# Fragmenting the Commons: The Transformation of Property Rights in Kenya's Maasailand

Research Proposal
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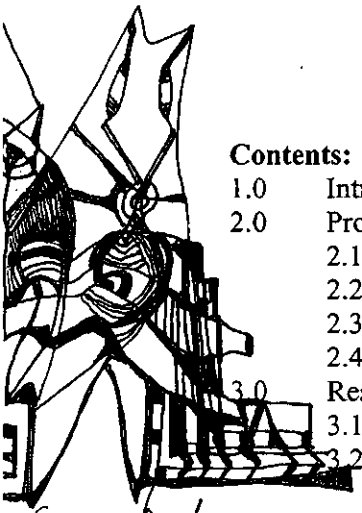

**Contents:**



Feeney Bork
John Bruce
Sarah W

Meet w/ Esther Thurs.

Vincent: Your hypotheses are not helpful & your research. Need to have understanding of law, adaptations? How do people adapt? What do people do?

## 1.0 Introduction and Problem Statement;

The transformation of property rights from communal rights based on indigenous or traditional systems, to more formal and legally enforced individual rights continues to characterize much of sub-Saharan Africa. The stated objective of this transformation is to increase land productivity and to control environmental degradation that is thought to occur under communal property rights systems. In Kenya's rangelands, such transformation was initiated by the colonial administration in the early 1960s as a component of land reform policy and was implemented by the independent administration in later years.

This dissertation research explores the process by which property rights to land in Kenya's Maasailand[1] are transforming from communally owned and managed parcels to individually-held, private units. It also explores the environmental outcomes of privatization in an ecosystem that is typically characterized as arid to semi-arid. The research anticipates that much of the process of transformation may be an endogenous reaction by ordinary Maasai to various influences. Privatization may be a mechanism to guard against increased encroachment and dispossession of their land by wealthy/powerful Maasai elite and an increasing population of cultivating, non-Maasai immigrants. It may also be a response to pressure by Maasai youth who envision greater access to credit for land development activities that individual titling suggests. This research also anticipates that transformation into individual units is likely to result in a deteriorating range characterized by a higher proportion invasive species that are unpalatable to livestock.

Early experiments with land privatization in Kenya's rangelands were group ranches in Maasai territory in the 1960s and 70s. A group ranch is land that has been demarcated and legally allocated to a group (GOK, 1968) such as a tribe, a clan, section, family or other group of persons. The group ranch is composed of a body of members to whomiegal title has been awarded, and a management committee that is elected by the body of members. The management committee is responsible for coordinating and implementing development projects on the group ranch. Although land is held in common by all group members, certain property rights, such a residency rights, are assigned to individuals. The group as a corporate body also retains some rights such as control over grazing rights, tillage and water resources.

1 The Maasai are pastoral nomads. Livestock form the basis of their economic livelihoods, is the focus of their social relations and a critical element of their ethnic self-definition. Prior to transformational changes the social structure of the Maasai comprised an elaborate age-set system, communal use of natural resources, an 'egalitarian' distribution of the means of production, and a diffuse, decentralized society. The Maasai are administratively located in Kajiado and Narok Districts of southwestern Kenya.

**Group ranches were introduced in an attempt to control environmental degradation and to increase herd productivity. The colonial government, as early as the 1950s, proposed the subdivision of Maasai communal land into privately owned parcels. According to the colonial authorities indigenous systems of land management resulted in severe land degradation because they encouraged pastoralists to keep excessively large numbers of cattle that exceeded the environment's "carrying capacity". Colonial authorities thought that such systems provided inadequate incentives for groups or individuals to invest in conserving the land resource. Privatization was expected to create incentives that would lead individuals to adopt better resource management practice. However, initial efforts at privatization did not divide the range into individually owned units, but rather sought to maintain legally-titled group-held units, in keeping with the Maasai communal socio-cultural structure. Successive governments, upon Kenya's independence in 1963, continued to pursue the policies that had been proposed by colonial authorities. Although some group ranches were subdivided into individual units barely five years after their registration, most remained as group-owned parcels until the mid-1980s. Currently there is evidence that subdivision of group ranches into individual units is gaining momentum (Kimani and Pickard, 1998; Galaty, 1994).**

