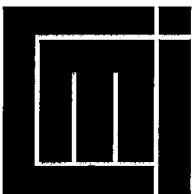


Living with the Commons:

Local Institutions for Natural Resource Management

Are J. Knudsen

R 1995: 2
May 1995



Report
Chr. Michelsen Institute
Bergen Norway

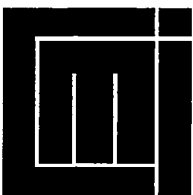
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Preface

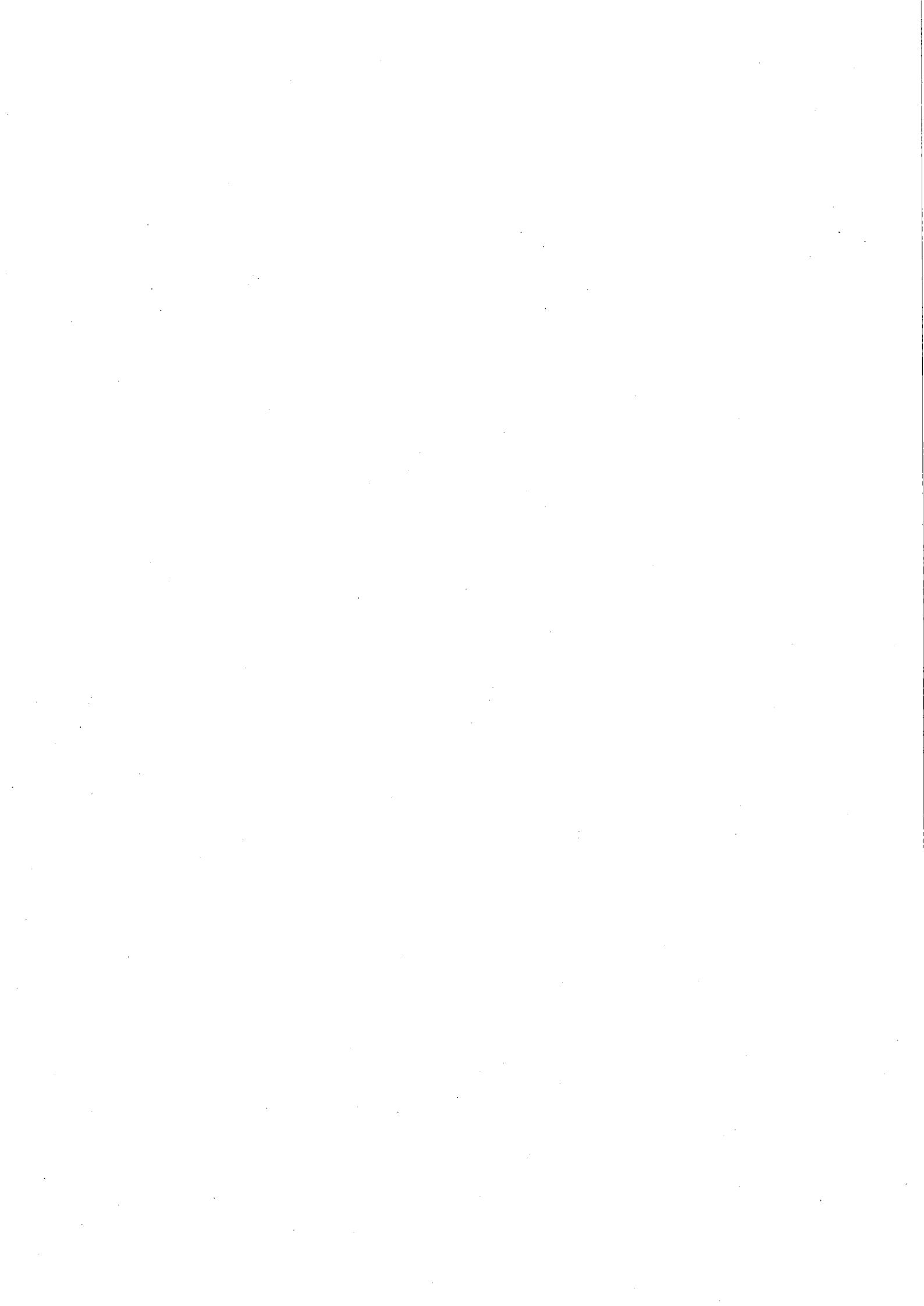
The purpose of this report is to present the “state-of-the-art” of research on common property regimes. Hopefully, this report can serve as an introduction to common property theory for non-specialists, as well as being useful to scholars who are engaged in research on common property regimes. In order to aid future research on the subject, the bibliography accompanying the report is available in electronic form to students and researchers.* With the staggering amount of new publications in this field, it has been necessary to limit both the thematic and the geographic coverage. The three themes which have been selected for closer study are coastal fisheries, rangelands management with an emphasis on East African pastoralism, and forestry management. It has been necessary to leave out work on irrigation, even though it clearly is a relevant and important theme (cf. Wade 1988; Coward 1990; Ostrom and Gardner 1993). Regionally, case studies from Africa and Asia have been preferred over material from the rest of the world. This delimitation is deferred to pick up important contributions from the North Atlantic region, including Northern Norway, as well as Oceania, because without them, important theoretical contributions would have been left out. The bibliography accompanying this report is not exhaustive, neither was it intended to be so. There has, however, been a conscious effort to find new, and less well known material in addition to classic material presented elsewhere. The studies selected for inclusion in the report reflect their importance in terms of theory and thematic scope, and whether they bring new points to the debate. Naturally, a short report of this kind cannot do justice to the subtlety of the original works, but can only summarize their main points.

