls over the range of gears traditionally used by fishermen. Prohibition of a number of species-specific gillnets -- those thought to be responsible for the incidental capture of vaquitas -- will prevent fishers from switching technologies in response to species abundance. This poster will illustrate and discuss these conflicts between local efforts to establish a more rational fishery and national and international efforts to protect endangered species.

Margaret McKean
 Department of Political Science Duke University
 Durham, NC 27708-0204
 USA

**COMMON PROPERTY REGIMES AS A SOLUTION TO PROBLEMS OF
 SCALE AND LINKAGE**

This paper argues that common property regimes can be a solution to problems of scale and linkage between social institutions and the natural environment. Whereas fragmented individual property does not acknowledge the possible externalities (spillover effects) between one parcel and another, common property regimes can subsume these effects and thus internalize

externalities. And whereas fragmented individual property may develop without consideration of ecological systems and "natural" boundaries, common property arrangements offer a way of making joint decisions about resource use that can take ecological conditions into account. Finally, the notion of joint management can be layered to take into account that huge ecosystems have subsections but the subsections need to be managed with some consideration of interactions with adjacent subsections of the larger ecosystem.

Robin Mearns

The Institute of Development Studies, University of Sussex
Falmer, Brighton BN1 9RE
UK

WHAT FUTURE FOR THE PASTORAL COMMONS OF POST-SOVIET CENTRAL ASIA?

The twentieth century history of Sino-Soviet Inner Asia has been punctuated by the momentous events of agrarian collectivisation and decollectivisation. Despite superficial similarities, the form and substance of agrarian transformation has differed between the republics and autonomous regions that make up Inner Asia, including Mongolia; former Soviet Central Asia (including Kyrgyzstan, Kazakhstan, Tadjikistan and Uzbekistan); and the autonomous regions of northern China (Inner Mongolia), Xingjiang, Qinghai and Gansu). Pastoral livestock production is central to the agricultural sectors in all these areas, but the manner in which it has been integrated with or supplanted by crop agriculture varies between them.

The post-Soviet and post-Mao economic and political transitions of the 1980s and 1990s appear to offer a window of opportunity for pastoralists in the dry areas of Inner Asia. This is a moment of reappraisal of government policies in general, including land policy, that have profound consequences for the character of pastoral livestock production. Economic transition - if accompanied by significant political change - opens up space for the implementation of policies less straight-jacketed by ideology or assumed models of historical development.

Pasture land remains de facto common property in much of Inner Asia, while for much of this century it has been de jure state property. The rolling back of the frontiers of the state in at least some parts of the region provides an important opportunity to investigate the nature of different property regimes governing pasture land and other natural resources in a comparative context. Ongoing debates about land reform throughout the region are paving the way in which this will affect the pastoral livestock sector remains unclear. These questions of policy may be illuminated through a comparative analysis of pasture land tenure past and present, focusing on the inter-relationships between sets of resources held under state, private and common property regimes.

Madhusudan Brijlal Mehta
VADODARA-390 021
India

PROBLEMS OF CREATION OF COMMON PROPERTY RESOURCES IN SEMI-ARID & SALINE AREAS -- A CASE STUDY OF KACHCHH DISTRICT IN INDIA

Kachchh district is in the western corner of India with average rainfall of 340 mm spread over average of 13 days. Velocity of wind is 11-13 km/hr. Geologically, it contains sedimentary rocks lapped by Deccan trap, and sediments of tertiary period. Large areas are under saline flats and more than half the area is covered by arid and semi-arid deserts.

The land use pattern is unique. 37.4% area is barren and uncultivable waste-land; 36.4% is cultivable waste-land; gross cultivation area is 15.2%; forest area is 6.3%; while permanent pastures are only 1.5%. The remaining 3% is other areas. The soil is predominantly saline. Total identified saline area is 3652 sq. km., including inherent saline area of 2995 sq. km. - which is 82% of the total salinity affected area. There are no perennial rivers. All the rivers and rivulets have water only for a few days after rains. Since water is precious, 85% of the surface water is already harnessed through various irrigation schemes, while 55% of ground water is already tapped. Utilisation of wind energy is negligible.

Saline and arid lands are considered to be unproductive or low productive areas. This is coupled with an inhospitable climate, and the common property resources of land, water and wind are threatened for neglect by the human society. The development of such an area is a necessity, particularly in developing countries which also face the problems of excess population. Utilising these resources for creating utilisable common property or resources, is a need which cannot be overlooked.

A case study of Kachchh district in the western part of India is presented with a view to show that efforts are done in this direction of land utilization, and utilization of ground-water, wind energy, etc. These efforts are only a beginning and much remains to be done. The paper in short, focuses on the problems of creating resources for society living under such challenging desert conditions.

Rajendra Menaria
Society for Development Research and Action,
Udaipur,
India

MANAGEMENT OF DRINKING WATER IN ARID REGION: COMMUNITY ACTION IN RURAL RAJASTHAN

Community management of natural resources has been an essential part of life pattern in arid region of Rajasthan. Scattered population in small hamlets, dhanles and majras renders it difficult for the Government to provide drinking water in every locality. The village community has successfully managed to survive and cope with scanty, erratic rainfall and low ground water table. However, the recent trend of increasing population pressure and depleting common property resources necessitates active involvement and cooperation between local community and the Government. In isolation it will not be possible for the Government to spare so much resources nor will the community be able to survive because of population pressure and resource depletion.

In the desert region, drinking of water is available through rainfall (average annual rainfall being as low as 5 mm) or through ground water resources. The rain water is stored and conserved in common ponds and reservoirs. These are maintained by the villagers, each family contributes in pre-monsoon cleaning and repairing tasks of water channels, ponds and reservoirs. This water is sufficient for two, three months in post-monsoon season.

For the remaining months, villagers depend on village wells for drinking water. Such wells are very few and far between. In recent years, mangement of water from such source has been done by the village community. Water supply schemes have not been launched in such remote villages. The village community renovate, repair and maintain such wells by group participation. As water table has gone deeper, water cannot be manually drawn. Thus, the village elders have given a contract to Diesel Pump owner, who operates the pump daily for

specified hours. Families take water from the pump side tank. Animals also drink from a separate point. Each family contributes water charges proportionally to pay the contractor.

The initiative to manage own water supply by villagers and readiness to share the cost must be extended to Government operated water supply schemes so as to make the same viable and sustainable.

Stuart Mestelman
Department of Economics, McMaster University
Hamilton, Ontario L8N 3Z5,
Canada

STUDYING ENVIRONMENTAL REGULATION IN LABORATORY ENVIRONMENTS

Members of the Department of Economics at McMaster University are participating in a major Eco-Research programme at the University which focuses on the restoration of the Hamilton Harbour and the Harbour eco-system. With funding from the government of Canada, McMaster has established the first dedicated experimental economics laboratory in Canada, and work is proceeding on the study of a pollution emission permit trading scheme which has been proposed for nitrous oxides and sulphur oxides. In addition to studying market-based regulation schemes, researchers in the McMaster Experimental Economics Laboratory are studying voluntary allocation by individuals of resources to group goods (such as environmental clean-up) and alternative forms of collective decision-making for determining environmental standards.

This presentation introduces the research designs which underlie the current projects in the McMaster Experimental Economics Laboratory which are directed towards regulation of environmental pollution and presents the rationale behind the research whose results will be presented in the three papers which follow.

Simon Metcalfe
Center for Applied Social Sciences, University of Zimbabwe,
Harare,
Zimbabwe

LIVESTOCK WILDLIFE AND THE FORAGE COMMONS. PROSPECTS FOR RANGELAND REFORM IN A SEMI-ARID COMMUNAL AREA OF ZIMBABWE.

Tenure defines who can (and who cannot) do what with a particular property in question, and under what circumstances. Forage resources, grass, trees, and water, which allow animals to survive by grazing, browsing, and drinking, are the most important resources for a majority of people in semi-arid areas. Access to forage resources is generally broad and subject to competing legal (national) and utilisation (local) systems.

Land resources are administered through three overarching tenure systems: state, communal, and private. In the communal context, local authorities are also land authorities. However, statutory regulation of communally based natural resources is challenged by a customary system, based on traditional authorities.

Forage resources (graze, browse, water) are communal property, as is wildlife. Livestock are household assets. Consequently, forage resources are effectively privatised by those households which own most of the livestock. The CAMPFIRE programme presents wildlife as

a valuable communal resource with a valid claim on forage resources. Competition for these resources is highlighting the need for land use plans which consolidate a new set of rules of access, involving an improved management mechanism, capable of allocating scarce resources, productively, sustainably, and equitably.

The underlying question regarding the 'ownership' of the forage resources remains. Is a more formal, transparent, and accountable system possible? Would it be acceptable, or enforceable? A locally legitimated decision making arrangement needs to be constructed which can market forage "produced" to the resource "users", within a co-management context of communities of interest, and local government authorities.

Any new policy, and institutional framework, must foster both community interests, such as food and social security, as well as enable individual households to access resources, and accumulate wealth. The CAMPFIRE concept, by redefining forage as a public group property, can advise this process.

Gun E. Mickels
International Development Studies, Roskilde University
Roskilde,
Denmark

COMMON PROPERTY RESOURCES: AN ARENA FOR CONFLICT BETWEEN THE STATE AND CIVIL SOCIETY IN ZAMBIA

The miombo woodland of the high-rainfall zone of northern Zambia plays an important role for the livelihoods of the people. Exploiting different niches in the environment and optimising their labour input the people transform natural endowments into entitlements. The upland forest is their main resource, the primary source for generation of entitlements. The woodland provides vegetation to be transformed into energy for crop production (shifting cultivation), and it supplies a wide range of wild foods that give variation to the diet and buffer foods in times of shortages. The bush is also the source of fuel-wood, timber and other raw materials, and a source of cash income through the sale of various products.

This important resource, the miombo forest, may be considered a common property resource (CPR). The land is under the governance of Chiefs, although the state is the ultimate owner. Traditionally, access to land resources was granted freely and once cultivated, indisputable tenure rights were established. Resources in non-cultivated land were open to anybody, although produce ownership could be marked. Increasing population pressure has changed the situation. Access to land has become stratified. And in the non-cultivated lands, the availability of bush products is significantly reduced. Meanwhile, an institutional vacuum in the governance and management of the forest resources opened the remaining CPRs for external exploitation. Eroding communal distribution mechanisms expose the poorer strata of society to increasing food insecurity.

Exploitation is shaped by recent events and historically embedded structures. Encroachment on CPRs is propelled by short-term economic gain sought by entrepreneurs and businessmen in the newly opened market economy. The institutional vacuum in natural resource governance and organisation which emerged in the 1960s and 1970s has not been addressed by the present government. The local people seek ways of coping with the situation ranging from strategic adaption to political opposition. What are the possibilities to resolve the situation to ensure livelihood security and environmental sustainability? The Luapula case study strongly suggests that local empowerment is the key to sustainable common property resource management rather than land reform, as presently advocated by the Zambian government.

Knut H. Mikalsen, Richard Apostle, Bonnie McCay, and Leigh Mazany,
School for Resource and Environmental Studies, Dalhousie University, Halifax, Nova Scotia
Canada

DOCKSIDE MONITORING FOR THE MOBILE GEAR ITQ SYSTEM IN THE SCOTIA-FUNDY REGION: SOLVING PROBLEMS OR DISPLACING THEM?

Privatization of common property resources is one of the new models which is being more widely employed to deal with problems in fisheries management. This paper uses a case study of a new independent transferable quota (ITQ) system in Canada's Scotia-Fundy region to consider some of the specific issues involved in enforcement. Can the industry-funded dockside monitoring programme (DMP) serve as an adequate enforcement system for the new management scheme?

Manoshi Mitra
Agriculture Unit The World Bank
21, Jor Bagh New Delhi 110003
India

REINVENTING THE COMMONS WITH GENDER PERSPECTIVES: WOMEN'S ROLES IN REDEFINING COMMON PROPERTY MANAGEMENT IN INDIA.

This paper will analyze the results of an ongoing movement by organized peasant women's groups in India to define and articulate their perspectives on the impact of the breakdown of community management of common property resources, and to evolve new systems of property rights and obligations with regard to the common property resources, centered around women's groups. These initiatives are significant, insofar as they: a) provide policy implications for gender-sensitive planning of common property resource management systems; b) provide instruments to meet women's practical and strategic gender needs; c) have demonstrated capacity for equitable and sustainable management which is important from the point of evolution of sustainable common property resource management systems. The paper will draw conclusions for policy makers, planners, international agencies, NGO's, and women's groups, working in the area of common property resource management.

Rob Moir
Department of Economics, McMaster University
Hamilton, Ontario L8N 3Z5,
Canada

VOLUNTARY CONTRIBUTIONS TO GROUP GOODS: ALTRUISM OR SELF-INTEREST

Allocating resources to maintain environmental quality may be viewed as a group good. It has public properties, in that contributions from one individual will benefit others, and the contributor has no way of excluding others from this benefit. Resources are frequently inefficiently allocated to goods which exhibit various characteristics of publicness because potential donors of resources have incentives to "free-ride" on other contributors. These activities are usually underfunded by private sources. Group goods are frequently provided in laboratory environments, even though the model of self-interested agents predicts no provision. Usually, however, these goods are underprovided. Any provision at all suggests that some degree of altruistic behaviour must characterize the individuals participating in these environments. Because this laboratory result is so prevalent, a belief that peoples' are, in

general, moderately altruistic rather than self-interested may be true. This paper presents results of a laboratory experiment in which there is an attempt to separate altruistic behaviour from cooperative self-interested behaviour of a group of subjects participating in a voluntary contribution game (an altruistic individual will do something to benefit another even if he has to incur a cost to deliver this benefit to another). The results suggest that cooperative self-interested behaviour rather than altruism characterizes the behaviour of subjects who tend to contribute more to a group good than is predicted by a behaviour model in which people are driven by self-interest.

Betty N. Morgan

The Centre for Public Administration and Policy, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA

CHAOS ON THE COMMONS: CONSIDERING THE IMPLICATIONS OF NONEQUILIBRIUM THEORY FOR COMMON PROPERTY RESEARCH

The rapidly emerging "new science" of nonequilibrium systems theory may offer common property researchers and scholars an exciting alternative ontology from which to consider the development, behavior and efficacy of common property systems. Deriving from the dynamical holism of quantum physics nonequilibrium theory engages the spontaneity, chaos, interrelatedness and interconnectedness of complex natural systems, such as common property regimes, and considers these system behaviors temporally. Viewing system evolution, or iteration, in this way permits researchers to assess the entire range of system behavior from episodes of equilibrium to episodes of chaotic or unpredictable behavior which suggest that the system is self-organizing and adapting to environmental stimuli.

This study explores the connections between common property scholarship and the recent theoretical developments in nonequilibrium analysis. Using the Navajo Indian Irrigation Project as a case study, this paper explores the aspects of nonequilibrium theory which may be instructive in an expanded vision of common property research. Nonequilibrium theory holds that the behavior of all natural systems, of which human systems such as common property regimes are clearly a part, can be understood differently, and more completely when the tools and concepts of nonequilibrium theory are employed. After presenting the theoretical elements of nonequilibrium theory, the paper turns to an examination of the developmental history of the Navajo Indian Irrigation Project from a nonequilibrium perspective. The paper concludes with a discussion of the implications of nonequilibrium theory for common property research scholarship.

R. Andrew Muller

Department of Economics, McMaster University
Hamilton, Ontario L8N 3Z5,
Canada

POLLUTION EMISSION PERMIT TRADING: AN EVALUATION OF CANADIAN PROPOSALS

Two important decisions in designing markets for tradable pollution emission permits are whether to allow banking and whether to allow trading in entitlements to future permits. Recent studies in laboratory markets suggest that banking will be particularly important when uncertainty about actual emissions requires trading in a reconciliation period after the quantity of emissions has been determined. This paper reports an experiment designed to measure the individual contributions of banking permits and trading entitlements under alternative

conditions of certainty and uncertainty. We expect to find price spikes and troughs in markets with uncertainty and no banking. We expect banking to lead to greater price stability and efficiency in such markets. Tradable entitlements are expected to act as substitutes for futures contracts, leading to higher price stability and efficiency. These expectations will be tested in a complete 2x2x2 factorial design with 3 observations per cell. Trading will be conducted for 12 periods in a computerized double auction with experienced subjects.

Eva Munk-Madsen
Norwegian College of Fisheries Science, University of Tromsø
N-9037 Tromsø
Norway

FROM COMMON PROPERTY TO ALL-MALE PROPERTY IN NORWEGIAN SMALL-SCALE FISHING - A GENDER PERSPECTIVE AT RECENT RESTRICTIONS IN ACCESS TO RESOURCES.

Common practices in of sexual labour division have led to a pattern where fish resources are exploited largely by men. Traditionally women's contributions to fishing were primarily shore based services, while fish was harvested at sea primarily by men. In spite of this dominant cultural practice, fish resources are available to women and could serve to improve life conditions or lessen economic dependence. In 1990 all cod fishing in Northern Norway was regulated by boat quotas. I argue that the distribution of the cod stock in quotas strengthens and formalises the gender bias in access to fish resources. This paper explores how the cod resources are distributed on the sexes today. I discuss to what extent and in which ways the regulation discriminate against women directly and indirectly. If the rationality of regulations follow and privilege a masculine fishing pattern, the system can be viewed as a patriarchal construction. A feminist perspective on fishing regulations elucidates the gender bias in basic assumptions of common property theory. The data presented in this paper covers statistics on distribution of quotas between the sexes, historical accounts of women in fishing as well as contemporary case stories, collected by interviewing and participant observation among Norwegian small-scale fisherwomen.

Tore Nesheim
Høgskolen i Finnmark
9500 Alta
Norway

THE CULTURAL CONSTRUCTION OF NATURE - INCLUDING RESOURCES

The 18th century philosopher Immanuel Kant made clear that it is impossible to make unbiased representations of reality (or 'things'). This is now a general consideration that can be found in e.g. Roy A. Rappaport's works. He demonstrates that people act towards nature with reference to cultural constructions of nature - or 'cognized environment', in his terms. The implications of these acts can be traced in an 'operational model' of nature.

The Kulunge Rai is an ethnic group living in the remote eastern hilly region of Nepal. They exploit a wide range of natural resources, through cultivation, animal husbandry and utilisation of forest products. The focus of my research was originally on 'management of common property resources'. After finishing a MA thesis based on fieldwork conducted in 1991, I realised that I had written it with an insufficient knowledge about how the Kulunge Rai perceive nature (e.g. identify something as being a resource).

A short fieldwork in 1994 gave me the opportunity to improve this shortcoming. I found that e.g. some trees were not used for some of the purposes that seems "natural", given the inherent qualities of these trees: 'Posing' can be used as firewood by some people and not by others. No one will burn 'Karpau' etc. A cultural explanation for such usages is needed, and suggestions for describing them in an interpretative framework will be given in this paper.

Ragnar Nilsen
University of Tromsø,
Norway

COASTAL SAMI FISHING UNDER PRESSURE

We discuss actual Coastal Sami adaptations in fishing in North Norway based on case studies from fjord areas in Troms and Finnmark.

The adaptation strategies are seen partly as a result of the social and economic marginalization of the Coastal Sami, partly as an ethnic and rural consolidation process in peripheral fjord areas in the North.

Lars Norum
Salten Land Consolidation Court
N-8026 Mørkved
Norway

THE LAND CONSOLIDATION COURTS IN NORWAY: DESIGNING RULES FOR JOINT OWNERSHIP

Rules about land consolidation is found already in the oldest known Norwegian laws. The first Land Consolidation act came in 1821, and in 1859 the Land Consolidation service was established.

The Land Consolidation service has mainly worked with dissolving joint ownership. In the later years this process has slowed down, and consolidation courts in Norway are now working more and more with designing rules for the use of joint ownership instead of dissolving them.

In this paper the reasons for this will be discussed, and the results of a case where the court designed rules for a joint ownership will be gone through.

Leonid Novakovsky,
Institute on Organisation of the Use of Land, Ukrainian Academy of Agrarian Sciences,
Kiev,
Ukraine

THE PARTICULARITIES OF LAND PRIVATISATION IN UKRAINE

The reform of land relations in Ukraine that started in 1991 did not envisage change in the forms of property in land. The subject of land reform primarily was creation of various forms of activity on lands first of all due to organising private farms and considerable expansion of private plots of population. Together with that the monopoly of state property on land remained but the functions of land use and rent of plots.

The process of destatization of lands is provided for by adoption of Law on forms of property in land in January 1992 and land privatisation according to the second edition of Land Code of Ukraine (adopted in January 13, 1992) started in May 1992. The concept of privatisation of land fund gives the idea that plots should be given as property strictly according to proposed use on the basis of approved or calculated norms and mainly free of charge.

The author tries to analyse the particularities of transfer of land into private property depending on purpose of use and arising practical problems of implementation of adopted legal norms on these questions.

Taking into consideration the existing differences in approach to privatisation of land plots which previously were permanently used by citizens (the so-called "small privatisation"), the lands allocated for organising farms, lands belonging to big agricultural enterprises on the basis of statistical data analysis of developed programs and forecasts of implementing land reform the report presents proposals on expanding the sphere of land privatisation, stabilisation of land structure of Ukraine, improving the existing legislature on land.

Martin O'Connor and Richard Dawson
Department of Economics, University of Auckland
Auckland
New Zealand

THE DYNAMICS OF DISPOSSESSION

This paper will discuss the redistribution of access to fisheries consequent on colonial domination of Aotearoa/New Zealand. Prior to the arrival of Europeans to Aotearoa/New Zealand, there existed in Maori society a complex and evolving configuration of rights with respect to fishing. Strict control on access, together with a system of social control which inculcated an ethical sensibility to pass on the gift of the fish to the yet-to-be-born, made for sustained plentiful catches. Despite the reaffirmation in the Treaty of Waitangi (with the British Crown in 1840) of "full exclusive and undisturbed possession of their [...] fisheries", Iwi (tribes) have been largely dispossessed of their fisheries. Since the 1860's there has been a significant widespread decline in both stocks and catches following, among other things, the forced dismantling of Iwi legal and extra-legal institutional structures, the subsequent general absence of access restrictions, and pollution.

In the early 1980's, in response to the biological and economic collapse, access restrictions were introduced via the implementation of a system of Individual Transferable Quota. The distribution thereof was in proportion to recent bureaucratically documented catch history. In effect, the Crown gifted to mostly non-Maori 'full exclusive and undisturbed possession' of the fishery. Dissenting Iwi were powerless to prevent this as the Treaty of Waitangi is deemed by the extant (non-Maori) legal institutions not to be part of municipal law and thus not binding on the Crown.

Luke Ipoto Ojok
Department of Zoology University of Nairobi,
Nairobi,
Kenya

IMPACT OF WARFARE ON THE COMMONS

The "Commons" are an important asset to rural Communities in developing Countries. Large settlements/ movements of communities caused by wars are threatening the contribution of the commons to sustenance of rural life, environmental stability and the capacity of indigenous people-based farming systems. The war in Sudan has had and will continue to have devastating effects on the commons within and without the Sudan where large settlements/ movements have occurred. This is particularly so in the case of Uganda and Kenya. The settlements in these countries are located in savannahs and arid areas. These areas themselves are fragile and populated environments and with additional populations often outnumbering the indigenous, enormous stress on the commons and conflict of resource use are bound to occur. This paper examines the use of the commons at some of the refugee settlements in Kenya and Uganda. It tries to document and analyse the impact on the environment and conflicting use of the commons between the refugees and the local population.

Aderibigbe S. Olomola,
Ibadan,
Nigeria

SOURCES AND RESOLUTION OF CONFLICTS IN NIGERIAN ARTISANAL FISHERIES.

The traditional approach to fishery management is predominant in the artisanal fisheries of Nigeria. However, the control of access to and use of fisheries resources using traditional methods is often encumbered by varying objectives and preferences of different groups of resource users, different interpretation of rules and different perception of existing usufructuary relations. Thus, even though the approach provides rules for exclusion and regulation of use, it is not free of conflicts.

This study therefore, sought to examine the types, causes and resolution of conflicts in the Nigerian artisanal fisheries. This is crucial because the competence of resource owners and users in ensuring sustainable management and the resilience of management practices can be viewed in terms of their capability to resolve conflicts arising from the social relations associated with the control of access to and use of fisheries resources. The study was conducted in Ondo and Rivers States in southwest Nigeria. Data collection extended from July to December, 1991; and was based on key informant interviewing and focus group discussion involving traditional rulers, chiefs and other community leaders selected from eight fishing villages in the area.

