

Formal and Informal Institutions in the wetlands of the Lesotho Highlands

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Abstract

Natural resource dependent communities in developing countries are especially vulnerable to climate change because their livelihoods are dependent on climate sensitive activities, and they have a limited capacity to adapt. In these communities, collective action is required to sustainably manage ecosystem services, where collective action is defined as the co-ordinated action of individuals to achieve outcomes that would not occur on the basis of individual self-interest. This paper applies the Institutional Analysis and Development framework to carry out an institutional analysis of the natural resource management regime in the highlands of Lesotho. The paper also reviews model-based versus participatory approaches to vulnerability and adaptive capacity assessment in climate change research, in order to both motivate the institutional focus taken here, and make clear the advantages of approaches including local knowledge. Representing this 'action situation' of natural resource management in the Lesotho highlands makes clear pressing future research and policy questions, such as: what are the non-adaptive elements in the regime, and how can those be improved? What barriers to adaptation are presented by traditional (or informal) networks, and what are the social and moral costs of overcoming such barriers?

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1 Introduction:

Climate change impacts are already being felt at the regional scale and, because of the inertia of the climate system, this will continue to be the case in the short to medium term (IPCC, 2007). With the knowledge that impacts are occurring, and will continue to occur, irrespective of the success or failure of global greenhouse gas emission mitigation efforts, adaptation to climate change has increased in importance at all scales. Climate change is an additional source of risks to resource dependent communities and in many cases increases pressure on ecosystem services. It is often argued that because the impacts of climate change occur at the local level, adaptation should also occur locally. While it is certainly true that impacts do occur on scales comparable to the community level and are rarely uniform across, for example, nations, the institutional setting which constrains and enables adaptation actions reaches across scales which incorporate actors at scales much higher than the community or local level. In other words, from an institutional perspective, while the formal and informal networks operating at the community level are certainly important, the way in which adaptation options, and thus vulnerability, are constructed at the local level generally involve formal institutions originating at the national (and international) level, as well as rules, or institutions, determining the access of local actors to those institutions operating at a higher scale of political organisation. Climate adaptation action while being locally based, should also take into account the institutional context which is often determined at larger scales (Adger, 1999, 2003).

Natural resource dependent societies in Africa are thought to be especially vulnerable to climate change because their livelihoods are dependent on activities which are highly sensitive to climate change and they possess a limited capacity to adapt. While adaptive actions can reduce vulnerability either by effecting sensitivity or increasing adaptive capacity, addressing the institutional aspects is arguably the most pressing need in climate change adaptation of natural resource dependent societies, as this offers opportunities for capacity building and improvement in spite of large uncertainties in the knowledge of future climate. That is to say that institutions for the management of natural resources which exhibit high capacity to adapt to current, and short-term, stresses, are likely to be beneficial for adaptation to future climate change in which knowledge about the environment, and human-environment interactions, are fraught with uncertainties (Adger, 2003).

This paper is focused on the institutional analysis of natural resource management regimes in the context of climate change, where institutions are understood in the new institutional economics sense

of being the rules, both formal and informal, which govern decision-making and access to decision-making (Ostrom, 2005). By looking at local adaptation to climate change through an institutional lens higher scales of political organisation are brought to bear on local adaptive strategies. Thus both formal and informal rules at the local level and their interaction with institutions at the national (and international) level are analyzed with respect to the role they play in managing the resource under current and future climate risks. Concepts developed in the new institutional economics and water management literature, such as 'adaptiveness' and 'adaptive management', can then be applied to the resource management regime in order to identify properties of the regime similar or dissimilar to the properties identified in the literature as making up these concepts. This analysis makes clear to what extent natural resource management regimes are currently able to manage the resource according to the normative criteria of these concepts and what barriers exist towards increasing the adaptiveness of the regime to manage increasing, yet uncertain, environmental risks. This approach builds on a body of research in natural resource management, and the management of the 'commons', (Ostrom, 1994, 2005; Argwala 2001) which emphasizes capacity building and 'adaptive management' arguing that the outcomes of interactions in the human-environment system are often too complex to focus on specific 'control', or engineering solutions.

By presenting a case study from the Lesotho highlands, where the population is largely dependent on livestock for its livelihood, in the Institutional Analysis and Development (IAD) framework (Ostrom 2005), I will show the benefit of formally representing knowledge for analysis and comparison about the resource management regime in the context of climate change. This is essentially an institutional vulnerability assessment. The example case presents an interesting intersection of formal and informal networks, as the traditional institution of chieftainship has been legally replaced through government reforms by decentralized formal decision-making. However, this traditional institution, though formally obsolete, still appears to play an informal role in the implementation of decisions. Representing this 'action situation' of natural resource management in the Lesotho highlands should elucidate pressing future research and policy questions, such as: what are the non-adaptive elements in the regime, and how can those be improved? What barriers to adaptation are presented by traditional (or informal) networks, and what are the social and moral costs of overcoming such barriers?