* The bibliography contains 342 entries. A diskette containing the bibliography included in the report is available from CMI for an additional cost of NOK 50 (including postage). The diskette contains the bibliography in three different formats: unformatted text file (ASCII), formatted (WordPerfect 5.1 for DOS) and database file (DataPerfect 2.1). Readers are also advised to consult two excellent bibliographies (Martin 1989, 1992), which provide a number of references to common property regimes throughout the world. They are available directly from Indiana University (USA) on plain paper and diskette. Online searches can also be done using the Internet (WWW: //lib-gopher.lib.indiana.edu).

The preparation of this report was supported by a grant from the Norwegian Research Council to promote aid-related environmental competence (“Miljøkompetanseprogrammet”). This study could not have been completed without help to identify hard-to-find articles and books by CMI library staff, Kari Herland and Hilde Sperrevik. Thanks are also due to editorial assistance from Inger A. Nygaard and to colleagues at CMI — Arild Angelsen, Johan Helland, Eyolf Jul-Larsen and Ussif R. Sumaila — who commented on earlier drafts of the manuscript. Remaining shortcomings, omissions and errors are, of course, my own.

Bergen, May 1995

AJK



1. The “tragedy of the commons”: The legacy of Hardin

Introduction

Natural resource management has recently generated much multi-disciplinary research activity. The article which initiated this activity was Garrett Hardin's (1968) essay titled “The Tragedy of the Commons”. The essay's prime aim was to discuss a class of social problems which has no technical solution. One such problem, Hardin argued, is the long term effects of unrestrained individual maximizing behaviour on a finite resource base. Hardin proposed that without outside intervention, there was no solution to this dilemma, and coined it “the tragedy of the commons”. Hardin had drawn on sources in mathematics, biology and economics to popularize a research theme of great importance: the tension between individual rationality and collective outcomes.¹ Hardin's deceptively simple article has had numerous re-readings, but its legacy is (regardless of whether Hardin was right or wrong) that it provoked research in a theme that is highly relevant to problems in developing and modern countries alike (Kehoane and Ostrom 1995).

Despite the massive critique of Hardin's thesis, and efforts to revise (McCay and Acheson 1987; Berkes et al. 1989), rephrase (McCay 1993; Rose 1986), expand on (Ostrom 1990), or flatly reject his ideas (Berkes 1983), nobody it seems, has been able to dispel the impact the notions contained in Hardin's paper have had. It is perhaps the wide acceptance of the view contained in his essay among managers, bureaucrats and state agencies, which has caused the unending criticism and condemnation of Hardin's work in almost all the new research on common property regimes.

