

**INSTITUTIONS, GOVERNANCE, AND INCENTIVES IN  
COMMON PROPERTY REGIMES FOR AFRICAN RANGELANDS**

Brent M. Swallow  
Agricultural Economist  
International Livestock Centre for Africa  
Nairobi, Kenya

and

Daniel W. Bromley  
Anderson-Bascom Professor of Agricultural Economics  
and Acting Director  
Institute for Environmental Studies  
University of Wisconsin-Madison.

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## I. INTRODUCTION

Africans keep about 14 percent of the world's cattle, and 21 percent of the sheep and goats, on a land base that comprises 25 percent of the world's total area of rangeland. The number of people engaged in extensive livestock production is higher in Africa than in any other region of the world. Of the 30 to 40 million pastoralists in the world--people who rely on extensive livestock production for most of their income and subsistence needs--over half reside in Africa. Ethiopia, Kenya, Mali, Mauritania, Niger, Somalia and Sudan have the world's largest populations of pastoralists.

The forage and water resources of most African rangelands are shared by several individuals, households, or village groups. This shared use of natural resources received its early indictment in the fisheries literature when writers began, unfortunately, to refer to the open access fishery as a "common property resource." Garrett Hardin, seeking to make a point about uncontrolled population growth, coined the allegorical phrase, "the tragedy of the commons (Hardin 1968)." To make his point, he invoked the proverbial grazing pasture in which each separate owner of cattle had no incentive to control grazing pressure. For some reason, few questioned the Hardin link between parents deciding to have more children, and a community of graziers deciding how many cattle to place on the range. By mixing metaphors, Hardin seems to have induced an entire generation of economists and development assistance experts to believe that livestock management was no different from couples having babies. Those intent on individualizing (i.e. "privatizing") African land tenure so as to make it conform with prior ideological notions found much comfort in the Hardin allegory. A paper about population policy became, instead, the "theoretical" foundation for grazing policy on an entire continent.

Repeated challenges to the applicability of the "tragedy of the commons" model have prompted a surge of interest in common property. It has been pointed out that collectively-used natural resources are usually regulated by resource management regimes that approach the conceptual essence of common property (res communes). Here we consider a common property regime to be a set of ordered institutional arrangements that define the conditions of access to, and control over, a stream of benefits arising from collectively-used natural resources. Despite the insights provided by the new theory of common property, there continues to be a general lack of understanding about the operation and evolution of African rangeland

regimes. Compounded by misunderstandings about the dynamics of rangeland ecological processes, this lack of understanding has resulted in a series of inappropriate land tenure policies and failed interventions.

## II. INSTITUTIONAL DIVERSITY IN COMMON PROPERTY REGIMES FOR AFRICAN RANGELANDS

Few of Africa's rangeland resources are subject to any of the alleged extreme institutional forms of rigid centrally-controlled institutions, or completely self-enforcing institutions, or of complete anarchy. Here we will point out that African rangeland regimes consist of diverse constellations of rules or institutions best characterized as rights, conventions, and contracts. A rule is a standard setting forth actions that agents are expected to perform (or refrain from performing) under appropriate circumstances. Externally-enforced rules were popular among colonial government authorities.

The emphasis on externally enforced rules has continued in post-colonial Africa. For example, under Lesotho's "Range Management and Grazing Control Regulations" of 1980 and 1986 it is decreed that principal chiefs will operate under the direction of officers of the Ministry of Agriculture to enforce a strict set of controls including: grazing permits, limitation of livestock numbers to the "carrying capacity" of the local area, specifications on the location of cattlepost kraals, dates at which cattlepost areas are opened and closed for grazing, and prohibitions on grass burning. In practice these rules have had few impacts on rangeland utilization in the country. To understand, therefore, African rangeland practices and regimes requires us to move beyond the formalism of official rules and into another domain.

### **A. Rights**

Much of the current literature on common property speaks in terms of the concept of "property rights." To clarify, we consider a right to be a guarantee given by a collective authority system to those who comprise--are part of--the entity. An individual or group has a right to an opportunity or benefit stream if a policy that advances the enjoyment of that opportunity is preferred over one that does not, regardless of the implications for the collective goals of the society. Property rights--rights to potential future benefit streams--are rarely unconditional guarantees. Usually they are qualified by: (1) the types of agents holding rights and

bearing duties; (2) the distribution of those rights and duties within the population; (3) the conditions necessary for their realization; and (4) their level of abstractness. Rights and duties vis-a-vis rangeland resources are held by states, directly by individuals, or indirectly by individuals through their membership in groups. Property rights might be held by all individuals in a society, or only by the occupants of certain social roles. Rights might be superior to collective goals, conditional on the advancement of those goals, or derived from those goals.

