Common Choices: Policy Options for Common Pool Resources

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Executive Summary

1. 'CPRs' have become popular in development thinking as a means of combating poverty and of promoting community-based, environmentally sustainable, locally beneficial development. The debate is clouded by the ambiguity of the acronym. It is used to refer both to 'common pool resources' and 'common property regimes', which are quite different entities. Resource management regimes take on complex institutional forms, and it is helpful to consider a spectrum of regime types, rather than the relatively rigid legal typologies of private, common and state property. Increasingly, mixed and shared management regimes are being seen as possible alternatives, since these seek to build upon the complementarity of inputs from different sectors (private, community, state and non-governmental).

2. It is also apparent that the links between common pool resources, common property regimes and poverty are not straightforward. Both resources and regimes can be integral to the livelihoods of the poor, but management of both can also result in poverty. At the local level, there is often a multiplicity of stakeholders, with competing resource use interests, and it is not appropriate to assume that the needs of the poorest will necessarily be reflected in the management and use of common pool resources.

3. There is a gap between theoretical discussions and policy needs. On the one hand there is a growing literature extolling the virtues of 'CPRs', on the other there is a more critical examination of community-based natural resource management. It needs to be recognised that the complexities and difficulties associated with community-based natural resource management do not necessarily imply that a policy interest in common pool resources is misplaced. A prominent omission is that there is not enough attention to the problems of multi-use and multi-user resources. In such circumstances, the key policy issue is making choices between users and uses in relation to access and management of common pool resources. Such choices need to explicitly consider trade-offs between policy objectives, especially economic growth, environmental needs and considerations of social equity. For communities, governments, NGOs and donors that are involved in the decision making process, these issues are potential sources of conflict. The challenge (to the research community) is to find procedures by which decision-makers can make these apparently intractable choices between competing policy objectives, resource uses and resource users.

4. A series of factors add considerably to the complexity of decision making over the use of common pool resources, and make the impacts of policy measures on poverty reduction unpredictable. The conceptualisation of resource management regimes that is found in the institutional economics literature often neglects these complexities. For decision-makers, it is important to appreciate that resource management regimes sometimes fail in their objectives not because of inherent design flaws, but because the assumptions that they are based on are not matched by reality. The specific issues include: the social construction of resources and their meanings; the interface between formal and informal institutions; the difference between *de facto* access and *de jure* rights; the implications of illegality; political mobilisation and social movements.

5. A selection of scenarios drive processes affecting the common pool resource base. These drivers operate at a number of levels, including global, national and local. Some, although important, are relatively distant from local common pool resources: global climate change, trade liberalisation, and Structural Adjustment Policies are examples. Other drivers have closer links, and these include changes in tenure (privatisation; quasi-privatisation; nationalisation; redistribution); intensification of agricultural production; inclusion of common pool resources into the market economy; urban-rural/rural-rural economic integration; shifts in household well-being (increasing wealth, increasing poverty, disease); environmental change; population growth; and cultural changes. Although many different drivers of change are discussed, they actually result in a relatively narrow set of processes that affect common pool resources as a basis for livelihoods. These are shown to be an increase or decrease in exclusion from common pool resources, an increase or decrease in the volume or rate of use of common pool resources, the creation of new demands for common pool resources, and an increase or decrease in the supply of common pool resources.

6. The links between drivers of change and processes affecting common pool resources are used to develop a generic framework for policy formulation. Drawing on these processes, and taking into account the trade-offs between objectives, uses and users, relevant policy options need to be considered. All policy options will inevitably have underlying assumptions and important implications that should be acknowledged. Finally, the process required to achieve change must be determined. A detailed, although still rudimentary, illustration of a suitable policy decision-making process is discussed, exemplifying the way in which decision makers may need to think about policies in the context of common pool resource use and management. The analytical framework developed in this paper is admittedly – and necessarily – simple in its approach. However, it does allow space for a number of complexities that have not been included within the immediate framework, but could be developed in a more detailed exposition. The paper concludes with a list of potential future directions for research.

Contents

List of figures and tables

1. Introduction

There is a widespread belief that common pool resources and common property regimes can contribute substantially to the livelihoods of the rural population in poor countries (Jodha, 1992). Despite initial scepticism that common use of resources could ever be sustainably beneficial (Gordon, 1954; Hardin, 1968), there is now a vast literature on the theoretical aspects of common property regimes, there are many examples of the operation, success and failure of common property, and there is much writing on the relevance and importance of common pool resources for rural livelihoods. This has been matched by a growing interest in community-based natural resource management (CBNRM) among the development policy community.

The aim of this paper is to explore the links between policy towards common pool resources and poverty reduction. It does not attempt an exhaustive review of published literature, but seeks to set out issues that are critical to understanding how common pool resources relate to poverty, and how policy regimes for such resources can be developed that contribute to poverty-reduction.

1.1 Definitions: resources and regimes

The popularity of 'CPRs' in the policy discourse has resulted in a confused debate. One source of this confusion is about definitions. There are two quite separate meanings of 'CPRs' – as 'common pool resources' and as 'common property regimes'. The distinction between these is important.

1.1.1 'CPRs' as Common Pool Resources

This definition relates to the physical characteristics of the resources, rather than their particular ownership or use. Understood in this way, common pool resources have two key characteristics (Ostrom, 1992: 295):

1. the physical *exclusion* of potential users from common pool resources is difficult;
2. their consumption is *rivalrous* or *subtractable*; that is, increased consumption by one agent implies that less is available for others.

In drylands/semi-arid regions, these common pool resources include, in particular, grasslands and closed and open woodlands, typically used for grazing, collection of plant products (including wood) and hunting (Box 1). Under some circumstances, common pool resources can exist on private land (e.g. in the livestock forage resource of crop residues), or state land (e.g. harvesting from forest reserves or National Park). The term 'CPRs' is also used rather loosely to refer to **ecosystems** (e.g. savannas) or **landscape elements** (e.g. dambos, or shallow valley wetlands), or **land uses** (e.g. 'rangelands').

In this paper, common pool resources will be used to refer to the resource, rather than the ecosystem or land use element within which they occur. Further, the common pool resources of concern in this paper are "local" commons, typically found within the sovereign jurisdiction of a state, which may (in principle) establish rules regarding their exploitation (as distinct from 'global' commons, such as the high seas and the

atmosphere, where the non-existence of a super-national state restricts the availability of certain types of coercive resource management regimes).

Box 1 – What are Common Pool Resources?

- Plants and plant parts (fuelwood, fodder, crop wastes, small timber, and other products which are derived from the bark, seeds, flowers and fruit of trees)
- Animals and animal waste (cow dung, organic manure; mammals, birds, fish, insects and other species)
- Water for drinking, cooking or irrigation drawn from groundwater or surface water (ponds, tanks, wells, rivers and lakes)

1.1.2 CPRs as 'Common Property Regimes'

Resource management regimes are understood as the sets of rules or other arrangements that determine access to and use of resources. It is becoming increasingly clear, from theoretical work in New Institutional Economics (NIE) and other social sciences, and from practical experience on the ground, that the institutions governing the use of natural resources can be highly complex. Four resource management regimes have usually been identified: private, common (community) and state management regimes, in addition to open access (Berkes (ed.) 1989; Ostrom 1990; Bromley 1991; Stevenson 1991; Singh 1994). In this literature, 'CPR' usually refers to *common property regimes*, defined as regimes in which access is allowed to all members of a well-defined community, while non-members are excluded (Bromley and Cernea, 1992).

These definitional clarifications are of some consequence to our understanding of rural resource management. Common pool resources may be managed under a variety of regimes. They can be open access resources with no rules in operation. They could be found on private or state land and used by others either informally, or illegally. They could also be managed under common property regimes. Since both uses of the term are prevalent, this paper will review the literature that deals with 'CPRs' as resources *and* as regimes, but will take care to specify which particular definition is being used in a specific context.

1.2 Resource management regimes: further considerations

Much of the literature on institutions for natural resource management has emerged in response to two influential articles (Gordon, 1954; Hardin, 1968), both of which set out the logic that appears to inevitably drive common property resource management regimes to extinction. These articles have now been widely criticised for their imprecision when dealing with the institutional characteristics of the regimes that they were describing (e.g. Berkes (ed.) 1989; Ostrom 1990; Bromley 1991). In both cases, using the terms "common property" and "commons" to describe a resource management regime under which there are no rules at all for the exclusion of potential resource users created considerable confusion. Subsequent work has clarified that these authors were referring to a situation of *open access*, and has also developed a more careful analysis of the logic that drives specific types of resource management regimes.

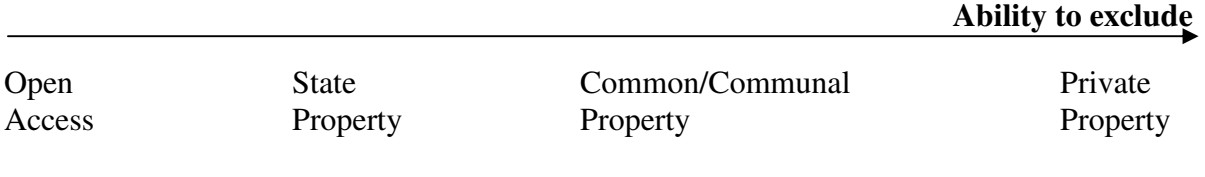
Open access (*res nullius*) is characterised by the absence of any regulations, and the reference is to a situation where no identifiable entity has the right to exclude others from the use of the resource. Consequently, no individual or group has any incentive to invest in the resource or to refrain from harvesting the resource. The only way to exert control over the resource is to extract it before others can. While there is access, there is no socially protected claim to a benefit stream, that is, there are no property rights (Vira, 2001). On a spectrum of resource management regimes, open access would define one extreme where nobody was excluded from access to resources.