The first concerted effort to challenge the conventional wisdom about the demise of common property regimes, was a conference in 1985 on common property resource management (National Academy Press 1986). The conference proceedings (*ibid.*) examined common property regimes in a

¹ The study of rationality has of course, long antecedents in the social sciences, cf. Weber's distinction between *Wertrationalität* and *Zweckrationalität* (1987:28 [1922]). A modern classic in the study of collective action is Olson (1965).

variety of settings. At the time, the papers represented an unprecedented wide range of empirical studies, held together by a common analytical framework (the "Oakerson framework"). Many of the papers presented at this conference were published in subsequent years in books and edited volumes by McCay and Acheson (1987), Berkes (1989), Ostrom (1990) and Bromley (1992). These books have in common that they want to revise Hardin's original work. The problem is that little has emerged from this critique, either in the form of a new theory or new analytical approaches, hence there is lack of a coherent theoretical framework. In a review of Elinor Ostrom's (1990) book *Governing the Commons*, Field (1992:356) notes that:

There is a curious lack of congruence between the material in early and late chapters, which may help explain why no particular compelling theory of collective CPR [common property resources] institutions emerges from these pages.

In a review of another major work on common property regimes, Daniel Bromley's edited volume, *Making the Commons Work* (1992), Lees (1993:106, italics in original) observes that:

it is a little surprising to read attacks...on positions which claim that common property *inevitably* leads to resource mismanagement and ecological disaster — that is, it is surprising that anyone today would hold such a position, and that anyone would find it worth the time to refute it. ...On the other hand, the occasional insistence on the intrinsic value of common property to people and their communities in this collection sounds somewhat romantic and often unnecessarily defensive.

The effect of this has been that though there appears to be a considerable research activity, original contributions which can move the study of common property regimes beyond a critique of Hardin are lacking (Feeny et al. 1990; McKean 1992). Much of the so-called "new" research on common property management tend to repeat criticism which has long been absorbed by the research community (Lees 1993). If Hardin was "wrong", how can we construct new models which are informed by the advances made by social science over the past decades? Before we can answer this question, there is a need for a review of empirical and theoretical contributions to the commons debate. Moreover, there is the question of why common property regimes have commanded scholarly attention across disciplines.

Why do we study common property regimes?

The study of common property regimes has attracted numerous scholars over the last decade. Both political scientists, economists, anthropologists – and we could no doubt extend the list – have joined forces to study “the commons”. It is difficult to identify a single reason why disciplines which normally pursue different research agendas, converged to study the commons. The problem Hardin raised was the divergence between individual rationality and collective outcomes, or to put it differently, between micromotives and macrobehaviour (McCay and Acheson 1987:2). Hardin was not the first to bring up this issue, but as he himself acknowledged, it was first formulated in the early 19th century by William Forster Lloyd in his pamphlet “On the Checks to Population” (1977 [1833]). Hardin, however, gave Lloyd’s ideas a more general form, saying that there is a fundamental difference in interest between users sharing a resource which, Hardin argued, could not be solved unless they willingly restrained their own freedom of action through “mutual coercion, mutually agreed upon” (1968:1247). Especially Hardin’s parable linking rationality with pastoralism attracted scholarly interest. The argument was simple. If a herdsman adds another animal to his fields, the positive gain, or utility for him could be denoted +1. For the other herdsman sharing the same pasture, the added grazing pressure represents a negative utility which can be denoted $-1/n$ (n = the number of herdsman). For the individual herdsman, Hardin claimed, the rational response is to add as many animals as possible to his herd. This was a simple and immediately attractive proposition which seemed applicable to a number of situations of shared resource use, and suddenly resources which previously had nothing in common – air, fish, public transport and drinking water – were found to share a singular trait; they were shared resources, or in short, a “commons”. Naturally, this opened new areas for comparative research, and to some degree explains why the field has grown so rapidly. The problem of rationality and resource management could be approached empirically in studies of natural resource management; it could be investigated by applying game theory or it could be used to investigate issues in relation to the structure of institutions, human behaviour and choice.