Rights can be general, specific, or particular. While a general property right may entitle an individual to some unspecified ownership right to rangeland benefits, a specific property right would identify the forage and water generated by the rangeland, while a particular property right would further indicate the precise area of rangeland over which the right extends. Expressed in terms of the level at which a right holds, the western notion is that all general property rights have corresponding specific and particular rights. This situation generally does not hold in customary African land law. Among the Tiv of Nigeria, for example, rights to farm are defined relative to a person's agnatic lineage, no matter where that lineage is geographically located. A person of the Tiv ethnicity does not have rights to a farm, or to a particular plot of land, but rather has the "right to farm." In other words, the Tiv people have specific but not particular property rights to agricultural land.

It is often difficult to distinguish the de facto rights structure for African rangelands. Invariably the de facto differs from the de jure. It is common that colonial governments, and later post-colonial governments, have declared customary rights structures to be void and thus declared state "ownership" of collectively-used rangelands. The results vary, but few post-colonial governments have been effective in governing local-level resource use and management. In eastern Senegal, state declaration of ownership may have had some positive consequences by reducing the power of the established elites and providing legal machinery for a more equitable distribution of rangeland rights. More common, however, are instances in which only negative social impacts are apparent. In the Niger River delta of Mali the dina common property regime has been undermined by French colonial rule and by the 1960 declaration of state ownership of all natural resources. In some areas of the delta powerful groups and individuals--founding lineages, merchants, retired soldiers--have been able to establish exclusive access to the most productive resources.

Other areas of the delta now have characteristics of open access. These areas have come under increased stress from herders, anglers, and rice producers. The level of conflict between users is high, and the quality of the resource base is deteriorating.

## **B. Conventions**

Rights and duties to collectively-used natural resources can often be maintained through self-enforcing institutions. In general, a self-enforcing social institution that provides agents with assurance regarding others' behavior is called a convention.

## **C. Contracts**

An institutional arrangement that has received little explicit attention by analysts of common property regimes is the contract. A contract is an agreement among agents that is supported and sanctioned by the actions of a third party in the case of externally-enforced contracts, or by the actions of the agents themselves in the case of internally-enforced contracts. The need for a contract can arise in any situation in which there is "transactional insecurity." Transactional insecurity is a situation in which agents' actions of compliance or deviation from the terms of an agreement do not occur simultaneously. Alternatively, transactional insecurity can arise when information about compliance or deviation is not received simultaneously, or such information is expensive to collect. This inter-temporal dimension makes contracts inherently dynamic phenomena.

Internally-enforced contracts can either be explicit or implicit--explicit contracts are enforced by the deliberate actions of the contracting agents, while implicit contracts are enforced by implicit threats of future retaliation for current deviations. The rangeland tenure system of the pastoral Fulani has been described by a number of analysts in terms that are very similar to the notion of the dynamic implicit contract.

## III. CURRENT MODELS

To date, models developed for conceptualizing the operation of common property regimes have focused on the differences between common property and other resource management regimes. Economic models have been developed for predicting resource use under each type of regime. The models of greatest import for African range tenure policy are the open access model (modelling resource use under the non-

property regime) and the common property models. Within the common property regime, two economic models have been developed: (1) the corporate model; and (2) the coordination model. Both models assume there is a recognized group of resource "owners" whose rights to use particular resource benefit streams are protected by a legitimate unit of authority that has the power to prevent encroachment by non-members. The models differ in their assumptions about the regime's internal institutional structure. The corporate model is based on the assumption that the co-owners of the resource are able to devise explicit mechanisms for enforcing rules on resource access and allocation. The coordination model proposes that self-enforcing conventions are sufficient to support mutually-beneficial resource use.

Questions about the applicability of common property models to African rangeland situations can be raised at two levels: (1) how well they depict situations prevailing at the boundaries of common property regimes; and (2) how well they depict situations within common property regimes. At the boundary, both models assume that there is a legitimate source of authority (coercion) that protects property rights by enforcing the correlated duties. Such conditions may approximate the situations prevailing for rice irrigation systems, or for alpine grazing areas in Switzerland, but they are unusual for African rangelands.

Few post-independence African governments have the legitimate authority, managerial capacity, or political will to perform such activities. In post-independence Kenya, for example, the boundaries of pastoral areas are continually infringed upon by "outsiders." In Kajiado District, Maasai group ranch areas are being settled by Kikuyu and Kamba people from surrounding districts; in Baringo District the Il Chamus have lost considerable areas of dry-season grazing to neighboring Tugen agriculturalists; in Turkana District large areas of rangeland have been rendered unusable by groups of Pokot bandits; and in Isiolo District the Boran pastoralists have lost use of large areas of rangeland due to a heavy influx of Somali pastoralists.