The results of our empirical investigation show that conflicts often arise over ownership of fishery resources and management of the resources. The conflicts involve strangers versus community, indigenes versus indigenes and strangers versus strangers. Conflicts arise mainly from misuse of resources and misperception of local jurisdiction and property rights by both indigenes and strangers. Detailed analysis of the ways of managing conflicts in the area indicate that conflicts involving indigenes have been resolved through traditional procedures of arbitration and adjudication whereas those involving strangers involved occasional recourse to litigation. In conclusion, cultural factors tend to be crucial in curtailing the damage resulting from conflicts and in minimizing the cost of conflict resolution.

Jonas Olsen,
International Development Studies, Roskilde University Centre
DK-4000 Roskilde
Denmark

**"COMMON PROPERTY" OR FLEXIBLE RESOURCE USE MANAGEMENT?:
ACCESS TO *FAIDHERBIA ALBIDA* IN SOUTHERN ZAMBIA**

Diverse production options seem to be an intrinsic part of coping with fluctuating, arid and semi-arid environments. Farmers management of an integrated agricultural system is explored through field studies in southern Zambia.

The *Faidherbia albida* agri-silvopastoral system has multiple uses. Most important is human medicine, soil amelioration and drainage assuring crop production, cattle fodder which is specially important in years of drought and timber for canoes providing other options such as hunting, fishing, transport and access for herders to remote pastures. The tree has reverse phenology, is considered sacred and associated with rain. In some cases the tree is the home of spirits as shown in one of its names, Musangu, spirit. Access to *Faidherbia albida* resources is complex, as is the "ownership" of the tree. Rights are hierarchical and fluid depending on the specific use, availability and who the user is. A wide range of people often have access to *Faidherbia albida* resources and specific uses are authorised, or restricted, by the owner of the tree, the land or the field, depending on circumstances pertaining locally. These access regulations do not imply a common property resource, rather a way in which to ensure that using a valuable resource will not be detrimental to the community as a whole. Site-specific inherent flexibility in time and space of management and access to rural resources provides a buffer against erratic ecological and socio-economic conditions

Kenneth R. Olwig
Menneske & Natur: Humanities Research Center, Odense University,
Odense,
Denmark

**REINVENTING NATURE AS COMMONS: PRIVATE TRAGEDY, PUBLIC
COMEDY AND THE CONSTITUTION OF DEMOCRATIC COMMUNITY**

The concept of nature and the idea of the pastoral commons were once closely linked to the notion of community and democracy in Western European thought. The idea of nature simultaneously embodied a conception of the natural. The qualities of the commons which made it a preeminent symbol of the natural was rooted in material, ecological, conditions as well as in folk cultural traditions vital to the constitution of community. Individual agriculturalists might have competed with one another as producers on a daily basis, but the sharing of the common grazing lands which was so vital to the reproduction of agricultural fertility also played a vital role in the reproduction of community identity via various cultural forms. In literary art these traditions provided the basis for a celebration of community and nature which was at the heart of comedy as a life affirming celebration of fertility. This original form of comedy (which need not be funny) was counterpoised to the tragedy of the isolated individual and death. In the course of the 19th century the idea of nature as commons was supplanted by the notion of nature as thing, a resource (literally: "thing source") which could be appropriated for private use. Eventually, the idea of the commons as nature was inverted, so the commons has come to be perceived by many as being "tragically" unnatural, as opposed to private ownership. The time has come to reinvent this earlier concept of nature by reexamining its origins and its importance to the development of democratic governmental ideals. This is necessary if we are to avert continued tragedies of privatization.

Karen Fog Olwig
Institute of Anthropology, University of Copenhagen,
Copenhagen
Denmark

CARIBBEAN FAMILY LAND: COMMUNAL LAND IN A PERIPHERAL SOCIETY

Communal land holdings are usually associated with pre-capitalist societies such as those of feudal Europe or tribal Africa. Indeed, the advent of capitalist economic systems is closely associated with the destruction of communal land tenure.

Caribbean family land poses an interesting exception to this pattern. This form of property holding emerged throughout much of the Caribbean area during the 1800's and originated in the conversion of private property to communal land holdings. This conversion took place, when private property acquired by an emancipated slave was passed to all the descendants to hold in common. Such family land, where all the heirs received a right in land, but no title to a particular piece of it, became an important pillar in the development of free African-Caribbean communities. It gave people access to land where they could settle and create at least partially autonomous social, economic and cultural spheres of life, even though they lived within the poverty stricken periphery of European colonial societies. At the same time, the land also provided vital anchoring points which enabled individuals to remain members of an African-Caribbean family and the local community of which it was part, even though they might be in faraway migration destinations, taking advantage of economic and social opportunities outside the local society.

If Caribbean family land has thrived in the periphery of the Western world, this common land tenure has been seriously threatened when exposed to modern economic development, often in the form of tourism. This has led to inflated land values and skyrocketing property taxes - which have forced many families to sell land held by them for many generations.

This paper discusses the rise and fall a modern commons and the complex socio-economic relations and cultural values associated with it. The paper is based on archival and field research on the American, formerly Danish West Indian island of St. John.

Gail Osherenko,
Arctic Studies Institute, Dartmouth College,
Hanover, New Hampshire,
USA

CHANGING PROPERTY RIGHTS IN NORTHWEST SIBERIA: BETWEEN COLLECTIVIZATION AND PRIVATIZATION

Privatization of business enterprises is expanding rapidly in Russia, and land is next on the privatization agenda of US-AID and the Russian Federation. But few have considered what form of property rights would be most appropriate in the northern regions of Russia where indigenous peoples and Russian old-timers are engaged in traditional activities of reindeer herding, hunting, trapping, and fishing. This paper discusses the question of changing property rights with regard to personal property (reindeer), public enterprises (sovhozes), and land on the Yamal Peninsula, the homeland of Nenets reindeer herders as well as the locus of supergiant gas fields slated for rapid development.

Elinor Ostrom
 Workshop in Political Theory and Policy Analysis, Indiana University Bloomington, Indiana
 47405-3186
 USA

**THE RELATIONSHIP BETWEEN ECOSYSTEMS AND INSTITUTIONS:
 SCALE CHALLENGES IN NATURAL RESOURCE GOVERNANCE AND
 MANAGEMENT**

Authors: Cutler Cleveland, Robert Costanza, Thráinn Eggertsson, Louise Fortmann, Bobbi Lowe, Margaret McKean, Elinor Ostrom, James Wilson and Oran Young.

We hypothesize that successful sustainability requires human social systems that are concordant with the ecosystems to which they are related at appropriate scales given the limits of human information processing. Many current governance and management systems are either too large or too small for the ecosystems to which they are related, leading to inappropriate policies for these systems. Problems often occur when human systems developed and sustainable at one scale or for one ecosystem or for one part of an ecosystem are transferred to other scales and ecosystems or to the whole system without adequate modification. In order to test this hypothesis, we are developing multiscale conceptual and mathematical models and data bases that include a range of ecosystem characteristics and human system characteristics.

Oddmund Otterstad
 Senter for Social Studies Research, University of Trondheim
 Trondheim,
 Norway

**IDEAL-TYPE MODELS OF NORWEGIAN FISHERIES: MODEL
 DEVELOPMENT WITH PRACTICE IN MIND**

This paper describes and presents an ideal typical model approach which has proved useful in understanding a complex material for the development of fisheries communities within Norway.

The approach is inspired by two different sets of sociological models: a) a real-type model approach drawn from empirical research and historical cases (an adaptation of Max Weber's concept of "ideal types") and b) a stage-development model inspired by the Marxian/Hegelian mode of analysis which links the particular real-type models to the modernisation of Norwegian society as a whole.

The paper argues that a range of models can be found among Norwegian fisheries communities at any one time and that these differences among fishing communities are the result of the strategic choices made consciously or unconsciously over time by different communities in response to changes in their external environment. The real-type models described range from the archaic model of the simple subsistence fisheries to the most recent model in which the political entry of large consumer groups is the most important for the outcome. This battery of historical models produces a good analysis of the empirical material. It illustrates how general policies can have dramatically different effects for different communities.

The paper concludes with reflections on the relationship between the approach taken here and game theoretical approaches and the advantages that the real-type/stage development approach seems to offer for policy making and practical work.

Xin Ouyang
Institute of Environmental Law, Wuhan University,
Wuhan,
China

CHINA'S ACTION PLAN: BIODIVERSITY CONSERVATION

China is a country with wide territory and complicated climate. This makes her living things various, China possesses about 83,000 land species and 13,000 marine species. Biodiversity in China is now severely threatened, There are several reasons: 1) the deterioration of the habitat, 2) over exploitation, 3) pollution. It is now the critical time that concrete measures should be taken to protect China's biodiversity immediately. A comprehensive plan for the protection of her biodiversity in China is urgently needed, Under which, a general goal may be set up. In order to achieve this goal, a number of measures may be taken, they may be: 1) absolute protection be given to those species which are endangered; 2) for those species which are existent in mass amount, a strict Plan for exploitation is to be designed with a view to ensure sustainable development; 3) a nation-wide net of information as monitoring may be established; 4) put the biodiversity plan into China's National Economic Developing Program so as to ensure financial support; 5) corresponding laws and regulations should be enacted; 6) international cooperation be improved.

Gísli Pálsson
Faculty of Social Science, University of Iceland,
101 Reykjavík,
Iceland

Agnar Helgason
University of Iceland/Brunel University

FIGURING FISH AND MEASURING MEN: THE QUOTA SYSTEM IN THE ICELANDIC COD FISHERY

This article discusses inequality in the Icelandic cod fishery, focusing on changes in the actual distribution of fishing quotas and the ways in which Icelanders currently talk about equity and ownership. The quota system, introduced in 1983, divided access to an important resource among those who happened to be boat owners when the system was introduced. With the fisheries legislation in 1990, the system was revised: some of the smallest boats (6-10 tons) previously excluded from quota restrictions were now incorporated in the system and, secondly, permanent quotas became effectively transferable. Our statistical findings - built on a database (the "Quota-base") we have constructed with detailed information on all vessels that have been allotted quotas from the onset of the system - show that quotas have been increasingly concentrated in the hands of the biggest companies. Meanwhile, public discontent with the concentration of quotas and the ensuing social repercussions is increasingly articulated in terms of feudal metaphors, including those of "tenancy" and the "lords of the sea."

Gísli Pálsson
 Faculty of Social Science University of Iceland
 101 Reykjavik
 Iceland

LEARNING BY FISHING: PRACTICAL SCIENCE AND SCIENTIFIC PRACTICE

In many fisheries, resource management is largely informed by professional marine biologists and public officials. Such management often assumes that the extensive knowledge that fishing skippers have achieved, after years of practical experience of fishing, is of relatively little use. Indeed, in many cases there is very little attempt to utilize such knowledge and to involve them in the process of ecological research and decision-making. At the same time, much recent research indicates that, given the uncertain (if not chaotic) nature of marine ecosystems, practitioners' knowledge - knowledge gained on the spot, in the course of production - is of key importance. The aim of the present project is to explore, with particular reference to Icelandic fishing, how indigenous producers acquire knowledge about the ecosystem within which they operate, how their knowledge differs from that of professional biologists, and to what extent the former could be brought more systematically into the process of resource management for the purpose of ensuring sustainability.

Haribhai G. Patel
 Department of Sociology, Saurashtra University
 Rajkot-360 005, Gujarat
 India

INSTITUTIONAL INNOVATION IN UNDERGROUND WATER MANAGEMENT IN WESTERN INDIA

The renewed interest in the institutional factors in the most recent decades has prompted researchers in developing new prescriptions to address old and unresolved issues of CPR management. The traditional theoretical framework based upon the utilitarianism supports the tragedy of the commons type outcome in the use of common property resources. Privatisation and government intervention in the use of such resources present more simplistic solutions and therefore fail to provide usable techniques of resource management. The problem lies more with the nature of the resource in question.

We, in this paper, touch upon the underground water which is characterised by complex indivisibility as compared to grazing land and forest resources. Therefore, no means like privatisation or government intervention can adequately address management issues of this resource.

In the above context we have attempted to address the following points:

- (1) role that voluntary agencies play in solving crisis of underground water resource management;
- (2) methods and techniques used by voluntary agencies to elicit cooperation from people in solving such crisis; and
- (3) assessing the efficacy of the programmes launched.

The major outcome of our inquiry reveals that people concerned with the crisis cooperate in regaining the resource they had lost for various reasons, including their self-interest. However, voluntary agencies have yet to devise means to restrain self-interest of the people affected.

Jens Paulsen and Kate Sandersen
 North Atlantic Marine Mammals Commission (NAMMCO)
 University of Tromsø,
 Tromsø,
 Norway

THE NORTH ATLANTIC MARINE MAMMAL COMMISSION - REGIONAL APPROACHES TO THE MANAGEMENT OF WHALES AND SEALS

The paper will begin with a brief overview of the North Atlantic Marine Mammal Commission, outlining the work of the organisation since the signing of the Agreement between Faroe Islands, Greenland, Iceland and Norway in 1992. It will then focus on the management needs in member countries and how these have been dealt with in the context of the North Atlantic Marine Mammal Commission

Holly E.X. Payne
 Gainesville, FL 32601
 USA

THE LONG-TERM POWER OF COMMON PROPERTY RESOURCES: LOCAL MANAGEMENT OF THE INTERNATIONAL DEMAND FOR SHELLFISH IN CHILE

Of the shellfish products exported by Chile, the indigenous "abalone" (*Concholepas concholepas*) claims the highest local and international price. Uncontrolled harvesting of the formerly abundant resource resulted in its dramatic decline. Since 1989, the Chilean government has banned abalone extraction to enable the resource to recuperate. In addition, common property favoring sustainable extraction by small-scale fishers is now legally recognized. Shellfish "Management Areas" in the form of marine concessions may be obtained from the government by small-scale fishing unions. The organizational structures of four such unions, with and without Management Areas, were observed with respect to their abilities to control international demand favoring "abalone" extraction. Under heightened political pressure, when the harvest ban was lifted and prices were more favorable, well-organized unions with Management Areas chose not to extract "abalone". Instead they voted to leave their resource inside of their legally recognized common property areas to accumulate value for sustained use in the future.

Evelyn Pinkerton,
 School of Community and Regional Planning, University of British Columbia,
 Vancouver, B.C. V6T 1Z2
 Canada

ALTERNATIVES TO THE "PROPERTY" DILEMMA: WHAT IS THE MOST USEFUL WAY TO CONCEPTUALIZE CO-MANAGEMENT RIGHTS?

Theorists have conceptualized the rights of communities to participate in natural resource management decisions in several ways. For example,

- (1) resources are seen as communal property, similar to private property but collectively owned;
- (2) resource use is governed by the collective choice of individuals whose individual self-interest is better protected through a combination of collective rule-making and individual rights, such as the rights to sell one's interest in the resource;

(3) resources are managed by the state in the public interest, but communities with long-term stable resource use patterns have rights to share in decision-making; the rights are greater in relation to the community's capacity to manage sustainably.

This paper proposes a broad typology of fisheries management decisions as a way of illustrating the utility of the third option for conceptualizing sustainable community-based co-management. In particular, by avoiding the concept of "property" and focusing on the concept of "management as a public trust", this approach can clarify some of the conceptual pitfalls which arise when analyzing mixed regimes in which private property rights may or may not be compatible with the public interest. The paper suggests that the ability to predict sustainable outcomes may be the most useful yardstick in evaluating the fit of private rights and the public interest.

Robert S. Pomeroy, Michael D. Pido and Melvin B. Carlos
International Center for Living Aquatic Resources Management (ICLARM)
Makati, Metro Manila,
Philippines

CO-MANAGEMENT OF MARINE FISHERIES AND OTHER COASTAL RESOURCES IN AN ISLAND ENVIRONMENT: THE CASE OF PALAWAN, PHILIPPINES

The island-province of Palawan has the richest fishing grounds and possess the largest intact assemblage of coral reefs, sea grass beds and mangroves in the Philippines. However, these resources are under threat from population pressure and various illegal or destructive fishing practices. Further, despite the rich coastal resource base, the small-scale fishers are among the poorest population.

Using an institutional analysis research framework, a forum was organized to discuss with fisheries resource managers and decision makers the various management systems of fisheries and other coastal resources in Palawan. The various experiences suggests that the management system is determined by several contextual factors such as the biophysical and technological attributes, the market structure and the local institutional arrangement.

Within the island-province, several management systems have been identified. Some are spearheaded by national government agencies while others are administered by the local government units. Still, others are initiated by nongovernmental organizations or facilitated through the assistance of a research institution. A common approach among these management systems is some form of co-management or sharing of authority between government and community.

Tomasz Potkanski
Department of Ethnology and Cultural Anthropology,
University of Warsaw, 00-927 Warsaw
Poland

LIVESTOCK AS COLLECTIVE VS. INDIVIDUAL PROPERTY AMONG THE TANZANIAN MAASAI: MANAGEMENT OF LIVESTOCK AS A PART OF PASTORAL RESOURCE MANAGEMENT SYSTEM.

The CPRM framework is usually applied to analysis of the way pastoralists utilize range and water resources only. The paper based on the recent fieldwork in Tanzania among the Maasai argues that in some circumstances livestock is managed with some of the characteristics of

common property. In this respect it forms a part of a wider system of pastoral common property that includes range and water. It also argues that the CPRM and the New Institutional Economics (NIE) provide a useful way of interpreting decisions made by livestock managers with respect of all three types of resources.

The paper analyses briefly how these three key resources in the Maasai economy are appropriated, utilizing categories of common/collective vs. individual property as guiding tools. Special attention is paid to forms of collective management of livestock as exemplified by redistribution of stock to destitute families within clans (the custom of "engelata-ewoloto" that has not been previously described in the literature).

Author argues that decisions in one domain (e.g., livestock...) cannot be independent from decisions in another (e.g, water/range and vice versa), and analyses ways in which system strengthens the pressure on individual to conform and not to "free-ride" or ignore customary cooperative rules of management of any of the resources. Based on data from his fieldwork he shows that , when economic destitution among pastoralists is coupled with easing the pressure of the social sanctions, it leads to redefinition in customary property relationships and breakdown in the collective management of that particular resource. Using analytical apparatus of the CPRM and NIE, and the concept of transaction costs he shows how this change affects other domains of pastoral resource management system.

Ujjwal Pradhan
International Irrigation Management Institute
Panipokhari, Katmandu
Nepal

GOVERNANCE AND LEGAL PLURALISM: TOWARDS LOCAL MANAGEMENT OF IRRIGATED AGRICULTURE

In Nepal, as elsewhere in Asia, the governance of irrigation systems are slowly being transferred to local institutions from government authority. This process has been characterized as privatization, turnovers, local institutional strengthening, democratization, decentralization and so on. Whatever the nomenclature, it is important to assess this trend in terms of salient features that are indicative of the relationships between the state and locality and the local communities themselves with one another.

What once was controlled and managed by the state through its irrigation and agricultural support bureaucracies are now being slowly transferred to local communities. This trend in an agrarian society and economy of Nepal has occurred due to fiscal and legitimacy crises faced by the state in managing and controlling the natural resource, and to some extent, the confidence that the planners and policy makers have had in the institutional capacity of the farmers and local irrigators in managing their own systems through their own customary practices and laws.

This paper explores the adoption and transfer of many of the germane customary practices, laws, local and indigenous knowledge and skills of the local communities of irrigators in the transfer of authority and management of state irrigation systems for local governance of the irrigation systems. The paper also explores the contradictions, tensions, and conflicts encountered in this transitional period by both the state and the local communities in the "creation" of common property in the resource that used to be controlled by the state. A legal pluralism perspective is used for the analysis of this process not only for the understanding of the relationship between the state and the locality or within local communities but also to understand the cultural diversity existing even within local heterogenous communities. This information would help in better policy reformulations and planning for local governance.

Sanjeev Prakash,
New Dehli
India

INFORMAL INSTITUTIONS, CPR'S AND THE SOCIAL CONTEXT OF FAIRNESS: FOREST AND PASTURE COMMONS MANAGEMENT IN A VILLAGE IN THE INDIAN HIMALAYA, 1987-92

In determining the design of local institutions for the regulation of natural resource use, some scholars have pointed out that the nature of society may be at least as important as the nature of the resource (Blaikie 1993). The study of informal institutions in CPR management includes much more than the assumptions of rational choice and game theory embodied in certain traditions of contemporary academic discourse.

A number of authors have noted the way in which perceptions of nature and environmental risk vary across social and political cultures, which seems in some ways related to the fundamental Kantian assertion that it is impossible to make unbiased representations of things (Douglas 1966, 1975; Rappaport 1979; Pedersen 1992; Simmons 1993). These perceptions are different from, though they may be related in different ways to, the formulation of individual and collective interests.

The role of the Himalayan village commons managing institution as a forum for mediating different perceptions and interests, each with its own interpretation of ecosystem resilience, will be illustrated through a case-study of forest and pasture management in Pujargaon village in the Garhwal Himalaya over a five-year period (1987-92). This informal institution successfully mediated plural and frequently contentious dialogues on environmental risk as well as related notions of fairness with respect to the consequent allocation of benefit and burden, instead of assuming that there could be any single correct definition of the problems concerned.

Concerns of fairness have also influenced the evolution of other natural resource management programs in the Himalaya, often playing an important role in their ability to involve popular participation, and in their ultimate success or failure in creating robust institutions.

If such discourses on fairness, like those on justice, represent the form of a society (Douglas 1993), then it may be necessary to study why different actors and cultures are attracted to various notions of fairness in order to inform policies sufficient for the cultivation of "new traditions" of collective resource use (Sarin 1993), and to understand the significance of alternate plausible regimes of natural resource management in their relation to societal variations.

Archana Prasad
Department of Science and Technology Studies, Cornell University
Ithaca, New York 14853-2501
USA

INVENTING THE COLONIAL COMMONS : FOREST LANDS AND ENCLOSURES IN COLONIAL CENTRAL INDIA

The main aim of this paper will be to show the process by which the forest lands were enclosed for grazing in the Central Provinces, between 1860 and 1935. The analysis will proceed at three levels : First, I will map out the different ways of forest use amongst the peasant communities. Secondly, I will discuss the changing nature of pasture-land management by the colonial authorities. Finally I will show why grazing became an important issue politically in the 1930s.

The first section of this paper will argue that there was an inherent tension between forest and peasant economies. The very nature of peasant cultivation implied a deforestation of forested tracts. But despite this apparent contradiction, there was also an underlying complementarity amongst the two economies. The forest provided the support that sedentary cultivation required. It provided pasture-lands for the cattle and supplementary food in times of famine. It also provided fuel for every-day life and wood for implements. This is why it was important for the peasant communities to make rules for the use of nistar lands.

The second section will show how traditional nistar rights were reordered in Colonial Central Provinces. It will argue that the colonial organisation of these required a specific interpretation of pre-colonial history. Concentrating mainly on the writings of people like Henry Maine and Baden-Powell, it will examine these constructions of the pre-colonial rule in India with specific focus on the classification of wastelands. Thereafter it will proceed to examine the nature of the enclosures that were demarcated for peasant use and examine its impact on agricultural practices. It will argue that the European enclosure movement was instrumental in shaping the British ideas of what the "commons" should be and how customary peasant rights in forests can be legalised and recognised under the colonial regime.

The final section will argue that the classification of wastelands and their demarcation was a political exercise that evoked an equally sharp political response from the Nationalists. The dynamics of the Nationalists forest satyagraha and the reasons for its failure amongst the peasant and grazing communities will be examined. In contrast I will show how the forest communities used the opportunity to protest against the forest laws.

Irina M. Pribytkova,
The University of "Kiev-Mohyla Academy",
Kiev
Ukraine

ATTITUDES TOWARDS PRIVATIZATION OF LAND AMONG UKRAINIAN PEASANTRY

Reforming of land ownership system in Ukraine infringes upon different social group's interests in the village. The principal of them are peasantry and authorities of all levels. Their interests, expectations, resources, notion about property rights and its firmness have the great influence on running of land ownership reformation. For understanding all collisions of current moment and forecast the most probable way of land ownership system changing it is necessary to find out answers for the next questions:

-What is the the attitudes towards land privatization and different forms of rural economics among diverse social groups of Ukrainian villagers to-day?