Apart from the theoretical issues in the research on common property regimes, the field has wide ranging *practical* implications and is therefore relevant to development interventions. Keywords in this respect are security, equity, community-based resource management, resource conservation and ecological sustainability (Berkes and Farvar 1989:11ff.). Around the world resources critical to people’s livelihood are under pressure (Blakie and Brookfield 1987), and this is not only a threat say, to

East African pastoralists (Graham 1988; Lane 1990), but equally to Saami pastoralists in Northern Norway (Berge et al. 1994; section 3; Bjørklund 1990; Stenseth et al. 1991:ch. 2). In particular, it seems that *institutions* which govern the use of common pool resources are being eroded by diverse forces such as population growth, market integration, urbanization and government interference. In particular, state policies have eroded, or in some cases, actively dismantled traditional institutions without replacing them with functional equivalent institutions within a framework of state resource management.

An important question, then, is whether local level management can be reintroduced or reinstated as an intermediate form? "Management" is not a very precise term, but could be defined as the "balancing of labour and material inputs to the natural system in order to enhance its carrying capacity and achieve a profitable and sustainable level of production" (Watson 1989:55). Management, according to this definition, has the positive connotation of utilizing a resource in such a way that it continues to benefit its users. At the outset, local management seems to offer an advantage over state management due to lower transaction costs, and at the same time, by keeping a resource open to legitimate users, avoids the alienation that is a consequence of privatization. However, as McGranahan points out: "Advocates of reinvigorated common property institutions must show not only that common property was effective in the past, but that it can be effective in the future" (1991:1285). One of the aims of this report is to look more closely into how institutions change their form and function, and how diverse forces such as population growth, market integration and state intervention influence traditional institutions and alter their legitimacy and relevance. Moreover, this study is particularly concerned with "local institutions" as a possible solution to the high transaction costs associated with state management and the equity problems that arise from privatization (Seabright 1993:125ff.). The term "local institutions" is imprecise. It will be used here to denote institutions which have one or more of the following characteristics: a) govern resource use in a bounded or restricted area (spatial dimension), b) are devised and enforced by social groups (whether indigenous or not), c) are informal, that is, unrecognized by central authorities and not part of statutory law. The term "local institution" as defined here does not, however, imply that an institution must be traditional in the sense that it has been in place for a long time, neither does the term disqualify institutions which are the result of local innovation.

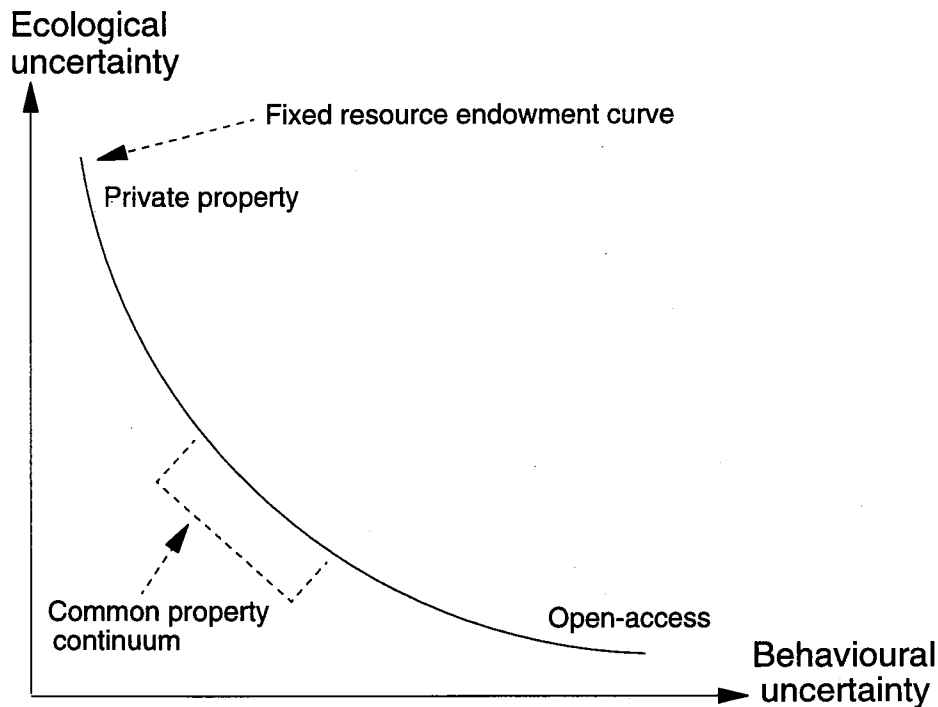
What is meant by “common property”?