**The importance of property rights as a policy issue cannot be overstated. By assigning ownership to valuable assets and by designating who bears the rewards and costs of resource use decisions, properly rights institutions structure incentives for economic behavior (Libecap, 1989). By allocating decision-making authority, property rights institutions influence the distribution of power within society. Yet the process by which property rights institutions change and whether the changes represent an appropriate solution to a particular social problem have received much less attention (Libecap, 1989). Much as the new institutional economists have highlighted the important role that institutional change plays in determining economic development, they have paid very little attention to the dynamics of institutional change (Feeny, 1988). The issues concerning why and how institutions change are neglected while the beginning and end points in institutional evolution are overemphasized. My research is a response to this challenge. Drawing from theories of property rights (Firmin-Sellers, 1995, 1996; Libecap, 1989, 1995), I focus on the process by which property rights are transformed, and in particular on the political process that characterizes this transformation.**

**Sadly, the policies that were designed to define property rights have produced mixed results in different parts of the world. With few notable exceptions, trends toward privatization have in many developing countries been associated with potentially harmful economic and environmental consequences. While increased land privatization and individualization may have**

resulted in greater agricultural productivity in Thailand (Feder and Feeny, 1991), and Brazil (Alston, Libecap and Schneider, 1995), or in better land productivity and grassland condition in Switzerland (Stevenson, 1992), many scholarly reports illuminate a series of negative outcomes that can be associated with the privatization process. The exclusionary nature of private property often leads to inequalities and strips individuals of rights (Seabright, 1990; Bromley, 1991). By assigning rights to a single holder privatization cuts off many who formerly had customary rights to the resource (Lasstarria-Cornhiel, 1997; Meinzen-Dick et al, 1997; Rocheleau and Edmunds, 1997; Weise and Meinzen-Dick, 1998). Proponents of privatization do not indicate how the various attributes of the goods involved will be measured, who will pay for the costs of excluding non owners from access, how conflicts over rights will be adjudicated, or how the residual interests of the rights-holders in the resource will be organized (Ostrom, 1990; Seabright, 1990).

For Africa's pastoralists, the failure of range privatization programs is almost universal. Under the "ranching model", only a small minority of pastoral elite has been able to take advantage of government incentives that facilitated private ranching. For others, the costs of fencing, water development and sedentarization are too high (Niamir, 1995; Oxby, 1981). Evaluations of privatization programs in Kenya reveal that land concentration, landlessness and economic marginalization of pastoral households is on the increase because individuals in positions of economic and political power take advantage of the less powerful (Kipuri, 1989; Kituyi, 1990; Migot-Adholla et al., 1993; Galaty and Ole Munei, 1999; Doherty, 1987; Little, 1985).

Additionally, claims that privatization improves the management of range resources have little empirical support. Overstocking and environmental deterioration appear to be just as common and serious in areas of rangeland in parts of USA and Australia where both land and livestock are individually owned (Sandford, 1983). Similarly, in New Zealand, land privatization on pastoral areas resulted in overgrazing and a proliferation of weedy, unpalatable species on the range (Johnson, 1996). The sedentarization or settlement of pastoralists in arid and semi-arid ecosystems has adverse ecological consequences (Niamir, 1990; 1995; 1998). Decreased mobility of animals results in overgrazing of lands around settlements and invasion of range by unpalatable plants. Van der Brink et al. (1995) indicate that the increasing severity of drought periods can be attributed to the formation of group ranches.

But in spite of this catalogue of unfavorable outcomes of the privatization process the Maasai of Kajiado still choose to privatize or individualize their rights to land. This is puzzling, as the Maasai live in a climatically variable environment and rely on herd mobility to maximize the variability of forage and water in both space and time. Fragmentation will likely restrict

**livestock movement, threatening the survival of Maasai herds. Why would the Maasai, who have lived and adapted to such an environment seek to adopt a land management system that threatens their survival? Why would they pursue an "irrational" system in the face of a more rational alternative such as group ownership? Further, what are the environmental implications of this transition from group-owned land to individual units in a semi-arid environment that is periodically ravaged by drought? This is a concern shared by many scholars who puzzle at why seemingly perverse property rights persist in the face of what would appear to be obvious alternatives. Many seek explanation in the origins of property rights institutions and in the process of institutional change; yet others focus more narrowly on the role of politics in promoting unexpected outcomes (Libecap, 1989; North, 1990).**

**In order to unravel the puzzling transformation of property rights in Maasailand, this research seeks explanation within the political arena and will focus on who the main actors are, what their property rights preferences are, the resources (in terms of power and wealth) that they bring into the political arena and the political institutions that they use to press their claims. The study uses an institutionalist framework (March and Olsen, 1984), drawing from the theories of property rights (Libecap, 1989; Firmin-Sellers, 1996), the state (Bates, 1981, 1989; Gibson, 1999) and collective action (Ostrom, 1990; 2000). To reach an environmental assessment, the study will conduct vegetation analyses and compare the status of range between group-held parcels and individual units.**