-What is understanding of property rights and its protection among peasantry?

-Does Privatization of land, conducting in Ukraine "from the top", correspond to peasantry's interests?

-Does design of land privatization answer to its realization?

-What is the level of peasantry trust in authorities intention to change the property rights?

Author of the paper makes an attempt to answer these questions using the results of sociological inquests and analysis of statistic data. Author comes to a conclusion about the very low level of rights-consciousness among villagers, their distrust to authorities and as a result of this-temporising position towards radical reforming of property rights, the peasants' adherence to habitual collective forms of agrarian economics. But the vital interests of the Ukrainian peasants are bound up with their private plots, which demonstrate stability and efficiency during the whole of its history.

Tom Princen,
School of Natural Resources and Environment, University of Michigan,
Ann Arbor, MI 48109-1115,
USA

A's AND B's: DYNAMICS OF RESOURCE USE AMONG PROPERTY REGIMES AND STATES

This paper develops a model for analyzing interactions among different property regimes and among property regimes and states. The model rests on four premises of human behavior at the individual, group, and state levels: individuals are disposed to form restricted access property regimes--private or common; individuals tend not to "foul their own nests"; individuals deplete others' resources with little regard for long-term resource impacts and little attempt to moderate use of those resources; and state interests align with the interests of those who use others' resources.

The paper argues that although individuals tend to resist outsiders' appropriation of the resource, several factors mitigate against such resistance. These include: insufficient threat, monitoring benefits, favorable prices, state promotion, and jurisdictional distance. An especially important factor is the state and its imperative to generate revenues from convertible currencies. Introducing an outsider results in an increased aggregate discount measure, a strain on resource management, and a common currency that devalues self-organized restraint mechanisms. These results can occur when the exchange between regimes entails no gains from trade. They can be interpreted as the externalization of costs and the conversion of property regimes to open access.

The paper concludes that the contemporary political economy is reaching a critical juncture ecologically whereby cost externalization and open access are no longer minor impediments to increasing wealth and prosperity.

Lewis E. Queirolo, Richard S. Johnston, and Zhengkun Zhang
NOAA-NMFS
Alaska Fisheries Science Center
Seattle WA 98115
USA

TRANSFORMATION OF THE COASTAL COMMONS THROUGH COOPERATIVE FISHING ARRANGEMENTS

For centuries the world's oceans have been regarded as the common heritage of all mankind, held in trust for the collective good. When demands upon the oceans were relatively few, such a perspective was probably not unreasonable. But the burgeoning of human populations and the accelerated growth of technology have conspired, in the latter decades of the twentieth century, to make the concept of a "common property interest in the oceans" functionally obsolete.

In response, many coastal nations have unilaterally extended economic jurisdiction over adjacent waters, traditionally regarded as "open ocean." Although petroleum exploration, minerals mining, etc., have been a consideration in extended jurisdiction, living marine resources, and particularly fisheries, have been the principal focus.

While extended jurisdiction has characterised most of the world's marine fisheries for the past 15 years, nations continue to look for their comparative advantage positions in that sector. In so doing, they sample from a variety of production and trade arrangements.

In studying the resulting resource allocation, analysts should distinguish between the terms of agreements between partners operating in isolation and those that result when there are many potential partners. Competitive conditions on both sides of the market for access to resources may reduce the magnitude of potential asymmetric information problems. Indeed, as the number of potential partners rises, instability and conflict within co-operative fishing arrangements may decline, smoothing the transition of the commons to a regulated resource management state.

Jesper Raakjær-Nielsen
Institute for Fisheries Management and Coastal Community Development,
The North Sea Centre
Denmark

Lars Jøker
Danish institute for Fisheries Technology and Aquaculture, DIFTA,
The North Sea Centre
Denmark

FISHERIES MANAGEMENT AND ENFORCEMENT IN A DANISH PERSPECTIV

The paper describes the fisheries management and enforcement system in Denmark. Denmark is a member of the European Union (EU) and therefore subjected to EU policies. The paper examines the organization of the Danish enforcement institutions and portray how the inspection is carried out in practice. The paper describes the different sanctions in the event of infringements and finally the paper summarizes the main problems of the present enforcement regime.

Jesper Raakjær Nielsen,
The North Sea Centre,
9850 Hirtshals,
Denmark

Robert S. Pomeroy,
International Center for Living Aquatic Resources Management (ICLARM)
Makati, Metro Manila 0718
Philippines

FISHERIES CO-MANAGEMENT: AN ALTERNATIVE MANAGEMENT STRATEGY.

The Study of International Fisheries Research on Living Aquatic Resources Management (SIFR), (World Bank 1992), concludes that changes in the fishery sector over the past two decades call for a reappraisal of the relevance of conventional fishery development and management strategies.

The SIFR recommends that national fishery laws should be changed to incorporate a system of user rights - either individual or collective - to control access to productive waters. New legal arrangements should address the ownership of the resources, and define the mechanisms (economic, administrative, collective) and the structures required for allocating use rights to optimise use and ensure conservation of resources, and the means and procedures for enforcement

There is a need for rapid and substantial evolution Of existing fisheries management systems to support sustainable resource use. On one hand evidence shows that national administrations cannot accomplish this entirely through bureaucratic and regulatory instruments. On the other hand it is unlikely that fisher groups or local communities can accomplish this change on their own There must evolve a more dynamic partnership using the capacities and interests of fisher groups and the local communities, complemented by the ability of the national government to provide enabling legislation and administrative assistance. This partnership can be called co-management, where the national government and user-groups share authority for fisheries management Community-based management is a central element of co-management the amount of authority that the national government and the community have will differ and depend upon country and site specific conditions.

There is a growing realisation Of the need for a stronger community role in resource management and development activities. Community-based management strives for more active people's participation in the planning and implementation of fisheries management. An essential ingredient for success of any resource management system, whether centralised or community-based, is the system of incentives and sanctions - rights and rules - for influencing individual behaviour of those who use and depend upon the resource. Thus, at the core of community-based management are the issues of property rights, resource management regimes and institutional arrangements in CBM are common property regimes.

This paper gives an overview of common property rights theory applied to fisheries management. Based on this theory a framework is developed to address co-management issues at both national, fishers organisation and community level inter alia identifying institutional arrangements, the set of right and rules by which fishers organisations/communities organises activities and which affect user behaviour and incentives. In order to identify barriers, criticism, opportunities and benefits of using the co-management approach in fisheries management. While fisheries co-management may not be a viable alternative fisheries management strategy for all countries and situations, it is proven to be a sustainable, equitable and efficient management strategy under certain conditions. However, it is crucial that the national government enabling legislation and administrative assistance in order to make this process work as well as the fishers organisations/local communities have the capability and the willingness to undertake management responsibility.

M. Moklesur Rahman
Center for Natural Resource Studies (CNRS), Dhaka,
Bangladesh

WETLANDS AND BIODIVERSITY: A CASE STUDY OF COMMON PROPERTY RESOURCES IN BANGLADESH

Bangladesh, a deltaic floodplain formed by the three major rivers of the world is endowed with vast wetland resources which include 1.03 million hectares of rivers, canals and estuaries, 114,161 hectares of reservoirs, 2.8 million hectares of seasonal floodlands and 87,300 hectares of brackish water aquafirms. These wetlands support biological diversity of flora and fauna. Wetlands and their biodiversity have been contributing substantially to the socio-economic life of the millions of people of rural Bangladesh by providing opportunities of employment, food and nutrition, fuel, fodder, transportation, irrigation, etc. Men, women and children are engaged in harvesting diverse resources of wetlands. The paper highlights different management patterns of wetlands. It also covers the use and access rights in harvesting wetland-based natural resources and relates these to social stratification and wetland types (including location and seasonality). The paper discusses issues related to conversion of wetlands to croplands and depletion of wetland-based biodiversity. It cites some instances of

gradual transformation of common property rights regimes on wetland resources into private property rights. One of the aims of this paper has been to focus on the importance of conducting detailed studies on the existing status of wetland-based common property resources and rights in Bangladesh and to come up with specific recommendations toward building institutions in the country for conserving and protecting biological and cultural diversity of wetlands on a sustainable basis so that the common people are benefitted.

D.Narasimha Reddy and G.Venkataswamy
Department of Economics, University of Hyderabad
Hyderabad, 500134
India

POLITICAL ECONOMY OF STATE PROPERTY AND THE COMMONS IN SOUTH INDIA.

The basic proposition of this paper is that situations of the Olsonian "tragedy of commons" do not hold in conditions with a history of user-group or village or tribal institutions. The Olsonian proposition that people confronted with a common problem "will not act to achieve their common or group interests" unless coerced to do so may result in State intervention or transformation of commons into state property which would contribute to the erosion of the commons. There exist specific institutions like the user-groups or village communities evolved over time, which negate the very basic assumptions of the 'prisoners' dilemma' that players choose in ignorance of each other's choices and that each player chooses only once before the outcome. The specificities of the locale, the socio-economic context and the historically evolved institutions need to be carefully examined in evolving a policy towards commons.

The paper is divided into four parts. The first part discusses Olson's theory of commons and collective action with a view to analyse the State intervention and common property in the rural South Indian context. The second part examines the evolution of State property in resources like forests and pastures since the British intervention in India and its impact on rural commons. The third part is a detailed analysis of two villages, one of which is predominantly of tribal households, with a view to analyse in detail the state of commons and the institutions for their use and maintenance in the tribal and non-tribal villages. The caste-class-tribe aspects as well as the overall changes in the socio-economic forces including State policy and their impact on the decline of some institutions and persistence of others are examined. The fourth section concludes that the Olsonian 'tragedy of commons' and the necessity for coercion may not be appropriate to understand the state of commons in India. There are adequate indications of the possibilities of respective institutions for certain common resources as an alternative to reducing these resources as private property or that of the State.

Ann Heidi Ripnes,
Department of Land Use and Landscape Planning,
The Agricultural University of Norway,
Norway

LAND POSSESSION - BETWEEN COLLECTIVISM AND INDIVIDUALISM.

Both in pre-revolutionary Russia and in the former Soviet Union, we find a strong tradition of collectiveness related to property rights and organisation of farming. A large part of the Russian peasants was, before the revolution, organised in village communities, holding and partly operating land in common (opshchina, mir). In western and southern parts (which includes today's western Ukraine) individual farmers dominated. In the period between abolition of serfdom (1861) and forced collectivisation (1930-32) the number of individual

farmers increased, much due to the Stolypin reforms. This increase was most pronounced in the South and West. Statistics from 1905 show that west of Dnepr (except for Kherson) less than 10 % of the households were in communal tenure. After the revolution, theoretically individual property rights no longer existed, and after the collectivisation individually operated farms also ceased to exist. Elements of individualism could still be found, not as formalised ownership rights, but related to the personal plots all rural families held and operated.

Today Ukraine has opened up for new structures of ownership and property rights. The land is no longer supposed to be the sole property of the State, and large agricultural enterprises are no longer the only accepted way of farming. The development of new structures has just started, and it is far too early to tell what the results will be. There are some indicators though, that patterns of collectivism and individualism are re-emerging. It seems now that peasants in the western part of Ukraine are more eager to use the opportunities in the new Land Code and establish themselves as individual farmers. This paper discusses collectivism and individualism in former Russia and Soviet Union and relate this to the development in Ukraine today.

Mats Ris,
Department of Anthropology, University of Alberta,
Edmonton, Alberta T6G 2H4,
Canada

INUIT BOWHEAD WHALING: CANADIAN INUVIALUIT RESPONSE TO TRADITION AND MODERN MANAGEMENT

This paper discusses the role of tradition and history as important elements in modern marine mammal management through an example of recently resumed bowhead whaling by indigenous peoples in the Inuvialuit Settlement Region (ISR) in the Canadian Western Arctic. Tradition and history have been driving forces behind the creation of a management plan for the resumption of bowhead whaling after over 70 years. But this management process also involves political aspects, such as the creation of a constitutionally binding land claims agreement with the federal government and the influence of forces outside local control, such as the International Whaling Commission (IWC) and strong anti-whaling sentiments in the urban Western world. The hunt has thus become an important way to demonstrate indigenous rights in contemporary Inuit society through the means of tradition and history as well as a successful response to the expectations of co-management with federal authorities. The paper will especially discuss in detail important concepts, such as "tradition" and "management".

It will be argued that it is precisely the often criticised Cartesian worldview separating man from nature that has enabled westerners to develop a new environmental ethics

Jan Åge Riseth and Arild Vatn
The Agricultural University of Norway,
1430 Ås,
Norway

DEVELOPMENT OF PROPERTY REGIMES AND INSTITUTIONAL STRUCTURE FOR SUSTAINABILITY IN THE SAAMI REINDEER INDUSTRY IN NORWAY. COMPARISON OF TWO DIFFERENT REGIONS.

During the last decades the Saami Reindeer Industry has gone through a transition from a mainly subsistence based pastoralism towards a market integrated industry. The development has been clearly different in the central North Saami reindeer districts in Finnmark compared to South Saami districts in Troendelag. The former seems to be in a rather severe ecologic,

economic and social crisis due to overgrazing while the latter seem to be rather well adapted to pasture resources and get well off economically.

The paper outlines the main differences in development in the two regions and discusses a set of explanations. We are mainly focusing on the following dimensions:

- internal factors: ecology, culture and institutions
- exogenous pressure: market integration, general social processes and public policy.

Generally the traditional common property system seems to be unsuited to handle the new situation. In the North we observe rising conflicts and undermined old common institutions while in the South institutional innovation have made it possible to cope with new challenges. Three relations seem to be of special significance when explaining the different development paths. Firstly, differences in size and openness seem to have equipped the two societies with unequal capabilities to handle the transition in mode of production. Secondly, the transition has developed at a different pace in the two areas. Thirdly public policy did not sufficiently take into consideration the different situation in the two regions. In the North, as a result of the national integration of the local Saami society a set of exogenous forces seem to have put the established norms and rules under pressure. Processes like becoming sedentary, market integration and mechanisation challenged existing norms as they also increased costs. While productivity stayed rather unchanged, the overall result was a need for enlarging the number of reindeer. Public subsidies seem to have accelerated a spiral of investment in reindeer.

Baiba Rivza
Latvian University of Agriculture
LV-3001 Jelgava
Latvia

ATTITUDE OF THE CITIZENS TOWARDS THE PRIVATIZATION OF LAND IN LATVIA

1. The process of land privatization has two aspects - its objective necessity and the subjective attitude of the population.
2. The point of view of the society about the fact, that the change of the property is necessary was created already before 1990, when on June 3 the Supreme Soviet the Republic of Latvia adopted the decision "On the Agrarian Reform in the Republic of Latvia". Thus our investigations carried out in 3 different rural districts of Latvia during the late 80-ies proved that the attitude of the people was mainly positive. Regarding Latvians the positive attitude varied from 67.8 to 81.7 percent, but from 57.3 to 73.4 percent for other nationalities. 25.0 to 31.5 percent of Latvians were ready to start farming, 19.8 to 39.8 percent of the people of other nationalities. It was planned by the people of all ages.
3. While continuing the investigations regarding the problems of land privatization 658 people working in agriculture were questioned in all districts of Latvia. Approximately only every fifth of the inquired had a definite point of view about the privatization. The main reason was the contradictory character of law of privatization.
4. In January 1995 there were 56748 farms. There are two large groups of population in Latvia countryside at present-
 - 1) real and potential land owners; 2) hired workers or the people having no land. There are parishes where 70 percent from the total number represent the second group. The attitude towards the land privatization of both groups is completely different. The potential land owners consider that the land privatization process is too slow. The second group - that it is too quick. The last group say that the main reason is that old economical structures have been often destroyed in a very short time, but the development of new structures is too slow. The result is a high level of unemployment that reaches 20% in some rural districts in Latvia. There are many proposals as regards the improvement of the legislation.

Deborah Robinson
Department of Geography, McGill University
Montreal,
Canada

COMMERCIAL FISHERIES ON KODIAK ISLAND. ALASKA: CHANGING RELATIONSHIPS TO MARINE RESOURCES IN OLD HARBOR.

This paper will present research conducted in the summer of 1994 concerning indigenous access to natural resources. The case study documents the effects of state-directed resource management arrangements on the Native (Koniag) village of Old Harbor, on Kodiak Island, Alaska. A change in commercial salmon fisheries management policy to a "Limited Entry Permit" system instituted in 1975 resulted in the transfer of fishing rights away from some Native fishermen, accompanied by an overall increase in gear capitalisation and efficiency of the salmon fleet. The results of interviews with vessel captains and crew members, resource managers, policy makers, processing industry managers, and other men and women who have participated in the fishery before and since the institution of the Limited Entry system will be discussed. The sustainable viability of commercial fishing, both as an occupation and as an important cultural pursuit, will be evaluated in the context of changes in commercial fishing and in the political, economic and social systems of Old Harbor.

Kenneth Ruddle
Hyogo-Ken 662,
Japan

DESIGN PRINCIPLES AND THE RESILIENCE OF COASTAL-MARINE COMMON PROPERTY FISHERY MANAGEMENT SYSTEMS IN THE ASIA-PACIFIC TROPICS

In the Asia-Pacific Region, traditional community-based fisheries resource management systems exhibit differential responses to the impact of the major external factors that drive change at the local level. Responses range from a reinforcement of the traditional system, through hybridisation with non-traditional components or a general weakening of systems, to their total collapse. Based on a comparative analysis of traditional authority, rights, rules, monitoring, accountability, and enforcement, I examine the impact of the major external stresses (principally the legacy of colonialism, contemporary government policy, change in local authority, demographic change, urbanisation, education change, economic development, infrastructure change, commoditization and commercialisation, technical change, and development projects) on a range of systems. The hypothesis that the nature of system response is governed by the synergistic combination of "design principles" on which any system is predicated is then evaluated.

Thierry Ruf,
ORSTOM, Laboratoire d'etudes agraires,
34032 Montpellier,
France

IRRIGATION, WATER RIGHTS , STATE AND PEASANT COMUNITIES IN THE ECUADORIAN ANDES.

The subject of the paper is the constitution of water rights in the Ecuadorian Andes montains, looking at all the history of water conflits from colonial times to now, when the state begin to privatizate the old systems of irrigation.

Since the end of the 1980s, in many countries, the role of the State in the management of irrigation projects is questioned. Public administrations often reveal ineffectives. Sometimes, thet even appear as an obstacle to private initiative or as a hindance to development.

From all sides, critics abound about the bureaucracy, but these critics depend on differents ideologic backgrounds. Thus, NGO's sometimes oppose to national administrations, or ignorethem considering that civil servants are devoted to big landowners, and not to peasant communities. International experts suggest a general simplification of administrative procedures. About water questions, they preconize the State's withdrawal and the transfer of the watermanagement to the users.

The water administrations, in South America as well as in other parts of the world, were founded in the XIXth century and more often in the XXth century in order to manage water in existing irrigation schemes and to develop new projects on a larger regional basis. Therefore, powerful centralizad administration were built up in order to collect public funds, to develop irrigation projects whose extension was out of reach of local communities, and to substitute to the regular courts of justice, especialy to avoid legal disputes when the State appropriated the water ressources to its projects, even if they were already formerly appropriated.

However, many arid or semi-arid regions made use of water by traditional irrigation systems whose origins go back to several centuries and whose history is marked by numerous conflicts on water appropriation. Political authorities were often claimed by the rival groups who compete on water share, to resolve to the water ownership. With central water administration, the legal framework change (water ley) but not the types of disputes between users' communities.

In Ecuador, the State created a water central administration in the 1930th, but the nationalization came only in 1972, with a strong legal power given to the National Intitute for the Hydric resources (INERHI). In that way, the State has financed in the last fifty years twenty irrigation projects which represent about 75 000 hectares. However, the traditional irrigation sector still represents 75 to 80 % of the irrigated area, i.e. more than 3.000.000 hectares in the Andes.

The communication is made of four parts :

1. The role of the Ecuadorian State in the hydraulic management : - organization of the irrigation systems before the creation of INERHI; - the scales of the water conflicts and the institutions involved; - the nationalizacion and the substitution of institutions.
2. The appropriation and the management of water ressources by the users'communities: - the formation of water rights, before the nationalizacion and after it ; - the offices of the water associations; - the limits of its powers.
3. The comparison between the legal association structure and the real one in the case of a village of north ecuadorian Andes, Urcuqui.
4. What means the liberalism policy in watermanagement ? Innovation or social retreat ?

In conclusion, it is important to know that common property existed before nationalization of water resources, that common watermanagement still go on after the nationalization even if civil servants think that they are able to manage all the water network. In reality, the main office of administration has to be the arbitration of water conflicts. Thus, privatization of water resources seems very dangerous for peasant communities when they still go on with common watermanagement, if any people is allowed to buy most of the water rights.

Marcel Rutten
African Study Centre-Leiden,
2300 RB Leiden
The Netherlands

THE TRAGEDY OF INDIVIDUALISING THE COMMONS

In Africa, the early 1980s showed a switch to the adoption of the individualization of landownership and a shift away from other policies such as the socialization of land or adaptation of customary tenure. Also in Kenya, calls for subdivision of group ranches -the first of its kind in Africa started in the late 1960s among Maasai pastoralists of Kajiado District-grew louder. By 1995, 90 per cent of the ranches ceased existing or are soon about to do so.

Supporters of group ranch subdivision state that it will raise standards of living, boost the ability to procure a loan, minimize the exploitation of the poor by rich households, and facilitate better maintenance of the existing infrastructure. They are echoing Garret Hardin's theory of the link between overusing and communally held resources, a view embraced by World Bank officials in the mid-1970s. The Maasai ranches were considered to be a failure by the authorities in that the main objective of de-stocking the pastures was not met.

In general, those opposing subdivision claim that the ultimate result will be the alienation of land to non-Maasai, the creation of severe erosion in areas where cultivation is to start, and the restriction of the movement of livestock.

All of these arguments have been studied among a group of 500 Maasai households. The analysis showed that land subdivision has been most favourable to the most powerful. Whole groups of Maasai pastoralists have been excluded. Still, only a mere 10 per cent of the households have a sufficient large parcel during the dry season period. Land sales to outsiders worsened this situation by a reduction of the area available and by buying of animals, using the proceeds of the land sales. These outsiders fence off their land for cultivation or act as absentee landowners interested in speculation only. The few Maasai that took a loan had to sell land because of not being able to repay it. Nowadays government officials and the World Bank, judge the initial outcome of group ranch subdivision to be disastrous.

Kyrre Rystad
Nordland Farmers Organisation,
Bodø,
Norway

REESTABLISHING COMMON PROPERTY RIGHTS IN NORDLAND AND TROMS IN NORTHERN NORWAY

200-250 years ago the Danish King introduced restrictions on country (local) people's traditional rights to logging trees on the state commons in his colony Norway, apparently because of overcutting. In the south of Norway the restrictions were lifted after some decades.

In the northern provinces Nord-Trøndelag, Nordland and Troms the restrictions continued and were even tightened, in stark violation of ancient customary law. This resulted in that the northern rural areas gradually lost their old common property rights in the King's commons (the state commons).

The reclaiming of common property rights (to grazing, cutting, hunting and fishing) has been discussed repeatedly - the first time during the 1880's. The Norwegian Parliament decided in 1926 to reestablish the common property rights in Nord-Trøndelag, and was brought on line with the rest of the country. In the King's commons in Nordland and Troms it was claimed that "no state commons did exist" and later, that "the legal status of the state's areas was not yet clear."

In 1991 the Supreme Court passed a verdict stating that the northern areas of the state are regarded as commons, and grants the rural communities the right to grazing on the basis of legal common property rights. Owing to this fact Norges Bondelag (The Norwegian farmers association) has worked for that the reestablishing of the law of the property rights in the state common land (called the Mountain law) should be introduced in these areas. The law administers the property rights of use to the state common land. This means: 1) Equality for the law between North- and South-Norway. 2) A larger degree of local administration of the state common land, which is app. 45% of the total area in Nordland and Troms. 3) The income from these areas will remain in the local communities where the value is created.