Specific management regimes are characterised by rules that govern at least four different dimensions of resource access and use –

1. Rules that exclude non-users, and define a group of users;
2. Rules that regulate the use of resources;
3. Procedures for monitoring the legal and illegal use of resources;
4. Mechanisms for enforcing rules, and sanctions that punish violations.

The literature identifies a variety of arrangements under which such rules can be defined, and three 'pure' regime types have attracted particular attention: private, communal, and state-based systems. Private (individual) tenure can be seen as the opposite end of the spectrum to open access, since access is restricted exclusively to the individual owner. In between these extremes lie a range of intermediate systems, in which individual and group rights are combined in different ways (see Figure 1). Common property systems are those in which access is restricted to a specific and well-defined 'community', whereas state-based systems are typically those that vest ownership exclusively in government. The state then allows access to the general public subject to regulations. In such cases, the decision-making unit may be national, provincial (state) or local government, and management may be vested in a specialised agency such as the bureaucracy.

Figure 1 – A spectrum of resource management regimes



In their review of the empirical literature, Feeny (*et al*) (1990: 12) find that all three ideal types (private, community and state-management regimes) have been associated with success and failure according to economic and ecological criteria and considerations of equity. They conclude that 'Success in the regulation of uses and users is not associated with any particular type of property-rights regime'. The incentives for use which follow from all three ideal-type regimes may lead to over-exploitation from an ecological point of view. Equally, there may be circumstances where the optimal, implementable production plan under each regime coincides with some level of investment in resources and is consistent with long term sustainability. The important implication of this empirical work is to demonstrate that there are a variety of alternative institutional contexts under which common pool resources may be managed. Furthermore, there are no simple policy prescriptions regarding the optimal or ideal management institution. Careful empirical analysis is required to determine which regime would be most

appropriate for specified policy objectives in any particular context. It is simplistic to argue for the replication or adoption of a 'successful' resource management regime without studying the range of technological, institutional, and political factors that may have contributed to its initial success, and considering whether the criteria used to judge success are appropriate in other contexts.

S*hared production regimes* are distinct from *pure resource management regimes* (private, common and state property). Shared production regimes produce goods or services by utilising inputs from (at least two) individuals or legal entities who are not part of the same organisation, and are not under the control of a single principal (Vira, 1999). Each partner independently decides the level of her input which is contributed to the shared production process. Instead of optimising returns to the principal, the objective function in a shared regime is jointly determined. Payments to each of the inputs are negotiated between the partners, as is the share of any residual profits after factor payments have been made, and no single entity has the right to renegotiate these terms unilaterally. Shared regimes are frequently 'inter-sectoral,' in the sense that the collaborating partners belong to different 'levels' of social organisation, individual, corporate, collective, or state.

Such arrangements are becoming increasingly common, especially in the context of common pool resource management, and for the delivery of public services, areas which have traditionally provided the domain for state activity. This is partly due to the accumulation of a body of evidence which suggests that the state has been less than perfect in its stewardship of natural resources, as well as in the provision of public services. Furthermore, there is a recognition that other groups perceive a substantial stake in these sectors, and are willing and able to contribute to these activities, either independently, or in conjunction with agencies of the state. This is forcing a considerable rethinking of the traditional dichotomy between the public and private sectors, and there is an emergent discourse which describes a complex new institutional mosaic, consisting of a multiplicity of ideologies, interests, actors, organisations, legal frameworks, and informal arrangements, all collaborating to pursue a range of objectives (Borrini-Feyerabend, 1996). This empirical reality is difficult to describe using traditional ideas of private, common and state property, and the concept of shared production has been developed in response to the need for new analytical tools for the study of institutional pluralism (Vira, *et al*, 1998; Vira, 1999).

1.3 Relevance of Common Pool Resources to Poverty Reduction

The diversity of empirical experiences with resource management regimes for common pool resources, as well as the much more sophisticated theoretical treatment of such regimes, has effectively undermined the simplistic conclusions of the Tragedy of the Commons literature. From a policy perspective, common pool resources have increasingly been seen as valuable for their contribution to combating poverty. There is both an empirical and conceptual basis for believing that these links are strong, and continue to be important:

- They can make substantial contributions to rural income and employment.
- They have a particular importance in seasonal environments such as drylands (Jodha 1986).

- Common pool resources can provide an insurance against uncertainty. For instance, access to such resources enables people to pool risks associated with natural disasters and crop failure.
- Common pool resources such as trees can substitute for inadequate or poorly functioning credit for poor people, who view them "like savings bank accounts with low initial deposits and high rates of appreciation" (Chambers and Leach, 1989).
- Access to common pool resources may be the only non-human assets available to landless people, or the very poor.
- Common pool resources can underpin 'ecosystem services'.

In economic terms, common pool resource-based livelihood strategies can be thought of as an 'optimal' response to specific types of market failures in the rural sector – in the markets for labour, insurance, credit and land, for instance. From a narrowly economic perspective, then, investment in common pool resources can be seen as a sensible policy response where direct intervention in these 'imperfect' markets is difficult or impossible.

However there are problems with this economic approach. First, common pool resource-use also serves non-economic functions (symbolic, political and social), and common pool resources are frequently valued for their own sake (in terms of their aesthetic or ecological functions, for instance). It is insufficient to restrict policy interest to the purely economic contribution of common pool resources.

Second, there are problems with presuming that the management of common pool resources offers an economic basis for combating poverty. Some regimes require the exclusion of significant groups. A common pool resource-based livelihood strategy would only be compatible with poverty reduction if the poor were given privileged access to flows of benefits from the resource. A focus on such resources may be an appropriate poverty-reduction strategy only if the benefits are targeted towards the poorest populations. Equally, it is possible for poverty to be the *consequence* of successful or strong management of common pool resources, if such regimes exclude the poor.

Four potential sets of poverty impacts are described in Table 1. While some regimes for the management of common pool resources may include the poor, it is also conceivable that other regimes (especially those under individual tenure, or those under restrictive state control) may seek to exclude these groups. Such regimes may or may not be successful in their desired objectives, and this relative success could also affect actual impacts on poverty reduction.

Table 1: Impacts of common pool resource management on poverty reduction

	Strong ('successful') Management Regime	Weak ('unsuccessful') Management Regime
Regimes seek to include the poor	++ (1)	- (3)
Regimes seek to exclude the poor	-- (2)	+/- (4)

1. Common pool resources may be an integral part of the livelihoods of the poor, and regimes for their management may successfully include them as beneficiaries, right holders or decision makers. Such regimes may offer secure access to resources, which might otherwise be taken over by the state or brought under individual tenure. The perceived close relationship between effective management of common pool resources and poverty reduction usually focuses on relationships in this quadrant.

2. Resource management regimes may entail strong laws of exclusion governing who can use the resource and who cannot. The livelihoods of those excluded may be disadvantaged as a result, including the very poor. The regimes themselves may be quite successful, but would fail to contribute to poverty reduction since the poor are either explicitly excluded, or neglected, in the design of the regime.

3. Unsuccessful resource management regimes may fail to provide the security of access to resources that the poor need to pursue their livelihoods. Failure and breakdown of management could result in chaotic distribution of the benefits, and this is unlikely to benefit the poor. Failure may also lead to resource degradation (and hence poverty) as the resource fails to yield the returns necessary for peoples' livelihood. Indirect ecological benefits from the forests, pastures, lakes and rivers may also be lost.

4. Paradoxically, perhaps, if resource management strategies seek to exclude the poor, and such regimes are not well managed, the poor may negotiate everyday forms of access to such resources (e.g. in a National Park or Forest Reserve). In such a situation, unsuccessful management may result in positive outcomes for the poor. However, if poor management results in continual dissipation of resource values, one may eventually expect the poor to be negatively impacted (or, perhaps, such pressures may induce institutional change and, ultimately, a shift to one of the other quadrants in Table 1).

It is helpful to consider in some more detail how these interactions between common pool resources, management and livelihoods are played out with reference to specific resources in arid and semi-arid lands. Table 2 outlines the significant situations and outcomes for different common pool resources found in dry lands under various forms of tenure. It considers the wide range of local level stakeholders who have interests in such resources, and the potential for the very poor to be excluded from access. It also makes clear the importance of both legal and illegal forms of resource use, and the difficulty of ensuring that particular sets of arrangements or management regimes will necessarily benefit the poor, given the demands of other stakeholders upon these resources.