2 Theory and Methods

2.1 Top-down versus Bottom-up in Vulnerability Assessment

Before turning directly to the case it is useful to place this research within the broader context of climate change vulnerability assessment. The term vulnerability itself has been used in many different disciplines, and is a concept which, at times, evokes controversy and confusion, owing to this diversity of uses (Adger, 2006). O'Brien et. al. (2004) describe a contrast of 'top-down', model-based (system control) approaches versus 'bottom-up', participatory approaches to vulnerability assessment in climate change research. The conflict inherent in these two approaches is based on differing assumptions about human behavior present in each of them: whereas in the top-down case, assumptions are made about human behavior (i.e. rational or boundedly rational actors) in order to model or assess a given outcome, in the bottom-up case, human behavior and decisions are seen as influenced by, and contingent on, the social context and processes in which they occur, and thus permit a broader range of outcomes (Aaheim, forthcoming). In this sense, taking a bottom-up approach can be seen as investigating the social and institutional context in which adaptation strategies are developed in greater detail: expectations about agency, in the latter case, are an output from, rather than an input to, the assessment.

A point of criticism stemming from this dichotomy in vulnerability assessment is that top-down approaches are deficient or incomplete, due to limiting assumptions, and that they are also unjust, due to not allowing democratic access to decision making by large segments of the population. In this sense, O'Brien et al. point out that the discourse in climate change vulnerability assessment which is dominated by top-down approaches limit adaptation thinking, proposing a 4th IPCC Working Group to deal with the social justice issues which are marginalised by this approach. Alternatively, it has been proposed that top-down and bottom-up assessments are in fact undertaken for different purposes or, at the very least, they provide insight into different problems. As such, assessments should make use of the methods which are appropriate to the question they mean to address.

In general, top-down assessments are exemplified by coupled climate-economic models at the macro-scale. For climate change analysis, outputs from climate models, which are driven by given scenarios of future growth and emissions, are registered and fed into economic models. This type of assessment answers questions regarding how much mitigation is appropriate, and, in regards to adaptation, can be useful for addressing questions such as priority areas to direct funding between countries (Fuessel and Klein, 2006). As well-deserved attention has been shifted to adaptation, these models have begun to include different adaptation strategies in assessment (Schroeter et al, 2005, Dinas-Coast 2005). However, despite the inclusion of adaptation to broaden the exclusive focus on biophysical impacts, the

IPCC assessment process remains dominated by top-down, model-driven approaches (Burton et al. 2002). When the impacts of climate change are assessed through models which make assumptions about human action, such as in macro-economic models, the models are used to assess the effectiveness or costs of a given policy, such as a tax instrument. What is left out is an evaluation the social or political feasibility of such an instrument. Participatory assessments focus on gathering information from stakeholders in a given region or sector, and projecting qualitative vulnerabilities to climate change given coarse information about possible future climates (Berkhout, 2005).

This opposition mirrors similar debates in natural resource economics where solutions to the classic 'tragedy of the commons' have taken the form of either a 'top-down' approach, assigning and implementing property rights, or a more inclusive 'bottom-up' approach, building on traditional local institutions to develop sustainable resource management strategies (Corcoran, 2007). The opposition can equally be classified on the basis of the assumptions an approach makes about human agency. The proponents of property rights allocations as the solution to natural resource over-exploitation, base their argument on assumptions of rational actors and the efficient resource allocations that follow from them. On the other hand, scholars advocating the importance of institutions and social and economic context, include variables of social norms and social capital. Ostrom's theory of self-governance includes variables such as the expected benefits from cooperation, expected costs from cooperation, and discount rates -- discount rates in turn being affected by "exit options", or the range of opportunities an individual retains outside a given situation (Ostrom, 1990; Grafton, 2000). However, she argues that endogenous institutions -- such as common property regimes -- need not be at variance with rational choice so long as these institutions effectively mitigate the transaction costs incurred by the individual (Woodhouse, 1997: 539). Ostrom incorporates consideration of social processes in her framework, including internal community norms, the amount and type of conflict that existed in the past, and particular status quo rules (Ostrom, 1990; Ostrom, 2003). This theory of self-organising systems is locally based and, while it can be seen as an extension of model-based approaches described above rather than in direct opposition, it must be noted that this theory addresses different questions than those normally looked at in climate vulnerability assessment.

This paper pursues such a bottom-up approach, which necessitates a focus on institutions, both formal and informal, which determine the social context. As explained in the following section, several decades of research in natural resource management have brought insights about the generic features of sustainable management regimes. These features are contained in the concepts of 'adaptability' (Ostrom,

2005) and 'adaptive management' (Berkes et al. 2000). These concepts are in turn contained in the IPCC definition adaptive capacity: 'the ability of a system to adjust to climate change to moderate potential damages, to take advantage of opportunities or to cope with the consequences.' In the following section, I will briefly review current approaches to adaptive capacity assessment in the climate change literature, so as to better situate an assessment of a natural resource management regime in the context of climate change, and adaptive capacity research.