Disagreeing with Norges Bondelag, The Ministry of Agriculture (the state) has worked against the introduction of the Mountain law. This means: 1) The state through the state owned company Statsskog Ltd. is still going to administer the areas without any significant local influence. 2) The income, app. 2.000.000 USD per year, is still going to fall to the state and not to the local communities. 3) The farmers will still have to pay for the grazing by their animals on the state commons, and also pay for the cultivation, and supplementary land, and mountain pasture in the commons, and cutting for private use. This is a case about rural district politics which has great importance for the communities in North-Norway and which it is up to the Parliament to decide. The poster will explain this case and the political process around this change in legislation.

Bjørn K. Sagdahl
Bodø College,
Bodø,
Norway

FISHERY REGULATIONS, ENFORCEMENT AND CONTROL A NOTE ON THE RELATION BETWEEN LEGITIMACY AND CONTROL IN MANAGEMENT OF COMPLEX ECOSYSTEMS

Sustainable management of fish stocks and the ecosystem as a whole may be said to be a delicate balance between political compromises and the considerations to the actual state of the ecosystem. The optimal solution is the one that is considered acceptable and legitimate by those affected and still provides sustainability of the resource system. In complex ecosystems with straddling stocks such solutions are hard to be found, and the costs of regulations are often shared on unequal bases. This paper deals with the relations between apprehended legitimacy and the motivation to abide to the set regulative system discussing experiences from the regulations of the Norwegian - arctic cod stock. It also sheds some light on the possibility of maintaining a negotiated regulative system, while some actors operate as freeriders outside national jurisdiction. It also questions the nation state as the sole actor performing control tasks in cases of straddling stocks.

M.S.Samantar,
Somalia

THEORETICAL AND PRACTICAL FRAMEWORKS OF ANALYSIS OF PASTORAL COMMON PROPERTY REGIMES IN SOMALIA

The purpose of this paper is to consider an alternative assumption which involves cooperation in individual pastoral behaviour. This approach offers completely different policy implications than the usual Defection Dominant Strategy models, which advocates privatisation of the commons or state control of these resources. This alternative theoretic-game is known as the Assurance Problem. We give a brief presentation of the salient features of this model. This analysis is covered by section II of the paper.

Secondly, the paper presents an overview of pastoral common properties in Somalia (Nugaal region) as an empirical example of successful efforts to manage such resources. The technical and physical characteristics of Nugaal, a typical dryland area in Somalia, as well as the difficulties and options open to the pastoralists and their livestock are presented. This part is presented and discussed in sections III and IV of the paper.

Thirdly, the paper offers a useful practical framework of analysis of the pastoral customary common property regimes in Somalia. This framework of analysis is based on the strategies of the above Assurance Problem model. The paper contends that the Assurance Problem's strategies of interdependence, coordination, cooperation, and expectations, found among the pastoralists in Somalia, are necessary to cope with the difficulties of their environment. This analytical framework is presented and discussed in section V of the paper.

Audun Sandberg,
Bodø College,
Bodø,
Norway

COMMONS OF THE NORTH ATLANTIC COASTS

Aquaculture, Sea-ranching and Salmon River enhancement are all modern activities that are heavily dependent on one fundamental marine resource - the clean and healthy coastal environment. To understand fully the function of the Coast as a commons, it is necessary with an inquiry into the normative foundations for present European resource management institutions - a task which several of the papers in this session aim at. This particular paper analyses the interaction between different resource utilisation systems on North Atlantic Coasts - in particular on Norwegian Coasts. In the multi-layer governing of these northern coastal environments there is one type of governing institutions for the use of healthy coastal ecology for aquaculture - in closed pens - with limited participation by local government. There are other governing institutions for the wild salmon that migrates through the coastal waters on its way between the ocean and its spawning river. There are again other governing institutions for fish-fry areas, for underwater parks, for sea-birds' nesting areas and for various categories of coastal fishing areas. With advanced plans for the release of thousands of fish fry in sea-ranching schemes and through various enhancement efforts, like artificial reefs in coastal areas, new questions of rights as basis for new institutions arise. These shed interesting light on old questions of property rights and on the role of local communities, of professional organisations and of the role of the State in its various forms. From this, the paper contributes to the development of theories that can explain emerging points of convergence between a governing of resources based on "folk science" and a management of resources based on "scientific science."

L. Anders Sandberg
 Faculty of Environmental Studies
 York University, North York, Ontario, M3J 1P3
 Canada

Peter Clancy
 Department of Political Science, St. Francis Xavier University
 Antigonish, Nova Scotia, B2G 1C0
 Canada

PROPERTY RIGHTS, SMALL WOODLOT OWNERS AND FOREST MANAGEMENT IN NOVA SCOTIA

This paper sheds light on the political, economic and social power structure in the forest sector of Nova Scotia by exploring the history of forest tenures and forest management, focussing on small woodlot owners. Forest management has been guided by two major assumptions. One holds that small woodlot owners are imbued with very strong beliefs in the notion of private property. The other holds that it is unacceptable to interfere with such rights, and that private land forest management can only be promoted through educational and voluntary programmes.

We question these assumptions and argue that they are based on an insufficient definition and a lack of appreciation of the history of property rights and forest use in Nova Scotia. The state's alleged protection of property rights has been rhetorical and highly selective. Property rights have been contested. Individual and common property rights and open access resources have been eroded while corporate property rights have been favoured. The ascendancy and unchallenged position of the latter is not a function of a natural order. There are precedents for different sets of rules, even within capitalism, as illustrated by the history of the province and the conditions in other jurisdictions.

Haakan T. Sandersen
 Nordland Research Institute
 Bodø
 Norway

DISCURSIVE DESIGNS OF CO-MANAGEMENT INSTITUTIONS? - LESSONS TO LEARN FROM SMALL SCALE FISHERIES IN THE CARIBBEAN

The promising managerial CPR-institutions that have come to be defined as "co-management" in the growing body of literature, may differ in scale, form and function. Even if these institutions share common features such as user-involvement, self-governance, decentralisation and democracy within a legal framework established by the government, the principle of power-sharing between user-groups or communities and government may be implemented and applied in many ways. We know however, from organizational theory that the way we organize has profound effects on the outcome and efficiency of the organization. The critical questions of institutional design of co-management institutions is the questions of representation, scale, legitimacy and social and biological effectiveness. The Habermasian concept of communicative rationality offers an interesting alternative approach to decision-making in collective matters. According to Habermas, people can coordinate their actions through talk rather than unthinking compliance with norms or by following established incentive structures. Communicative rationality is the extent to which this action is characterized by the reflective understanding of competent actors. This situation should be free from deception, self-deception, strategic behavior, and domination through the exercise of

power. Further, all actors should be equally and fully capable of making and questioning arguments. Under such conditions, the only remaining authority is that of a good argument. This type of rationality is said to be well suited in situations characterized by ambiguity and complexity, and where participants with different norms and values are involved. This fits very well into the situation and management problems in the small scale fisheries in most parts of the world. The purpose of the paper is to see what insights the theory of communicative actions can bring about with respect to the questions of how to design co-management institutions, with special emphasis on representation, scale, legitimacy and social and biological effectiveness. I intend to draw heavily on experiences from my coming fieldwork in the Caribbean this autumn.

Anders Sara/Ánde Máhte Ándde,
Kautokeino/Guovdageaidnu,
Norway

REINDEER ECONOMICS AND THEIR TRANSFORMATIONS

My discussion intends to bring into focus issues related to 'reinventing the commons' in 'Saami' perspective. The headline notation and inverted commas reflects the idea that something is getting lost simultaneously within the ongoing modernization process.

My point of view is that the local accustomed-experience imparts a specific universality because it always has defined itself through "universally" skills, and whose values is useful fare throughout its local space where it is arised - in different shapes of establishing the everyday organisations. This universality also shows a remarkable ability to adjust to new schemes (of culture). In this meaning it is fruitful to talk about tradition in opposite to modern. Modern comprehends here two meanings: 1) A strong form of contradiction where the modern represents an experience of transformation without looking back and comparing with previous times, and 2) A consideration not as a contravention with traditions but as a support of something attracted by the community. Such understanding is particularly nearest my experience to approach the modernization purposing to "reinventing the commons". In those particular dimensions the development is like a line or a spiral where reinvention never returns exactly to its original starting point.

In my introduction I intend to present a very short explanation of the reindeer economics in view of historical states, the undergoing changes in the past, today's t situation and maybe as a reinvention process.

Jan Willem van der Schans
Erasmus University,
Rotterdam,
The Netherland

SALMON FARMING IN THE UK.

The paper provides an analysis of the development of the marine salmon farming industry in the UK. The institutional structure in West Scotland to regulate conflict of interests that (may) exist between salmon farmers and other users of the coastal zone is described and its performance is compared with the institution with similar function in Shetland.

By lack of a formal institution in west Scotland to control the development of this new industry, the Crown Estate Commissioners (CEC), in their capacity as owners of the sea-bed, assumed a 'voluntary planning role'. Although CEC decision making involved a consultation

procedure, the arrangement was criticised by those consulted -conservation groups, fishermen, local authorities, etc. alike- for the fact that they had difficulties to participate constructively, that CEC consultation procedures were not subject to democratic control, and that there was no comprehensive government policy to guide the development of fish farming. The obvious alternative, to extend planning control of Local Planning Authorities beyond the Low Water Mark out to the sea bed, although many saw it as a reasonable option, was never adopted.

There are some remarkable differences between the system in operation in Scotland and in Shetland. The Shetland Island Council (SIC) had unique powers to regulate all developments in its coastal waters. SIC was better able to reserve access to the marine resource for local residents rather than non-resident (multinational) companies, hence the salmon farming industry became more integrated with the other local seafood industries. SIC was also better able to engage different users of the coastal zone in a communicative process based on argumentation and mutual adjustment.

With reference to Hardin's Tragedy of the Commons article and Habermas' Theory of Communicative Action the paper argues that to find an acceptable balance between diverse uses of the coastal zone is a socio-political problem for which no technical solution exists. The differences in legitimacy of planning decisions between West-Scotland and Shetland are to be explained from the difference in communicative rationality as perceived by the different participants in the planning process.

Edella Schlager
School of Public Administration and Policy, University of Arizona
Tucson, AZ 85721
USA

STATE CENTERED MANAGEMENT AND LOCAL LEVEL REVOLT: THE CASE OF ARIZONA GROUNDWATER POLICY

Groundwater Policy in the State of Arizona has experienced a fundamental transformation over the past twenty years, from state enforced open access, to state centered control and management, to local community governance of groundwater aquifers. The breakup of existing coalitions of private interests, and the creation of new coalitions produced this transformation. This paper examines the formation, structure, maintenance, and dissolution of various coalitions of interests that formed around groundwater policy. In particular, this paper examines 1) how private actors overcame collective action problems and formed coalitions to act in concert to achieve common goals, 2) the norms and conventions that actors of coalitions evolved or adopted to regularize relations among themselves to ensure that promises of mutual support were carried out, and 3) the impact of the structure and influence of these coalitions on the types of groundwater policies adopted and implemented in Arizona.

Carl-Erik Schulz,
Department of Economics,
University of Tromsø,
Norway

THE COMMONS UNDER FOREIGN STRESS: TRADE POLICY TO OVERRULE NATIONAL MANAGEMENT

Important global joint resources are under national management. If no international agreement on the management is reached, there may arise a conflict on the management, and industrial countries may try to use trade policy to enforce their management regime. This is the base for

the CITES convention, and trade sanctions are also used to influence rainforests for biodiversity reasons. Such policies have important long run effects on the stocks of different species in the commons, and the long run effects of sanctions are studied. It is shown how trade sanctions may work counterproductive even for the sanctioning country, and how sanctions may influence other stocks - or even trigger a conversion of the habitat to other commercial use.

Adel Selmi
Tunis

ISLAM ET GESTION DES RESSOURCES NATURELLES

(paper in French available upon request, E.Berge)

Nirmal Sengupta,
Madras Institute of Development Studies
Gandhinagar,
India

CURRENT FOREST AND WATER POLICIES IN INDIA - SOME FACTS AND APPRAISAL

By now common property relations are considered not only viable, but also a desirable for natural resources management. This has led to many development efforts. The emerging common property institutions are far different from the traditional local formations and have wider economic, even global relevance. Newer issues have come up, in the area of control and ownership, in mode of participation, in fairness criteria in distribution etc. On the one hand there is the question of perpetuating the traditional rights. On the other, there is the possibility of more widespread distribution of the benefits of common property resources and of improving the quality of rural life over a wider area. The choice is not merely ethical but also of management; the suitable alternative forms must be viable and sustainable, probably also productively efficient. These are the kinds of questions we are going to face in the future. This paper makes a modest attempt towards comprehension of common property from this perspective. The data base is the recent efforts of forest and water development in India through joint management. The effort is about ten years old with some degree of success. Assessments and evaluations have begun being available. The present study uses this information.

Hans Sevatdal,
Department of Land Use and Landscape Planning, The Agricultural University of Norway,
N-1432 Ås,
Norway

Ola Rygg,
Agder Lagmannsrett,
Skien,
Norway

LEGISLATION CONCERNING THE NORWEGIAN COMMONS

Norwegian commons comprise forests and mountain areas, and are, at present, of two types: 1) State commons owned by the State, in the sense that the State have the title to the land, while most of resources are owned and used by the local community. 2) Parish communes are owned

by a group of local farms, while the local community have the same rights as in State commons. Up till now the legislation, which derive from medieval times, have been fragmented and dominated by traditional rather than statutory law. In 1992 this legislation were codified. The nature and peculiarities of ownership, rights to use and the institutions for management, are discussed in this paper.

N. Shanmugaratnam,
NORAGRIC, The Agricultural University of Norway
N-1432 Ås,
Norway

NATIONALISATION AND PRIVATISATION OF LAND AND THE DILEMMAS OF COMMON RESOURCES MANAGEMENT IN ARID AREAS: A CASE STUDY FROM WESTERN RAJASTHAN, INDIA

Nationalisation of land and the creation of modern forms of private property for agricultural expansion along with rising population densities have caused continuous decline in availability of common resources and undermined possibilities for collective action. The failure of policy to provide appropriate environments to enable endogenous evolution of common resources management institutions in the changed circumstances has had far reaching effects on the sustainability of arid ecosystems and on the rural poor. This paper addresses these issues in the arid zone of Rajasthan, India. It places the Common Resource Management (CRM) Problem in a Historical-institutional perspective and provides a microanalysis of the commons question in the arid zone. It concludes by highlighting the current dilemmas of CRM and possible directions for policy intervention.

Ganesh P. Shivakoti
Institute of Agriculture and Animal Science, Tribhuvan University
Chitwan
Nepal

LOCAL SUPPORT SERVICES PROVIDED FOR FARMER-MANAGED IRRIGATION SYSTEMS IN NEPAL

Farmer-Managed Irrigation Systems (FMIS) in Nepal are not restricted to small units. Irrigation systems may be less than one hectare while farmer-managed systems as large as 15,000 hectare sizes have been identified. There are a total of 16,700 FMIS in Nepal. During the past few years many agencies (both governmental and non-governmental) have started either providing a modest level of support services or are trying to coordinate with relevant agencies to make provision for providing essential services. The level and types of support services vary with the agencies involved. The paper examines different processes and intensities of interventions in providing support services to FMIS in Nepal. Systematic and comparative analysis of 18 FMIS under intervention programs of 15 different agencies were included to assess the impacts of intervention. The aim was to explore ways and means of assisting numerous FMIS, located in different parts of the country, in order to improve the performance of irrigated agriculture. The variables included in the analysis were: policy and institutional environment for support services, process of providing support services, cost sharing criteria, basis of resource mobilization and resulting changes in agricultural performance upon intervention. While some processes of interventions were found effective, the impacts of others were found either less effective or negative. Several issues pertaining to intervention process and irrigation performance pertaining to FMIS were identified. The paper draws on policy implications on providing institutional support for improvement of performance of FMIS in Nepal.

Sugandha Shrestha
Sustainable Mountain Agriculture Programme, ICIMOD,
Kathmandu,
Nepal

REVIVING THE LOST COMMONS : THROUGH FARMING SYSTEMS PERSPECTIVE

Based on the field study conducted in one of the hilly areas of Nepal, this paper draws two major policy implications for improving degraded or revitalising the lost common land. Firstly, the CPRs should be seen from farming systems perspective particularly in the hills and mountains. Secondly, initiatives and actions should emanate from local communities while external interventions playing a role of catalyst.

Over the last 20 years, local people had completely lost (technically as well as institutionally) their forest, pasture, grazingland, and other marginal and sub-marginal land that are essential for their sustenance for various reasons. Consequently, people were left not only with reduced quality and range of options (in terms of production, consumptions, welfare of a community) but many of them had no option except to migrate elsewhere. In order to improve the situations, state intervention, in terms of special project, was launched but with little success.

This paper will illustrate how a local community have recently revived the lost CPRs with improved quality and how the community is now better off in terms of not only socioeconomic well-beings but also with improved biophysical conditions of the areas.

This successful experience is now being replicated in 10 districts of Nepal, some of the outputs are also being exported to neighbouring countries such as India and Bangladesh, and thus enhancing self-reliance of the community.

Neera M. Singh and Kundan K. Singh,
Chandrasekharpur, Bhubaneswar-751016,
India.

COMMUNITY FOREST MANAGEMENT SYSTEMS IN ORISSA: INSTITUTIONAL ARRANGEMENTS

In Orissa, a state in India around 2000 communities are protecting and managing over 200,000ha of State owned forests as CPRs. Forest dependent communities have come forward to protect and regenerate forests and asserted their rights to protect and manage forests. These forests are state owned but communities have evolved rules and penalty systems for controlling access to the forests and regulating forest product extraction. These rules vary from community to community. Some have few simple unwritten rules while others have evolved elaborate written operational rules. The complexity of the rule system depends on the physical condition and perceived value of the resource, maturity and the experience of the community institution, threat perception, external pressures etc.

The paper provides an overview of the spontaneous community initiatives to protect, regenerate and manage natural forests on the State owned land. The initiating factors and the main issues pertaining to the community forest management and its conflict with the State control paradigm have been brought forth. The paper focuses on : The Operational rules in community forest management systems pertaining to:

- Patrolling arrangements/protection
- Regulating access of the user groups vis a vis the excluded groups.
- Rules for extraction of various forest produces

- Penalty systems/ Disincentives for non-adherence to rules
- Benefit sharing arrangements
- conflict resolving mechanisms

It details the various categories of operational arrangements, and attempts the analysis the rationale behind these rules and the various factors that influence and shape these rules. In the Paper special emphasis has been paid to the analysis of the equity aspect of the rule systems as well as the decision making processes in the community institutions.

R.B. Singh and B.W. Pandey
Department of Geography, University of Delhi
Delhi-110007,
India

COMMON RESOURCES AND SUSTAINABLE LIVELIHOOD OF MOUNTAIN ENVIRONMENT: A MICRO-LEVEL EXPERIENCE OF KULLU VALLEY

In a developing country like India, the Common Resources (CRs) and the Common Property Resources (CPRs) are important means of livelihood.

In spite of their limitations the CPRs as well as the CRs are the substantial source of livelihood security and economic development of the mountain community as the economic opportunity is not available everywhere throughout the year. The present study examines the role of the CRs in sustainable development of mountain environment by assessing the various socio-economic and ecological aspects of mountain geosystems. The study area is concentrated in the Upper Beas Basin which is situated in the extreme north of the upper Kullu Valley in Himachal Pradesh. The study involves the household survey in order to understand the mass perceptions and attitudes regarding the significance and utilization of Common Property Resources for their basic needs satisfaction and economic development.

The major findings highlight the changing concept from CPRs to CRs as the Common Property resources have been converted into common resources. The massive decline due to physical degradation and disruption of traditional management system has been observed due to ill-conceived public policies and side effects development strategies. The villagers have given up traditional resource management practices involving protection, development and utilization of CPRs. The major impacts of such changes are over-exploitation and degradation of resources threatening sustainable livelihood. Among all the common property resources the grazing lands have been reduced in size due to Natur Land Act (1968), in which common grazing lands have been privatized as people shifted to garden-forming. The total number of sheeps have been decreased in the area due to privatization of grazing land and closing of forest by Forest. Department. It is obvious that a complex system of common grazing and traditional ecological knowledge on grazing land is being lost as the local village spectrum is being transformed from leading traditional based economy to an orcharding cash based economy. The concerns for participatory development and environmentally friendly natural resources management system is a must for strengthening the sustainable mountain environment.

Harald Skogseid,
Bodø College,
Bodø,
Norway

WHOSE COMMONS ? PASTORAL NOMADS MOVING BETWEEN OTHERS' COMMONS AND OTHERS' PRIVATE PROPERTIES: THE CASE OF THE KURDISH BERITAN TRIBE OF EASTERN TURKEY.

Index words : pastoral nomads - tribal society - land tenure

It is a common assumption that in modern societies well defined rights to property, be they individual or common, are dependent on regulation and sanction by a powerful State. Eastern Turkey is economically underdeveloped and suffers from a major social and cultural upheaval due to the Government's harsh policy towards the Kurdish minority. There are 750 Kurdish tribes in Eastern Turkey with varying potentialities for political mobilization. This fact lends an anarchic feature to the regional, social organization. Access to and management of land rights are dependent on the ability of different social groups to mobilize political force against each other. This fact has a profound impact on the control and distribution of common resources. Pastoral resources basic to the Beritans' nomadic adaptation, fall into a variety of categories of property from collective rights to use of commons to individuals' private titles to land. However, Beritan nomads do not own land and do not have collective rights to pastures.

During the last generation the development of the system of land tenure in the region has reduced the space of the commons in the sense of "common resources which everybody has a right to exploit". Nomadic pastoralism in Eastern Turkey is an adaptive specialization within a complex, regional resource management system. The social division of work in this region is influenced by the interdependence between the productive regimes of agriculture and pastoralism, a relationship that is accentuated by the fact that land can be used alternatively for agricultural or pastoral purposes. This paper is about how Beritan nomadic groups gain access to pastures that are either completely or partly controlled by settled groups of people. In pursuing their nomadic way of life, the Beritan enter into relationships of either competition or symbiosis with settled agriculturalists. The main pastures used by the Beritans are controlled by other people who demand pasture fees. Fees can be considered as one of the mechanisms regulating the balance between people, animals and pastures so that, at least in certain periods, resources are managed in sustainable ways.

Anders Skonhøft
Department of Economics, University of Trondheim
N-7055 Dragvoll
NORWAY

ON THE EXPLOITATION OF AN UNMANAGED LOCAL COMMON. HARDIN'S ANALYSIS RECONSIDERED

A bioeconomical system of communally owned grazeland and privately owned livestock is considered. The local common is unmanaged in the sense that none of the fixed number of herdsmen owning and using the common pay any attention to their impact upon the common when deciding the size of their livestock and offtake. The exploitation of the common is studied under different social and economic constraints and four types of harvesting strategies are analysed. First of all, a situation where the herdsmen slaughter a fixed proportion of the livestock every year is studied. Secondly, it is assumed that the harvest follows as a result of utility maximization of consumption. Thirdly, the case two situation of utility maximization of consumption is extended with a 'wealth' effect reflecting that large herd gives status. Finally,

the effects of the ecosystem is studied when the offtake is regulated by the wish of keeping as large stock of animals as possible. Three of the harvesting strategies reproduce Hardin's verbal notion of a 'tragedy of the common' while the fourth one -the fixed proportion of offtake case- can result in a relatively robust and stable ecological system. Under this scenario it is also demonstrated that the exploitation of common is unaffected by the number of herdsman.

M.S.Skourtos and A. Kontogianni
Department of Environmental Studies, University of the Aegean
Mytilini
Greece

THE USE OF BENEFIT ESTIMATION IN PRESERVING THE COMMONS: AN APPLICATION OF THE CONTINGENT VALUATION METHODOLOGY TO THE PROTECTION OF THE MEDITERRANEAN MONK SEAL MONACHUS MONACHUS

The paper examines the potential of using the technique of benefit estimation called Contingent Valuation Method [CVM] in contributing to the management of biodiversity. The problem setting is the East Aegean Archipelago and the common resource to be managed is the mediterranean monk seal *monachus monachus*. The question to be investigated concerns the potential role that this methodology, and benefit estimation in general, can play in revealing values and attitudes towards species preservation. These in turn can help us in understanding the factors affecting sustainable use of common resources through revealing possible obstacles to cooperative solutions. The mediterranean monk seal *monachus monachus* is one of the most endangered species in Europe, if it is not practically already extinct. The last populations worldwide have until now been identified in the Atlantic coast of Morocco and in Greece. Especially in the islands of East Aegean relatively large numbers of subpopulations have been reported. The main problem facing the preservation of this specie concerns the loss of habitat due to human expansion and touristic development and deliberated killing from fishermen because of damages caused by monk seals to fishing nets. The application of CVM reveal, on one hand, the maximum willingness to pay to protect the specie. On the other hand, a carefully conducted CVM can also be used to reveal patterns of thought and attitudes towards different incentive schemes. This information is then used as an input in designing reliable strategies for managing the conflict between fishing activities, touristic development and species preservation. The paper ends with some indications on the general usefulness of CVM method to influence policy outcomes in matters of biodiversity conservation.