**This study addresses several policy concerns: First, the appropriateness of land management choices to prevailing environmental conditions. Second, the role of politics in policymaking and the on-going puzzle of the conditions under which politics can lead to desirable policy outcomes. Finally, the management of the interface between cultural practice and technological innovation, as fragmenting communal into private, individually owned units is a 'modern' technology at odds with indigenous Maasai land management practice.**

**On the theoretical front, this study expects to make two important contributions. First, it will provide an indication of how well property rights models, most of which have been designed and tested by Western scholars in the Western hemisphere, fit the African context. Second, and very importantly, it will allow the articulation of a theory of property rights transitions in Maasailand that takes into account the mix of conditions, political, socio-economic and environmental, under which transition occurs.**

## 2.0 Property Rights, Politics and the Environment: A Literature Review

### 2.1 The Evolution of Property Rights in Kajiado District:

**Group ranches were created with the expectation that they would provide tenure security thus creating incentives for the Maasai to invest in range improvement and ultimately to reduce the tendency to over accumulate livestock (Republic of Kenya, 1974). Group ranches would also act as collateral for loans to enable investment in range enhancement and livestock improvement.**

**To implement this development program the Kenyan government sought loans and grants from international agencies such as World Bank, USAID, Swedish aid agency, Canadian development agency and the United Kingdom. The loans were granted under the auspices of the Kenya Livestock Development Program (KLDP). This program combined investment and extension services with the establishment of group ranches under a land adjudication and registration program. The program entailed a shift in land tenure and organization from one under which the range was under common ownership, to one in which the land was sub-divided into portions owned by groups, each of which held title to its group ranch.**

**Specifically, group ranch objectives were: to increase range productivity by bringing them into commercial production; to maintain production by keeping stocking rates of ranches within limits set by 'carrying capacities'; to conserve natural resources in pastoral areas by controlling their exploitation; and to provide human populations with an adequate standard of living. Some scholars identify a tacit objective aimed at removing "this relatively large portion of land, adjacent to the densely populated Kenyan highlands and the capital city of Nairobi, from communal hands, and bring it into the lively Kenyan market for individually owned real estate. Market mechanisms were to put the lands into the hands of those "most suited" to using it effectively, indirectly providing an outlet for the densely populated, land scarce communities nearby" (Galaty, 1994).**

**The objectives of group ranches were to be achieved through:**

- **Registration of permanent members of each ranch; these members were thus to be excluded from other ranches;**
- **Allocation of grazing quotas to members to limit animal numbers and the carrying capacity of the ranches;**

- **Development of shared ranch infrastructure (such as water points, dips, stock handling facilities and fire breaks) using loans. Members would pay user fees and be collectively responsible for loan repayment.**
- **Members would manage their own livestock and would be able to obtain loans for purchasing breeding stock and cattle for fattening.**
- **A group ranch committee would be elected to manage all group ranch affairs including:**
  - **Overseeing infrastructure development and loan repayments**
  - **Enforcing grazing quotas and grazing management**
  - **Maintaining the integrity of the group ranch boundary**

**Group ranches do not fall under corporate law in Kenya. A separate Act, the Land Groups (Representatives) Act of 1968 was passed to provide a legal framework for ranch operation. This Act provides for greater simplicity, lower costs and lower tax rates in handling of group ranch affairs. The entire group holds the title to the ranch. Each individual has residency rights, but the group as a corporate body controls the means of production i.e. grazing, water, and tillage and may establish mechanisms for the allocation of the means of production. This it does via the elected group ranch committee. The Department of Land Adjudication and Registrar of Group Representatives, both in the Ministry of Lands and Settlement were extensively involved in the initial establishment of group ranches. The Range Management division of the Ministry of Agriculture played a key role in drawing up group ranch development plans. The Ministry of Water Development coordinated water development. The Agricultural Finance Corporation administered the loans provided by the hinders.**

**Development scholars criticize the unstated assumptions underlying the creation of group ranches (Campbell and Axinn, 1980). These assume that an increase in commercial cattle production can be initiated in Maasai subsistence economy; that increased cattle production can be increased by adding water points; that a market system would absorb increased production; that market prices would be free of distortions; and that credit would help in increasing productivity. These assumptions missed the point. They failed to identify the logic under which Maasai herders accumulated livestock. The Maasai regard livestock as capital goods, with the stream of value being realized in the animals themselves; satisfaction is a positive function of the numerical sizes of the herds (Munei, 1987). Surplus livestock are not surplus output but surplus value that cannot be disposed of. Beyond economic power, large holdings of cattle represent security, political influence and social status (Raikes, 1981). It is unlikely that such potential income would be traded for cash. In any case even if the Maasai were prepared to sell their cattle,**

official prices of beef remained low and controlled in the 1970s and 1980s (Evangelou, 1984). Group ranch development thus had minimal effect in persuading Maasai to move toward commercial beef production (White and Meadows, 1981).