Within the boundaries of particular common property regimes, it is unusual to find the extreme institutional structures that are assumed in either the corporate or coordination models of common property. Common property regimes are often supported by combinations of rights, conventions, and contracts between individuals and groups. For example, the nineteenth century dina code defined property rights and duties that were sanctioned and enforced by the authority of the Fulani state. The Fulani state regulated common property rights and duties of Fulani clans that in turn defined access and use rules for

clan members and non-members. Individuals within common-property-owning groups worked out various explicit and implicit contracts to coordinate their mutual access and use of resources.

A richer conceptual framework would recognize three key propositions: (1) the nature of the government supporting a common property regime determines the types of institutions that can feasibly be implemented; (2) the effectiveness of the alternative institutional arrangements depends upon the incentives and expectations of those who use resources, those who aspire to use resources, and those who are responsible for enforcing the terms of institutions; and (3) the institutions, governance structures, and incentives that comprise common property regimes are continually evolving and co-evolving.

#### IV. GOVERNANCE AND INSTITUTIONS

Fundamental to the operation of common property regimes are the authority systems which sanction rights, enforce rules, and define the contexts in which contracts are negotiated. Authority systems are concerned with governance, and governance is the process of deciding what a collective will do, and how it will do it. Governments exist for the process of governance; that is, governments are created to carry out governance. Institutions are defined by the process of governance to provide order to the relations among the members of a collective, and to constrain what governments may do to the members in the name of governance. To understand institutions, therefore, it is necessary to consider the processes of governance and the implications of those processes for the implementation of institutions.

##### **A. Governmental Diversity**

Besides institutional diversity, rangeland regimes also exhibit considerable governmental diversity. Three types of customary government prevail (or have prevailed) among the livestock-keeping peoples of Africa: (1) centralized governments; (2) diffused governments; and (3) minimal (or non-existent) governments. Societies with centralized governments have hierarchical political structures in which a single authority is recognized. Many agro-pastoral groups in Eastern and Southern Africa have (or had) centralized governments in which chiefs perform executive, legislative, and judicial functions.

In contrast to this centralized structure, most pastoralist groups in Eastern and Western Africa have customary governments that are characterized as being "diffused" or "minimal." Those with diffused customary governments include the Maasai, Kipsigi, Pokot, Nandi and Samburu of Kenya, and the Karimojong of Uganda. In those societies, legislative and judicial authority is held by relatively egalitarian elders' councils. The enforcement of elders' decisions depends upon the type of case: the coercion of younger age-sets is used to enforce judgments in criminal cases, while social sanctions and coercion of individual litigants combine to enforce judgments in most civil cases.

Societies identified as having minimal governments include the Turkana of Kenya, the Fulani of West Africa, and the Western Dinka, Nuer, and Mandari of Sudan. Those groups have neither chiefs nor elders' councils with the authority or power to enforce rules. Designated individuals or councils may arbitrate disputes but have no power to enact punishments. Rather, individuals and coalitions evaluate the fairness of those judgments and impose sanctions on deviants.

## **B. Implementation of Institutions**

The structure of government under which a common property regime operates--whether it be centralized, diffused, or minimal--determines the type of institutions that can be implemented to govern relations among members and between members and non-members. The most demanding type of institution to govern is that taking on the power of a "right." To be implemented, rights must be: (1) formulated and promulgated; (2) communicated to those to whom they apply (members and non-members alike); (3) interpreted; (4) enforced; (5) legitimized with the persons or groups to whom they apply; and (6) adapted to changing needs and circumstances.

To implement the rights of groups--that is, rights at the boundaries of regimes--a body performing these functions must also be able to interpret the aims of the larger society in which the groups are embedded, judge between the rights and duties of competing groups, and enforce sanctions on individuals, groups and collectives of groups. Such a body must be capable of enforcing sanctions on the individuals and groups who hold rights and duties and on collectives of groups. To implement the rights of individuals as members of groups--that is, rights within regimes--the body must interpret the aims of the group, judge between competing rights, and enforce sanctions on individuals and collectives of individuals.



Government units with the power and social mandate to perform such functions may be referred to as "states." Of our three types of government--centralized, diffused and minimal--states only exist in centralized systems, by definition. Depending upon the governmental structure, it is possible for individuals to have rights within a group without the group having rights within the larger society. It is also possible for groups to have rights within a society without individuals having rights within groups. An illustration of the former is found when the land base of structured groups is overrun by outsiders at the behest of--or at least the acquiescence of--the larger society and its government. An illustration of the latter is found when the state recognizes the legitimacy of a family, yet fails to address the physical abuse of children within that family by one or more of the parents.