Table 2: Resources, land use and livelihoods

Land Use	Common Pool Resource	Form of Tenure	Local Stakeholders
Farmland	Gleaning, grazing on crop residues, crop residues as construction materials or domestic fuel.	Private farmland (statutory right of occupancy).	All farmers, including poor farmers; poor clients, relations or neighbours; labouring wage-earners; pastoralists or gatherers tolerated in slack season.
		Farmland in customary occupancy, allocated by local chief or local state. De facto private; may be leased, lent, even sold.	All farmers, including poor farmers; poor clients, relations or neighbours; labouring wage-earners; pastoralists or gatherers tolerated in slack season.
		Farmland in extended household sharing system. De facto private; may be leased, lent, even sold.	All farmers, including poor farmers; poor clients, relations or neighbours; labouring wage-earners; pastoralists or gatherers tolerated in slack season.
Open woodland or wooded grassland or grassland	Livestock grazing and browsing; wood supply; building materials; domestic fuel; medicines; famine foods; honey; game meat; safari incomes; gathered foods.	Communal or group access under control of, or sanctioned by, the state.	Rich farmers (esp. livestock, commercial exploitation); poor households; all households in drought or extreme circumstances; crafts-people; pastoralists.
		Communal or group access either sanctioned by a private owner, or allowed because they cannot enforce exclusion.	Poor households; all households in drought or extreme circumstances; crafts-people; pastoralists.
		Private ranch	Owners; illegal users; trespassers.
		Group Ranch	Owners; illegal users; trespassers.
Forest	Livestock grazing and browsing; wood supply; building materials; domestic fuel; medicines; famine foods; honey; game meat; safari incomes; gathered foods.	Private woodland	Owners; illegal users; trespassers.
		State tenure: Forest Reserve; most de facto use illegal unless specifically permitted (as in JFM, or logging concessions).	Specific right holders and beneficiaries; concessionaires and lease holders; illegal users; trespassers.
		Communal woodland	Community members (rich farmers (esp. livestock, commercial exploitation); poor households; all households in drought or extreme circumstances; crafts-people; pastoralists); illegal users; trespassers.
Wildlife Conservation area (e.g. national park)	Livestock grazing and browsing; wood supply; building materials; domestic fuel; medicines; famine foods; honey; game meat; safari incomes; gathered foods.	State; most de facto use illegal except where CBNRM/shared use programme in place.	Rich and poor farmers; livestock owners of all descriptions; commercial exploitation; all households in drought or extreme circumstances; crafts-people; illegal users; trespassers.
Aquifer	Domestic and livestock water; irrigation.	De facto open access, although sometimes regulated by the state.	Rich households with private wells; households near public wells; users of dambos; users of groundwater-fed surface water.
Tank	Domestic and livestock water; irrigation.	Communal	All nearby households.
Irrigation channels	Domestic and livestock water; irrigation.	Private, group; communal	Clan, user group; illegal users.

2. Common Pool Resource Theory and The Theory-Policy Gap

Policy makers concerned with poverty and livelihoods in the developing world have typically been interested both in common pool resources, as well as common property management regimes. However, it is often not recognised that the correspondence between these concepts is not one-to-one. As defined in this paper, common pool resources may be managed under various tenurial arrangements (including communal tenure), while common property regimes may be used to manage a variety of resources, including some that have all the characteristics of market goods (a typical example would be a publicly-listed company which is the 'common property' of its shareholders). In our present understanding, an interest in common pool resources does not necessarily imply the uncritical recommendation, and adoption, of common property regimes (or community-based resource management).

2.1 The gap between theory and policy

To some extent, this lack of conceptual clarity in the academic literature may be responsible for what appear to be naïve and/or simplistic policy rules. It is frequently suggested that common pool resources are best managed under community-based systems. However, such policies have often failed in practice, or worked less successfully than expected. Explanations for failure abound, usually rooted in the particularities of place and time, and the experience generally suggests that community-based natural resource management is successful only under highly specific conditions. The policy maker, looking for clear guidance, is confused – on the one hand, there is a vast and growing literature extolling the virtues of 'CPRs', and their importance for rural livelihoods; on the other hand, there is an emerging literature pointing out that community-based natural resource management strategies are complex and difficult to implement (and, indeed, defining 'communities' may in itself be a source of considerable conflict).

One implication of such an understanding of the interface between the academic and policy communities would be a straightforward recommendation for much greater care in the use of terminology. It needs to be clearly recognised that the complexities and difficulties with community based natural resource management do not necessarily imply that a policy interest in common pool resources is misplaced. However, it would be disingenuous to suggest that this is all that is needed. An expanding empirical and theoretical literature appears not to be engaging directly with the sorts of issues that policy makers are facing in their operations. For instance, much theoretical work (and many academic field studies) implicitly only consider single-use resources (e.g. a continuous groundwater aquifer, the use of irrigation water in a single channel system or a bounded fishing resource, e.g. a floodplain pool). These situations raise fairly straightforward questions of conflict between *users*, for example: what is the ecologically or economically optimum rate of 'extraction', or what is the optimum distribution of costs and benefits between users (including present and future generations).

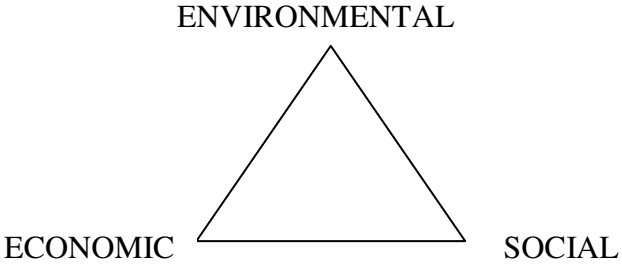
However, in semi-arid Africa and India, there are often multiple resource *uses* as well as multiple resource *users* on the same piece of land. In such circumstances, choices between uses (trade-offs) are just as important as conflict between users (in many cases more so). Classically, the rangelands or open forests of India, Tanzania or Zimbabwe present difficult choices between various consumptive uses (wildlife, livestock,

agriculture, forest products), and between consumptive and reservation uses (biodiversity versus agriculture, livestock, fuelwood, etc.). Uses may be mixed on the same area; indeed they almost always are, sometimes with elegant and complex partitioning ecologically, or in space or time. However, there are usually trade-offs between uses and different uses are often open to particular ethnic groups (e.g. pastoralists versus farmers), or particular socio-economic groups (e.g. between relatively wealthy farmers keen to enclose and farm land, and poorer households dependent on grazing or gathering for cash or food). Therefore decisions have to be made over who gets to use which resource, and how, when and where. Different social groups may be interested in different uses; farmers and pastoralists may compete for access to floodplain wetlands in West Africa; or the international conservation community may have an interest in protected areas, while the poor farmers and herdsmen of the immediate area have their major interests in production (Brockington and Homewood 1996). To this extent, trade-offs between uses and conflicts between users are connected, since different users are interested in different uses. There is a political and distributional dimension to choice between economic options.

2.2 The policy challenge

In most dryland/semi-arid countries, a variety of factors are leading to the loss of the stock of unenclosed land, and the erosion of the land resource base that supports common pool resources. Conventional approaches to development have tended to allocate such 'unclaimed' (waste)land to new and putatively more 'productive' uses (e.g. enclosing rangeland for irrigation or wheat production), or to meet some other overriding national purpose (e.g. biodiversity conservation). Critics of pastoral or conservation policy have repeatedly attacked the implications of such enclosures for equity or environmental sustainability, and the flawed technical appraisals on which they are based (Leach and Mearns 1996). More recent interest in common pool resources and community-based natural resource management has suggested that poverty can be reduced by fostering communal management of such resources, and that enclosure, therefore, should be re-assessed. An important challenge for policy makers is to determine how to allocate these remaining land-based resources (often loosely referred to as 'the remaining national common pool resource') between competing land uses and land users (or stakeholders), given a diversity of policy objectives. The problem here is a version of the classic one of trade-offs between the three goals of sustainability (Munasinghe, 1993, see Figure 1):

Figure 1: The three dimensions of sustainability



- **Environmental sustainability**: how can common pool resources be managed so that their ecological integrity and biodiversity do not decline irreversibly or unacceptably?

- **Economic sustainability**: how can common pool resources be managed so that their productivity and economic yield are maintained at socially optimal levels, and so that they contribute to poverty-reduction goals?

- **Social sustainability**: how can common pool resources be managed so that their benefits can be shared equitably between different right-holders, and so that they contribute to broader equity targets (e.g. benefiting the asset-poor even if they are not right-holders, and meeting the needs of different ethnic groups)?

The rules that govern resource use typically have to address two issues – first, the aggregate rate of exploitation of the resource for specified *uses* (*management*); and second, especially where there are multiple resource users, the distribution of benefits (and contributions) among these different resource *users* (*equity*). For communities, governments, NGOs and donors that are involved in the decision making process, both these issues are potential sources of conflict. The challenge (to the research community) is to find procedures by which decision makers can make these apparently intractable choices between competing policy objectives, resource uses and resource users.

3. Complexities

A series of factors add considerably to the complexity of decision making over the use of common pool resources, and make the impacts of policy measures on poverty reduction unpredictable. The conceptualisation of resource management regimes that is found in the institutional economics literature often neglects these complexities. For decision makers, it is important to appreciate that resource management regimes sometimes fail in their objectives not because of inherent design flaws, but because the assumptions that they are based on are not matched by reality. The specific issues include:

- The social construction of resources and their meanings;
- The interface between formal and informal institutions;
- The difference between *de facto* access and *de jure* rights;
- The implications of illegality;
- Political mobilisation and social movements.

3.1 The social construction of resources and their meanings

The institutional economics literature focuses on the difficulty of exclusion as a *defining physical characteristic* of common pool resources. A social constructivist view would suggest, instead, that physical properties always exist in a social context. In particular, the ability to exclude is partly a function of the nature of people's needs to use a resource, and of others to guard it. To this extent, describing woods, pasture or water as a common pool resource says as much about the social context of the resources' existence as it does about the nature of the resource itself. The neat analytical distinction that is made by

institutional economists between the nature of the resource and its management regime becomes untenable.

Furthermore, 'resources' are not given, but are frequently defined by people in the light of culture and economic change. One cannot, therefore, simply think in terms of different claimants to rights, as different people will see different resources in a landscape. These differences may arise due to ethnicity (e.g., the views of pastoralists versus those of farmers and settled populations); gender (e.g., male hunters versus female firewood-cutters or thatchers); age (e.g., traditional older farmer versus dynamic business-orientated son); and even religion (e.g. eager modernising Christian versus a traditionalist). As economies and perceptions change, elements within the landscape become 'resources' by acquiring a value for some groups. For example, a market may develop for something previously regarded locally as useless, such as game viewing. Existing tenure regimes may not be designed to cope with the emergence of such 'new' resources, and this may lead to conflict. Newly valuable resources may be subject to demands from a wide range of stakeholders, and existing, possibly stable, tenure regimes may break down.