2.2 Defining and measuring Adaptive Capacity

Adaptive capacity has been a major focus of climate adaptation research because of large uncertainties in the future environment, and the result of interactions with that environment. Both measuring and building a daptive capacity have been identified as pressing policy needs, though the former case tends to address questions of directing funding rather than informing intervention (Vincent 2007, Adger 2007, Pelling and High 2005). The IPCC defines 'determinants' of adaptive capacity which provide the resource base from which adaptive actions can be made (IPCC 2001, Yohe and Tol 2002, 2007). These 'determinants' , are measured through economic, technological, political, institutional, etc, indicators although the relative importance of these determinants is thought to be scale specific (Vincent 2007). These determinants have a bearing on the entities ability to take adaptive action in all situations (or these determinants have a bearing on the outcome of an entities adaptive action, i.e. better market setting means a farmer will meet with more success if he decides to sell his cow). This corresponds to the concept of 'generic' adaptive capacity denotes the fact that there are elements of adaptive capacity which reduce an entities vulnerability, regardless of the type of hazard, or environment, with which they are faced.

Adaptive capacity assessment which takes the determinant approach where the 'wellness' of the state is assessed via indicators and future 'wellness' can predicted by modeling the evolution of these indicators. Yohe, Tol (2002, 2007) have explored this approach formally and developed indicators for the range of factors determining adaptive capacity described by the IPCC (economic, technological, institutional, access to risk spreading,...), noting that some of these factors may only be described quantitatively. This approach can be seen as taking place in the top-down mode, as no account is given of how adaptation strategies are arrived at, which local interests, traditions and institutions influence decisions, or how democratic decision making enters the adaptation process. Similarly, the vulnerability studies of ATEAM, and O'Brien et al. (2002) assess vulnerability based on assumptions

about actions rather than through stakeholder consultation, or a contextual evaluation of likely adaptation strategies. The vulnerability of a region in these studies is measured by combining measures of sensitivity and exposure with the adaptive capacity indicators. Adaptive action enters the picture only in the form of scenarios (the SRES Scenarios) which are fed into climate, land use and ecosystem models and give a time series for the evolution of adaptive capacity indicators. The adaptive capacity indicators serve as a proxy for action. In this sense, action is accounted for in aggregated terms and serves as an inputs into the various regional or global models as needs specify. Thus vulnerability is an outcome based on adaptive capacity which necessarily makes assumptions about human action. This may be useful at an aggregate scale to answer question like: which country is in greatest need of adaptation funding support, however it falls short of supporting the adaptation process, by not taking into account the local political and institutional context which could pose important barriers to adaptation.

In the second approach, authors generally distinguish between adaptive capacity and adaptive potential, where adaptive capacity is smaller than adaptive potential as it is constrained by factors, institutional and economic, which determine an action that is actually taken. This is the approach taken by Luers et al. (2005) studying farmer's yields in the Yaqui Valley, where statistical methods are used to determine an individual's adaptive capacity with respect to their best possible outcome. Similarly, agent-based modeling is now being used to formally represent knowledge and predict outcomes for multiple resource users. This approach gives in a sense a more complete picture of adaptive capacity as social norms can potentially be represented dynamically by the models. This is a bottom-up approach which allows for flexibility in the assumptions about agency of the actors. However, the complex human-environment systems which characterise natural resource management regimes have been shown to be very resilient to predict policy-outcome relationships (Ostrom, 2005). Therefore, a third approach to adaptive capacity assessment from the bottom-up perspective is offered by the adaptive management paradigm. This concept shifts the research and policy focus to those generic characteristics of a institutional regime which promote the flow of information, the ability to learn and adaptive responsive decision-making. Next we define institutions and outline the approach of the Institutional Analysis and Development framework.

2.3 Institutions

Adaptation to climate change often requires co-ordination and regulation, what is generally termed

collective action. Co-ordinating information and action in the face of possibly diverging interests is the role of institutions, where institutions are understood as “prescriptions that humans use to organise all forms of repetitive and structured interactions” (Crawford and Ostrom, 1995). The importance of institutions is increasingly emphasized in the climate change context (WHO 2002; Adger et al. 2003; WHO 2004; Schipper and Pelling 2006; O’Brien et al. 2006; IPCC 2007). While much of the discussion has focused on appropriate global institutional frameworks for mitigation and, to a lesser extent, adaptation (Moehner and Klein, 2007), local adaptation research has shown that both formal and informal institutions, as the rules governing decision-making and access to decision-making, must be accounted for in successful and just adaptations (High 2005, Pelling and High 2006). Pelling and High (2006) emphasize the importance of the 'shadow network' in aiding an organisation's ability to respond to changes in, and shocks from, the environment. The role of actors beyond the state and the informal relationships which exists outside of formal, legal authority and decision-making are emphasized as being important for 'adaptive earth system governance' (Biermann, 2007) . Adger (2001) notes that adaptation to climate change is based on the institutions of local culture and tradition. In fact, according to Adger, social capital is itself an institution, representing the informal ties in communities which can be used to pursue collective action and replace, when needed, the functions normally assigned to the state in, for example, disaster preparedness and recovery. Thus institutions include formal rules (e.g. legislation, decision-making procedures, enforcement and sanctions) as well as informal rules (e.g., culture and tradition, conduct and behaviour, social norms, and verbal commitments). Zizek (2005) notes that informal codes of conduct and behavioral norms are the normalized interactions of everyday life which reduce transaction costs in everyday interactions and are essential to the functioning of economies at all scales.