From an economic point of view, the Kenya government had a genuine need to raise the low levels of productivity associated with subsistence pastoral practices in semi-arid regions such as Maasailand. Group ranching schemes appeared to offer the most efficient means of utilizing development loan investments to bring pastoral regions into commercial production. Group-based schemes were expected to enjoy economies of scale. For group ranches, capital costs per unit of ranch area were estimated to be only about one third of those for individual ranches (Grandin, 1986). Moreover development costs would be further reduced in group ranching schemes by the fact that ranches were already fully stocked by the members' privately owned cattle and there was no need to provide funds for ranch employees, such as would have been the case had commercial or company ranching schemes been opted for.

The group ranch framework was expected to reflect existing patterns of socio-economic behavior in Maasai society. The government intended that each group would consist of individual families who normally lived and herded together so that group ranch development would be a genuine attempt to promote socio-economic change in Maasailand without unduly disrupting longstanding traditional socio-economic relationships. The group ranch option seemed to offer the possibility of developing pastoral lands without making pastoralists landless. This was a major concern since similar programs to individualize communal lands in the high potential Kikuyu areas resulted in landlessness and violent spates of political unrest.

Many government administrations have regarded pastoralism as an undesirable form of land use. Wandering peoples are not easy to administer, to 'develop', or to bring within the orbit of the state as obedient tax-paying citizens. Sedentarizing pastoral nomads under the guise of development may have been an easy way to bring them under the state's control. The fact that pastoralists including the Maasai were largely neglected during the colonial period, meant that the Maasai socio-political structure remained largely unaltered. The Maasai elders were still a source of authority and the Maasai Moran (the warrior age-set) as the source of tribal defense unsettled the government, whose major intention was to centralize the means of coercion within the state.

Many scholars agree that although the Maasai did not accept or even understand some features of the group ranch (such as grazing quotas, boundary maintenance and the management committee), the Maasai nevertheless accepted the idea of group ranches mainly because they needed to secure their land against incursion by government, by non-Maasai cultivators and by the elite Maasai (Grandin, 1986; Bekure et al, 1991; Galaty and Ole Munei, 1991). The history of

**Maasailand since the 1800s has been one of dispossession. European settlement took away areas such as Uasin Gishu, Nakuru and Nyandarua Districts; while District boundary changes transferred parts of Maasailand to Machakos, Nyeri and other areas. Population pressures in the mostly high potential areas resulted in infiltration into Maasailand. The transfer of land from Maasai owners to non-Maasai buyers particularly affected these areas.**

**Because group ranches issued titles to land, they enabled the Maasai to retain control over the land they occupied since independence. Group ranches also restricted the alienation of large tracts of better-watered land to the political elite. The Maasai also felt that if land were subdivided into individual units the resulting land size per family would be inadequate to support livestock pastoralism. Group ranching scheme was thus accepted for these reasons, rather than for the development objectives stated by the Kenya government.**

**For the Maasai, group ranch development carried with it the promise of water development in the form of dams and boreholes, as well as the promise of improved livestock husbandry through introduction of dipping facilities and regular vaccination against prevalent animal diseases. Water is a crucial limiting factor in Maasai livestock husbandry and any measure that promised to enhance herd survival and productivity was likely to engender Maasai support.**

**A major shortcoming of group ranches was their lack of ecological viability (Helland, 1980). Group ranch demarcation was not based on any Maasai institution normally used for organizing production as had been intended by government. Consequently each group ranch did not include the complement of dry and wet season pasture that would ensure year-long herd survival. Most ranches were far too small to provide an adequate balance between wet and dry season grazing. Studies by anthropologists reveal that group ranch demarcation, instead of following traditional territorial structures that guaranteed an adequate balance of dry and wet season graze, were instead demarcated to suit planners' convenience. Physical landmarks such as streams and hills formed the bases of group ranch boundary demarcation. A crucial consequence of this error is the increase in the vulnerability of Maasai livestock to drought. A lack of flexibility and mobility means that mortality of Maasai herds is much higher during drought periods. This lowers their self-sufficiency and often results in their becoming food aid recipients. The concentration of livestock within fixed boundaries is also thought to have increased environmental degradation as Maasai maintained the same levels of herding that they had before albeit in a smaller area.**