3.2 The interface between formal and informal institutions

A distinction that is of some significance is that between formal and informal institutions. The former are generally recognised by states or enshrined in law. The latter tend to be local level customs and arrangements that are not always acknowledged by the state or do not always have legal backing. Often, both can exist at the same time with respect to the same resource, sometimes in competition, sometimes in mutual support. A game reserve, for example, may be officially closed to herders, but informal grazing institutions can exist to regulate the use of its resources. Similarly, division of farmland between family members may proceed according to custom, but formal law courts may need to be involved to sort out disputes that 'traditional' conflict resolution mechanisms fail to resolve. The relationship and histories of formal and informal institutions with respect to a particular place or resource may be important to understanding the nature of conflict surrounding its potential uses. However, it is important here not to essentialise informal institutions as being 'traditional', ancient or time honoured (*ergo*, superior), nor to trivialise the state as a recent imposition on robust arrangements. Tradition is invented and continually redefined. Traditional practices represent adaptations to current circumstances – of which states, their requirements and formal institutions may be part.

3.3 The difference between de facto *access and* de jure *rights*

There is often a difference between *de jure* tenure, which has been recognised by some formal or legal process, and *de facto* access, which describes the reality of everyday resource use. Many resource conflicts are caused by such differences, where one part of a community or group of people believe themselves to have rights to a resource claimed by others or by the state (e.g., the claims of local people to resources on land gazetted by the state as a national park; or pastoralists' claims to dry season grazing on irrigated land irrigated by local farmers).

Legal tenure may be weakly protected not because of inherent features of the regime, but because there is inadequate political capacity to enforce it, which may reflect a "weak state." Here, "weak" refers to the power of the state to enforce a formal institutional

structure relative to the organisational power of groups who challenge this structure. This could mean that the state itself cannot enforce formal laws (so that, for example, illegal use persists), or that relatively powerful groups or individuals may be able to override the illegitimacy or illegality of interference, and the disempowered right holder may have no recourse to relief through the state.

The institutional literature does recognise this distinction, but some analysts suggest that *de facto* (informal) rights "are less secure than *de jure* rights" (Schlager and Ostrom, 1992). Such observations appear to be referring to a system of law that is enforced by a strong state, which can protect *de jure* rights. In situations where the state, legal system or executive are weak, *de jure* rights may be less well protected. Clearly, the strength of the state cannot be theorised in abstraction, but must be determined by careful empirical analysis. What needs to be recognised for our present purposes is that there may not necessarily be a one-to-one correspondence between the social legitimisation and legal protection of tenure (the *de jure* structure) and the actual pattern of resource use (*de facto* outcomes).

3.4 The implications of illegality

The ability to enforce a resource management regime is usually related to its perceived social legitimacy, especially if the regime involves the exclusion of some potential users. Such groups may have the ability to appropriate or use the resource, or to disrupt flows of benefits to right holders and beneficiaries. This is likely to raise the costs of maintaining the regime, since resources may need to be devoted to monitoring, enforcement and punishment. The expected benefits from a specific set of tenurial arrangements may not be realised because of these higher costs of implementation.

In the extreme, it may be necessary to use violence to enforce a regime that is subject to widespread contestation. The state usually enjoys a monopoly of coercive power to enforce the structure of ownership and rights, and would typically be expected to exercise this power on behalf of rights holders. However, where widespread political mobilisation challenges the legitimacy of existing tenure arrangements, notions of illegality may themselves need to be redefined, or interpreted more generously. Even in the absence of such political mobilisation, 'illegal' use may be tolerated as a means of co-opting potential opponents of the regime, or more directly as a means of distributing state or private patronage to selected client groups.

3.5 Political mobilisation and social movements

Tenure arrangements and resource management regimes may be contested at the level of everyday use, but contestation may also take another form, at a higher level of political organisation. Some groups may see existing legislation or policy as illegitimate, but may feel that these views are not adequately recognised by the social process and the legal system. Direct political mobilisation, then, may be the only action available to such groups in order to contest the legal framework, by renegotiating what is seen to be legitimate and worthy of social recognition.

An example of how these processes impact on policy towards common pool resources can be seen in the complex bargaining that has been taking place in India since the late 1970s over forest policy and legislation. The current legal framework is provided by the

colonial Indian Forest Act of 1927, and a protective legislation enacted in 1980, the Forest (Conservation) Act. Observers agree that these are no longer appropriate to guide forestry policy in the twenty first century, and there have been a number of campaigns that have sought to place the welfare concerns of local populations at the centre of a new legislative instrument (Fernandes, ed., 1996). Clearly, this political process is challenging what is currently legally protected, by arguing that this is no longer socially legitimate (even though it may have been legitimate under an earlier administration, dealing with different objective conditions). At the same time, the provisions of the legislation are under challenge by *de facto* illegal use in some areas, while new partnerships between the state and local communities under Joint Forest Management are serving to redefine ideas of legality in this context. This example serves to highlight the complex and dynamic nature of links between what is *socially legitimate*, what is *legally protected*, and what is *actually realised* in the context of policy towards common pool resources. Assuming that consensus is not easy to achieve, what may be legitimised and protected under a particular regime may be simultaneously opposed and challenged (negotiated) at different levels by everyday use practices and through the political process.

The theoretical and conceptual discussion in the first part of this paper has attempted to demonstrate the difficulty of making simple, generalisable policy conclusions about common pool resources, and their impacts on poverty and rural livelihoods. Much of this is likely to be familiar to those who have engaged with these issues for any length of time, either in an academic or an applied context. The real challenge, however, is to find ways in which decision makers can learn to deal with these complexities and make real-world policy choices. The next part of the paper begins to develop an analytical framework that seeks to inform and guide this process of decision making, fully cognisant of the considerable difficulties that such an exercise must inevitably face.

4. Drivers of Change Affecting Livelihoods and Common Pool Resources

In this section, the legal, political, institutional and social complexities of dealing with common pool resources, dealt with in section 3, will be built upon by considering the drivers of change that affect common pool resources. Changes in tenure, shifts in the socio-economic status of rural households and the establishment of rural-urban and rural-rural linkages, for example, are parts of a suite of conditions that result in processes affecting the common pool resource base. These 'drivers of change' may work at different levels, from global environmental impacts and international policies down to proximate causes directly affecting rural livelihoods. Exogenous drivers such as global climate change may, for example, have widespread implications for the use and status of common pool resources. At an international level, organisations such as the World Trade Organisation (WTO) strongly influence national policies, and ultimately impact upon local level resources. Nationally throughout the developing world, Structural Adjustment Programmes (SAPs) have had major impacts on rural livelihoods. Among other effects, the retrenchment of government jobs has reduced formal sector employment, and state-driven support for crop production has undermined agricultural livelihoods (Bryceson, 1999; Bryceson and Jamal, 1996). The knock-on effects of SAPs are therefore likely to have contributed to important changes in resource use and the status of common pool resources. Although international and national policies may ultimately drive changes in common pool resources, they may be seen as representing the last, or most distant, of a long chain of factors affecting common pool resources. Therefore, in order to analyse the

direct impacts affecting common pool resources, this section will deal with more local level drivers of change.

It is important to recognise that some drivers of change are interconnected. For example, an environmental change such as long term drought may lead to coping strategies adopted under conditions of increasing poverty. Both may result in similar processes affecting common pool resources. Although this section attempts to maintain a local level focus, where particular drivers of change do relate to or result in other drivers of change, these links are simply referred to in the text. The final part of this section will go on to illustrate the links between the drivers of change and the processes affecting common pool resources. Section 5 will draw upon this conceptualisation to provide a framework for policy makers to assist in making decisions in response to processes affecting common pool resources.

4.1 Changes in Tenure

There are a number of ways in which tenure arrangements for common pool resources may change, each with corresponding impacts on their status. These may include privatisation, quasi-privatisation, nationalisation and redistribution.

4.1.1 Privatisation

Tenure change through the privatisation of common pool resources (usually involving enclosure) may be an economically attractive strategy for the state. This would occur if the corporate sector is seen to have the means and the incentives to exploit such resources more efficiently than existing forms of use, such as through community-based natural resource management. The critical point from a narrow economic perspective is the value-added from common pool resource-based economic activities: the system that delivers the greatest value added to the common pool resource wins. The 'efficient' management of common pool resources becomes of paramount concern, with the objective being to maximise sustainable economic yields from such resources. Policy towards fisheries and logging in many parts of the world reflects such thinking, since these sectors are seen to provide important market opportunities and thereby to enhance economic growth.

The impacts of such privatisation are the inevitable loss of direct access to previous resource users, as well as impacts on their well-being through the privatisation of revenue streams. The exclusion of local people may occur directly as in the case of the rights to a locally used forest being sold to a private logging company. Rutten (1992) and Galaty (1994) show that enclosure of Kenyan rangelands allows access to wealthy herders and urban elites whilst excluding the stock poor and politically marginal. Exclusion may also occur through the erosion of indigenous institutions that once enabled equitable access to common pool resources. For example, in the Ada district of coastal Ghana, salt, a common pool resource, had been equitably accessible to local people under the customary supervision of the local chief. In the 1970s during the development of a dam, the chief, with government approval, transferred resource rights to private companies to the exclusion of local people. Intense conflict ensued as people sought to win back their access rights (Manuh, 1992). Conflict has similarly developed in northern Zimbabwe over access to the wild fruit, *masawu,* where access regulations by village-level institutions have been undermined by the local government through the sale of resource rights to

private urban companies. Conflicts and negotiations over customary resource boundaries and the distribution of levies from the external users have resulted, as well as fears surrounding the degradation of the resource.