Norman B. Snow and Robert K. Bell
Inuvik, N.W.T. X0E 0T0
Canada

WHITHER GOEST THE ERRANT BELUGA? (AND WHERE IS IT LEADING US?)

Historically, the Inuit are a coastal people. They are sea-mammal hunters *par excellence*. Their geographic distribution, historically and currently, reflects their dependence upon sea-mammals. Although the Inuit use sea-ice extensively for travel, their harvesting patterns are coastal and primarily land-based.

The beluga (white whale) is a species which has been harvested by Inuit peoples for many years. It is highly migratory, and it is no coincidence that the summer range of this species overlaps with the harvesting areas of the Inuit. Over the past two decades, scientific research

on belugas has tended to focus on the inshore distribution and biology of the species. This has resulted in the portrayal of this marine mammal as a shallow water species.

Recent advances in telemetry have allowed a re-assessment of this assumption. The resultant picture of beluga biology is somewhat different than what either traditional knowledge or "western science" would have portrayed a few years ago.

This paper documents the historical perspective, as well as the result of research over the past two decades, and explores the challenges to the co-operative management of subsistence whaling for beluga. It also examines some of the political ramifications of this new information.

Lars T. Soeftestad
Environment Department, World Bank
New York,
USA

USING COMMON PROPERTY IN DESIGNING DEVELOPMENT ASSISTANCE: APPLICATIONS TO COASTAL ZONE MANAGEMENT

While the re-invention of common property already is well under way in the academic community, this is not the case among the various categories of potential users of such knowledge and insight. The development community presents a case in point.

Development organizations and practitioners have only recently begun absorbing and buying into the idea of common property and its implications. Reasons for this new interest are to a large extent to be found in recent activities focusing on the search for a workable agenda for sustainable development. Aspects of this agenda are to some extent predicated upon inputs from environmental economics, the environmental lobby and the NGO community, and include an emphasis on protecting biodiversity through the creation of protected areas, increased understanding of the significance of systems of traditional knowledge and the importance of local participation.

The paper will focus on this emerging work within the World Bank and GEF, and how theoretical propositions on common property slowly are being translated into action. The current portfolio of projects, many of which are in the pipeline or under preparation, will be presented and analyzed. Special emphasis will be given to work on common property in connection with integrated coastal zone management.

Following this, an effort will be made to synthesize this work in emerging trends. In particular, current work on social assessments will be applied to integrated coastal zone management. Practical and policy oriented implications of this for the use of traditional knowledge, local participation as well as processes of consultation throughout the project cycle will be described.

Marietta C. Soriano
 Faculty of the Institute of Forestry and Environmental Studies
 Tarlac College of Agriculture, Tarlac,
 Philippines

CONTRACTOR'S PROFILE AND PERCEPTIONS OF THE CONTRACT REFORESTATION PROGRAM IN THE PROVINCE OF TARLAC

A study was conducted in four contract reforestation project sites in the province of Tarlac to determine the profile and perceptions of participants in the Contract Reforestation Program (CPR). The study sought to highlight the socio-demographic characteristics and organizational aspects of contractors in the CRP: determine their perceptions on the objectives and some aspects of the program; find out the experiences and motivation of the contractors in joining the program; determine their accessibility and competency of the Project managers; and identify the problems encountered by the contractors in the implementation of the program. Data were gathered from 19 family and 98 community contractors and a 133 non-members hired as laborers by the contractors.

Evidence indicates that majority of the family contractors were officially recognized by the DENR. Likewise, out of the 52 organizations involved in contract reforestation, 65 percent were registered with the Securities and Exchange Commission (SEC). The rest could not be considered organizations because of lack of legal personality. The majority of the participants have had unsatisfactory experience on the different aspects of reforestation especially in the benefits/privileges and the mode of the works carried out.

Employment and income were the primary motives for joining the CRP. All the reforestation projects are located in remote upland areas and accessible only by foot for about 2-3 hours walk.

Project Managers were easily accessible when their services were needed. These were perceived as technically competent in reforestation, however the people expressed some doubts as to their sincerity in entertaining urgent problems.

Marvin S. Soroos,
 North Carolina State University,
 Raleigh,
 USA

THE ATMOSPHERE AS A GLOBAL COMMONS

The atmosphere, which is a layer of gases surrounding the earth which makes life possible on the planet, is an example of global commons that has been subjected to overuse as a sink for a wide variety of pollutants. The paper (1) considers the ways in which the atmosphere fulfills the definitional characteristics of commons and draws comparisons with other commons; (2) identifies the major types of problems that arise in the use of the atmospheric pollutants, such as transport/deposition and atmospheric change; (3) reviews the types of international regimes that have been established to manage use of the atmosphere; and (4) explores questions of effectiveness and equity in international rules. Reference will be made to four major types of atmospheric pollution problems: (a) radioactive fallout from nuclear testing, (b) transboundary air pollution, in particular acid deposition, (c) depletion of the stratospheric ozone layer, and (d) climate change due to buildup of greenhouse gases. The proposed paper will be drawn from the conceptual and theoretical chapter of a book I am writing entitled **THE CHANGING ATMOSPHERE: THE QUEST FOR GLOBAL ENVIRONMENTAL SECURITY**.

Pamela Stanbury
U.S. Agency for International Development
Washington, D.C. 20523
USA

PROPERTY RIGHTS: A CRITICAL DEVELOPMENT STRATEGY FOR FOOD AID AND FOOD SECURITY

This paper explores the linkages between land rights and food security for the poor in developing countries. At present, over 900 million people are food insecure, meaning they do not have enough food to meet their daily nutritional requirements. Food security is a growing concern in many developing countries, given the uncertainty surrounding availability of future food supplies and employment opportunities. The bundle of rights to land can enhance or constrain people's ability to gain access to adequate food supplies. The existing land tenure literature focuses narrowly on the link between tenure security on individual holdings and agricultural productivity. Yet, very little attention has been paid to how property arrangements more broadly, whether individual, common or open access arrangements, enhance or inhibit food security. The paper will develop a matrix for analyzing linkages between land rights and food security, defined as food access, availability and utilization. It will review existing literature on the topic, identify gaps in understanding and explore policy recommendations for development practitioners concerned with food aid and food security.

Nathalie Steins
Department of Rural Development Sociology,
Wageningen Agricultural University,
The Netherlands.

A CO-OPERATIVE, COMMON PROPERTY RESOURCE MANAGEMENT AND SOCIO-ECONOMIC DEVELOPMENT: THE CASE OF A SHELLFISH FARMING CO-OPERATIVE IN CONNEMARA, IRELAND

A strategy for a group of people who fear that future access to a common resource is endangered, is to create an 'artificial common property' within this resource. The question is whether this strategy forms a sound basis for the sustainable management of this new property and, on its turn, the management of the larger resource. In Connemara, Ireland, a group of fishermen felt that the expansion of finfish farms in the local bay resulted in a decreasing catch and an increased number of restricted areas. They initiated a shellfish farming co-operative under the guise of expanding the fishing season and providing the area with employment opportunities through revitalizing the bay's derelict oyster beds. Shareholders' rights on dredging permits are based on a yearly 'voluntary labour' obligation. The establishment of this co-operative can be considered as a strategic action. Once the necessary licenses had been obtained and access to part of the sea had been secured many shareholders chucked it. More than two third of them have become free-riders. The necessary work at the oyster resource has been done through a government-sponsored social employment scheme. Shareholders' willingness to sustain the oyster resource has been influenced by (a) conflicting individual interests; (b) the (still) relatively unimportant position the co-op has in the community's socio-economic structure, aggravated by opportunity costs in other areas and the four years' waiting period between labour contributions and first uncertain rewards; (c) the institutionalised reluctance to sanction free-riders; (d) lack of back-up from social coercion mechanisms in community; and (e) external institutions prepared to support the co-op 'in the name of development', but whose well-intended interventions stimulated a reverse process. The fishermen may have 'saved' their bay from the finfish farms, but the future of the revitalized oyster resource is uncertain.

Ussif Rashid Sumaila
Christian Michelsens Institute
bergen
Norway

A TWO-AGENT MODEL FOR THE ARCTO-NORWEGIAN COD

A two-agent model for the exploitation of the Arcto-Norwegian cod stock is developed to investigate a possible social loss from a non-unified management. These two agents are identified as a trawl fishery versus a coastal fishery. When only the trawl or coastal fishery exploits the resource, the well-known sole-ownership regime results. On the other hand, when both fisheries harvest the cod, we are more likely to end up with a non-cooperative game. Standard economic theory predicts that, *cet. par.*, the sole ownership regime should give the optimal solution whereas non-cooperative exploitation will generally entail inefficiencies. However, due to the differences in fishing gear and grounds, the question of which case gives the optimal solution is not obvious. Using a non-cooperative game framework, we show that given current Norwegian prices and costs, the highest social benefit is achieved when only the trawl fishery exploits the resource. This conclusion is, however, rather sensitive to perturbations in costs and prices.

Hanne Svarstad
Centre for Development and the Environment
University of Oslo
Norway

TROPICAL GENES FOR SALE: WHO BENEFITS??

Development of modern medicines in USA and Europe is often based on the diverse flora and indigenous knowledge in tropical countries. To what extent do the source countries and local communities benefit from the pharmaceutical industry's utilization of local intellectual contributions and natural resources? Do the "gene hunters" or "biopirats" from the North contribute to an exploitation of poor people and poor nations in the South? Is it possible to establish institutions which can secure a fair and equitable sharing of the benefits from this use of biodiversity?

These questions are subject to discussions and negotiations in a number of international fora. Until recently, genetic resources have been considered as the "common heritage of mankind". Everybody has had the right to access and utilization, and nobody has had the right to receive payment for the collection and use by other actors. The Convention on Biological Diversity (CBD) introduces a new regime based on national sovereignty over the genetic resources which more or less can be considered as primary commodities. The CBD is yet to be implemented. Meanwhile, pharmaceutical companies and research institutes are initiating ways of sharing benefits with the national and local providers of medicinal plants.

The paper examines how two of these actors arrange for the sharing of benefits. Their designs of interaction models, including their choice of source country participants, are essential for how the benefits are to be shared. The paper also discusses implications of these models for the management of biodiversity in the source countries.

Brent M. Swallow,
International Livestock Research Institute,
Nairobi,
Kenya

Damaris Kamara, Kenya Trypanosomiasis Research Institute, Kikuyu, Kenya
Protase Echessah, Kenya Trypanosomiasis Research Institute, Kikuyu, Kenya
John J. Curry, ODA/KARI Socio-economics and Epidemiology Project, Nairobi, Kenya

DO CONTINGENT CONTRIBUTIONS IMPLY CONTINGENT VALUATIONS? ASSESSING WILLINGNESS TO CONTRIBUTE TO LOCAL PUBLIC GOODS IN KENYA

Tsetse-transmitted trypanosomiasis is a parasitic disease that affects the health of people and animals across much of Africa. While several traps and targets have been developed to suppress tsetse, there have been few examples of self-sustaining 'community-based' programmes. We are assessing the prospects for community-based tsetse control in Busia District, Kenya.

A contingent valuation survey was implemented to assess willingness to contribute money and labour to tsetse control in 6 villages. Respondents were presented with a hypothetical situation and questioned about the maximum amounts of money and/or labour they would be willing to contribute if the situation became real. Econometric techniques were used to test hypotheses about factors affecting the types and levels of contributions individuals were willing to make.

Two villages were then selected to receive assistance in implementing tsetse control. Those villages have been engaged in a participatory process of education and mobilization for tsetse control. Community organizations have been formed and decisions taken at village meetings. A survey of "planned contributions" was conducted after decisions about the amount of money each household would contribute were made. Actual contributions are being monitored, particularly for the 60 households included in the initial survey. The results show marked differences between contingent, planned and actual contributions. While useful for planning purposes, we postulate that none of those measures reflect the contingent or actual value of the control.

Brent M. Swallow,
International Livestock Research Institute,
Nairobi,
Kenya

INCORPORATING RISK IN A MODEL OF INDUCED INSTITUTIONAL CHANGE FOR CROP-LIVESTOCK SYSTEMS IN AFRICA

The model of induced institutional change suggests that a society will change the property rights to a resource when the social benefits of change exceed the social costs. It is postulated that the costs associated with a property rights regime are positively related to the degree of atomization of rights and that the benefits of atomization depend upon the capability of the resource to generate economic rents. The model implies, therefore, that resources capable of generating high rents will be held under individual rights, resources capable of generating moderate rents will be held under common property, and resources capable of generating low rents will be held under state property or open access.

When applied to arid, semi-arid and sub-humid zones of sub-Saharan Africa, this model implies a gradient of land use and property rights defined over the level of average annual

rainfall. Holding everything else constant, areas receiving the lowest amounts of rainfall will be used for extensive grazing and will be held under state property or open access. Areas receiving the highest amounts of rainfall will be used for mixed crop-livestock production and will be held under individual property.

It is important to recognize, however, that the economic rent generated by a particular land use depends upon highly variable climatic and market conditions. 'Rent risk' implies uncertainty regarding the land use-property rights gradient. For many resources there will be uncertainty over which land use generates the greatest levels of rent; this uncertainty is likely to translate into uncertainty and conflict over property rights. For such resources the optimal property rights regime may be the one that is flexible enough to accommodate various types of land use.

Jeremy Swift
The Institute of Development Studies, University of Sussex
Falmer, Brighton BN1 9RE
UK

CREATING AND ADAPTING INSTITUTIONS FOR SUCCESSFUL PASTORAL COMMON PROPERTY MANAGEMENT

The transaction costs to individuals involved in different institutional approaches to the management of pastoral common property (including, but not limited to pasture and other natural resources) must be commensurate with the benefits obtained by those individuals from abstaining from free-riding. One of the advantages of customary common property institutions, including their contemporary hybrid versions, is that they are embedded in the social structure: as a result, the marginal transaction costs of cooperative common property management are small. At the same time, the cost to the individual free-riding is very high, since it involves exclusion from a much wider range of economic, social, political and ritual cooperation, without which the most elementary livelihood strategies are extremely difficult.

Carol Sørensen
Department of Ethnography and Social Anthropology, Aarhus University
8270 Højbjerg
Denmark

CONTROLS AND SANCTIONS OVER THE USE OF RESOURCES IN THE KAFUE FLATS OF ZAMBIA

The research on which this paper is based, enquired into the traditional management of the resources of a non-equilibrium environment, the Kafue Flats, a Zambian flood plain. Management includes crop cultivation, trans-humant pastoralism, fishing, hunting and the gathering of forest products. The purpose of this paper is to describe the links between the actual use and the system of controls and sanctions of the use.

Generally, in order to effect regulation of resource use, there must be an institution surmounting political, ethnic and economic divisions, which is able to endorse commonly respected, enforceable sanctions. In this locality the source of such control was found in what have been termed "territorial shrines" (Schoffeleers 1979; Binsbergen 1981) here known as malende.

These findings suggest that in the subsistence economy of the Flats the utilisation and regulation of natural resources is linked in a fundamental way to political and religious

organisation. Although local communities still control land use this has to be achieved within a dual legislative context, the terms of which are not entirely under their control. For example grazing and fire management have been controlled by local leaders for more than 1000 years, with the Kafue Flats becoming one of the most productive grasslands in the world. Control of the management systems is as powerful as ever, but outside control of the one resource, water for production of electricity, has damaged grazing lands.

It is clear that local people have access to funds of indigenous knowledge held by various experts varying in age and status. There are examples of people using the store of knowledge to adapt to the changing ecological conditions of the area. It is the capacity for change, reliant on the common access to information, which is the strength of the traditional system.

Ani Takforyan
CIRAD-GREEN, 42 rue Scheffer,
75116 Paris,
France

WILDLIFE MANAGEMENT: NEW COMMONS AS AN ALTERNATIVE TO PROTECTED AREAS ? THE CASE OF THE DIMAKO FOREST (EAST OF CAMEROON)

For a few decades developing countries have been facing a significant decrease in wildlife stocks, due to habitat destruction and hunting. In response to this situation, many conservation programs have been launched, taking the form of protected areas. The creation of such an area consists in isolating, as far as possible, endangered species and ecosystems; of course, it implies that these ones can be managed in isolation. In fact, practice has shown that a great interdependence between the area and its neighbouring zones does exist because of human activities, especially since wildlife is mobile. Also, these programs are rarely successful while local communities are strongly opposed to them. The increase in the number of protected areas seems quite illusive although endangered ecosystems are numerous. In the Dimako rainforest, wildlife is on the decline. Hunting is traditionally a major activity, and men and wildlife have always been in interaction. Many ethnographic works, dealing with the relationships of people to the resources they use, show that African communities establish many rules of access to these resources based on a perfect local knowledge. Under these conditions, relatively closed and small-sized socio-economic systems may allow a viable use of wild resources. But, many exogenous changes at Dimako (contacts with strangers, settling process, trade) may have had two types of consequences: an internal evolution of the society (which, indeed, has always been dynamic) translated into a weakening in some of the access rules, and/or a diminution in the impact of these rules faced to the importance of external elements. Thus, further to the study of this context and in reference to previous works, the discussion will focus on the pertinence of establishing new commons as a sustainable management tool for Dimako.

Kirk Talbott
Centre for International Development & Environment,
World Resources Institute, Washington, DC 20006,
USA

STRENGTHENING INSTITUTIONAL CAPACITIES FOR MANAGING NATURAL FOREST SYSTEMS IN MAINLAND SOUTHEAST ASIA.

This analysis will examine opportunities for and constraints to strengthening the international, national, and local institutions' capacities to better manage mainland Southeast Asia's remnant natural forest systems. Based on the World Resource Institute's Center for International

Development's on-going field work in northern Thailand, Laos, Yunnan Province, Vietnam, and Cambodia, this paper will explore linkages and innovative approaches to improving institutional responses to deforestation in the region. It will pay particular attention to national-level policy frameworks and institutional mechanisms for integrating environmental concerns into national economic development planning.

Touch S. Tana, M. Ahmed and Ly Vuthy
 Department of Fisheries
 Phnom Penh
 Cambodia

COMMON PROPERTY MANAGEMENT OF CAMBODIA'S FRESHWATER CAPTURE FISHERIES - ISSUES AND APPROACHES

Located in the lower Mekong river, the inland waters supported an extensive fishing and provided food security to Cambodia's largely subsistence oriented population. Current fishery production is over 100,000 metric tons, one third of which comes from subsistence fishing. Despite government regulations, the fisheries face threats of depletion due to loss of habitat (e.g., destruction of flooded forest and siltation of migratory tributaries), destructive fishing practices, increasing commercialisation and a growing demand for fish both in domestic and export markets. With no alternative income earning opportunities, low risks of apprehension and penalties and continuing internal conflicts regulatory management is becoming more and more ineffective. Redefining of user rights and co-operation of the fishing community is essential for habitat protection, enforcement improvement and achieving a higher degree of voluntary compliance.

Elisabeth Thannberger,
 INRA-Ecodeveloppement,
 84914 Avignon,
 France

COMMON COUNTRYSIDE MANAGEMENT BASED UPON CONTRACTS

The paper analyses the implementation of contracts between stockbreeders and the Ministry of Agriculture in order to lead livestock farming towards the protection of forest against fire in the Mediterranean area.

The contracts are on individual basis and relate to precise land parcels of the farms. At the farm level contract deals with individual land mobilisation. Most of the time it develops property rights rather than ownership. Through this process the farmer also leaves the individual dimension of his farm for a social service.

The environmental concerns that are taken into account through contracts make the appropriation of the countryside more complex. Two social groups had been traditionally involved in its management (the owners and the tenants). Now a third actor is brought into play: the one that decides how the countryside must be managed. This issue is not specific of our case study. This new body has to link together the individual contracts, in order to organize a common management of the environment and therefore to comply efficiently with the social demand.

The link between private and common property leads to the study of countryside management. Contracts promote individual purchase of means of production. This is a way to have sustainable farms. The tool also can be alternatively used in the maintenance of rural areas.

The contracts thus entitle the society to control the farmer's way of production. His decision of using the productive factors is then no more personal, but has also to deal with collective concerns. Countryside management moves from an individual process (private concern of keeping the productive factors) to a collective one (maintaining the integrity of common resources). The public asset (the protection of countryside's qualities as a final service) is added to the private good (the plot as a mean of production).

Man B. Thapa
Winrock International,
Kathmandu,
Nepal.

INDIGENOUS INSTITUTIONS AND PASTURE MANAGEMENT IN HIGH ALTITUDE NEPAL

Rural communities everywhere in the world are known to maintain indigenous institutions for the management of natural resources. Such indigenous institutions are formal as well as informal. In Nepal also, there are several strong informal indigenous institutions. These Informal Indigenous Institutions (IIIs) carried out effective communal management of land-based natural resources (particularly, forest, and pastureland) and are largely responsible for the continued up-keeping of these resources.

In many cases, these IIIs are "Councils" represented by all permanently settled households of the village. The councils decide, usually by consensus, the rules for the management of natural resources. Often again, the councils nominate one or a small number of households in rotation for a specified period (usually one year) to act as the "enforcer" of rules for the management of natural resources. In some cases, the council may elect the enforcer.

Animal husbandry, which counts much in natural resources, is the primary source of economic survival of the population inhabiting in the high altitude northern areas of Nepal. The agriculture sector in these areas pivots around it, while the centuries-old trans-Himalayan (Nepal-Tibet) trade depends on animal husbandry for pack animals. It is also an important element in the social structure of the population. The successful practice of animal husbandry in this area has been based on indigenous pasture management systems, which is basically implemented by the IIIs. There are several indigenous pasture management systems existing in different parts of the country. Sustained development of animal husbandry through local management of pasture will bring about economic betterment of the inhabitants of the northern areas of Nepal. Due to various factors, however, these prospects have so far been largely left unexplored.

Olivier Thébaud,
Cirad-Green,
Paris,
France

Yves Renard.
Caribbean Natural Resources Institute
Vieux Fort,
St.Lucia, West Indies

DECISION MAKING PROCESSES IN THE MANAGEMENT OF COASTAL COMMONS : CASE STUDIES FROM THE CARIBBEAN

The paper focuses on Coastal Zone Management issues in the small Caribbean islands of Martinique and Saint-Lucia, and underlines the importance of understanding decision-making processes in the implementation of collective measures to regulate the access to and use of coastal resources. The two islands appear to face similar problems linked to the increase and diversification of the demand for these resources. Multiple activities, particularly tourism and leisure activities, have developed in recent years, both on land and at sea, together with growing urbanization and the concentration of communication infrastructures on the sea shore. Despite new and strengthened public regulations, there appears to be an increase in the number of conflictual situations, and a growing need for more efficient collective management of the coastal areas.

Reference is made to a study led in Martinique in 1993, under an IFREMER (Institut Francais de Recherche pour l'Exploitation de la Mer) research programme concerning coastal conflicts analysis, and to the work done by CANARI (Caribbean Natural Resources Institute) in both the analysis of conflicts and the provision of assistance in the definition of a regional management program for the district of Soufriere in Saint-Lucia. In the case of Martinique, the study showed that effective management of coastal areas as public property on the island did not result of integrated decision-making, more or less efficiently implemented trough a single decision-maker's actions, but rather of simultaneous interactions between different actors involved in coastal use. This has led to situations of free access and conflicts, which are managed through locally devised, collective regulation systems, following general public land management principles. The case of Soufriere, where a specific institution integrating local activities into a collective regulation system was created, gives an illustration of the negotiation process and problems encountered in tackling the establishment of practical rules of access to and use of coastal resources.