Research on common property, the specific class of property relations which concerns us here, has suffered from a lack of accuracy and analytical rigour. Bromley (1989a, 1991:ch. 2) has suggested a conceptual scheme which removes the ambiguity connected to the term “common property resources”. First, it is important to keep the terms “resource” and “regime” separate from each other. Property, as Bromley (1991:ch. 1) has pointed out, is a benefit (or income) stream and a property right is a claim to such a benefit stream. Common property is a particular type of property rights, *not* typical of a particular class of natural resources. Despite being analytically ambiguous, the term “common property resources” is still widely used (Berkes 1989; Seabright 1993). Bromley has suggested that “the term *common property resource* is abandoned in favour of the more correct *common property regime*” (1991:2, italics in original).

Bromley distinguishes between four different types of property regimes: state property, private property, common property and non-property regimes (see also, Schlager and Ostrom 1992). The term “non-property regimes” is important because this too, is often interpreted differently. The reason Bromley adopts the term “non-property regimes” is to underline that in a situation where nobody lays claim to a resource (i.e., the benefit stream) we can no longer talk about “property”. In much of the literature on the subject, the preferred term is “open-access”, that is, entry is unrestricted and the resource is open for all potential users. The problem with the term “open-access” is that researchers have tended to define it differently. Some authors use the term “open-access” as synonymous with “common property”. The confusion of these very different situations is usually attributed to Hardin’s original work (1968). Among the first to point this out were Ciriacy-Wantrup and Bishop (1975), who argued that Hardin failed to comprehend the difference between shared ownership (“common property”) and situations of diffuse or non-existent property rights (“open-access”).

Another attempt to clarify the terminology of common property regimes, is Ostrom’s (1990) introduction of the term “common pool resources”. This term is linked to another way of arriving at a definition of common property, namely by introducing the concepts of “excludability” and “subtractability” (Feeny et al. 1990:3; see also Oakerson 1992). By excludability it is meant that the resource is of such a kind that it is difficult or costly to exclude other potential users. A typical example of this is migratory fish stocks. Subtractability means that one user’s harvest subtracts or diminishes other users’ gains from the resource. This is typical of most natural resources, but the classic example is pastures where adding

Figure 1
Trade-off between ecological and behavioural uncertainty



Adopted from Wilson and Thompson 1993:312

more animals negatively affects other herdsmen. Ostrom (1990) has suggested the term “common pool resources” for the particular class of property where exclusion is difficult and one user’s gain is the other’s loss (i.e., the resource is subtractable).

Common pool resources share properties both with the class of resources known to economists as “public goods” and “private goods”. Public goods are those goods where one user’s use or consumption does not reduce others possibility to consume.² Private goods, on the other hand, are goods where one user’s consumption reduces what can be consumed by others by the same amount. Unlike pure public goods where exclusion is either difficult or impossible (such as street lighting), common pool resources allow for exclusion, but not to the degree possible in private goods. Runge (1984a:808) distinguishes between private and common property rights in this way: “Property institutions characterized by rights of exclusion are

² The original definition of public goods is attributed to Samuelson (1954). In pure public goods there is no rivalry among users ($x = x_1 = x_2 = x_3 \dots$). Private goods, on the other hand, can be defined as ($x = x_1 + x_2 + x_3 \dots$), i.e., there is rivalry among the users.

often called private property; while those characterized by rights of inclusion are termed public or common property”.