4.1.2 'Quasi-privatisation'

A similar loss of access to common pool resources may occur through the 'quasi-privatisation' of resources. The availability of unenclosed common pool resources provides some opportunity for governments to widen access to assets and resources without having to dispossess existing landholders. This has been true in some parts of India, where a series of 'regularised' encroachments on common pool resources have provided considerable opportunity for political patronage. Interestingly, these episodes of regularisation have been shown to coincide somewhat opportunely with the electoral cycle (Geiser, 2001). Land grabbing undertaken with political protection may be seen as 'quasi-privatisation' of the common pool resource, since the encroachers usually undertake individual cultivation. Again, such a driver would mean that previous users lose access to the common pool resource and its revenue streams.

4.1.3 Nationalisation

The nationalisation of common pool resources may also lead to attempts to exclude people from common pool resources, or impose strict new management rules on their use. A state priority may be the efficient exploitation of common pool resource rents. Enclosing the range as a protected area and developing it for tourism revenue may therefore be the most economically efficient use of the land, at the cost of excluding local resource users (Brockington, 2001).

Extension of state management over common pool resources might also be a response to concern for biodiversity conservation based on aesthetic or ethical concerns, or in attempts to adhere to international treaty obligations such as the Convention on Biological Diversity. In this context, identifying the most effective and just protection regime becomes critical. Traditional conservation policy, which advocates the designation of protected areas, is based on the premise that a spatial separation of natural ecosystems from human activities is necessary for effective protection. Local people are therefore excluded from access to and benefits from common pool resources within these areas.

Policy makers may sometimes perceive the need to expand the area under common pool resources as a direct objective in itself. For instance, in Forest Policy Resolutions since 1952, the Government of India has adopted the goal of bringing at least one-third of the total land area under forest cover. To achieve this goal, fast growing species have been planted in many areas. However, the extension of state-sponsored forestry programmes into former grazing areas in parts of India may be threatening the pastoral economy while creating new opportunities for the landless to sell wood-based charcoal in fuel markets (Robbins, 2001). Such an example shows how the expansion of state management may exclude access to common pool resources by some rural people and simultaneously create alternative livelihood opportunities for others, including the very poor.

Policies employed to enhance or maintain a particular resource through its nationalisation may similarly alter the extent of use of common pool resources. Forest protection regulations previously described may be accompanied by state strategies to reduce wood

consumption. In many parts of India and Africa, more efficient stoves have been introduced in deforested areas, and kerosene has begun to replace wood for fuel. Such protection policies also seek to reduce demand and consumptive use of common pool resource products such as ivory, and to restrict trade in endangered species.

4.1.4 Redistribution

In the light of many exclusionary interventions regarding common pool resources, governments are often driven by a policy need to redistribute access to resources, especially to those who are landless or asset poor. More recent policy initiatives to shift tenure of common pool resources have sought to be more inclusive, and have been based upon ideas of community-based natural resource management. The widely documented CAMPFIRE programme in Zimbabwe, illustrates such an attempt. In other circumstances, the availability of common pool resources may allow the state to pursue redistributive strategies that are targeted at the asset poor, while retaining land under some form of communal or state tenure. India's tree *patta* scheme is an example of this (Chambers *et al*, 1989). By targeting the poorest, such projects seek to achieve social and economic equity. However, radical strategies such as widespread resource tenure reform have been successful in a small minority of cases, and often occur under fairly coercive political systems, or at times of revolutionary change. As in most cases, the elite resist attempts at genuinely radical redistributive strategies.

4.2 Intensification and commercialisation of agricultural production

In response to state-provided technical assistance characteristic of many structural adjustment programmes, there has been a shift in many developing countries away from subsistence agriculture to more intensive production of cereals and livestock for the market. On a micro-scale, this may alter the type of resources used, and create new demands on common pool resources. For example, McGregor (1995) found in Zimbabwe that as more land was being cultivated, everyday resource use adapted. The diversity of species available, particularly those species found in woodlands, was reduced. Instead, people used a relatively greater number of species found in arable and disturbed environments, as well as 'weeds' and 'pests' gathered from private land.

The major indirect impact of land intensification on common pool resources is through the conversion of common pool land to privately owned farmland, with the exclusionary implications described in section 4.1. Additionally, the type of inputs employed in land intensification will affect common pool resources. Inputs might include an increase in labour inputs or physical inputs, such as seeds and fertiliser, or tractors and irrigation tube-wells. The capital required to initiate land-intensive agriculture, with its requisite high input levels, effectively excludes the poor from such accumulation strategies. Instead they are left with decreasing common pool resources on which to draw. This leads to increased pressure and subsequent degradation of those resources, and further immiseration. Policies that increase the price of land-intensive outputs may have the same effect on the common pool resource base (Lopez, 1998). Land intensification as a diversification strategy may therefore be responsible for disproportionately disadvantaging the poor, whilst enabling further accumulation for the relatively wealthy.

4.3 Inclusion of Common Pool Resource products into the market economy

Common pool resources are increasingly recognized as playing a key role in rural markets, resulting in part from the process of specialization characteristic of diversification. Not only do common pool resources provide basic household necessities such as firewood and fodder and lean season food supplements, but also represent important income generating opportunities for the rural poor. Arnold and Townsend (1998), in a survey of seven sub-Saharan African countries, estimated that 15 million people are involved in forest-based income activities. In Nigeria, Osemeobo (1993) estimated that individual earnings from common pool resources in rain forest areas were between US$ 817-5200 per annum. The sale of common pool resources is seen as a critical means of meeting contingencies and normalizing seasonal fluctuations particularly for marginalized groups such as women and the poor. In a forest area of Mali, women earned an estimated 79% of their personal income from the sale of common property firewood and shea butter, using the money to purchase daily food requirements (Becker, forthcoming). Chalfin (1999, 2000) describes the collection, processing and sale of a wild oilseed tree crop known as shea (*Butyrospernum parkii*) by rural women in Ghana. Shea is not only a locally important source of food, and a crucial form of revenue for rural women, but it has also been responsible for catapulting rural women into the macro-economy.

The commoditisation of common pool resources has also had adverse effects on rural livelihoods. As structural adjustment policies promote diversification and the export of local produce into the growing world market for tropical products, users are becoming increasingly tied to unsteady and externally-rooted material currents through the use of common pool resources (Chalfin, 2000). In some cases, growth in some economic activities has led to the degradation of natural resources. In southern Zimbabwe, the tourist industry surrounding the Victoria Falls has led to a booming trade in hard wood wildlife sculptures and the subsequent depletion of surrounding mopane forests. The inclusion of common property resources into the market economy is also said to further exclude the poor from access to certain resources (Freese, 1998). Berkes et al (1998) described how local organizations in two Himalayan villages allowed poor women to gather grass and firewood for household use, but restricted their access to resources for cash sale. Processes of common pool resource commoditisation may therefore involve the cornering of resources by local elites, effectively privatising resources to which the poor previously had access (as discussed in section 4.1).

4.4 Urban-rural/rural-rural economic integration

One form of rural diversification – migration - can be seen as a response to the perception that more lucrative economic opportunities are available elsewhere. This has encouraged not only important rural-urban linkages, but has also led to increasing movement between rural areas. These may take various forms and have different implications for the status of common pool resources.

Discussions concerning rural-urban migration have centred around a handful of issues which may indirectly affect common pool resources as a basis for rural livelihoods. Migration away from rural areas has been represented as an efficient allocation of labour, permitting the movement between areas of relatively scarce to abundant labour markets. Seen in this light, remittances returned to rural areas are more valuable than the loss of

labour to the agricultural system (Russell *et al*, 1990). The rural investment of urban-derived remittances may then affect the common pool resource base. For example, households may invest in the capital required for land-intensification, leading to related impacts on other people's access to resources. Other studies have suggested that labour loss is not compensated for by the meagre remittances received (Brock and Coulibaly, 1999; Richards, 1939), and strategies to alleviate the loss may result in a shift to less labour-intensive subsistence activities which may include a heavier dependence on common pool resources.

The economic and political environment of many developing countries has encouraged others to move away from urban areas and incomes and return to rural lifestyles. Similarly, some rural areas are also offering very real economic incentives for in-migration by farmers from other rural areas. In Zimbabwe's northern Zambezi Valley, vast numbers of rural farmers from over-crowded, unproductive rural areas in the south are responding to the lure of unsettled land in ideal conditions for growing cotton, an extremely lucrative crop unsuited to other areas. In-migration at a rapid rate has important impacts on the status of common pool resources; tenure shifts from common to private resources as households lay claim to agricultural land, so leading to other's exclusion. There may also be new demands for resources, as well as increasing pressure on the shrinking common pool resources.

State action and corporate investment in rural areas may represent more incentives for rural-rural migration. Government construction of dams and corporate mining projects, for instance, draw large labour forces into rural areas that are not necessarily prepared for the population influx. Besides issues relating to the change in resource tenure and possible displacement of people by such projects (privatization and exclusion), the accompanying migration places new demands and increasing pressures on the common pool resource base (Child 1996).

4.5 Shifts in well-being

Shifts in social and economic security or the extent of poverty are important factors driving the processes that affect the common pool resource base. In this section, the impacts of increasing wealth and security, as well as the entrenchment of poverty are described as important factors shaping the use of common pool resources.