**The group ranch concept is now well into its third decade, yet there is consensus among scholars and planners that this policy innovation is a dismal failure (Galaty and Ole Munei, 1999; Rutten, 1992; Munei, 1991). Not only has it failed to meet its stated objectives but has also**

jeopardized the socio-economic and cultural welfare of the Maasai (Kipuri, 1989; Kituyi, 1990; Fratkin, 1994). There is a growing trend toward subdivision of group into individual ranches, and frequent sale of portions of individual holdings to prevent foreclosure on development loans (Galaty, 1988; Kimani and Pickard, 1998). Further, individual ranchers have often used group ranches or pastoral domains as commons, further breaking down collectively enforced systems of land management (Little, 1985). The economic and ecological viability of this fragmentation and the environmental sustainability implications of such fragmentation in semi-arid to arid environments is at best marginal.

## 2.2 Ecological Dynamics and Institutions:

Rangelands throughout the world share one significant characteristic: Rainfall is relatively low, typically less than 800mm (i.e. less than the rate of transpiration), unevenly distributed through the year and often unreliable, and also variable from year to year usually with a longer term cyclical variation.

Similarly, pastoral use of many rangelands, particularly those in Africa has been plagued by one misperception. Pastoralists are often assumed to be irrational producers holding large herds and flocks, which, because land is held in common and because livestock and people are sometimes mobile, result in mismanagement and ultimately degradation or desertification. Consequently, policies and programs in the past have concentrated on sedentarization, on control of stocking levels and on technical improvement programs in order to boost production and protect the environment. It is now beginning to be widely recognized, that both the analyses and interventions arising from them are deeply flawed for most African settings (Niamir-Fuller, 1990, 1998, 2000).

Studies in Northern Kenya (Conant, 1982) and in the Nairobi National Park (Western and Gichohi, 1993) show that pastoral "overgrazing" might indeed be beneficial to pastures. Non-palatable, thorny Acacias invaded rangeland removed from pastoral grazing in Northern Kenya. Similarly, the exclusion of livestock from the Nairobi National Park, and the absence of heavy grazing and burning, produced qualitatively poorer grasses.

Other ecologists suggest that traditional patterns, including livestock diversity, mobility, low energy efficiency, and biomass maintenance are cornerstones of environmental sustainability rather than prescriptions for degradation (McCabe, 1990). In fact social institutions do exist within pastoral societies to cope with environmental problems. Institutions that facilitate livestock exchange protect individual families and the resource base is protected by the identification and defense of territorial boundaries.

**But why have the initial misperceptions persisted and the solutions such as land privatization and the sedentarization of pastoralists been so influential? It is partly the result of the conventional view of range management. This view concentrates on the control of animal numbers in relation to an assumed carrying capacity of the land. This view, based on the successional theory of vegetation change, derives from Clementsian ideas of plant ecology and succession (Clements, 1916; Weaver and Clements, 1938; Tobey, 1981), which supposes that a given rangeland, in the absence of grazing, has a single and stable state, the "climax" and that retrogressive changes caused by improper grazing result in unstable states which can be reversed by the manipulation, reduction or elimination of grazing.**

**Range scientists have however accumulated substantial empirical evidence of cases where the assumptions of the range succession model do not hold, particularly in the dry as opposed to humid rangelands of the world. Vegetation changes in response to grazing have often been found not to be continuous, reversible or consistent. For example, in the absence of grazing, Mediterranean grassland communities do not succeed towards a single steady state dominated by "climax" species (Biswell, 1956, Heady, 1958, Naveh, 1967, White 1967, LeHouerou, 1972, Bartolome and Gemmil, 1981, Foin and Hktner, 1986, Bartholome, 1989).**

**Further, criticisms of the range successional model focus on its tendency to overemphasize vegetation condition and ignoring other crucial determinants of the amount and kind of vegetation that can be produced on a site. Differences in soil, topography, and climate as well as in natural levels of soil erosion need to be included in the assessment. Failure to recognize these site differences may result in one classifying some land in 'poor' condition when it does not have the potential to be better. Many of the conclusions drawn from range condition assessment, for example that range deterioration is due to livestock grazing, are thus unsupported by the kind of information collected.**