The advantages of common property regimes can be seen as a trade-off between ecological uncertainty (for example, erratic rainfall and drought) and behavioural uncertainty: what is the probability that other users will maximize their own benefit? (Figure 1). Private property reduces the behavioural uncertainty — the owner and user is the same person — but gives less protection against ecological uncertainty (Wilson and Thompson 1993). For an open-access situation this is reversed; there is no check on individual action (high behavioural uncertainty), but ecological uncertainty is low (as long as degradation does not occur) because a herdsman can move his animals to any pasture which offers good grazing.

Defining institutions

This study looks in particular at the role of local institutions in natural resource management: what are institutions and why are they needed? Among the first to argue that institutions are important to understand why common property regimes break down or endure were Ciriacy-Wantrup and Bishop (1975). They developed a conceptual framework for institutional analysis (*ibid.*:716), and posited three hierarchical levels of decision making systems which they termed the operating level, the institutional level and the policy level. They argued that in non-market economies, informal regulations such as customs and taboos are adequate to achieve sustainable use of resources. After reviewing a selection of European examples, Ciriacy-Wantrup and Bishop conclude that common ownership of resources can function satisfactorily in a market economy too (*ibid.*:721). What is unclear from Ciriacy-Wantrup and Bishop’s article is exactly what role institutions play in the management of common property regimes.

Social scientists working on common property management are quick to put the label “institution” on any condition regulating resource use, but are characteristically vague about how to define the term (cf. Acheson 1989a:358; Askvik 1993:150; Vedeld 1992). Before discussing the role institutions play or should play, we need to clarify what an institution is. There are, broadly speaking, two ways of viewing institutions among social scientists. The first is the “bottom up view” which sees institutions first of all as the outcome, the aggregate of individual action (Ostrom 1986). Here institutional change results from actors changing preferences or changing constraints (opportunity set), what we could term a “voluntaristic” view of institutional change (Askvik 1993:152). The other approach takes a normative perspective, arguing that institutions shape peoples action and

preferences. In this view, changing preferences come about as a result of institutional change, what we could term the “deterministic” position (ibid.).

In a review of the study of institutions, Askvik (ibid.) points to the fact that the term institution refers both to a micro and a macro phenomenon. From the micro perspective institutions are often identified simply as organizations, whereas the macro perspective reserves the term for entities such as “the state” or “the economy” (ibid.:151). Both these strands in the study of institutions would agree that to qualify as an institution requires a degree of permanence as well as independence of the personnel attached to or organized by it. As Askvik points out, an institution may or may not be an organization (and vice versa). North (1990:5) wants to keep the two distinct from each other, and argues that institutions represent — to use a sports analogy — the rules of the game, whereas organizations represent a set of players, a team, working within the framework of these rules towards specific objectives.

This duality in the study of institutions is expressed by Ridell (1982:56) who distinguishes between institutions understood as a normative concept within the social structure, from the more dynamic meaning of institutions referring to the ability of people to assert their collective will to reach some goal vis-à-vis each other and the environment. Similarly, Ostrom (1986:3-4) lists two standard definitions of institutions as either “rules about behaviour, especially about making decisions” or “equivalent to the term ‘political structure’”. In the same vein as Ostrom, Runge (1984a:807) defines institutions “as a public system of rules that specify certain forms of action as permissible, others as forbidden, and provide for certain penalties and defenses when violations occur”. In her book, *How Institutions Think*, Mary Douglas (1986:46) defines institutions simply as “a convention”. In contrast to the minimalist definition offered by Douglas, a more comprehensive definition of institutions is given in North (1991:97):

Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, tradition, and codes of conduct), and formal rules (constitutions, laws, property rights).