4.5.1 Increasing wealth

With increasing wealth in rural areas, the time-consuming collection and preparation of common pool resources may be substituted by longer-lasting, manufactured alternatives. Thatching grass is increasingly being replaced by corrugated iron for roofs, and plastic string used in place of twisted tree bark. As rural people are able to purchase goods, so labour-demanding common pool resources become less desirable. However, increasing wealth may similarly place extra pressures on the resource base. The move towards more permanent brick houses instead of those made from mud requires not only the extraction of large quantities of clay soil, but also vast supplies of fuelwood to dry the bricks. Such resources are frequently drawn from the common pool base.

4.5.2 Increasing poverty

The prevalence of rural poverty in developing countries has important and perhaps more widely publicised impacts on the processes affecting common pool resources. It is acknowledged that common pool resources are particularly important to the rural poor, and that a household's dependence on such resources becomes exacerbated under specific circumstances. One study in Ghana found that the poorest households relied on 'bush' sources to meet 20% of their food requirements during the lean season, compared to bush sources providing 2% to 8% of wealthy and middle income household respectively (Dei, 1992). Similarly, studies from India have found that that incomes from common pool resources contributed more than a fifth of income from all other sources for the poor (Jodha, 1986). Even if the *incidence* of rural poverty is declining (as is true in some parts of the developing world), there a growth in *absolute numbers* of the rural poor, and this continues to add to the pressures on the common pool resource base.

4.5.3 Disease

One scenario that may impact upon the use of common pool resources is the prevalence of disease. In particular, the rapid spread of HIV/AIDS throughout the rural areas of developing countries, particularly in sub-Saharan Africa, has had important direct impacts on rural livelihood strategies, and indirect impacts on the common pool resource base upon which rural households partly depend. With the ability of small producers under threat, the AIDS pandemic constitutes an additional shock to some rural systems, representing a 'long wave disaster' (Barnett and Blaikie, 1992). The primary effect of HIV/AIDS at the household level is the loss of labour; recent research suggests that an HIV/AIDS afflicted household may lose about two person-years by the time of the death of the patient, as well as the ultimate permanent loss of one source of labour. Financial loss, resulting from the diversion of labour from economic productive activities to a care-taking role, as well as the money required for medical and funeral costs, also play major roles in shaping household livelihood strategies. The combined impact of these losses poses increasing threats to food security and household assets. In Tanzania, an AIDS related death was shown to reduce the per capita food consumption by 15% in the poorest households, whilst in Zambia, households with a chronic AIDS patient had an average income of 30-35% lower than unaffected households (Mutangadura et al, 1999, quoted in White and Robinson, 2000).

Financial and labour losses due to HIV/AIDS generally result in a move away from household cash production to a focus on basic subsistence. This shift may include the adoption of coping strategies to improve food security, to maintain or increase income for household expenditure and to alleviate loss of labour. Households may substitute expensive food items with common pool resources such as wild fruits and vegetables, and diversify income to include the use and processing of common pool resources in home-based activities, such as basket making. In East Africa, more than 40% of AIDS afflicted households supplemented their income with non-farm, often home based, low labour activities in which common pool resources may play a key role (FAO, 1995, 1998). Previously diversified households were shown to have a buffer against the impact of HIV/AIDS (FAO, 1995) indicating the increasing importance of non-farm incomes in rural livelihoods.

4.6 Environmental Change

Environmental change may directly drive the processes affecting common pool resources. Long-term drought may, for example, reduce the availability of resources. Conversely, extensive rains may result in lake with increasing areas under water, thereby offering new fishing opportunities. Environmental change is also a driver that indirectly affects the status of common pool resources by shifting the patterns of everyday resource use. For example, long-term drought can act as a shock that drives the rural poor deeper into poverty and increases their reliance on common pool resources. As in the case of HIV/AIDS afflicted households, a move from cash production to a subsistence livelihood may be required. Wild resources that were lucrative sources of income during years of good rain, may become important diet supplements during lean times. At such times, the lack of disposable income can drive the rural poor to rely more heavily on freely available resources for other purposes such as building materials, rather than seeking manufactured alternatives. In Zimbabwe, environmental change forced productive households to gather fertilisers from common woodland, while poorer households became increasingly dependent on consumption, sale and use of woodland resources and other gathered produce than wealthier households (McGregor, 1995). Responses to shock and increased vulnerability may alternatively lead to migration: in Mali, West Africa, increasing aridity over at least two decades is said to have forced households to relocate to more productive areas (Davies, 1996), with implications on common pool resources discussed in section 4.4.

4.7 Population growth

The growth in human population may be a factor directly affecting the availability of common pool resources. In rural areas, booming populations put increasing demands on resources whose rates of supply remain unchanged. The rapid rise of urban populations also has major effects on common pool resources in rural areas. Resources such as firewood and charcoal are siphoned off to fuel an urban economy, and urban dwellers may increasingly look to the rural areas as providers of raw materials (see also sections 4.1 and 4.4).

Population growth may also indirectly affect the use of common pool resources, and the ability of the rural poor to maintain sustainable livelihoods. Beck and Ghosh (2000) suggest that rapidly increasing population in India is leading to the systematic exclusion of the poor from these resources. They state that population growth has led to the intensification of agriculture and commoditisation of common pool resources, leading to privatization of, and reduced access to resources and to environmental degradation. In sub-Saharan Africa high rates of rural population growth have also been linked to agricultural intensification, with the resulting decline of common property management regimes, and competition over access rights to key resources, often in marginal areas. Meanwhile, Murton (1999) emphasises the political nature of these impacts of population growth on common pool resource use in Machakos, Kenya. He shows that the effects are not homogenous; those households with access to urban derived non-farm income could accumulate land and undertake agricultural intensification, so exploiting the increased availability of labour to generate greater wealth and environmental sustainability (Tiffen *et al.* 1994). Meanwhile, poorer households found it increasingly difficult to maintain livelihood standards in the face of population growth and depended increasingly on the collection of common pool resources and on the agricultural labour markets (Murton,

1999). The indirect effects of population growth - agricultural intensification and exclusion from access to resources - therefore relate closely to discussions of resource tenure in section 4.1, leading to increasing poverty and the associated greater dependence on common pool resources characteristic of the very poor (as discussed in Section 4.5).

4.8 Cultural change

Changes in both local and international cultural values may serve as drivers that affect the use of common pool resources. The establishment of rural-urban links and the forces of globalisation are changing values; what was once expected of or desired by rural men and women of particular ages or social status may no longer be seen as legitimate or desirable. For instance the collection of medicinal herbs, a common pool resource, is frequently shunned by those with formal educations. The loss of indigenous knowledge or a growing reluctance to adhere to customary resource uses may therefore lead to a decrease in the demand for once important common pool resources. Alternatively, on an international scale, concern for wildlife conservation and the growing popularity in game viewing is adding a new demand for common pool resource products. Conversely, a thriving international market in ivory and animal skins increases a demand for wildlife resources.

4.9 Summarising links between drivers and processes

This section has sought to illustrate a selection of scenarios that drive processes affecting the common pool resource base. Although many different drivers of change are presented, they actually result in a relatively narrow set of processes that affect common pool resources as a basis for livelihoods. These are:

- Increasing or decreasing exclusion from common pool resources;
- Increasing or decreasing volume or rate of use of common pool resources;
- The creation of new demands for common pool resources;
- Increasing or decreasing supply of common pool resources given the level of demand.

Table 3 maps the ways in which each of the categories of drivers of change discussed in this section relate to each of these processes affecting the use of common pool resources. Expanding on these links, Table 4 provides generic and specific examples of these drivers and processes affecting common pool resources.

Table 3: Drivers and processes affecting Common Pool Resources

	Increasing exclusion	Decreasing exclusion	Increase in volume/rate of CPR use (demand with respect to supply)	Decrease in volume/rate of CPR use (demand with respect to supply)	Demand for new CPR products	Increasing supply of CPRs (given level of demand)	Decreasing supply of CPRs (given level of demand)
4.1 Changes in resource tenure:							
4.1.1 Privatisation	√		√				
4.1.2 Quasi-privatisation	√		√				
4.1.3 Nationalisation	√		√	√			
4.1.4 Redistribution		√					
4.2 Intensification of agricultural production	√		√				√
4.3 Inclusion of CPRs into market economy	√		√		√		
4.4 Urban-rural/rural-rural economic integration			√		√		
4.5 Shifts in well-being							
4.5.1 Increasing Wealth			√	√	√		
4.5.2 Decreasing wealth			√		√		
4.5.3 Disease			√		√		
4.6 Environmental Change			√		√		√
4.7 Population growth	√		√				√
4.8 Cultural Change		√	√	√	√		