**The range succession model outlined above operates under the assumption of equilibrium conditions. Under this assumption, conditions inside and outside of the system of interest are relatively stable over time, allowing internal processes of the system to equilibrate, and to regulate system structure and dynamics. In equilibrium grazing systems for example, the physical conditions supporting plant growth are relatively unvarying thus consumption by herbivores controls plant biomass, and the availability of feed ultimately regulates the growth of the herbivore population.**

**However, range researchers in dryland Africa are increasingly recognizing three characteristics of arid ecosystems: ecological variability, unpredictability and resilience (Westoby at al, 1989; Ellis and Swift, 1988; Friedel, 1991; Behnke et al, 1993). And many researchers are**

questioning the usefulness of principles such as climax and succession in describing arid ecosystems, where equilibrium is rarely achieved because of the high degree of variability (Laycock, 1991). This new thinking recognizes that grazing, together with other mechanisms such as fire, changes in soil condition (e.g., due to compacting or erosion) may in concert or alone, produce alternative persisting vegetation states. In such non-equilibrial systems, the physical conditions supporting plant growth vary widely and consumption by herbivores does not control plant biomass because the animal population is itself held in check by the same physical factors that control the vegetation. While grazing pressure may cause changes in vegetation, its the effects are complex and intermittent.

When ecological dynamics are considered, an additional set of institutional issues arise, and the distinction between equilibrial and non-equilibrial systems becomes important, particularly for land management purposes (Cousins, 1990). In the former there is direct feedback between animal numbers and vegetation states, successional processes can be identified, and conventional notions of carrying capacity are often relevant. This means that stocking rate and other "mainstream" range management techniques can usefully be employed, and that exclusive property regimes are appropriate (de Leeuw and Tothill, 1993).

However, in non-equilibrial systems opportunistic strategies involving a great deal of mobility will be more important as a strategic response to ecological variability and risk, and non-exclusive forms of tenure will be more appropriate (Wilson and Thompson, 1992; Behnke and Scoones, 1993; Niamir-Fuller, 1999; Mehta et al, 1999; Sandford, 1983, 1994). These allow a coordinated access to heterogeneous patchwork of resources within a framework of a great deal of temporal variation. Formalized organizational structures, which bring with them a host of procedural, bureaucratic and legalistic constraints may not only undermine the flexibility to respond quickly and opportunistically, but also may have high transactions costs. Ostrom (1990) suggests that the greater the unpredictability and variability of a natural resource, the more suited it is to being managed communally.

Clearly, ecological conditions must play an important role in the determination of optimal property rights regimes. Property regimes, which may be useful and appropriate in equilibrial systems, will often be counterproductive and destabilizing in non-equilibrial systems. Such destabilizing practices would include those that confine pastoralists to relatively small ranches or other such schemes, many of which have resulted in overgrazing and an invasion of rangelands by unpalatable grass species (Niamir, 1990; Johnson, 1996).

## 2.3 Property Rights and Institutional Change:

Property rights are the social institutions that define or limit the range of privileges granted to individuals to specific assets such as land or water (Libecap, 1989). These institutions range from formal arrangements such as constitutional provisions, statutes and judicial rulings to informal conventions and customs regarding the allocation and use of property. Property rights also indicate who has the legitimate authority to act in a predetermined manner; an authority that implicitly carries the state's backing (Bromley, 1991).

Problems with property rights have long been identified in scholarly literature. The 'tragedy of the commons' theory (Garret Hardin, 1968) suggests that common ownership of resources inevitably leads to situations in which individual behavior can prevent the securing of socially desirable outcomes. Hardin argued that pastoralists overgraze common pastures because individual herd owners try to optimize resources by putting in additional stock on communal rangeland. Hardin proposed two solutions. First, privatizing or creating individual ownership of range resources, or second, converting communal land to state-owned resources. Such interventions, according to Hardin, would halt the tragedy. Hardin's argument has had tremendous influence in justifying tenure reforms in favor of land privatization policies in much of Sub-Saharan Africa.

Hardin's solutions have been criticized on various counts. Ciriacy-Wantrup and Bishop (1975) suggest that Hardin's characterization confuses common property with open access situations. Open access situations, unlike common property systems, do not have institutional arrangements that regulate access and hence are susceptible to degradation. Ostrom, et al (1998) find Hardin's solutions as presenting a "disempowering and pessimistic vision of the human prospect", since resource users are depicted as being trapped in a situation that they cannot change, and must rely on solutions imposed by external authorities. Most importantly, current and historical examples attest to successful collective use and management of communal resources by local populations (Ostrom, 1990; Bromley, 1991; Keohane and Ostrom, 1995; McCay and Acheson, 1997). Users of shared resources are able to develop and sustain rules and institutions for the governance of shared resources.