In many respects, rules are transformed into rights. Rules can be implemented within groups and between groups, but at both levels they must be formulated, communicated, interpreted, legitimized and adapted. The legitimization of rules by the recognized authority system transforms them into "rights." The main difference is that the governmental unit that implements rules need not--indeed often does not--have the legitimate power to enforce sanctions on the collectivities that it serves. Governmental units that implement rules on the interactions between groups need to be superior to those groups but not to collectives of the groups. Governmental units that implement rules within groups need to be superior to individuals but need not be superior to collectives of those individuals. Rules can be implemented in societies with central or diffused forms of government.

Conventions and contracts, because they are not "rights," can be implemented without central government units. They can be effective, therefore, in societies with central, diffused, minimal or non-existent governments. Conventions and internally-enforced contracts can also govern relations between groups of resource users (at the boundaries of regimes) and within groups (within regimes). It is unlikely, however, that internally-enforced contracts will be simultaneously effective at both levels in the absence of some other institutional arrangements. That is, for a group of resource users to be successful in maintaining an implicit internal agreement, members of the group must have confidence that future entry into the group will be restricted--or at least limited to a known number of potential entrants. A minimum condition for the effective operation of dynamic implicit contracts may be, therefore, that there is some social authority that

enforces: (1) rules regulating the entry of new individuals or groups; (2) the mobility of individuals between groups; and (3) the mobility of groups between sovereign polities.

## V. EXPECTATIONS, INCENTIVES AND INSTITUTIONS

Governmental structure determines necessary, but not sufficient, conditions for the implementation of institutions in common property regimes. Equally important are the incentives and expectations of individuals affected by those institutions. If rules are not generally self-enforcing, under what conditions might we expect a group to be effective in enforcing a rule internally? It can be shown that the incentives of a livestock owner to comply with, or deviate from, a stocking-rate rule depend upon: (1) the agent's overall set of opportunities; (2) the agent's expectation of the efficacy of the rule-enforcing agency; (3) the size of the group; (4) the severity and duration of the punishment for deviation; and (5) expectations regarding others' compliance or deviation. The incentive that a group of livestock owners has to enforce a stocking-rate rule depends upon those factors, and upon the cost of rule enforcement. Among other things, the cost of rule enforcement depends upon the size of the geographical area, the spatial and temporal variability of environmental conditions across the area, the social mechanisms available to define collective goals and enforce sanctions on deviants, and the efficiency with which information is collected and transmitted.

The literature on internally-enforced contracts suggests that agreements on resource allocation can also be enforced by the individual actions of the contracting parties themselves. No matter what punishment strategies are adopted an implicit contract will be successful if each player decides that the expected payoff from compliance exceeds the expected payoff from deviation. In general the payoff from compliance will be positively related to: (1) the single-game payoff from cooperation; (2) the probability of a repeated play of the game; (3) the probability of being detected when cheating; and (4) the proportion of other players expected to cooperate. Alternatively, the payoff from deviation will be positively related to: (1) the agents' discount rate; (2) the short-term gain from deviation; (3) the duration and severity of the punishment; and (4) the proportion of other players expected to cooperate.

Most analyses of dynamic implicit contracts assume that agents play the same game every period. This assumption is generally violated for the case of African livestock owners who share access to

rangelands. Payoffs derived from collectively-used rangelands vary from period to period depending upon stochastic climatic and market conditions, and depending upon the productive potential of the rangeland. Implicit contracts, supported by exclusion, can exist when a group of livestock keepers share repeated access to a rangeland whose production potential changes from period to period.

## VI. THE EVOLUTION OF REGIMES

The operation of common property regimes depends upon overall government structures, individuals' incentives and expectations, environmental conditions, and the technical characteristics of production and extraction processes. But the relationships between these various phenomena are not uni-directional. Individual incentives and production techniques are defined by the same institutions that they shape. For example, an effective stocking-rate rule that allows cattle owners to capture a greater proportion of the benefits of improved animal breeding may stimulate the adoption of dairy breeds that in turn would increase the demand for feed resources and exert pressure on the initial stocking-rate rule. The adoption of feed production techniques such as fodder banks and alley farms both affects and is affected by land and tree tenure institutions.