The focus on informal institutions and social capital has provided the insight that adaptation planning taking strictly a 'top-down' or engineering approach will be limited in both its effectiveness, and its ability to fulfill the requirements of 'fairness' (O'Brien et al 2004, Paavola and Adger 2003). This criticism is premised on the idea that local knowledge and decision-making in the hands of local actors is beneficial both in terms of the functioning of the system, ensuring equitable and sustainable results which incorporate local knowledge, and in terms of justice, ensuring a larger degree of democracy. This is the case particularly as institutions can be understood as the mechanisms by which co-operation is achieved, information is shared and conflicting interests are overcome. Taking stock of the full-range of institutions which determine the social, political and economic context goes beyond the typical top-down approach in an attempt to understand the social dynamics motivating actions.

This paper formally represents the natural resource management regime, in this case rangeland management in the Lesotho highlands, in the IAD framework. The aim is to indicate which components of the regime qualify as adaptive (Ostrom, 2005), and to identify barriers to increasing adaptiveness. The focus on the generic properties of the institutional regime follows from the noted uncertainties associated with knowledge about the future climate at the local level, as well as further uncertainties pointed out in the literature in action-outcome linkages in complex human-environment systems.

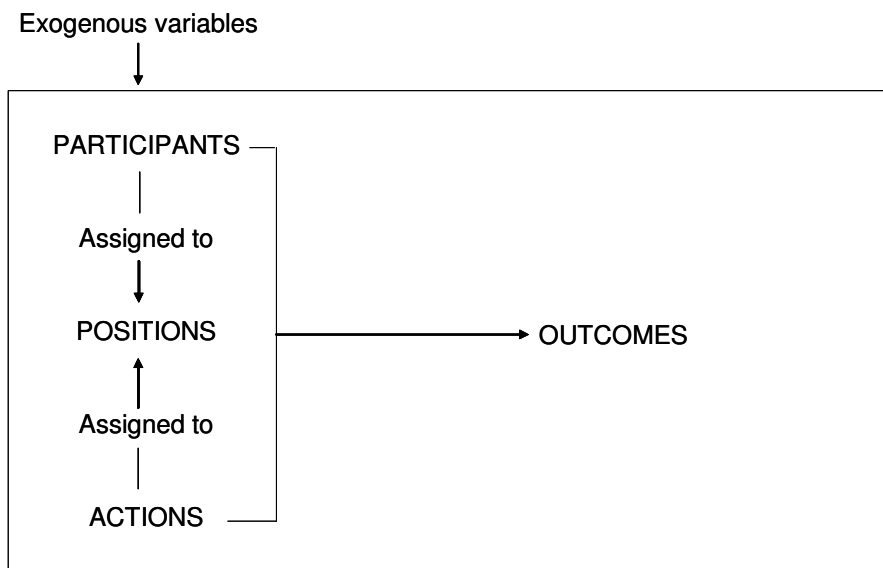
2.4 The IAD

The Institutional Analysis and Development (IAD) framework (Ostrom 2005) provides a language with which to speak about actors, and the institutions and bio-physical context they find themselves in. The IAD develops classes and relations between classes in order to provide researchers with a tool to consistently describe and compare the action situations they observe. The framework has been developed through an extensive analysis of cases in order to extract the building blocks of classes and rules that attempt to describe the full diversity of human interactions. One advantage of this approach is that the framework is relatively theory-neutral, in that it has been developed from the extensive study of empirical work. A second advantage of applying the framework is that it is less abstract, or less removed, from the object of study than the use of indicators for example. With the IAD, we attempt a formal representation of the knowledge we have about the world with minimal theorizing in between.

With the IAD framework, Ostrom studies institutions by focussing on action situations in which participants with particular positions make choices under different institutional settings. A simplified internal structure of an action situation functions as follows: Participants are assigned to positions, which allow particular actions to the participants on these positions.

Action situations are influenced by exogenous variables, such as the biophysical environment, rules of applicable to a given situation and characteristics of the community. Figure 1 shows the structure of an action situation including its internal aspects.

Figure 1: Action situation



Ostrom 2005, 33

“An individual's choice of behaviour in any particular situation will depend on how the individual learns about, views and weighs the benefits and costs of actions and perceived linkages to outcomes that also involve a mixture of benefits and costs.” (Ostrom, 1990). The action chosen in a given situation is therefore effected which positions the participants fill, the participants’ expectations about outcomes, and the external influences.

The IAD framework allows investigating action situations at different levels, and also implies that the action situations are nested. The meta-constitutional level sets the rules for the constitutional level, which in turn sets the rules for the collective choice level, which then sets the rules for the operational level, on which the physical system is actually altered (Ostrom, 2005).

Defining climate adaptation also requires some care. Previous distinctions have been made between anticipatory and autonomous, public and private adaptations (Klein, 2003). What is clear, however is that adaptation must be defined relative to a 'normative' goal or criteria (Ionescu et al 2005). This is an important point in that it acknowledges that natural resource management is itself not necessarily a static goal (Rammel et al, 2007). In this case, I define adaptation as maintaining ecosystem productivity

(management goal) in the face of the impacts of climate change.