Table 4: Processes of change in Common Pool Resources

Process		Specific Example
Increasing Exclusion	Privatisation (4.1.1)	Kenyan Ranches, Salt resources in Ghana
	Land intensification (4.2)	Conflict between pastoralists and farmers, Senegal
	State nationalisation of resources (4.1.3)	National Parks
	Commoditisation of common pool resources (4.3)	Women collecting fuelwood in the India Himalayas
Decreasing Exclusion	Increasing access to state land (4.1.4)	Designated reserve land with weak enforcement
	Increasing access to private land (4.1.4)	Rapid political change –Ethiopia 1974; Zimbabwe present day
	Increasing access to communal land (4.1.4)	Rapid political change, weak governance; land-grabs; involuntary rural resettlement
Increasing volume or rate of common pool resource use (demand with respect to supply)	In-migration – rural-rural (4.4)	Zambezi Valley and other CAMPFIRE Districts; Mkomazi Game Reserve, Tanzania; Rukwa Valley
	Rural population growth *in situ* (4.7)	Machakos, Kenya
	Urban population growth: increase in commercial market for common pool resource product (4.7)	Fuelwood market near cities
	Increased demand for common pool resource products due to poverty caused by drought (4.6)	Common pool resources represent diet supplement (e.g. Baobab leaves, Hausaland), Movement to area offering common pool resources, Mali
	Increased demand for common pool resource products due to poverty caused by disease (4.5.3)	AIDS households coping stratagies
	Increased demand for common pool resource products due to local and international culture change (4.8)	Charcoal, ivory, bushmeat, animal skins
Decreasing volume or rate of common pool resource product use (demand with respect to supply)	State protection policy-driven substitution of common pool resource product with manufactured alternative (4.1.3)	Kerosine for fuelwood; more efficient stoves; formal medicines.
	Wealth-driven substitution of common pool resource product with manufactured alternative (4.5.1)	Plastic bowls, string, iron rooves for thatching grass
	Culture-driven change in demand for common pool resource product (4.8)	Young people shun communal work (e.g. irrigation) or collection of common pool resources
	Protection policy reduction in market demand for common pool resource product (4.1.3)	Furs; ivory
Demand for new common pool resource products (new structure to demand for common pool resource products)	Intensification leads to altered resources available and new demands (4.2)	Fewer woodland species available, so people rely on 'weeds' from disturbed/cultivated land, Zimbabwe
	Commoditisation of existing product (4.3)	Wooden carvings for tourists
	In-migrants seek something new from environment (4.4)	Immigrant pastoralists
	Households unable to practice agriculture seek common pool resource base alternatives (4.5.2)	Labour-poor, AIDS afflicted households; households adopting coping strategies in response to drought
	In-migration as a result of state action creates new demands (4.4)	Demands from labourers on government construction projects (e.g. dams); Involuntary rural resettlement
	In-migration as a result of corporate investment creates new demands (4.4)	Demands from labourers on corporate projects (e.g. mines)
	Culture-driven change results in a new demand for common pool resource products (4.8)	Game viewing
Increasing supply of common pool resources (given level of demand)	Environmental change increasing availability of common pool resources (4.6)	Expanding lake levels increase fishing opportunities
	State policy-driven land cover change (4.1.3)	Expansion of *Prosopis juliflora* in Rajastan, India, increases availability of fuelwood to the landless poor
Decreasing supply of common pool resources (given level of demand)	Environmental change reducing availability of common pool resources (4.6)	Drought causing loss of grazing resources or fall in groundwater levels
	Over-use of the resource, causing reduced availability	Over-fishing
	Epizootics (animal or plant disease, pests)	Rinderpest in 1890s

5. Policy Formulation in the Light of Changes to Common Pool Resources

5.1 Analytical framework

The links between drivers of change and processes affecting common pool resources outlined in the previous discussion are used in this section to develop a generic framework for policy formulation. A useful organising principle for the analysis of policy concerning common pool resources is represented by the 'Sustainability Triangle' (illustrated in Figure 2, section 2.2) with the three goals of economic sustainability, environmental sustainability and social equity. The Holy Grail of policy is, of course, 'win-win-win' strategies that simultaneously optimise all three dimensions of sustainability. However, the policy challenge (as laid out in section 2) rests not only in managing and equalising the inevitable trade-offs between these policy **objectives** (economic and environmental sustainability, and social equity), but also in addressing the exploitation of the resource for specified **uses**, and distributing the benefits among multiple resource **users**.

An important issue in drawing up guidelines for policy making concerns the existing structures within which decisions are made. Resource managers with the power to make relevant decisions may be part of formal or informal institutions, within or outside of the state. They may include:

- Informal local level user groups e.g. grazing associations and irrigation committees.
- Elected or appointed village leaders or village level natural resource officers determining who can live in an area and access local resources, and how much of each resource different households are allowed to use.
- District level appointed officers enforcing government rules of natural resource use and property ownership.
- State organisations involved in conflict resolution or suppression.
- Pressure groups lobbying for particular resource interests e.g. wildlife.
- Employees of state organisations concerned with controlling state-owned resources e.g. national parks or forest reserves.

By listing a selection of possible resource managers, there is an implication that such discrete and identifiable groups, individuals, organisations or fora exist, and that these can be supported, negotiated with or informed. However, in some circumstances, identifying the decision-maker may be contentious and the source of considerable conflict, and this may impact on the wider applicability of generic guidelines for policy making.

An appropriate framework for guiding policy decisions must begin by examining the processes affecting common pool resources, and the direction in which these processes are working. These will include increasing and decreasing exclusion, increasing and decreasing demand for common pool resources, a new demand for resources, or increasing and decreasing supply of resources. Drawing on these processes, and taking into account the trade-offs between objectives, uses and users, relevant policy options need to be considered. All policy options will inevitably have underlying assumptions and important implications that should be acknowledged. Finally, the process required to achieve change must be determined. Figure 2 below illustrates these links and presents a framework for decision making for common pool resource policy.

Figure 2: Generic framework for common pool resource policy

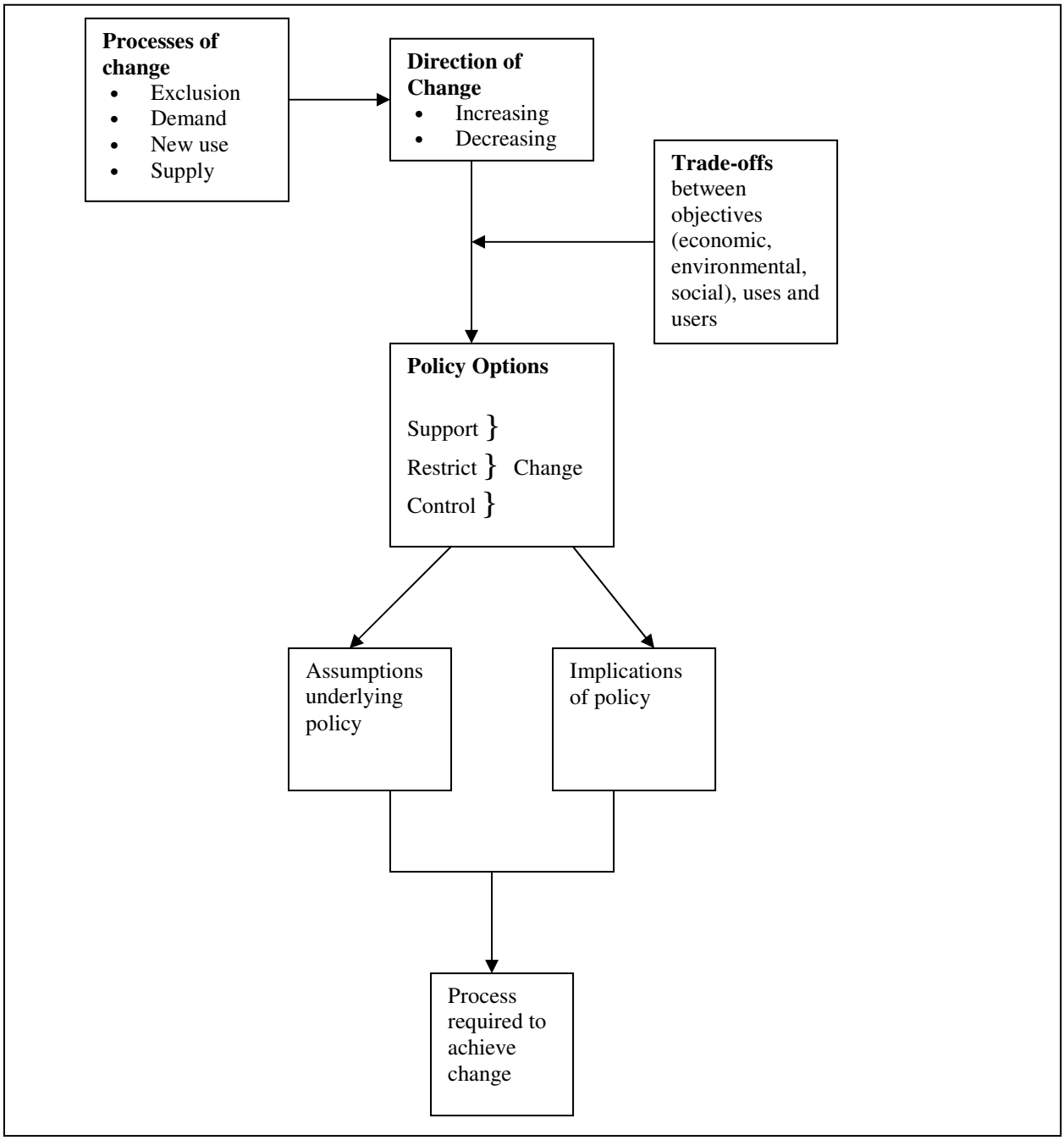


Table 5 expands on this flowchart, to present a more detailed, although still rudimentary illustration of a suitable policy decision-making process. This is not intended to be an exhaustive analysis, rather a framework to illustrate the way in which decision makers may need to think about policies in the context of common pool resource use and management. Appendix 1 works out a detailed example based on a case study of the Mkomazi Game Reserve in Tanzania.