James T Thomson
Associates in Rural Development, Inc.
Burlington, Vermont
USA

MALI: ENABLING FRAMEWORK FOR USER-BASED GOVERNANCE OF FOREST RESOURCES

This paper will assess the impact in Mali of recent reforms in the forestry code and new decentralisation legislation on the capacity of local users to govern and manage forest resources. It will be based on empirical examples drawn from the Fifth Region .

Mali, among the West African group of francophone countries, which has had the most militarised tradition of renewable natural resources governance and management. The national Waters and Forestry agency from independence in 1958 to the fall of the Moussa Traore

military regime in March, 1991, exercised extremely tight control over access to forest resources in many regions of the country. Foresters did not so much regulate use as collect legal fines and illegal rents from users.

With the formal liberalisation of politics in Mali under the new Third Republic, efforts have been undertaken to modify the forestry code and increase the authority of user groups in governing and managing forest resources. However, the extent to which this legislation will enable users to exercise greater control over their resources is problematic. Complementary legislation designed to decentralise provision of many public services and provide for elected local governments appears to share the same weaknesses as the revised Forestry Code, at least insofar as creating the conditions for greater user control of forest resources.

James T Thomson and Nadia Rabesahala Hingen
 Associates in Rural Development, Inc.
 Burlington, Vermont
 USA

MADAGASCAR: ASSESSMENT OF EFFORTS TO CREATE AN ENABLING FRAMEWORK FOR USER-BASED GOVERNANCE OF FOREST RESOURCES

In Madagascar, evidence compiled through recent field research reveals substantial local institutional capital available for governance and management of forest resources. Collaborative efforts are under way among local users, state authorities and integrated conservation and development projects (IPCDs) to establish systems that will facilitate sustained-yield use of these resources. A critical weakness in these efforts to date has been development of institutional arrangements that create incentives sufficient to ensure that users will willingly bear the costs of sustained-yield management and associated governance activities. This involves creating a long-term guarantee for users of continuous access and use rights. It involves a capacity to exclude other users. Since disputes over access to valued resources will almost certainly arise, it is critical to the sustainability of these efforts that low cost, effective, reliable dispute resolution procedures be available to communities engaging in governance and management of forest resources. Under current circumstances, however, it is not clear that these conditions can be met.

The current situation, and the impact of new decentralisation legislation on the capacity of local users to govern and manage forest resources is illustrated by examples drawn from peripheral zones of three protected areas, of which two are located in the extreme northern and southern ends of the Island, and the third in the rain forest inland from the eastern shore

Dirgha Nidhi Tiwari
 IREM, Asian Institute of Technology
 Bangkok 10501
 Thailand

RETHINKING THE COMMONS IN THE CONTEXT OF GROWING RESOURCE SCARCITY AND EXTERNALITIES: DEVELOPMENT OF MARKET BASED AND INSTITUTIONAL MEASURES WITH FARMERS PARTICIPATION.

The government failure in managing rural natural resources has raised wide concerns over the past few decades. The increasing natural resource scarcity and environmental degradation have made the task of managing the natural resources even more complex. While institutional

economists put emphasis on the transfer of property rights to the local community, the neo-classical economists golden rule suggests for internalisation of externalities through the Pigouvian taxes. This paper argues that common property regime is not without fault and in the face of growing natural resource scarcity and environmental degradation both the approaches have to be considered together for sustainable use and management of the natural resources. The agricultural water supplies in many parts of the world are entering into the era of physical scarcity, This paper briefly highlights on the misconceived concreteness with regard to water as a common good in the context of Thailand. Guarding against the fallacy of the misconceived concreteness and solving water scarcity problems requires development of both the market based and institutional approaches starting right from the local level. This paper provides a framework for the internalization of the externalities adopting both the market based and institutional measures by presenting a case study of a large scale irrigation system in the Northern Plains of Thailand. In the processes of internalizing the external costs and transferring water rights to the local community, farmer's participation is required right from the beginning. In measuring the value of irrigation water and environmental costs, the Willingness to Pay (WTP) method and farmers perception of the incremental value of water are used. The water price determined from other conventional methods are compared and used to determine the level of water fee from the farmer's, government's and the societal perspective. This paper shows that adopting cropping practices based on the farmers perception and transferring water rights to the farmers along with arrangements in the water tax systems for the off-farm environmental costs provide a better solution for sustainable management of the resources than continuation of the full government control over the irrigation water as well as in other decision making process. Finally, the procedures for adopting such measures are suggested.

Ralph Townsend
Department of Economics, University of Maine
Orono, Maine 04469-5774
USA

PRESERVING COMMUNITY INTERESTS UNDER FISHERIES ENCLOSURE

The adoption of "rights-based fishing" as the basis for management of fisheries involves the enclosure of common property. Although there are often good efficiency grounds for moving to private property, this enclosure transfers property from the community to private owners. Institutions could be devised in which decision making is governed by private property institutions, but in which the broader community continues to share in the benefits produced by the resource. The usual proposal to accomplish this has been to require lease or royalty payments by resource users, but such payments (especially to central governments) are politically unpopular. This paper instead proposes the creation of fisheries governance corporations with both private and public stockholders. These public stockholders might be local governments or local service institutions, such as hospitals, schools, or port authorities. By exercising its share rights, the local public owners continue to have input into the governance of the resource and continue to receive benefits, perhaps in the form of lease payments for use of the publicly-held fishing rights. Because the public ownership continues to be at a local level, this form of joint public-private governance is more consistent with many traditional institutions of common property governance than various forms of control by a national government.

Aud Mikkelsen Tretvik,
 Department of History, University of Trondheim,
 N-7055 dragvoll,
 Norway

FIELDS AND FORESTS. LEGISLATION, MANAGEMENT AND THE VIEW OF COMMON PROPERTY IN NORWAY IN THE 17TH AND 18TH CENTURY.

This presentation focuses on three issues:

The first one is the changes in legislation from the early 17th century (King Christian IV's Norwegian Law of 1604, which was rooted in the Land's Law of 1274) through the Mining Ordinance of 1683 to the Norwegian Law of 1687 and later royal decrees given in the 18th century. The legislation in this area is seen as an answer to the steadily growing pressure on natural resources during the period, partly due to population growth and partly due to development of industries such as mining and forestry.

The second point is the management of common property. The local community participated in the management through the lawrightman-institution (a Norse term used for the members of an assizes) at the local court. Cases concerning taxation and establishing of regular farms within the common land was handled by the lawrightmen in cooperation with the local judge. The local judge was a state official, but the lawrightman-institution circulated between all the male farmers using taxable land in the local community. 8 men were appointed lawrightman each year for each law district. The bailiff was the state representative and took care of writing contracts for the exclusive use of common property and collected duties for its use and fees for the contracts. The habit of asking for a permit for exclusive use of common property was steadily increasing throughout the 18th century, although the law did not demand it in all the cases where it occurs in practice. The bailiff's role is here first and foremost seen as an intermediary between the members of the local community. At the central level was the Department of Finances (Rentekammeret) in Copenhagen, and for two shorter periods in the 18th century also the General Forest Office (Generalforstamtet 1739-1746, 1760-1771). The bailiff reported to the Dept. of Finances. The General Forest Office can be seen as an effort from the central government in Copenhagen in dealing with acute resource crises.

The third point to be made is about the view of common property, and the view of common property in contrast to the view of private property. How people in the 18th century looked on common property through the way these resources were used in practice, can be studied in a wide range of source material: Court records, contracts of exclusive usage, correspondence and reports. The view of different interest groups can here be visible: The view of the local farmers, that of the newcomers, the view of the burghers with their economic interests and the view of the central government and its regional representatives.

Waranoot Tungittiplakorn
 Thailand

COMMON PROPERTY RESOURCES AS A SOLUTION TO THE CONFLICT BETWEEN HIGHLANDS AND LOWLANDS

Different ethnic groups in the highlands of northern Thailand are increasingly involved in conflicts over natural resources. In this paper, the author examines the differences in property right regimes of three main groups: the Karen, the Hmong and the northern Thai. Juxtaposing these differences with the State's property management, the paper attempts to illuminate the discrepancies between each groups' understanding of their rights over the resources.

Using a high profile case of conflict between the Hmong highlanders and the Thai lowlanders over forest and water at Mae Soi, Chiang Mai province, the author explores the possibility of a communal property management (CPM) as a solution to the conflict. It is not likely that a single CPM scheme will be successful among the highly diverse groups; separate communally managed schemes are necessary. The villagers interviewed express confidence in managing the forest communally, providing that the boundaries are clearly defined. The third independent partner is required to provide mechanisms for conflict resolution between adjacent areas.

At a micro level, the communal resource management has high potential in the highlands of northern Thailand. Recognition of the local people's right over forest lands is, nevertheless, a substantial political shift for the Thai government. In practice this shift need not be dramatic. The State can maintain its ultimate jurisdiction over the forest by imposing necessary regulations. CPM will ensure that the State consult the local communities about what should be protected, for what purposes, and how monitoring can effectively be done. The most expensive task is to clearly demarcate the areas. This may prove to be the towering obstacle for the communal resource management in the highlands.

Foday Turay,
Sierra Leone

MANAGING EXPLOITATION RIGHTS IN THE INSHORE MARINE FISHERIES OF SIERRA LEONE

Access to inshore fisheries in Sierra Leone and its management is discussed in order to provide a basis for improving management.

On the basis of the property rights framework, the state is the *de jure* owner of the inshore fisheries resources, exploited by the artisanal fishers as authorized users. Fishers perceive stocks as a free good and in extracting the resource rent, they can be considered as *de facto* owners. There is therefore an overlap in the roles of the state and village management authorities. Fishers consider resource supply as a function of the willingness of "God" to replenish the stocks, ignoring the effects of fishing on stock abundance. No direct stock management problem is therefore perceived by fishers, but to appease "God" they do not fish for at least one day every week, thereby contributing to stock conservation.

The direct management problem for the village authorities concerns equitable access to stocks and resultant conflicts, which they attempt to overcome by spatial and temporal arrangements for different gears. The state's attempts to conserve inshore stocks by excluding the industrial fleet, and the use of small mesh sizes, chemicals and dynamite, are ineffective because of their minimal enforcement and disregard by fishers. The fishers' self-regulatory measures are spatially weakened by the variation of the non-fishing days according to the dominant village religion, and temporally by the upward trend in the number of fishers. Furthermore, these stock conservation instruments disregard the economics of fishing, and can therefore contribute to the inefficient allocation of labour and capital resources, hence to rent dissipation.

State and village management authorities should be integrated, with the state assuming overall resource ownership, and allocating local access management to fishers and enabling them to improve their knowledge and understanding of stock management.

Marcela Vásques-León,
Bureau of Applied Research in Anthropology, University of Arizona
Tucson, Arizona,
USA

AVOIDANCE STRATEGIES AND GOVERNMENTAL RIGIDITY: THE CASE OF THE SMALL-SCALE SHRIMP FISHERY IN SONORA, MEXICO.

The presence of central government authority in regulating access to fisheries has tended to be a dominant feature of marine resource management all over the world. States have spent enormous efforts at devising regulations to limit access in the belief that such efforts will lead to greater conservation. However, the issue of enforcement of such regulations remains rather problematic: costs have tended to be so high that regulatory efforts have largely failed. Surprisingly little attention has been paid to how local populations respond when faced with externally imposed regulations designed to restrict their use of resources. This is what I intend to address here. I will analyze the avoidance strategies developed by small-scale fishermen in the state of Sonora, where complex systems of rule breaking--involving fishermen, their communities and enforcement agents--have evolved. To facilitate the analysis, I have categorized avoidance strategies as follows: black market activity, use of illegal gear, entry violations, infringement of areal and seasonal closures, and open defiance. Within each category the following issues will be explored: why do some fishermen break the rules more often than others? what are the goals, justifications and incentives involved in different types of rule breaking? do fishermen act as individuals who calculate costs and benefits associated with non-compliance; or do they act as community members who break the rules in order to serve collective interests within the communities--such as attempting to secure long term equitable access to resources? does the violation of rules give flexibility to the strict regulatory structure in which communities must subsist? what happens, in terms of resource use when a community decides to collectively break the rules? Understanding and addressing the response of local fishermen to external regulatory enforcement is critical to any attempt at managing a fishery in a realistic manner.

Trond Vedeld
Noragric and The department of land use and landscape planning,
The Agricultural University of Norway,
Norway

STATE LAW FACING LOCAL LAW: THE DISSOLUTION OF CUSTOMARY TENURE REGIMES AMONG THE FULANI OF MALI

The property rights regimes governing the access and allocation of African rangeland resources show great diversity and complexity in patterns of governance, governments and institutions. This complexity is difficult to catch in statutory law. So far national law in most African countries has generally disregarded this complexity. In order for pastoralists and agro-pastoralists to maintain efficient and sustainable production systems the utilization of these rangelands require more secure property rights. Pastoralists often claim customary rights to rangelands and more firm recognition in official property laws. Until the 1980s, practical solutions to rangeland and pastoral resources management was dominated by Western models of 'ranching' which instituted fixed territorial boundaries and goals of regulating stocking rates according to an estimated carrying capacity, assuming that some kind of optimal 'equilibrium' could be found between the number of cattle and the pasture production. Current research on ecology stress that the ecosystems of African rangelands are often never in 'balance', but exhibit great variability and often non-equilibrium characteristics. Contrary to national law, customary tenure institutions recognise such ecological variability and the critical need for resource-sharing between various user groups to rangelands under common property regimes.

Part of the solution to dilemmas of strengthening property rights regimes for African rangelands through national law might lie in the introduction of procedural law, which among others would recognise distinctions between 'ownership in common' and 'joint ownership'. Procedural law would require recognition of certain general principles laid down in customary tenure institutions. Land tenure reforms would be perceived as a long term process embedded in the local culture, rather than as an intervention from the state with ambiguous policies and practices.

Torben A. Vestergaard
 Department of Ethnography and Social Anthropology
 Aarhus University,
 Denmark

A SOCIO-CULTURAL PERSPECTIVE ON FISHERIES MANAGEMENT IN DENMARK

In less than two decades the conditions of the Danish fisheries have changed from a situation where access to fish stocks was almost free to one of strict regulation and close monitoring of catches. The management practices have developed gradually, but with quota regulation as an important basic aspect. This has generated considerable resentment among fishermen. The reason is not just that it is unpleasant to have restrictions imposed on one's activity. There is a conflict between the premises of the management regime and the world views, strategies of action and forms of organisation of the fishermen. The basic logic of the management regime is that of a commonly accepted body of theory (bio-economic theory, common property theory) linked with a general modernist world view. This involves assumptions about the character of natural and social systems that are at odds with fishermen's view of nature, their conception of their own role and identity in relation to both nature and society, and their strategies of action. Predictability, lineal functions and equilibria have been axiomatic for the belief in output management. From fishermen's viewpoint quota management has widely been experienced as an affront to knowledge, practices and identity, all of which are in one way or another linked with the expectation of unpredictability and fluctuations with regard to natural conditions. This paper will explore and illustrate some points of conflict between fisheries regulation and fishermen.

Gro Waeraas
 EDF-GRETS, Paris,
 France

CREATING NEW COMMONS : " LANDSCAPING " AND LOCAL DEVELOPMENT IN FRANCE

This paper deals with the conflict between a public company, EDF (Electricité de France, the french national electricity distribution and generation company), and local communities on the issue of electricity distribution vs. landscape preservation. The presentation is based on a qualitative survey made in 1994 in four different spots.

The kind of conflict which will be described in the following takes place almost each time EDF builds new high voltage power lines. High voltage power lines are actually considered by many as destroying the landscape and thus diminishing the well-being of the people living along the power line. Moreover, the loss of environmental quality which follows the implementation of the line may also threaten tourism, which in some cases is a main income for local authorities (There are 36000 "communes" (municipalities, parishes) in France, their high number resulting in a very small size.), as well as for individuals and local companies.

Hence, this conflict raises an interesting problem, which can be described as follows : The owners of a land, be it individuals, companies, farmers or local authorities, are, according to french law, not considered "dispossessed" of their property by a power line crossing their land. Thus, up till recently, they were not consulted by EDF about the project, just informed after the final routing decision.

However, owners and local authorities claim that the presence of the power line leads to a depreciation of the land. That is why residents, ecological movements and local authorities now demand to participate in all phases of the project, in order ensure that local interests and knowledge (especially about traditional use of the land) be taken into account.

Due to the threat to landscape quality, a "new common" has thus appeared where private and public property prevailed before. The question is how to ensure an equitable and sustainable management, ensuring both landscape preservation and transport of electricity, at a reasonable cost. New procedures, including both political, economic and technical aspects, have been put into practice. The presentation will describe the creation and the (sometimes controversial) application of these new procedures.

Jean Yves Weigel
ORSTOM , Laboratoire des Sciences Sociales
93143 Bondy
France

TRADITIONAL FISHERY MANAGEMENT : SOME WEST AFRICAN LESSONS

It is now recognized that there is a renewed interest in traditional forms of small scale fisheries management. This review and analysis of traditional management practices raises the question of whether, after earlier neglect, there is not now a tendency to overvalue them.

The description of the management methods reveals a certain uniformity, although a distinction has to be made between the control of fishing effort (some parts of the Niger Inland Delta), the recent temporary or permanent management of water systems (Lake Nokoue, Keta lagoon, the Togolese lagoon system), and, finally, those measures and practices intended to increase productivity directly, such as the development of brush park fisheries on Lake Nokoue and formerly on Lakes Aheme and Togo.

The traditional management schemes analysed here show common characteristics, such as their "ad hoc" nature, precariousness, their localized character and even their ambiguity which again leads one to wonder if, having long disregarded traditional management, we are not now overestimating its value.

In contrast to this relative uniformity of management practices there is a great diversity of contexts. This diversity is a function of, among other things, the state of the resource, demographic pressures, settlement patterns and fishing techniques used, making it difficult to determine in general the performance of any given scheme. Placing each scheme in context does, nevertheless, allow us to identify the conditions which promote the transition of traditional management forms towards a modern type of management able to cope with the consequences of radical technical evolution .

James Wilson
Department of Resource Economics
University of Maine
Orono, Maine 04469-5782 USA

AN INTERACTIVE MODEL OF THE SCALE EFFECTS IN ECOSYSTEM GOVERNANCE

An interactive model of a fishery that incorporates biological events at two different geographical time scales was developed to illustrate the problems of ecosystem governance. The model incorporates up to four "harbors" with distinct fishing grounds and with up to six fishermen (participants) in each harbor. Sustainability problems occur at both the harbor and overall fishery level. Participants are asked to "go fishing" and are given a profit maximizing objective. Biological events (growth related) at the harbor level need to be resolved by collective rule making; similarly biological events at the fishery level (habitat/recruitment) need to be resolved by overall fishery rules. The principal lesson the model seeks to illustrate is the need to develop rules/governance at the various scales determined by biological events.

Marc Witbreuk
University of Twente, Civil Engineering and Management
7500 AE Enschede
The Netherlands

COLLECTIVE ACTION AND REGIONAL TRANSPORT POLICY

In the Netherlands the second long term National Transportation plan provides a new direction in transport policy in order to cope with rapidly growing mobility patterns. The plan focuses on both the improvement or the preservation of the accessibility of important economic centres and the reduction of environmental impacts of transportation. A prominent policy instrument to attain these goals is the restructuring of the organization in terms of the allocation of responsibilities, competencies and financial means in the field of transportation policy. Because of deficiencies in the coherence and effectiveness of former national policy schemes and the awareness that transportation has a maximum functional coherence at a regional scale, the government has launched incentives to create new regional public authorities in this respect. In principal, cooperation between participants in these regions should emerge voluntarily. The purpose of the paper is to describe and discuss the problems, impacts and potentials of this reorganization process. For the sake of illustration a particular case, the Twente region, will be highlighted. In the paper the theory of collective action will be used to examine the cooperation in the organization of the transport region of Twente. According to the theory, the prospects for a successful furthering of the common objectives are unfavourable. Present cooperation does not prove the contrary. An attempt will be made to build a model for predicting the prospects of a continuing voluntary cooperation in regions.

Chusak Wittayapak
Social Research Institute, Chiang Mai University
Chiang Mai 50200
Thailand

LOCAL INSTITUTIONS IN COMMON PROPERTY RESOURCES: A STUDY OF COMMUNITY-BASED WATERSHED MANAGEMENT IN NORTHERN THAILAND.

The community-based watershed management (CBWM) in Northern Thailand has demonstrated that local institutions are capable of solving the problems of the commons beyond the state and the market. This locally-initiated watershed management originated from the needs for water of the lowland peasants. Their dependence on watersheds for a sustainable livelihood brought the peasants together to form CBWM institutions to regulate joint use, sustain yields, and exclude non-members. The emergence and endurance of a CBWM system are closely associated with variables such as a small watershed, a small number of clearly defined users, clearly-demarcated watershed boundaries, close proximity of the watershed to the village, moderately scarce watershed resources, and charismatic leaders.

The definite geographical and social units of village communities and traditional reciprocities, when reinforced by norms, beliefs, and operational rules, are the foundation for cooperation amongst the resource users. The villagers were satisfied with the outcomes of resource use under the common property system, as they evaluate their satisfaction on the basis of sustainable livelihood security rather than short-term benefits. Minimal conflicts between de facto rights defined by local institutions and de jure rights defined by laws are also critical to institutional stability.

The incorporation of local communities in the nation state building and the penetration of the market economy into the rural areas have changed traditional reciprocities. Thus, CBWM system have evolved through the development of collectively-organized rules to govern the use of scarce resources. Over time, the operational rules of CBWM have become formal institutions as the village community is transformed into a territorial organization. Co-management between the state and local communities is feasible in Northern Thailand. It is timely to legalize the CBWM institutions and empower the local communities to strengthen their capability to manage the local resources.

Prasanna Yonzon
Resources Nepal, Biodiversity Profiles Project
Department of National Parks and Wildlife Conservation,
Kathmandu
Nepal

CHANGES OF SWAYAMBHU NATHIONAL FOREST OVER A HUNDRED AND FIFTY YEARS

The Swayambhu Nath Hill has been endowed with a rich cultural heritage that has been a place of worship and an attraction for tourists in Nepal. Forests of SNH are living testaments of traditional environmental procepts. The biological, geographical, historical, religious, social and cultural meaning of these phenomena is such that one aspect cannot be understood without reference to the others. However, these types of forests are slowly dwindling due to rapid urban development pressure, over exploitation of forest products and minimum regeneration growth. The outcome from this study would be an important tool of information that could complement and enrich overall scientific understanding and conserving biodiversities within the religious forests.

Roberts Zile
Latvian State Institute of Agrarian Economics
Riga,
Latvia

CHANGING OWNERSHIP AND THE SYSTEM OF PROPERTY RIGHTS IN LATVIA: RESTITUTION AND PRIVATIZATION - LEGAL, ECONOMICAL AND POLITICAL ISSUES.

Problems and approaches in legislation of changes in ownership and property rights in Latvia has been caused by political, legal and economical reasons, which were rather different from other Central and Eastern Europe countries (renovation of state de jure, the lowest ratio of native nation in the population of country among CEE countries).

Restitution of former owners as a main stream in the process of changes of ownership, is characterized by high degree of restitution in previous physical borders of real properties. Process of changes in ownership is added with newly created legal base on privatization. Mixing both of those aspects created high social costs of the process and decrease in value of real properties.

Return from very primitive Soviet type property rights to property rights defined by renewed Civil Law of Latvian Republic (1937), is followed by :

- compulsory, but temporary splitting rights on real property (land and building);
- uncertainties in conditions of rights (universality, exclusivity, enforceability);
- different approaches in rural areas and cities.

Transferability of property rights is still legally restrict by subject of ownership on land (Latvian citizens and legal entities, where owners of at least 50 % of the fixed capitals are Latvian citizens, or where owners are foreigners from countries, which have bilateral foreign investment protection agreements with Latvia) and limited by technical obstacles (capacities of Land Title register and Land Survey services). Long term credit shortages, slow and weak development of mortgages, some rules in the process of alienation of real properties and unprofitability of property possession and managing are still breaking real property market (particularly in rural areas).

PART 3

SPECIAL SESSIONS

Geir Arnulf, Svein Jentoft and Nils Chr. Stenseth
The Norwegian MAB Committee

SUSTAINABLE MANAGEMENT OF COMMON PROPERTY BIO-RESOURCES

The research programme Sustainable management of common property bio-resources is at present the main Norwegian activity within the frame of the UNESCO-programme Man and Biosphere. It is funded by The Ministry of Environment and coordinated through The Norwegian Research Council. The programme (1992-97) has a total funding of NOK15 millions. In 1994 22 research projects receives funding from the programme.