In another of North’s works on institutions (1990:4) he adds that “Institutions may be formal and informal, and they may be created or have evolved through time”. This brings us to the second question: why are institutions needed? One of the simplest answers to this question is provided by North (1991:97) who argues that: “Throughout history, institutions have been devised by human beings to create order and reduce

uncertainty in exchange". More specifically, North argues that effective institutions lower transactions costs hence reduce the risk of defection and enable cooperative solutions (ibid.).

To answer the counter-question of why do institutions not evolve, North adopts an explicitly evolutionist perspective (1991:102). In a tribal economy there are strong moral constraints to innovative behaviour and constant struggles for power. This serves to constrain the development of institutions that otherwise could have facilitated trade. At the next level, North discusses bazaar economies in North Africa and the Middle East, which even if they represent a step up the ladder, are still constrained by a lack of uniform price and weight agreements. A third, and further refinement was the caravan trade which moved commodities and cash over long distances, but still was unable to institute formal rules securing the trade and instead had to rely on negotiating informal and temporary agreements based on trust and honour (ibid.:105).

According to North, modern states represent the highest level of institutional complexity. To explain "the interrelationship between the state, property rights, and productivity" (Eggertsson 1990:319), North adopts the terms "technical production frontier" and "structural production frontier". Broadly speaking, the highest level of productive specialization in a society is the technical production frontier, whereas the most effective way of organizing production, including property rights, defines its structural production frontier. Maximum output is secured by bringing these two frontiers as close to each other as possible. North argues that historical evidence shows that states have been unable to accomplish this, which has limited the potential economic output. (For a critique of this view, see Field 1981).

Many social scientists seem to take institutions for granted, thereby avoiding the question of why they exist in the first place. North (1990:6) has proposed that:

The major role of institutions in a society is to reduce uncertainty by establishing a stable (but not necessarily efficient) structure to human interaction. ... Institutional change is a complicated process because the changes at the margin can be a consequence of changes in rules, in informal constraints and in kinds and effectiveness of enforcement.

Central to North's argument is that effective institutions reduce transaction costs. Only in situations where there are perfect information and zero transaction costs, are there no need for institutions (North 1990:57). Institutions are, in North's view, first of all a means to enable economic transactions. This is, however, only one of many possible approaches to the

study of institutions. The definitions of the term “institution” discussed above imply that the primary aim of an institution is economic (North 1991). However, this is not necessarily the case, and in the following we will review a number of ethnographic studies which reflect the diversity of local institutions for natural resource management. The questions which concern us here are not only what institutions are, but what they do and accomplish, how they are altered or changed and whether institutions can be revived or reinstated.

To summarize, there are two different ways of understanding institutions; either as a micro-level phenomenon which is created by actors for specific ends, or as a macro entity which structure human action. For North, institutions are first of all vehicles which structure economic behaviour, and efficient institutions enhance economic transactions by lowering transaction costs. There is less to be learned from North’s work about institutions whose function is not readily identifiable as “economic”. This is problematic, because we know that small-scale communities lack the institutional specialization found in modern states (Weiner 1994:591). There is, for example, a wealth of literature on small-scale communities which demonstrate that institutions whose function is not primarily economic, may still have economic implications. Examples of such institutions are religion (Rappaport 1968; Keiser 1991), magic (Fortes 1937), kinship (Brox 1964; Hviding and Baines 1994), village solidarity (Taylor 1987), aspects of social organization such as hierarchy (Park 1992) and age-grade sets (Tvedten 1990).

Analytical approaches to the study of property regimes and collective action

There are number of different analytical approaches to the study of property regimes and collective action. The frequent overlapping of approaches, however, tends to blur their origins. For the sake of clarity, we will review four different approaches to the study of property regimes and collective action. The first approach builds on the seminal work of von Neumann and Morgenstern (1945) where problems of collective action are analyzed from the perspective of games (*game theory*). The second approach is the contribution some economists have made in developing a theory of property rights (*the property rights school*). The third research strand is — broadly speaking — a reaction to the tenets of game theory and the property rights school, and aims to revise Hardin’s (1968) hypothesis (*the revisionist approach*). The last and most recent theoretical framework includes