Table 5: A framework for common pool resource policy

Process	Direction of Change	Trade-offs (objectives, uses and users)	Policy Options	Assumptions	Implications of policy	Process required to achieve change
Exclusion	Increasing	Increase economic efficiency of common pool resource use, or flow of public benefits to the state (e.g. biodiversity preservation), but at the cost of those excluded	1. Allow or encourage enclosure	That costs to those prevented from using common pool resources will be compensated or accepted willingly	Need to compensate for loss of income / livelihoods to those excluded	Eviction; displacement; enclosure
			2. Slow down or prevent enclosure, particularly if dubiously legal	That enclosure can be controlled, and that those doing it will agree to stop or slow down	Need to deal with hostility from would-be enclosers; to accept inefficient use of resources in national terms; to accept possible loss of biodiversity	Legal defence of common pool rights; promoting value of common pool resources; Government intervention to defend current users
	Decreasing	Access for new users to former communal or private land, but at the cost of the livelihoods of former users	1. Legalise new use	That existing users will agree to share the resources	Need to accept or compensate for losses or biodiversity impacts of land use change	Set up new stakeholder groups to establish common property regimes
			2. Prevent new users and evict users	That there is a strong locally legitimate management authority	The policy may be expensive; requires a need to meet legitimate poverty needs of new users	Transparent and fair governance required for legitimacy
Use	Increasing	Benefits to users versus sustainability of use	1. Restrict level of use	That there is a strong locally legitimate management authority	Need to meet aspirations and needs of users; need to create support for institutional change	Work with existing stakeholders to strengthen management institutions
			2. Allow unconstrained use and depletion	That there is no other practical alternative	Prepare for resource exhaustion	Work with stakeholders on an exit strategy
	Decreasing	Risks to remaining users if communal management collapses	1. Restructure user organisations	That there is a flexible, locally legitimate management authority; and that necessary investment in institutions is possible	Need to create support for institutional change	Work with stakeholders
Supply	Increasing	How to distribute the benefits	1. Intervene and target specific beneficiaries	That government and civil society are able to manage the intervention; and that necessary investment in institutions is possible	Need to create support for institutional change	Work with stakeholders
			2. Laissez-faire	That the market is able to operate unhindered, and as expected	Need to accept market-determined distributional outcomes	Support operation of free markets
	Decreasing	Benefits to users versus sustainability of use and future revenues	1. Restrict level of use to sustainable level	That there is a strong locally legitimate management authority	Need to meet the aspirations and needs of users; need to create support for institutional change	Work with all stakeholders to establish new rules; strengthen organisation
Demand for new products	New demand appearing	Benefits to users versus 1) needs of existing users and 2) sustainability of use	1. Bring new use under management control	That there is a strong, flexible locally legitimate management authority	Need to deal with aspirations of new users and fears of old users; create support for institutional change	Work with all stakeholders to establish new rules; strengthen organisation

5.2 Further considerations

5.2.1 Analytical complexities

The analytical framework developed in this paper is admittedly simple in its approach. A number of complexities have not been included within it. For example, the processes affecting common pool resources, and hence the policy options open to their management would be influenced by the type and effectiveness of the *existing* regime managing the common pool resource base. An unsuccessful management regime, for example, may be little affected by the change in formal tenure of a resource; a community-based natural resource management programme that is dictated by local elites may not provide a community's most marginal groups with any greater access to resources than they would have enjoyed under direct state management (as discussed in section 1.3). This has implications for the drivers of change (as discussed in section 4) and for the decision-making process in determining the processes required to achieve change (see figure 2). It is therefore vital that the effectiveness of the existing regime is accounted for in the assumptions that underlie policy options.

The link between processes affecting common pool resources and policy options must similarly address the inherent complexities surrounding the management of common pool resources (as discussed in section 3). The dynamic legal, political and institutional structures and the contested meanings of resources must be represented, for they are likely to affect the assumptions that guide policy choices, their implications and the processes required to achieve change. For instance, there is the essential space within the framework for a consideration of both *de jure* and *de facto* access to resources, or for the simultaneous existence of informal and formal institutions. This, then, enables an analysis of how stakeholders might use formal and informal institutions and legal and illegal means to negotiate their claims or forcibly impose their desires, and how decision-makers may respond to such attempts.

5.2.2 Issues of decentralisation and empowerment

Two critical concerns in making policies for the management of common pool resources include scale and power. Key decisions have to be made regarding the level – whether village, district, region or nation – at which resources should be managed. In many fields of policy-making, there is increasing pressure to decentralise/centralise or devolve/concentrate power and there can be disputes over who should benefit from these processes. This becomes a particularly pertinent question in poorer nations where states are often under pressure to reduce their expenditure, and where natural resources offer economic incentives. Guidelines for common pool resource management must therefore be sensitive to the practical problems of decentralisation and devolution that dominate local government and resource management in many potential target countries.

6. Conclusion: critical questions

This paper has sought to draw on a large theoretical and empirical literature on common pool resources and common property regimes in poorer countries to synthesise a decision-making framework for policy makers and project managers. It has identified confusions relating to definitions, and highlighted the importance of common pool resources and common property regimes to the livelihoods of the rural poor. In recognising the gap between theory and policy directions, the paper seeks to describe a number of complexities regarding the management of common pool resources, and to present a variety of situations that drive the processes affecting common pool resource use. By building on these processes, the final part of the paper addresses the policy gap by constructing a set of practical guidelines for researchers and policy makers to achieve more effective policy decisions and interventions.

However, a number of tasks remain. Whilst the framework offers a useful basis upon which to make decisions, it needs to explicitly incorporate the complexities of common pool resource management. A number of other issues are also worthy of further consideration, and the paper concludes with an initial list of these future directions.

1. Is compensation for exclusion a useful issue to discuss in these contexts? Is it feasible in poor countries? Are there the resources available to count the costs and deliver the payments? Do the government infrastructures and civil society capabilities exist to handle such payments? Could they be dealt with by independent organisations?

2. Is identification of discrete 'resource managers' (discussed in section 5) possible, and is this subject to conflict?

3. How can common pool resource users, and common pool resource management systems, be helped to cope with exogenous change (economic or environmental)?

4. What kinds of institutions and planning procedures have the potential to bring about lasting change?

5. What experience of common pool resources and common property regimes is not reflected in this paper?

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Appendix 1 – An application of the analytical framework: Mkomazi Game Reserve.

The Mkomazi Game Reserve was established in 1951. Some residence was permitted to a few herders and their animals. Natural increase and immigration resulted in a huge expansion of stock. In the late 1980s all people and their livestock were evicted with momentous consequences for local livelihoods (Brockington 2001). The tables below explore the application of this framework to this example.

Before eviction

Process	Increasing Use		
Nature of change	Immigration and natural increase at the Mkomazi Game Reserve		
Trade-offs between uses	Problems of environmental consequences of grazing Economic benefits of livestock industry Security of herds as opposed to security of farms Needs of biodiversity / tourism against those of local livelihoods		
Conflict between users	Between herders and Game Reserve Staff and conservation interests Between herders and farmers over crop damage Between herders and herders over grazing pastures		
Policy Options	1. Evict herders and re-establish the Reserve as a wildlife reserve	2. Control herder's numbers	3. Do nothing
Assumptions	1. Government has means and political will to evict and then maintain exclusion. 2. Costs of eviction can either be adequately compensated for. 3. If costs cannot be compensated for, they can be safely ignored 4. Evicting herders will improve environmental indices	1. Government has political will and means to regulate herders numbers 2. Herders will co-operate with the regulation 3. Regulation is sufficient for herders neighbours who may be annoyed at their very presence 4. Controlling herders will reduce environmental problems	1. Abuses to nature, justice etc are a better state of affairs than proposed changes, or proposed changes are too difficult to implement politically
Implications of policy	Need to compensate or ignore social consequences of eviction	Need to have stable institutions with strong local support and co-operation	No change is necessary or possible.
Process required to achieve change	1. Strong operation and subsequent follow up and patrols. Heavy fines and punishment 2. Enhance biodiversity and game viewing values of the reserve to make it worth more to conservation stakeholders.	1. Consultation, transparency, capacity building co-operation and discussion 2. Monitoring	NA

After eviction – herders limited illegal access to the Reserve and many stock concentrated around the perimeter of the Reserve.

After eviction

Process	Increasing exclusion from the Reserve, and increased demand for common pool resources outside the Reserve.		
Nature of change	More effective protection of state-controlled Reserve land		
Trade-offs between uses	Problems of environmental consequences of grazing Economic benefits of livestock industry Security of herds as opposed to security of farms Needs of biodiversity / tourism against those of local livelihoods		
Conflict between users	Between herders and Game Reserve Staff and conservation interests Between herders and farmers over crop damage Between herders and herders over grazing pastures		
Policy Options	1. Maintain exclusion, provide for some needs outside the Reserve	2. Allow limited use	3. Do nothing
Assumptions	1. Government has means and political will to provide meaningful benefits. 2. That the costs of exclusion can be adequately compensated for. 3. If costs cannot be compensated for, those who experience these costs can be ignored. 4. Conflicts outside of the Reserve (such as increased incidence of crop damage) do not undermine government policies. 5. Exclusion improves environmental indices inside the Reserve 6. Changes to the environment outside of the Reserve do not detract from conservation within.	1. Government has political will and means to regulate use 2. Users will co-operate with the regulation 3. Regulation is sufficient for tourist and conservation interests 4. Controlled use will reduce environmental problems outside the Reserve 5. Controlled use will make an impact on well-being	1. Abuses to nature, justice etc are a better state of affairs than proposed changes, or proposed changes are too difficult to implement politically.
Implications of policy	Need to compensate or ignore social consequences of exclusion	Need to have stable institutions with strong local support and co-operation	No change is necessary or possible.
Process required to achieve change	1. Strong enforcement of exclusion 2. Evaluation of local's priority needs through consultation and negotiation 3. Meeting needs – excluding those requiring use of Reserve resources	1. Consultation, transparency, capacity building cooperation and discussion 2. Monitoring	NA