The research programme aims to develop scientific competence on, and models for, management of common property bioresources focusing on two main areas:

1. Reindeer resources at Finnmarksvidda
2. Marine resources in Northern Norway and the Barents Sea

The programme will give a state of the art of scientific knowledge as regards the natural resources and its ecology. It will further provide knowledge on the interaction between nature and man, consumptive and non-consumptive use of the natural resources, formal and informal management regimes (and their legitimacy and control mechanisms), political instruments of regional and industrial character and their effects on resources and society. The programme is multidisciplinary involving social- and natural sciences as well as law. Preliminary results underlines the possibilities and limitations connected to a strengthening of the local level in resource management. The identification of local fish stocks (i.e. fjordbased) raises interesting new challenges to management. It suggests stronger local participation in public decisionmaking regarding use of these resources and raises questions about rights and the anticipation of rights regarding consumptive (economic) use of the resources. One topic covered by several projects regards the validity of traditional knowledge - and how this could be used to broaden the total knowledge as well as strengthen the democratic aspect in management of these common property bioresources. The geographic area covered by the programme has a substantial saami population and the question of how to incorporate indigenous rights and interests in to management regimes are integrated in the programme. This topic (and preliminary results) goes directly into to the political reality of Norway where the issue of local/ethnic participation in, and rights to, these bioresources are on the agenda. Furthermore this topic is directly linked up with the declaration of UNCED in Rio focusing on indigenous rights and local participation in creating just and sustainable management regimes. It is the ambition of the programme board that the projects will bring forward results that will be qualified inputs to the debate on sustainable management of common property bioresources at both national and international levels.

The results will be published by the researchers individually as well as at programme level, through participation at national and international conferences as well as through edited books.

Lloyd Binder
Arctic Institute of North America,
Calgary
Canada

CIRCUMPOLAR ABORIGINAL PEOPLE AND CO-MANAGEMENT PRACTICE: A ROUND TABLE DISCUSSION AND WORKSHOP

During the IASCP conference a round table and workshop sessions on co-management will be held. The purpose of these sessions is to discuss current issues in co-management practice.

These co-management sessions are not part of the scheduled IASCP conference program. They will be scheduled to coincide with non-peak conference hours such as lunch hours and evenings.

The session will offer co-management practitioners an opportunity to meet and share information.

The session will also be open to government managers involved in co-management regimes, consultants and others working with co-management committees, and researchers studying the subject of co-management.

The sessions will provide an opportunity for those interested in co-management to:

- * examine Arctic co-management regimes,
- * review issues of specific importance to circumpolar aboriginal people involved in co-management regimes,
- * discuss current issues and problems in co-management practice,
- * explore ways to improve participatory management systems
- * provide a networking opportunity for practitioners,
- * direct co-management research by linking the demands of user groups to the supply of researchers, and
- * identify issues that require further analysis.

Ivar Bjørklund and Jon Jørstad
Tromsø Museum, Universitetet i Tromsø
Tromsø,
Norway

SIIDA - SAMI REINDEER HERDING IN A CHANGING WORLD

Film, 54 minutes.

Through the lives and visions of a group of Sami reindeer herders, we are witnessing the historical changes which are happening to Sami pastoralism of today. The Sami experiences that traditional reindeer herding is being criminalized and that modern herding destroys the environment. The film tries to present skills and knowledge of the herders and some of the personal dilemmas they run into when meeting Norwegian laws and bureaucracy. Norwegian herding policy of today is based upon economic and biological models which often are quite different from the view of the herders. This contrast between Sami cultural practice and the Norwegian idea of "rational" herding, has established the impression that the Sami are not able to handle the reindeer herding themselves. In other words, they are turned into clients. By following a reindeer herding group - a siida - throughout the year, the film comments upon these changes through the eyes of the different herders.

Robert S. Pomeroy.
International Center for Living Aquatic Resources Management (ICLARM)
Makati, Metro Manila 0718
Philippines

Sten Sverdrup-Jensen and Jesper Raakjær-Nielsen
The North Sea Centre
Hirtshals,
Denmark

FISHERIES CO-MANAGEMENT A WORLD-WIDE. COLLABORATIVE RESEARCH PROJECT

There is a need for rapid and substantial evolution of existing fisheries management systems in developing countries to support sustainable resource use. It is unlikely that local communities can accomplish this change on their own. But neither can the national government accomplish it entirely through bureaucratic instruments. There must evolve a more dynamic partnership using the capacities and interests of the local community, complemented by the ability of the national government to provide enabling legislation and institutions and other assistance. This partnership can be called co-management, where the national government and the community share authority for fisheries management.

ICLARM, with funding from DANIDA, has embarked on a five-year world-wide research project on fisheries co-management. The research project will address issues of co-management at both the national and community levels. The research framework provides for a structural approach to examining and documenting the origin, current status, operation and performance of fisheries management systems. Institutional analysis, which examines how institutional arrangements, the set of rights and rules by which a community organises activities and which affect use behaviour and incentives, will provide the basic research framework for studying fisheries management institutions.

In the paper, we will provide details on the overall project objectives and scope, the research framework, project structures, and activities to date. It is hoped that presentation of the project framework at this meeting will provide feedback for improvement.

PART 4

TABLE OF CONTENTS

List of papers:		Page
Aarseth	Bernt	37
HERDING IN THE COASTAL COMMONS - THE POSSIBILITY FOR MANAGING COD AS LIVESTOCK		
Ahmed	Mahfuzuddin	37
INSTITUTIONALISATION OF FISHERIES CO-MANAGEMENT: EXPERIENCES WITH GO-NGO-FISHER PARTNERSHIP MODELS IN		
Alcorn	Janis B.	38
TENURIAL SHELLS AND SUBSYSTEMS: PROPERTY RIGHTS, SOCIAL ORGANIZATION AND THE ECOLOGY OF RESOURCE		
Alegret	Juan Luis	38
CONFLICTS: THE CASE OF THE CATALAN FISHERMEN CONFRERIES		
Allen	Barbara	39
FEDERAL SYSTEMS AND THE COVENANTAL TRADITION: APPROACHES TO COMMON PROPERTY DILEMMAS.		
Andersen	Kirsten Ewers	40
WHAT DO LOCAL/INDIGENOUS PEOPLE GET OUT OF BIODIVERSITY CONSERVATION? THE CASE OF THE HUAI KHA		
Andersen	Raoul	41
NEWFOUNDLAND'S SMALL CETACEAN HUNT: WHAT IT WAS AND MAY BECOME		
Anderson	C. Leigh	41
INCOME DISTRIBUTION AND PROPERTY RIGHTS ON THE ENVIRONMENT		
Angell	Jostein	42
ON NORTHERN FORUM		
Angelsen	Arild	42
BREAKDOWN OF COMMUNAL MANAGEMENT AND DEFORESTATION: A CASE STUDY FROM SUMATRA		
Antona	Martine	43
MARKETS AND COMMON PROPERTY REGIMES - SOME OBSERVATIONS		
Arifin	Bustanul	44
INDIGENOUS KNOWLEDGE AND SUSTAINABLE COMMONS: THE CASE OF AN INDONESIAN SUBAK		
Arnulf	Geir	179
SUSTAINABLE MANAGEMENT OF COMMON PROPERTY BIO-RESOURCES		

List of papers:		Page
Aubert	Hernán	44
APPLICATION OF A NEW MEASURE OF TRAWLING EFFICIENCY IN FISHERY MANGEMENT		
Auclair	Laurent	45
FORESTRY COMMONS IN MOROCCO ATLAS		
Aumeeruddy	Yildiz	45
LOCAL REPRESENTATIONS AND MANAGEMENT OF BIOLOGICAL DIVERSITY IN THE KERINCI VALLEY (CENTRAL SUMATRA):		
Bailey	Jennifer Leigh	46
TROUBLED INTERNATIONAL WATERS: BRINGING THE STATE BACK IN		
Bailly	Denis	47
SHRIMP CULTURE DEVELOPMENT AND NEW COASTAL COMMONS IN INDONESIA		
Baquero	Irma	47
PROPERTY, TECHNOLOGY AND SUSTAINABILITY EVOLUTION IN NARINO, COLOMBIA		
Begossi	Alpina	48
CULTURAL AND ECOLOGICAL RESILIENCE AMONG CAICARAS OF THE ATLANTIC FOREST COAST AND CABOCLOS OF THE		
Benjaminsen	Tor A.	48
NATURAL RESOURCE MANAGEMENT AND DECENTRALISATION. TOWARDS COMANAGEMENT IN MALI?		
Benton	Ted	20
BIODIVERSITY		
Berg	Bård A.	49
GOVERNMENT INTERVENTION INTO SAAMI REINDEER-MANAGEMENT IN NORWAY: HAS IT PREVENTED OR		
Berge	Erling	11
PROLEGOMENA		
Berglann	Helge	50
FLEXIBLE QUOTAS AS A DEVICE IN FISHERIES MANAGEMENT - A CONTROL SYSTEM BASED ON PROGRESSIVE TAXATION		
Berkes	Fikret	50
A FRAMEWORK FOR THE STUDY OF INDIGENOUS KNOWLEDGE LINKING SOCIAL AND ECOLOGICAL SYSTEMS		

List of papers:		Page
Berman	Tressa	51
CULTURAL APPROPRIATION AND LAWS OF PROPERTY IN CULTURAL PROPERTY CLAIMS		
Bertrand	Alain	52
CREATION OF NEW COMMONS AS TOOLS OF LOCAL RURAL DEVELOPMENT : RURAL MARKETS OF WOOD ENERGY IN NIGER		
Binder	Lloyd	180
CIRCUMPOLAR ABORIGINAL PEOPLE AND CO-MANAGEMENT PRACTICE		
Bjørklund	Ivar	180
SIIDA - SAMI REINDEER HERDING IN A CHANGING WORLD Film, 54 minutes.		
Bland	Simon	52
COMMON PROPERTY AND POVERTY- FISHERIES CO-MANAGEMENT IN MALAWI		
Bose	Anuradha	53
GARBAGE AS COMMONS? THE CASE OF CALCUTTA		
Bousquet	Francois	53
SIMULATING THE MANAGMENT OF A RESOURCE MOVING IN A PATCHY AND FLUCTUATING ENVIRONMENT.		
Brantenberg	Odd Terje	54
THE PASTORAL TRAGEDY IN COURT - RIGHTS OF SAMI REINDEER HERDERS, SAMI CUSTOMARY LAW AND NORWEGIAN		
Brown	Katrina	55
PLAIN TALES FROM THE GRASSLANDS: THE UTILISATION OF NATURAL RESOURCES IN ROYAL BARDIA NATIONAL PARK,		
Bråtå	Hans Olav	55
WILD REINDEER AND PLANNING IN THE RONDANE REGION		
Buck	Susan	56
BIOLOGICAL DIVERSITY AND THE STATES: IMPLEMENTING THE BIODIVERSITY CONVENTION IN THE USA		
Buoye	Thomas	57
AS USUAL EACH MANAGE YOUR OWN PROPERTY:THE STATE, PROPERTY, AND SOCIAL CONFLICT IN EIGHTEENTH CENTURY		
Campari	Joao S	57
FRONTIER EXPANSION AND DEFORESTATION IN THE BRAZILIAN AMAZON		

List of papers:		Page
Carlsson	Lars	58
HOW TO KEEP AWAY FROM THE LEVIATHAN - THE CASE OF THE SWEDISH COMMON FORESTS.		
Caulfield	Richard A.	58
INDIGENOUS PEOPLES AND COMMUNITY DEVELOPMENT QUOTAS IN ALASKA'S BERING SEA POLLOCK FISHERY:		
Chakravarty-Kaul	Minoti	59
UPHEAVAL IN THE NOMAD'S TRAIL. SURVIVAL IN THE FOREST COMMONS OF NORTHERN INDIA.		
Chmielewski	Piotr	59
MOUNTAIN COMMONS IN TATRA		
Collet	Serge	60
REJUVENATE AN OLD HALIEUTICAL WISDOM OR HOW TO RECONSTRUCT THE PARADIGM OF THE ARCHITECT OF THE SEA.		
Copes	Parzival	60
THE PROFITS OF JUSTICE: RESTORING ABORIGINAL RIVER FISHERIES IN BRITISH COLUMBIA		
Cormier-Salem	Marie	61
WEST-AFRICAN COASTAL SOCIETIES AND FISHERY SPACES		
Costanza	Robert	61
INTEGRATED ECOLOGICAL ECONOMIC MODELING AND ADAPTIVE MANAGEMENT OF COMPLEX SYSTEMS		
Dahl	Christopher	62
COMMUNITY -BASED WATERSHED PLANNING AND MANAGEMENT ON THE ISLAND OF POHNPEI, FEDERATED		
Degnbol	Tove	63
THE ROLE OF THE SAHELIAN STATE VIS-A-VIS LOCAL-LEVEL NATURAL RESOURCE MANAGEMENT - THE MALIAN		
Diegues	Antonio	63
RETHINKING AND RECREATING COMMON RESOURCES APPROPRIATION REGIMES IN BRAZIL		
Doubleday	Nancy Colleen	64
GLOBAL ISSUES, LOCAL NEEDS: THE CHALLENGES AHEAD FOR MARINE MAMMAL HARVESTING COMMUNITIES		
Dybro	Jens E.	64
ISLAMIC LAW AND THE DEVELOPMENT RURAL SETTLEMENT IN OMAN: ON THE QUESTION OF TRADITION AND DEVELOPMENT		

List of papers:		Page
Edwards	Victoria	66
THE NEW FOREST COMMONS, ENGLAND: HORSE-RIDERS BIKE-RIDERS, FREE-RIDERS.		
Eikeland	Sveinung	66
"FLEXIBILITY WHEN SPECIALISATION IS FEASIBLE" THE HARVESTING PATTERN IN NORTH NORWEGIAN COASTAL		
Einarsson	Niels	67
CULTURE AND THE KILLING OF ANIMALS: SOME THOUGHTS ON THE MANAGEMENT OF MARINE MAMMALS		
Eskesen	Mogens	67
DANISH SEINE AND GILL NET FISHERY: FORMS OF CO-OPERATION AND THE POTENTIAL OF CONFLICTS		
Eythorsson	Einar	68
FROM COMMON PROPERTY TO PRIVATE PROPERTY - ICELAND'S EXPERIENCE WITH A MARKET SOLUTION TO THE "TRAGEDY OF		
Eythorsson	Einar	68
WHO SHOULD HAVE A VOICE IN MANAGEMENT OF LOCAL MARINE RESOURCES?		
Famoriyo	Segun	69
LEGALIZING THE COMMONS-REVISITING NIGERIA'S LAND USE ACT		
Feeny	David	13
OPTIMALITY, SUB-OPTIMALITY, NIRVANA, AND TRANSACTION COST: FORAGING ON THE COMMONS (Plenary)		
Fingleton	Paul	69
EVALUATION OF THE POTENTIAL FOR INTEGRATED COASTAL MANAGEMENT WITH PARTICULAR REFERENCE TO THE IRISH		
Finsveen	Mathias	70
THE BYGDE-COMMONS IN NORWAY		
Fluharty	David	71
EVOLUTION OF FISHERIES ENFORCEMENT ISSUES IN NORTH PACIFIC		
Folke	Carl	71
RESILIENCE AND THE CO-EVOLUTION OF ECOSYSTEMS AND INSTITUTIONS		
Fontenelle	Guy	72
CAN A CO-MANAGEMENT ARRANGEMENT BE DEVELOPED FOR WILLAPA BAY WATERSHED, WA, USA?		

List of papers:		Page
Forni	Nadia	72
THE EVOLUTION OF COMMON PROPERTY RESOURCE MANAGEMENT (CPRM) IN CENTRAL ITALIAN PASTORAL AREAS.		
Frangoudes	Katia	73
CHANGING FISHERIES MANAGEMENT INSTITUTIONS IN THE FRENCH MEDITERRANEAN		
Freeman	Milton	73
ADAPTIVE MANAGEMENT OF MARINE MAMMALS: ACCENTUATING THE POSITIVE		
Freudenberger	Mark S.	74
THE EMERGENCE OF COMMON PROPERTY REGIMES IN THE WEST AFRICAN SAHEL: A COMPARATIVE STUDY OF THE		
Fricke	Peter H.	74
CO-MANAGEMENT IN UNITED STATES' MARINE FISHERIES: REFLECTIONS ON THE SHARING OF GOVERNANCE		
Ghosh	Madan Gopal	75
COMMON PROPERTY RESOURCE USE BY POOR IN WEST BENGAL		
Ginter	Jay J.C.	76
THE ALASKA COMMUNITY DEVELOPMENT QUOTA PROGRAM		
Glasbergen	Peter	76
MANAGING COMMON GROUNDWATER RESOURCES: THE CASE OF THE NETHERLANDS		
Gousseff	Vsevolode	77
INSTALLATION AND ALLOTMENT OF HOMESTEADS TO RUSSIAN REFUGEES IN THE RIAZAN OBLAST		
Guangjing	Ma	78
FOREST, ENVIRONMENT, SUSTAINABLE DEVELOPMENT COMMON FOREST RESOURCES SUSTAINABILITY AND		
Guizol	Philippe	80
LINEAL EROSION IN BURUNDI		
Gundersen	Frode	80
LOCAL INSTITUTIONS AND THE MANAGEMENT OF COMMON PROPERTY		
Gundersen	Tore	5
NORWEGIAN POLICY ON RESOURCE MANAGEMENT IN THE NORTH		

List of papers:

	Page
Hadi Satyawati FOREST LAND RESOURCE IN INDONESIA: COMMON PROPERTY RESOURCE AND A QUEST FOR SURVIVAL	81
Hallenstvedt Abraham REGULATIONS, CONTROL AND ENFORCEMENT: THE WEST-NORDIC COUNTRIES INFORMATION AS A CRITICAL	81
Hammer Monica RESOURCE MANAGEMENT AND ECOSYSTEM RESILIENCE: A CASE STUDY OF THE BALTIC SEA FISHERIES	82
Hanna Susan BUILDING FISHERIES STEWARDSHIP THROUGH INDUSTRY PARTICIPATION IN MANAGEMENT	83
Hansen Bente Vibeke CHANGING PROPERTY RIGHT REGIMES IN GREENLAND - AFFECTS ON MANAGEMENT ISSUES	83
Hansen Lars Ivar THE HISTORY OF THE COMMONS OF NORTHERN FENNOSCANDIA IN AN INTER-ETHNIC PERSPECTIVE.	84
Hendricks Frederick ANTINOMIES OF ACCESS: SOCIAL DIFFERENTIATION AND COMMUNAL LAND IN A NAMAQUALAND RESERVE, SOUTH	84
Hervé Dominique COMMUNITIES AND COLLECTIVE USAGE OF LAND RESOURCES IN THE ANDES	85
Hess Charlotte THE VIRTUAL CPR: THE INTERNET AS A LOCAL AND GLOBAL COMMON POOL RESOURCE	86
Hingco Theres Gladys AN ASSESSMENT OF PHILIPPINE EXPERIENCES IN IMPLEMENTING THE COMMUNITY-BASED APPROACH TO	86
Holm Petter FISHERIES MANAGEMENT AND THE DOMESTICATION OF NATURE	87
Hønneland Geir ENFORCEMENT AND CONTROL IN THE RUSSIAN ZONE OF THE BARENTS SEA THE ROLE OF THE NORWEGIAN COAST GUARD IN	88
Høydahl Even PROPERTY RIGHTS TO HYDRO POWER IN A DEREGULATED MARKET	89

List of papers:		Page
Ilahiane	Hsaïn	89
	COMMON PROPERTY, ETHNICITY, AND SOCIAL EXPLOITATION IN THE ZIZ VALLEY, SOUTHEAST MOROCCO	
Jena	Nalin Ranjan	90
	STATE, PASTORAL NOMADS AND THE COMMONS: A STUDY OF THE MUSLIM GUJJAR TRIBE IN NORTH INDIA.	
Jentoft	Svein	91
	FISHERIES MANAGEMENT IN POST-COMMUNIST POLAND: PROSPECTS OF USER-GROUP PARTICIPATION	
Jodha	N.S.	91
	FUTURE OF COMMON PROPERTY RESOURCES. WHY CONCERNS DONOT CONVERT INTO ACTION?	
Joshi	Yogesh C.	92
	MANAGEMENT OF COMMONS IN ARID AREAS OF INDIA AND ROLE OF LOCAL GOVERNMENTS	
Kalland	Arne	93
	IKI ISLAND AND THE DOLPHIN TRAUMA	
Kalstad	Johan Klemet	94
	PASTORALISM AND MANAGEMENT OF COMMON LAND IN FINNMARK	
Karlsen	Geir Runar	94
	ETHNICITY AS A MANAGEMENT STRATEGY IN FISHERIES	
Karsenty	Alain	95
	THE CREATION OF COLLECTIVE LANDS IN MOROCCO	
Kendrick	Anita	95
	UNEQUAL ACCESS TO COASTAL RESOURCES: CAPITALIZATION AND SOCIAL STRATIFICATION IN AN INDONESIAN FISHERY	
Kenkmann	Paul	96
	Privatization in Estonia	
Khakhar	K.K.	96
	STAGING DIVINE COMEDY ON THE WATERS : 'SWADHYAYA' - EXPERIMENT IN INDIAN FISHERIES	
Khouzam	Raouf	97
	REINVENTING THE MANAGEMENT OF IRRIGATION COMMON POOL RESOURCES: A CASE STUDY FROM EGYPT	

List of papers:	Page
Knudsen Are "REINVENTING" THE COMMONS: NEW METAPHOR OR NEW METHODOLOGY?	97
Knudsen Ståle AQUACULTURE ALONG TURKEY'S BLACK SEA COAST. KNOWLEDGE AND CAPITAL.	98
Kofinas Gary WAYS OF KNOWING CARIBOU: COMMUNITY DILEMMAS AND POWER DYNAMICS IN CO-MANAGEMENT DECISION MAKING.	98
Kokwe Misael RURAL LIVELIHOOD STRATEGIES EFFECTS ON THE ECOLOGY OF ZAMBIAN WETLANDS: POLICY AND INSTITUTIONAL	99
Kontogianni A MONITORING AND ENFORCING THE USE OF LOCAL COMMONS: MARINE RESOURCES IN THE AEGEAN ARCHIPELAGO	100
Korzycka-Iwanow Malgorzata OWNERSHIP TRANSFORMATIONS IN POLISH AGRICULTURE	101
Lane Charles CONTROL OF THE COMMONS: DRAWING LESSONS FROM THE BARABAIG CASE FOR LAND POLICY IN TANZANIA	102
Lescuyer Guillaume EMPIRICAL AND THEORETICAL LIMITS OF CVM: LESSONS FROM AN EXPERIENCE IN A CAMEROONIAN FOREST	102
Levang Patrice NEW FACE FOR ANCIENT COMMONS IN TROPICAL FOREST AREAS? THE "AGROFOREST STRATEGY" OF INDONESIAN	103
Levina Tatiana COMMON LAND RENEWAL IN RUSSIA: PROBLEMS AND APPROACHES	103
Low Bobbi A REVIEW OF FIVE STUDENT PAPERS	104
Lund Søren RATIONAL INSTITUTIONAL CHOICE THEORY AND THE DESIGN OF APPROPRIATE INSTITUTIONAL ARRANGEMENTS FOR	107
Lynch Owen SECURING THE BALANCE: NATIONAL LAWS AND COMMUNITY-BASED FOREST MANAGEMENT IN SEVEN ASIAN	108