The search for an explanation of why and how property rights evolve has for a long time engaged scholarly debate. Proponents of the property rights paradigm suggest that economic forces motivate the development of exclusive property rights over land and related natural resources (Demsetz, 1967; North and Thomas, 1973,1977, 1981). Their position is that any property regime other than private (individual) property is "inefficient" and prone to overuse.

**Private property, by rewarding owners, provides a direct incentive to improve efficiency and productivity.**

**In a study of the introduction of private ownership of beavers among Indian hunters in Eastern Canada, Demsetz (1967) demonstrates that the development of the commercial fur trade resulted in increased hunting. Consequently, in order to foster sustainable use and an increase in community wealth, individual hunters were motivated to introduce exclusive rights. In addition, Demsetz finds that the transferability of property rights under private property arrangements ensures that resources end up with the most productive users (Alchian and Demsetz, 1972). Also, because private property rights enable the private owner to exclude others from his resource, it facilitates a socially efficient exploitation of resources. The ability to exclude is also thought to provide incentives to individuals to invest in the quality of the resource since the person who bears the costs also reaps the rewards.**

**North and Thomas (1973) and North (1981) provide a historical account of changing property rights in the middle Ages. They argue that the plentiful land and scarce labor of the 9th century led to the feudal/manorial system, which institutionalized property rights over labor services. By the 12th century, a growing population led to a change in the relative factor scarcities, resulting in a shift of property rights toward land instead of labor. The result was the beginning of the enclosure movement.**

**The property rights argument as presented by Demsetz and North and Thomas has not gone unchallenged. Runge (1989) for instance suggests that these arguments, being predicated on individual strategies, fail to recognize the interdependent nature of individual's choices. Consequently they ignore the possibility of endogenous, cooperative solutions but rather seek institutional solutions enforced from outside. Baland and Plateau (1994) on the other hand point out that many of the assumptions upon which the privatization school rests are not fulfilled in reality. Market imperfections and equity considerations may, for example, render other property regimes more appropriate. Economists must therefore assess contextual issues before making blanket recommendations for private property regimes.**

**Other scholars have shown that economic gains are neither a necessary nor sufficient condition for the implementation of alternative property rights arrangements (Libecap, 1989; North, 1990; Eggertsson, 1990). Instead, distributional conflicts, transaction costs, and political intervention are crucial determinants of the path of institutional change. Eggertsson (1990) dubs Demzsetz' view as the naive model of property rights, since it articulates decision-making solely in terms of private costs and benefits and fails to explicitly model the influences of social and political institutions in changing property rights. Similarly, North (1990) argues that institutions**

**are not always created to be socially efficient and may sometimes be created to serve specialized interests, particularly of those with the bargaining power to devise new rules.**

**Libecap (1990), in particular, articulates a political theory to account for the process of property rights assignment, and suggests, contrary to the privatization school, that property rights are endogenous, generated by ongoing contracting. Contracting refers to efforts by individuals and groups to assign or modify property rights, and includes bargaining among private claimants within groups to adopt or to change group rules and customs regarding the allocation and use of property. It also includes lobbying and political negotiations among private claimants, bureaucrats, politicians, and judges to implement or to alter more formal property laws and administrative rulings. Libecap thus provides a framework explaining the conditions under which property rights will be changed, problems faced when that change occurs, and what actors and institutions are involved.**

**For Libecap, the impetus for changes in property rights is greater as the anticipated aggregate benefits increases, as the compatibility between divergent interests increases, and as the distribution of wealth and knowledge about individual claims under the proposed change is equalized. Libecap concludes that past political agreements concerning property rights are important determinants of how future property rights will be created and that the economic context and interests of relevant actors will influence the motivations for change.**

**Although Libecap acknowledges that property rights are determined by the political process and that political institutions are important to defining the context for their change, he leaves the state in the background and out of his discussion. For many scholars, there is a need for a clear theory of the state in accounts of property rights assignments and evolution as the state can influence the outcomes of institutional change through its policy choices (Baland and Platteau, 1998).**