Incentives, expectations, ecological phenomena, and techniques also have reciprocal relations with government structures. Some will suggest that relatively equitable resource control and mobile resource-use patterns are necessary conditions for the long-term viability of minimal governments. There is historical evidence from Southern Africa that military adventures, disease, or climatic stresses create conditions for the centralization of livestock wealth. Indeed, the devastating combination of war, drought, and disease that swept the region in the early years of the nineteenth century multiplied this centralizing tendency. Facing such pressures, pastoral societies can maintain minimal governments only if there is no central body with the power and desire to capture smaller social groups through controls on resource use or marketing.

Exogenous variables that affect common property regimes represent random phenomena, including climatic conditions and market conditions, and systematic phenomena such as external institutional arrangements, production techniques, extension services, famine relief, and public infrastructure. Changes in any of these variables could prompt a number of changes in a regime's operation. For example, changes in

rainfall patterns or market conditions could: (1) reduce the credibility of threats supporting implicit dynamic contracts; (2) cause agents to re-consider the riskiness of alternative strategies; (3) change the relative scarcity of the benefit streams or the factors that condition access to those benefits; or (4) transform self-enforcing conventions into institutions requiring external or internal enforcement.

In the long term, changes in exogenous variables can also cause changes in agents' values and beliefs. For example, exposure to alternative lifestyles and authority systems can change individuals' reactions to customary authority systems. Reductions in the power of the Basotho chiefs over the last century may be partially due to changing values as common Basotho have been integrated into the South African cash economy.

## VII. POLICY IMPLICATIONS

To address the problems of African rangeland development, feasible policy objectives must be established and feasible policy instruments designed to advance those objectives. A system of unconditional property rights and duties is only a feasible objective if legitimate central authorities have the power, will (incentive), and managerial capacity necessary to both protect individuals against the superior force of collectives, and adapt institutions to changing circumstances. Conventions are only feasible when technical and environmental conditions make it in individuals' self-interest to comply with their tacit or explicit terms. Such circumstances appear to be the exception, rather than the norm, for Africa's collectively-used rangelands.

Rules and internally-enforced contracts are feasible under a broader range of circumstances. Implementation of rules requires a central authority that need not be superior to the collective. That is, the "central authority" can be the collective action of the group itself. The effectiveness of a rule depends upon the incentives of the authority system to punish deviants, and the incentives of individuals to comply or deviate from its terms. Effective implementation of internally-enforced contracts needs no internal authority but may need an external authority to protect the regime's boundaries. Within a regime, internally-enforced contracts need effective enforcement mechanisms. Explicit contracts can be enforced

through such explicit mechanisms as collateral, hostages, or gains sharing arrangements, or through implicit threats of future retaliation for current deviations.

Political structures and the institutions they support are continually changing. What might have been feasible with customary government structures may not be feasible with current structures. Common property regimes evolve through their repeated interactions, and responding to exogenous political, economic and ecological shocks. The ultimate result of this co-evolution depends upon: (1) the power relations linking the entities comprising a regime; (2) the objectives of the various resource users, organizations, policy-making bodies, and donor agencies that directly or indirectly affect the regime; and (3) the availability of new production and marketing techniques.

Common property regimes for African rangelands are now undergoing rapid change in response to several strong internal and external processes. At the boundaries of common property regimes there is greater competition over resources between: (1) groups of pastoralists and cultivators; (2) pastoralists and national governments that are keen to expand domestic food production or conserve wildlife resources; and (3) pastoral groups of different ethnicities and nationalities. In many cases these boundary conflicts have arisen to the level of armed civil and international conflict.

Within common property regimes, relationships among livestock owners are changing as: (1) more pastoralists herd animals for absentee livestock owners; (2) the political and economic power of customary authorities erodes; (3) entrepreneurial livestock owners gain control over more resources through a combination of new institutional arrangements (such as individual land titles), and new techniques for water provision and disease control; and (4) more livestock owners become diversified crop-livestock producers.

These processes serve to undermine the efficacy of status quo institutional arrangements. In this context, policy makers need to search for ways to facilitate institutional change that will make regimes more resilient and better able to allocate resources to the mutual benefit of those who share their access. Priority should be given to support the internal institution-building capacity of local groups and communities. Policy makers should recognize the potential importance of internally-enforced contracts. Under appropriate conditions, livestock owners will work out mutually-beneficial arrangements without organizations or external enforcement. That is, we will have governance without government. External agencies can facilitate

greater levels of cooperation by: (1) defining and protecting the boundaries of common property regimes to provide assurance that agents will have long-term interactions with a known and trusted group of resource users; (2) fostering better understanding of agents' preferences, expectations, and their compliance or deviation from resource-use agreements; (3) providing resource users with organizational arrangements that will increase their points of contact and their propensity for cooperation and coordination; or (4) absorbing some of the transaction costs associated with the definition, enforcement, and maintenance of contracts.

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