List of papers:		Page
Macdonald	Theodore	108
LAND TENURE, LAND USE AND INTER-ETHNIC POLITICS: AMAZONIAN INDIANS IN THE 1990S		
MacInnes	Daniel	109
ACADIAN VERSUS HIGHLAND SCOTTISH SELF IDENTIFICATION AS FISHERS.		
Mackenzie	Fiona	109
CONFLICTING CLAIMS TO 'CUSTOM' IN THE STRUGGLE OVER LAND AND ENVIRONMENT, KENYA.		
Madsen	Stig Toft	110
SINS OF OMISSION AND SINS OF COMMISSION: RECENT CHANGES IN INDIA'S FOREST POLICY.		
Madzudzo	Elias	111
CATTLE, GRAZING AND RANGELAND TENURE IN BULILIMAMANGWE		
Magga	Ole Henrik	23
RIGHTS FOR INDIGENOUS PEOPLE		
Maheshwari	R.C.	111
UTILIZATION OF COMMON PROPERTY RESOURCES FOR MAKING A VILLAGE SELF- RELIANT -- A CASE STUDY		
Maitreyi	Kollegal R	112
SUSTAINABILITY OF EXTERNALLY INITIATED NEW COMMON PROPERTY REGIMES: THE JOINT FOREST MANAGEMENT		
Manning	Peter	112
MANAGING NAMIBIA'S FISHERIES: A COMMON PROPERTY RESOURCE OR CANDIDATE FOR TRADABLE PROPERTY RIGHT?		
Mathieu	Paul	113
PROJECT CONDITIONALITY AND INSTITUTIONAL UNSUSTAINABILITY: THE CASE OF WATER USERS'		
Mathis	Mitchell L.	114
THE EFFECT OF SUNK CAPITAL ON THE OPTIMAL MANAGEMENT OF COMMON STOCK SEARCH FISHERIES		
Mathisen	Stein R.	114
WHALING AND CULTURAL IDENTITY IN NORWAY		
Matowanyika	Joseph Zano	115
THE CHANGING FORMS OF COMMON PROPERTY ARRANGEMENTS IN ZIMBABWE OVER THE LAST CENTURY		

List of papers:		Page
Maurstad	Anita	115
FISHERMENS' CUSTOMARY TENURE AND STATUTORY LAW CONCERNING THE COD-FISHERY IN NORTH NORWEGIAN		
McCay	Bonnie J.	116
"THAT'S NOT RIGHT": RESISTANCE TO ENCLOSURE IN NEWFOUNDLAND FISHERIES		
McCay	Bonnie J.	19
THE NETTING MEMORIAL LECTURE		
McGuire	Thomas R.	116
SUSTAINABLE DEVELOPMENT IN A MARINE RESERVE: PROBLEMS, POLITIS, AND PROSPECTS		
McKean	Margaret A.	116
COMMON PROPERTY REGIMES AS A SOLUTION TO PROBLEMS OF SCALE AND LINKAGE		
McKean	Margaret A.	33
REINVENTING THE COMMONS		
Mearns	Robin	117
WHAT FUTURE FOR THE PASTORAL COMMONS OF POST-SOVIET CENTRAL ASIA?		
Mehta	Madhusudan	117
PROBLEMS OF CREATION OF COMMON PROPERTY RESOURCES IN SEMI-ARID & SALINE AREAS -- A CASE STUDY OF KACHCHH		
Menaria	Rajendra.	118
PROBLEMS OF CREATION OF COMMON PROPERTY RESOURCES IN SEMI-ARID & SALINE AREAS -- A CASE STUDY OF KACHCHH		
Mestelman	Stuart	119
STUDYING ENVIRONMENTAL REGULATION IN LABORATORY ENVIRONMENTS		
Metcalf	Simon	119
LIVESTOCK WILDLIFE AND THE FORAGE COMMONS. PROSPECTS FOR RANGELAND REFORM IN A SEMI-ARID COMMUNAL AREA		
Mickels	Gun	120
COMMON PROPERTY RESOURCES: AN ARENA FOR CONFLICT BETWEEN THE STATE AND CIVIL SOCIETY IN ZAMBIA		
Mikalsen	Knut H.	121
DOCKSIDE MONITORING FOR THE MOBILE GEAR ITQ SYSTEM IN THE SCOTIA-FUNDY REGION: SOLVING PROBLEMS OR		

List of papers:		Page
Mitra	Manoshi	121
	REINVENTING THE COMMONS WITH GENDER PERSPECTIVES: WOMEN'S ROLES IN REDEFINING COMMON PROPERTY	
Moir	Rob	121
	VOLUNTARY CONTRIBUTIONS TO GROUP GOODS: ALTRUISM OR SELF-INTEREST	
Morgan	Betty N.	122
	CHAOS ON THE COMMONS: CONSIDERING THE IMPLICATIONS OF NONEQUILIBRIUM THEORY FOR COMMON PROPERTY	
Mounolou	Jean Claude	20
	BIODIVERSITY: SCIENTIFIC STAKES AND RELATED INFERENCES	
Muller	R. Andrew	122
	POLLUTION EMISSION PERMIT TRADING: AN EVALUATION OF CANADIAN PROPOSALS	
Munk-Madsen	Eva	123
	FROM COMMON PROPERTY TO ALL-MALE PROPERTY IN NORWEGIAN SMALL-SCALE FISHING - A GENDER PERSPECTIVE	
Nesheim	Tore	123
	THE CULTURAL CONSTRUCTION OF NATURE - INCLUDING RESOURCES	
Nilsen	Ragnar	124
	COASTAL SAMI FISHING UNDER PRESSURE	
North	Douglass C	25
	THE NEW INSTITUTIONAL ECONOMICS AND DEVELOPMENT	
Norum	Lars	124
	THE LAND CONSOLIDATION COURTS IN NORWAY: DESIGNING RULES FOR JOINT OWNERSHIP	
Novakovsky	Leonid Ya.	124
	THE PARTICULARITIES OF LAND PRIVATISATION IN UKRAINE	
O'Connor	Martin	125
	THE DYNAMICS OF DISPOSSESSION	
Ojok	Luke Ipoto	126
	IMPACT OF WARFARE ON THE COMMONS	

List of papers:		Page
Olomola	Aderibigbe	126
	SOURCES AND RESOLUTION OF CONFLICTS IN NIGERIAN ARTISANAL FISHERIES	
Olsen	Jonas	127
	"COMMON PROPERTY" OR FLEXIBLE RESOURCE USE MANAGEMENT?: ACCESS TO FAIDHERBIA ALBIDA IN	
Olwig	Karen Fog	127
	CARIBBEAN FAMILY LAND: COMMUNAL LAND IN A PERIPHERAL SOCIETY	
Olwig	Kenneth R	128
	REINVENTING NATURE AS COMMONS: PRIVATE TRAGEDY, PUBLIC COMEDY AND THE CONSTITUTION OF DEMOCRATIC	
Osherenko	Gail	128
	CHANGING PROPERTY RIGHTS IN NORTHWEST SIBERIA: BETWEEN COLLECTIVIZATION AND PRIVATIZATION	
Ostrom	Elinor	129
	THE RELATIONSHIP BETWEEN ECOSYSTEMS AND INSTITUTIONS: SCALE CHALLENGES IN NATURAL RESOURCE	
Otterstad	Oddmund	129
	IDEAL-TYPE MODELS OF NORWEGIAN FISHERIES: MODEL DEVELOPMENT WITH PRACTICE IN MIND	
Ouyang	Xin	130
	CHINA'S ACTION PLAN: BIODIVERSITY CONSERVATION	
Pálsson	Gísli	130
	FIGURING FISH AND MEASURING MEN: THE QUOTA SYSTEM IN THE ICELANDIC COD FISHERY	
Pálsson	Gísli	131
	LEARNING BY FISHING: PRACTICAL SCIENCE AND SCIENTIFIC PRACTICE	
Patel	Haribhai G.	131
	INSTITUTIONAL INNOVATION IN UNDERGROUND WATER MANAGEMENT IN WESTERN INDIA	
Paulsen	Jens M.D.	132
	THE NORTH ATLANTIC MARINE MAMMAL COMMISSION - REGIONAL APPROACHES TO THE MANAGEMENT OF WHALES	
Payne	Holly E.X.	132
	THE LONG-TERM POWER OF COMMON PROPERTY RESOURCES: LOCAL MANAGEMENT OF THE INTERNATIONAL DEMAND FOR	

List of papers:		Page
Pinkerton	Evelyn	132
ALTERNATIVES TO THE "PROPERTY" DILEMMA: WHAT IS THE MOST USEFUL WAY TO CONCEPTUALIZE CO-MANAGEMENT		
Pomeroy	Robert S.	133
CO-MANAGEMENT OF MARINE FISHERIES AND OTHER COASTAL RESOURCES IN AN ISLAND ENVIRONMENT: THE CASE OF		
Pomeroy	Robert S.	181
FISHERIES CO-MANAGEMENT A WORLD-WIDE. COLLABORATIVE RESEARCH PROJECT		
Potkanski	Tomasz	133
LIVESTOCK AS COLLECTIVE VS. INDIVIDUAL PROPERTY AMONG THE TANZANIAN MAASAI: MANAGEMENT OF LIVESTOCK AS A		
Pradhan	Ujjwal	134
GOVERNANCE AND LEGAL PLURALISM: TOWARDS LOCAL MANAGEMENT OF IRRIGATED AGRICULTURE		
Prakash	Sanjeev	135
INFORMAL INSTITUTIONS, CPR'S AND THE SOCIAL CONTEXT OF FAIRNESS: FOREST AND PASTURE COMMONS MANAGEMENT IN		
Prasad	Archana	135
INVENTING THE COLONIAL COMMONS : FOREST LANDS AND ENCLOSURES IN COLONIAL CENTRAL INDIA		
Pribytkova	Irina	136
ATTITUDES TOWARDS PRIVATIZATION OF LAND AMONG UKRAINIAN PEASANTRY		
Princen	Thomas	137
A's AND B's: DYNAMICS OF RESOURCE USE AMONG PROPERTY REGIMES AND STATES		
Queirolo	Lewis E.	137
TRANSFORMATION OF THE COASTAL COMMONS THROUGH COOPERATIVE FISHING ARRANGEMENTS		
Raakjær-Nielsen	Jesper	138
FISHERIES MANAGEMENT AND ENFORCEMENT IN A DANISH PERSPECTIV		
Raakjær-Nielsen	Jesper	138
FISHERIES CO-MANAGEMENT: AN ALTERNATIVE MANAGEMENT STRATEGY.		
Rahman	M. Mokhlesur	139
WETLANDS AND BIODIVERSITY: A CASE STUDY OF COMMON PROPERTY RESOURCES IN BANGLADESH		

List of papers:		Page
Reddy	D. Narasimha POLITICAL ECONOMY OF STATE PROPERTY AND THE COMMONS IN SOUTH INDIA.	140
Ripnes	Ann Heidi LAND POSSESSION - BETWEEN COLLECTIVISM AND INDIVIDUALISM.	140
Ris	Mats INUIT BOWHEAD WHALING: CANADIAN INUVIALUIT RESPONSE TO TRADITION AND MODERN MANAGEMENT	141
Riseth	Jan Åge DEVELOPMENT OF PROPERTY REGIMES AND INSTITUTIONAL STRUCTURE FOR SUSTAINIBILITY IN THE SAAMI REINDEER	141
Rivza	Baiba ATTITUDE OF THE CITIZENS TOWARDS THE PRIVATIZATION OF LAND IN LATVIA	142
Robinson	Deborah COMMERCIAL FISHERIES ON KODIAK ISLAND. ALASKA: CHANGING RELATIONSHIPS TO MARINE RESOURCES IN OLD	143
Ruddle	Kenneth DESIGN PRINCIPLES AND THE RESILIENCE OF COASTAL-MARINE COMMON PROPERTY FISHERY MANAGEMENT	143
Ruf	Thierry IRRIGATION, WATER RIGHTS , STATE AND PEASANT COMUNITIES IN THE ECUADORIAN ANDES.	144
Rutten	Marcel THE TRAGEDY OF INDIVIDUALISING THE COMMONS	145
Rystad	Kyrre REESTABLISHING COMMON PROPERTY RIGHTS IN NORDLAND AND TROMS IN NORTHERN NORWAY	145
Sagdahl	Bjørn FISHERY REGULATIONS, ENFORCEMENT AND CONTROL A NOTE ON THE RELATION BETWEEN LEGITIMACY AND CONTROL IN	146
Samantar	Mohamos S. THEORETICAL AND PRACTICAL FRAMEWORKS OF ANALYSIS OF PASTORAL COMMON PROPERTY REGIMES IN SOMALIA	147
Sandberg	Audun COMMONS OF THE NORTH ATLANTIC COASTS	147

List of papers:		Page
Sandberg	L. Anders PROPERTY RIGHTS, SMALL WOODLOT OWNERS AND FOREST MANAGEMENT IN NOVA SCOTIA	148
Sandersen	Haakan T. DISCURSIVE DESIGNS OF CO-MANAGEMENT INSTITUTIONS? - LESSONS TO LEARN FROM SMALL SCALE FISHERIES IN THE	148
Sara	Anders REINDEER ECONOMICS AND THEIR TRANSFORMATIONS	149
Schans	Jan Willem SALMON FARMING IN THE UK.	149
Schlager	Edella STATE CENTERED MANAGEMENT AND LOCAL LEVEL REVOLT: THE CASE OF ARIZONA GROUNDWATER POLICY	150
Schulz	Carl-Erik THE COMMONS UNDER FOREIGN STRESS: TRADE POLICY TO OVERRULE NATIONAL MANAGEMENT	150
Selmi	Adel Islam et gestion des ressources naturelles	151
Sengupta	Nirmal CURRENT FOREST AND WATER POLICIES IN INDIA - SOME FACTS AND APPRAISAL	151
Sevatdal	Hans LEGISLATION CONCERNING THE NORWEGIAN COMMONS	151
Shanmugaratnam	N. NATIONALISATION AND PRIVATISATION OF LAND AND THE DILEMMAS OF COMMON RESOURCES MANAGEMENT IN ARID	152
Shivakoti	Ganesh LOCAL SUPPORT SERVICES PROVIDED FOR FARMER-MANAGED IRRIGATION SYSTEMS IN NEPAL	152
Shrestha	Sugandha REVIVING THE LOST COMMONS : THROUGH FARMING SYSTEMS PERSPECTIVE	153
Singh	Neera M. COMMUNITY FOREST MAMANGEMENT SYSTEMS IN ORISSA: INSTITUTIONAL ARRANGEMENTS	153

List of papers:		Page
Singh	R.B. COMMON RESOURCES AND SUSTAINABLE LIVELIHOOD OF MOUNTAIN ENVIRONMENT: A MICRO-LEVEL EXPERIENCE OF	154
Skogseid	Harald WHOSE COMMONS ? PASTORAL NOMADS MOVING BETWEEN OTHERS` COMMONS AND OTHERS` PRIVATE PROPERTIES: THE	155
Skonhoft	Anders ON THE EXPLOITATION OF AN UNMANAGED LOCAL COMMON. HARDIN'S ANALYSIS RECONSIDERED	155
Skourtos	Michalis S. THE USE OF BENEFIT ESTIMATION IN PRESERVING THE COMMONS: AN APPLICATION OF THE CONTINGENT VALUATION	156
Snow	Norman WHITHER GOEST THE ERRANT BELUGA? (AND WHERE IS IT LEADING US?)	156
Soeftestad	Lars T USING COMMON PROPERTY IN DESIGNING DEVELOPMENT ASSISTANCE: APPLICATIONS TO COASTAL ZONE MANAGEMENT	157
Soriano	Marietta C. CONTRACTOR'S PROFILE AND PERCEPTIONS OF THE CONTRACT REFORESTATION PROGRAM IN THE PROVINCE OF TARLAC	158
Soroos	Marvin S. THE ATMOSPHERE AS A GLOBAL COMMONS	158
Stanbury	Pamela PROPERTY RIGHTS: A CRITICAL DEVELOPMENT STRATEGY FOR FOOD AID AND FOOD SECURITY	159
Steins	Nathalie A CO-OPERATIVE, COMMON PROPERTY RESOURCE MANAGEMENT AND SOCIO-ECONOMIC DEVELOPMENT: THE	159
Sumaila	Ussif Rashid A TWO-AGENT MODEL FOR THE ARCTO-NORWEGIAN COD	160
Svarstad	Hanne TROPICAL GENES FOR SALE: WHO BENEFITS?	160
Swallow	Brent INCORPORATING RISK IN A MODEL OF INDUCED INSTITUTIONAL CHANGE FOR CROP-LIVESTOCK SYSTEMS IN	161

List of papers:		Page
Swallow	Brent	161
	DO CONTINGENT CONTRIBUTIONS IMPLY CONTINGENT VALUATIONS? ASSESSING WILLINGNESS TO CONTRIBUTE TO	
Swift	Jeremy	162
	CREATING AND ADAPTING INSTITUTIONS FOR SUCCESSFUL PASTORAL COMMON PROPERTY MANAGEMENT	
Sørensen	Carol	162
	CONTROLS AND SANCTIONS OVER THE USE OF RESOURCES IN THE KAFUE FLATS OF ZAMBIA	
Takforyan	Ani	163
	WILDLIFE MANAGEMENT: NEW COMMONS AS AN ALTERNATIVE TO PROTECTED AREAS ? THE CASE OF THE DIMAKO FOREST	
Talbott	Kirk	163
	STRENGTHENING INSTITUTIONAL CAPACITIES FOR MANAGING NATURAL FOREST SYSTEMS IN MAINLAND SOUTHEAST ASIA.	
Tana	Touch Seang	164
	COMMON PROPERTY MANAGEMENT OF CAMBODIA'S FRESHWATER CAPTURE FISHERIES - ISSUES AND APPROACHES	
Thannberger	Elisabeth	164
	COMMON COUNTRYSIDE MANAGEMENT BASED UPON CONTRACTS	
Thapa	Man B.	165
	INDIGENOUS INSTITUTIONS AND PASTURE MANAGEMENT IN HIGH ALTITUDE NEPAL	
Thébaud	Olivier	166
	DECISION MAKING PROCESSES IN THE MANAGEMENT OF COASTAL COMMONS : CASE STUDIES FROM THE CARIBBEAN	
Thomson	James T.	166
	MALI: THE ENABLING FRAMEWORK FOR USER-BASED GOVERNANCE OF FOREST RESOURCES, and	
Thomson	James T.	167
	MADAGASKAR: ASSESSMENT OF EFFORTS TO CREATE AN ENABLING FRAMEWORK FOR USER-BASED GOVERNANCE OF	
Tiwari	Dirgha Nidhi	167
	RETHINKING THE COMMONS IN THE CONTEXT OF GROWING RESOURCE SCARCITY AND EXTERNALITIES: DEVELOPMENT OF	
Townsend	Ralph	168
	PRESERVING COMMUNITY INTERESTS UNDER FISHERIES ENCLOSURE	

List of papers:		Page
Tretvik	Aud	169
FIELDS AND FORESTS. LEGISLATION, MANAGEMENT AND THE VIEW OF COMMON PROPERTY IN NORWAY IN THE 17TH AND		
Tungittioplakorn	Waranoot	169
COMMON PROPERTY RESOURCES AS A SOLUTION TO THE CONFLICT BETWEEN HIGHLANDS AND LOWLANDS		
Turay	Foday	170
MANAGING EXPLOITATION RIGHTS IN THE INSHORE MARINE FISHERIES OF SIERRA LEONE		
Vásquez-León	Marcela	171
AVOIDANCE STRATEGIES AND GOVERNMENTAL RIGIDITY: THE CASE OF THE SMALL-SCALE SHRIMP FISHERY IN SONORA,		
Vedeld	Trond	171
STATE LAW FACING LOCAL LAW: THE DISSOLUTION OF CUSTOMARY TENURE REGIMES AMONG THE FULANI OF MALI		
Vestergaard	Torben A.	172
A SOCIO-CULTURAL PERSPECTIVE ON FISHERIES MANAGEMENT IN DENMARK		
Waeraas	Gro	172
CREATING NEW COMMONS : " LANDSCAPING " AND LOCAL DEVELOPMENT IN FRANCE		
Weigel	Jean Yves	173
TRADITIONAL FISHERY MANAGEMENT : SOME WEST AFRICAN LESSONS		
Wilson	James A.	174
AN INTERACTIVE MODEL OF THE SCALE EFFECTS IN ECOSYSTEM GOVERNANCE		
Witbreuk	Marc J.G.	174
COLLECTIVE ACTION AND REGIONAL TRANSPORT POLICY		
Wittayapak	Chusak	175
LOCAL INSTITUTIONS IN COMMON PROPERTY RESOURCES: A STUDY OF COMMUNITY-BASED WATERSHED MANAGEMENT IN		
Yonzon	Prasanna	175
CHANGES OF SWAYAMBHU NATIONAL FOREST OVER A HUNDRED AND FIFTY YEARS		
Zile	Roberts	176
CHANGING OWNERSHIP AND THE SYSTEM OF PROPERTY RIGHTS IN LATVIA: RESTITUTION AND PRIVATIZATION - LEGAL,		

ORGANISING COMMITTEES

PROGRAMME COMMITTEE

Norway

Associate Professor **Erling Berge**
Department of Sociology and Political Science,
AVH
University of Trondheim, N-7055 Dragvoll
tel.: + 47 73 59 17 21; fax: +47 73 59 15 64
e-mail: erling.berge@svf.unit.no

Associate Professor **Audun Sandberg**
Høgskolen i Bodø, N-8002 Bodø
tel. + 47 75 51 73 10 fax: +47 75 51 74 57
e-mail: audun.sandberg@isv.hsn.no

Associate Professor **Alf Haakon Hoel**
NFH/University of Tromsø

Research Fellow **Trond Vedeld**
Norwegian Association for Development Research
NORAGRIC, Agricultural University of Norway,
Ås

Denmark

Assoc. Research Professor Dr. **Elisabeth Vestergaard**
Department of Ethnography and Social
Anthropology, Aarhus University

Iceland

Professor **Gísli Pálsson**
Department of Anthropology, University of Iceland

Sweden

Deputy Director **Carl Folke**
The Beijer Institute
The International Institute of Ecological Economics
The Royal Swedish Academy of Sciences,
Stockholm

Finland

Dr. **Kaisa Korpijaakko-Labba**
Nordic Saami Institute, Kautokeino, Norway

HEAD OF ORGANISING COMMITTEE IN BODØ

Associate Professor **Bjørn Sagdahl**
Høgskolen i Bodø,

Conference secretary **Trond Kristiansen**
Høgskolen i Bodø, N-8002 Bodø, Norway
tel.: +47 75 51 73 16 switchboard +47 75 51 72
00
fax: +47 75 51 74 57
e-mail: Trond.Kristiansen@isv.hsn.no

CONSULTING MEMBERS

President of IASCP, Professor **David Feeny**
McMaster University, Hamilton, Canada

President-elect of IASCP
Professor **Margaret A. McKean**
Duke University, Durham, U.S.A.

IASCP Secretary/Treasurer **Charlotte Hess**
Indiana University, Bloomington, U.S.A.

Professor **Svein Jentoft**
University of Tromsø, Norway

Dr. **Jacques Weber**
CIRAD, Paris, France

Research Fellow **Are Knudsen**
The Christian Michelsen Institute
Fantoft, Norway

SECRETARIAT

Conference Secretary
Anne Utvær, Executive Officer
Centre for Sustainable Development
Agricultural University of Norway
PO Box 5001, N-1432 Ås, Norway
tel.: +47 64 94 93 80; fax: +47 64 94 93 81
e-mail: anne.utvaer@sbu.nlh.no

Dr **Ragnar Øygard**, Director
Centre for Sustainable Development
Agricultural University of Norway
P.O. Box 5001, N-1432 Ås, Norway
tel.: +47 64 94 93 86; fax: +47 64 94 93 81
e-mail: sburo@sbu.nlh.no

CONFERENCE BANK ACCOUNT

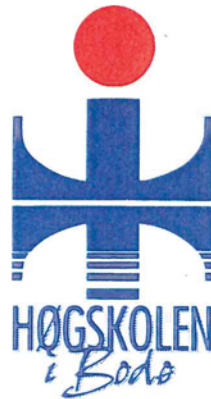
The International Association for the Study
of Common Property
Account no 82100475304
Sparebanken NOR
Kirkegaten 18
0153 OSLO, Norway



INTERNATIONAL
ASSOCIATION FOR THE
STUDY OF
COMMON
PROPERTY



NLH
AGRICULTURAL
UNIVERSITY OF NORWAY



UNIVERSITETET I TRONDHEIM
DEN ALLMENNVIITENSKAPELIGE HØGSKOLEN
INSTITUTT FOR SOSIOLOGI OG STATSVITENSKAP

LANDSDELSUTVALGET

(Omfatter Nord-Norge og Namdalen)