Natural resource dependent communities are thought to be particularly vulnerable to climate change, as climate directly effects growing patterns, yields, soil degradation, etc. In these communities, traditional institutions, or resource management systems, have often evolved with the goal of maintaining sustainable resource use. Yet these management systems nonetheless give rise to social conflicts stemming from the unsustainable use of these resources, as well as from significant changes in the biophysical or social system. We now turn to the case and a representation of the action situation to gain insight into the adaptive capacity of the system.

3 Case Study in the Lesotho Highlands wetlands

3.1 Introduction

Lesotho is a small, land-locked country completely surrounded by South Africa, lying at approximately 29° S latitude. It has a population of 2 million and is divided geographically between the lowland, foothills and highland areas, the latter being above 2500 meters in elevation. The great share, about 85 % of Lesotho's population is rural, this being especially the case in the highlands where rural villages rely on subsistence agriculture, livestock farming, and wage-labour from migrant workers in South Africa for their livelihoods. Subsistence farming supports a large segment of the population to some degree, and similar to much of sub-Saharan Africa, livestock farming also plays a large role in local livelihoods. The other main livelihood source in the highlands has been from migrant workers bringing home wages from the mines in South Africa, though this has diminished in importance in recent years due to mine closures and retrenchments.

3.2 Rangelands

In continental Africa, small-scale agro-ecosystems account for 90% of agricultural production and are the "single most powerful influence on environmental quality" (Scherr, 2000: 481). Over 70% of the world's rural poor depend on livestock (World Resources Institute, 2005: 50). Yet despite, or perhaps because of, the importance of livestock farming in Basotho culture, overstocking and overgrazing have been seen as problems for several decades. Population growth has been high in Lesotho over the course of the last several decades which is also exacerbating the soil degradation and rangeland productivity problems. Estimates of the overstocking rate vary over time and between different studies, but there is

general agreement that a reduction of stock would offer benefits in the form of reduced soil degradation and erosion in the grasslands, and healthier, more valuable and more productive stock. Although some efforts have been made in the past to provide incentives for stock reduction, they have ended in failure largely due to a poor understanding of local institutions and traditions related to livestock ownership. Ferguson (1990) shows that development programs aimed at destocking in Lesotho failed because they were based on a development discourse which ignored the role of livestock in Basotho culture and the local economy, and misrepresented the functioning of local markets and the dual cash and livestock economy. Lawry (1988) notes that, following several decades of changes in land use administration, enforcement of grazing regulations has been limited by deficiencies in social authority of chiefs, or other local institutions such as Range Management Associations, which have attempted to implement co-ordinating range management strategies: the traditional cheifainship institution has been weakened, while the formal institutions set-up to take their place have been beset by problems of legitimacy.

3.3 Wetlands

Due to the development of large-scale hydrological works for the sale of water and electricity to South Africa, a greater interest has been taken in recent years in the wetlands of the Lesotho highlands. The Lesotho Highlands Development Project is a series of dams which store water for hydro-electricity generation and transfer to South Africa. The wetlands in the Lesotho highlands are the sources of rivers which provide water to the dams. Although wetlands cover only 1.96% of the surface area of the country, they provide hydrological services through purifying water and storing water in the rainy season releasing it slowly over the dry summer months (MEA 2005). Precise biophysical data quantifying the amount of water provided by the wetlands to the dams has not yet been obtained, however the 'sponge' characteristics of wetlands has been quantified elsewhere and are thought to function in the same way in Lesotho (MEA 2005, GoL 2005). Additionally wetlands play a role in the livelihoods of local villagers, as they provide drinking water and house grasses for medicinal and handicraft uses. Despite their importance, wetlands in the highlands are currently experiencing degradation due to soil erosion, siltation and livestock trampling mainly from the same overstocking problem which are affecting the grasslands, though they have also been impacted by road construction and droughts. Because it is livestock management which affects both the rangelands and the wetlands, the latter largely contained within the former, land tenure arrangements and rangeland management policy are a key element of wetland management and conservation. Keeping management of rangelands and wetlands separate is very difficult due to location of the wetlands as well as the undesirability of designing fences and fines for conservation built on the colonial era model (Shale

2005, RMD, GoL Personal Communication 2007).

3.4 Land use and Natural Resource Management Policy

Natural resource management has traditionally been the responsibility, set out in the Laws of Lerotholi, of Basotho chiefs. These customary institutions based on local practice, dating from the 19th century, set out land use and grazing control in Lesotho's rangelands, granting powers to the chiefs to control the allocation of grazing areas, grant grazing permits, protect certain areas from grazing and prosecute violators of the regulations (Rohde et al 2006). These powers were exercised through the *Leboella* system, whereby a village's grazing area would be divided into three equal parts and reserved in rotation during the course of the year to allow vegetation regeneration. With Lesotho's independence in 1966 came a dissolution of the authority of the chiefs as local and village councils were given responsibilities previously under chief control. The Land Husbandry Act of 1969 repealed the Laws of *Lerotholi* and with them, the customary land tenure relationships which had been in place formally since 1903. This shift towards policies favoring democratic decentralisation did not continue unabated however. 1980 saw Range Management and Grazing Control Regulations reinstating chiefs in the role of grazing administration, reserving the trend towards dissolution of chieftainship authority. Subsequent formal changes further dismantled the power of chiefs however, as in 1992 village development councils were delegated the right to land allocation. The later removal of chiefs as chairs of these councils in 1994 resulted in a further erosion of the power of chieftainship over land (Turner, 2003). Most recently, the 2005 Local Government Act prioritized political decentralization by establishing community councils which formally took over all land administration and grazing responsibilities from the chiefs (GoL, 2005). The result of this formal institutional changes has been a continued existence of the customary land use system, the *Leboella*, however one which is beset by enforcement problems. As noted, the power of the chieftainship in enforcing rules of the *Loboella* has been diminished by the social and political changes described above, while local councils are often seen as not acting in a disinterested manner in their administrative role.

In addition to structural changes in authority at the local level, several rangeland initiatives have had an effect on land use in the Lesotho highlands. According to Lawry (1988), rangeland management in Lesotho in the 1980s was pursued along a dual track approach. On one hand, there has been a strategy to hand over decision making power to grazing associations. This was a strategy promoted by USAID, based on the model used of Native American Reserves in the US (Quinlan, 1990), which implemented projects emphasizing stock improvement and incentives for destocking. On the other hand, resources

were invested to build institutional capacities for better land use administration and enforcement was pursued through the local chiefs. However the chieftainship came with its own set of problems which were compounded by the periodic granting and taking away of its responsibilities. The chieftaincy now exists as a 'power stripped' institution (Shale et al, 2007), still essential for communicating with villagers but devoid of any legal authority. It should also be noted that the traditional authority of the chiefs in land use was limited to the local grazing areas surrounding the villages. The remote A and B areas were in practice common grazing areas for use by several villages, and thus subject to the 'tragedy of the commons'. The preceding discussion has illustrated the historical development of the institution of chieftainship in Lesotho. Before turning to the other strategy for land use and sustainable resource management, namely the implementation of project base Range Management Associations (RMA), we should first describe the structure of the pre-existing, or customary land use arrangements, the Loboella.

3.5 The Land Use System (Leboella) and Wetlands

The *Leboella* system divides the grazing lands into three sections. The A grazing area is found at the highest elevations and located furthest from the villages; they are grazed in the summer months from November to March. The B area is an intermediate area at lower elevations and used by livestock from April to May. The C grazing area is that area closest, or adjacent, to a village, and is utilized for livestock grazing during the cold winter months from June to October. The village chiefs have direct jurisdiction over the C grazing areas adjacent to the villages. The A and B areas, on the other hand, sometimes several days walk from a village, are shared between a group of villages forming a district. One Principle Chief, the district head, has jurisdiction over the A and B areas of the district, which could serve anywhere from 5 up to 12 villages, with stock-owners in these villages being free to graze their animals anywhere in these areas. The Principal Chief of the district determines the land that falls within the zones and sends out a message for when herds are to be moved between them. However Shale et al (2007) found that communication problems existed between Principle Chiefs, herd boys and stock-owners aware of the problems in the grazing areas. As a result, livestock are often not moved between areas quickly enough, and the overstocking problem is exacerbated by overgrazing in specific areas over the course of the year. When the cattle spend long time periods in Zone A, they end up eating grasses and plants that are not nutritious and could even be dangerous for them (Mphale 2000). The village chiefs control the C grazing areas and monitor them closely. However the A and B areas are under control of the Principle Chief and as such can be accessed by many villages. Zone A covers a larger area than B and contains more wetlands. Wetlands in Zone A are said to be bigger but they dry

up more quickly, while wetlands in Zone B very rarely dry up. The land around the wetlands in Zone A is apparently not too muddy to walk on and the grass is very nutritious. Where the land is muddier (e.g. Zone B), herd boys wait for the water in the wetlands to collect elsewhere, before allowing cattle to drink there, so that they do not get stranded. Cattle are taken by herd boys to the A area in the summer months where they stay on cattle posts often found in, or nearby, wetlands. It is these wetlands, in the 'no man's land' far from villages, lacking effective or consistent monitoring, that are suffering as a result of overgrazing and trampling from livestock (Mphale, 2000, Shale et al, 2007). Wetlands also exist in the A areas close to the villages, and are used by villagers for water supply as well as for medicinal plants and making handicrafts. However these wetlands were seen in several villages to be well maintained, and closely monitored by village chiefs (SEI, 2007). In fact, there appeared to be a rule in place for limiting cattle access to the wetlands once grasses decreased to a given level. Although institutions do exist to monitor and restrict or penalize access to the rangelands, they are the weak institutions of the chieftainship and not easily enforced. In this sense the traditional land tenure system in Lesotho exhibits properties of the 'tragedy of the commons'. Within the Leboella system, free access to the B and C areas provides little incentive for stock-owners to manage the resource sustainably or limit the number of animals they permit to graze. This can be attributed to the state of the resource, as well as the traditional lack of a land tenure arrangement and other social and political factors, noted by Lawry, which put pressure on the Leboella system. Next we look at the institutional arrangements of the Range Management Associations, the effect they have had and the current pressures they face.

3.5 Range Management Associations

Range Management Associations were favored by donors as area-based projects and seen as an effective way to deal with the overstocking problems ubiquitous in the Lesotho highlands, with the goal of promoting commercial livestock production as a means of development. The RMAs were initiated in Lesotho as part of the Livestock Policy Implementation Plan drawn up in 1990. The RMA concept is based on the belief that pastoralists over-exploit rangelands because they do not own them, and thus do not have the incentive to manage them for future use (Hardin 1968, Rohde et al 2006). By giving exclusive rights for a specific rangeland to a select group, it is believed the RMA will provide them with the incentives to sustainably manage that resource, and provide a means of economic development through the development of a commercial cattle industry (Ferguson, 1990).

The RMA are a district level agreement, administered by a Grazing Association committee, intended to

allow stock-owners exclusive rights to the B and C areas for a given district provided the stock-owners comply with certain rules. Stock-owners in a given district can join an RMA, thus having access to the lands administered by the RMA, provided their animals are suitably healthy. Stock-owners must also comply with rules and decisions on grazing rotation and the number of animals permitted based on monitoring undertaken by Range Management Division officers at a given site. In addition to rules governing the number and health of stock and monitoring of the rangeland, admission to an RMA might also include the payment of a fee. Non-members are excluded from the grazing areas under jurisdiction of the RMAs and are restricted to the C areas. The RMAs are based on the following three objectives: a) improvement in range management practices through the development of a management plan b) animal improvement through stud provision and animal culling c) encourage destocking through easier access to markets and auctions (Rohde et al 2006, GoL 2007). This approach to management of the commons can be seen as one side of the privatisation versus adaptation debate, where property rights are created and granted to select individuals in the RMAs to ensure better management of the resource.

RMAs exist in many parts of the highlands, although there have been pressures leading to stagnation or decline in their membership. The heterogeneity of livelihood strategies within villages is one factor leading to different incentives for joining RMAs. While a very high percentage (84%) of Basotho own livestock, far less (16%) list it as their principle source of income (Sechaba, 2003). Mine remittances, and agriculture also play roles to varying degrees in village livelihoods. Those households who rely mainly on remittances are less likely to adhere to the fodder and herding rules of the RMAs. These households are not likely to own cattle-posts, thus adhering to the RMA's rules would impose costs in terms of fodder and arranging cattle-post sharing. Because of such dynamics the problem of controlling stock numbers is a dilemma of creating co-ordinated, common behavior amongst actors facing different incentives. However, as Lawry puts it, when these costs are not overwhelmingly high, 'the policy problem then shifts to that of the viability of the grazing association in managing grazing, including enforcing rules, apart from any active involvement by government authorities.'

The legal status of the RMAs is not clearly defined as Lesotho's Local Government Act of 2005 grants land administration authority to the village and district councils. The rights of RMAs have been challenged in court as a result (GoL 2007). The executive committee of the Grazing Associations includes a village chief, however in the absence of legal authority, these committees have difficulties in obtaining the social authority to enforce rangeland management. This is attributed by a number of

sources to a lack of trust in the committees to carry out enforcement in an even-handed and disinterested way (Rohde, Lawry, Ferguson, GoL). The committees are usually made up of large stockholders and they are seen as being subject to self-interested and political infighting. Additionally, there is a lack of a strong tradition of local natural resource management as historically the chiefs have only ever limited access to the A areas. The lack of legal authority compounds the problem of enforcement (GoL 2007).

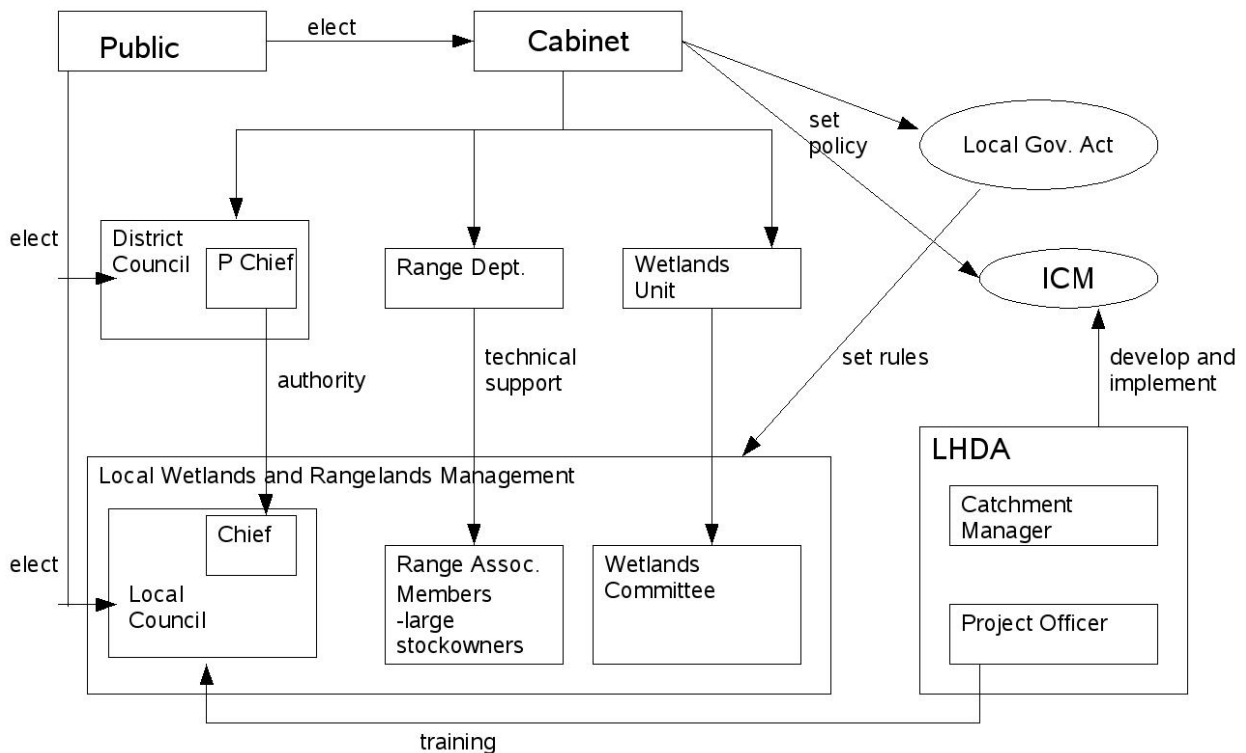
Ferguson (1990) analyses the implementation of a CIDA led livestock project in the Thaba-Tseka district, while Lawry (1988) looks at another RMA focused project at Sehlabathebe in Qacha's Nek district in eastern Lesotho. Although the organisations have not functioned without problems there have been some positive results. Mphale (2000) investigates grassland productivity and quality at three sites, comparing grasses in A, B and C areas in districts with an RMA with grasses in areas without an RMA. Those including the presence of an RMA show significantly better results. Despite these better results Rohde et al (2006) note a continuing decline in RMA membership numbers, which is attributed to conflicts and animosity between RMA and non-RMA livestock owners, the large distances and lack of communication between RMA villages and headquarters, and complaints from the RMA members about lack of disclosure by the committee members of the associations financial situation. Also because the RMAs have appropriated the A areas, relations have been strained with the chiefs who formally managed these areas. The RMAs have been put under pressure by conflict with non-members who see the appropriation of land traditional held communally as unfair. This had lead to conflicts and acts of sabotage such as rangeland burning, trespassing and vandalizing of fences (Rohde et al 2006, GoL 2007). Further, the enforcement of the range management plan by RMAs through the impounding of animals and imposition of trespassing finds, has been rendered more difficult by Lesotho's decentralisation process.

The RMA have not come close to meeting there goal of promoting destocking through the development of a market economy on communal rangeland. Ferguson argues that this is because development projects have not taken into account the dual economy of cash and livestock which exists in Lesotho. He shows that livestock are not exchanged at 'market value' by Basotho males except under desperate circumstances, because of the role they play in preserving male wealth. Rohde et at (2006) come to similar conclusions regarding livestock-cash exchanges, noting that 'the RMA model does not take into account the fact that rural populations strive to maintain flexible systems of livestock production that effectively meet income, savings, and cultural needs and provide for a diversity of products.' It is

apparent that commercial livestock sale has not developed in Lesotho as expected by development projects because of the roles livestock play in storing wealth and contributing to communal life in the villages.

3.6 The Actors

Lesotho Highlands Wetlands Governance



Wetlands management in Lesotho involves a number of actors at a different scales, extracting different uses from the resource. Local level users see limited importance in wetlands, though they do provide some grazing and medicinal benefits. Government departments and the Lesotho Highlands Development Authority, on the other hand, value wetlands for the water they provide. This is true up to the basin level of the Orange-Senqu River Commission (ORASECOM), and several international donors.

4 Discussion and Results:

Applying the IAD to this situation, or regime, and how it will be impacted by climate change, allows insight into the difference between adapting to a specific future or to a range of futures and uncertain.

In other words, with in the IAD framework, we can make clear what is meant by trading off efficiency versus diversity, or factors leading to resilience. Mapping the case out illustrates which elements of the system might be considered 'generically adaptive'. Similarly, we arrive at an indication of which social conflicts are barriers to either a specific policy, or even to generic adaptive capacity. It will be interesting to observe whether a given conflict is a barrier to only a specific set of policies, or whether it effects generic adaptive capacity more generally.

A main result of the analysis is to point to future research questions, including which changes could be made in order to resolve the conflicts identified, and which actors may drive them. By identifying possible institutional adaptations as solutions to conflicts posed by climate change, we raise some interesting questions for further research. In cases where institutional adaptation requires abandoning traditional and cultural institutions can we develop a method of compensation that would give 'fair' outcomes? In these same circumstances, is there a method of decision making in adaptation that can insure 'fair' procedures?

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