**Firmin-Seller's (1995, 1996) account on the transformation of property rights in colonial Ghana not only provides a political explanation for institutional change but also explicitly recognizes the role of the state in influencing the assignment of property rights. She argues that fundamental to the analysis of property rights transformations is the need to specify the conditions under which rulers act as well the political institutions by which they pursue their property rights assignments. This is because state rulers often manipulate political institutions to achieve their own goals. However, like Libecap, she recognizes that actors within the society also play an active and vital role in the definition and enforcement of property rights.**

**In her account, Firmin-Sellers also argues that the creation of property rights institutions can be coercive too. This is largely because people rely on the coercive authority of the state to**

**halt the most egregious distributional conflicts over the precise definition of property rights. In Akyem Abuakwa (in Ghana), for instance, the paramount chief wielded sufficient coercive authority to defeat those who advocated a different form of tenure; and reformed the state institutions to establish credible commitments. The key to the state's economic success lay not in the structure of property rights, but in the chiefs capacity to enforce property rights through the state's political institutions (Firmin-Sellers, 1995).**

**Ensminger's (1992) research among the Orma, a pastoral group in Northern Kenya, indicates that in addition to economic incentives and political structure, ideological perspectives also determine whether property rights will change, and how property rights will change. Ideological concerns are particularly important in determining the acceptable distribution of benefits that accrue from property rights. Ideological concerns may also play a role in reducing transaction costs associated with property rights change.**

**Powerful empirical support for an economic theory of the evolution of property rights is provided by the evolution of land rights in Thailand (Feder and Feeny, 1991), in the development of restrictive property rights among the pastoral Orma of northern Kenya (Ensminger, 1992) and in the frontier areas of Para in Brazil (Alston, Libecap and Schneider, 1995). Among the Orma pastoralists in Kenya, the transition from subsistence cattle production to commercial ranching appears to have been a response to increases in the terms of trade for cattle. In Thailand, private property rights in land evolved in response to the commercialization of agriculture and an appreciation in the agricultural terms of trade. In Brazil, in areas of Para that were closer to market centers, increasing land rents fueled a competition among claimants for exclusive rights as individuals sought to appropriate the gains of individual ownership. Lowland rents in the frontier areas limited competition over claims and informal tenure arrangements were found to be appropriate.**

**Despite this support, the economic theory of the origins of property rights merits several qualifications. In Thailand, for example, government officials who as landowners shared in the gains from titling, were willing to supply the institutional changes being demanded, especially in those areas where they owned land. Their motives also reflected the desire to provide mechanisms to resolve and reduce the incidence of land disputes. Similarly, in Brazil, political institutions play a significant role in the transformation of property rights. Individual claimants, particularly those with the knowledge of how bureaucracies' function and the ability to deliver votes and campaign funds to politicians were able to successfully lobby for governmental provision of formal tenure services. In rum, government policy affected who received title, when it was assigned, whether it was secure, and whether conflicts were adjudicated.**

**The outcomes of increasing privatization on both land productivity and natural resource conservation do not unequivocally follow predictions made by scholars. Many studies do indicate that the shift of property rights towards increasing privatization is not as optimistic as predicted by the early property rights theorists. Such studies, which I discuss below, contradict the notions of efficiency and natural resource conservation implied by this theory. Nonetheless, some transformations provide powerful support for the theory of property rights as elaborated by North and Thomas (1973) and Demsetz (1967).**

**In Thailand (Feder and Feeny, 1991) compared the performance of squatters on state land, who lacked titles on their farms, with that of titled farmers. The results show that titled farmers, in addition to higher output per unit of land, had a larger volume of investment, higher likelihood of land improvements and more intensive use of variable inputs. Similarly, studies in Switzerland by Stevenson (1991) find that privatizing grazing lands increased both land productivity as well as the ecological condition of grazing land. These cases, however, seem to be an exception to an overwhelming empirical evidence of unpredicted or unintended outcomes of land privatization in the developing world.**

**Migot-Adholla et al (1994) found no effect in type of tenure on land improvement. In their study on the Kenyan highlands, Migot-Adholla et al (1994) found that neither title nor tenure security were related to terracing or perennial tree crop planting in three of the four in-country sites. The study also found no effects of title on agricultural yields. In an analysis of the Kenyan, Ghanaian and Rwandan data sets Place and Hazell (1993) also found that with few exceptions land rights were not significantly related to whether farmers made land-improving investments or used yield enhancing inputs. The argument that private property leads to the highest and best use of land is severely challenged.**

**In addition to ambiguous effects on land use, privatizing land in the developing world has serious effects on the traditional rights of many claimants. In many developing countries, land tenure may consist of multiple rights by multiple parties to a variety of resources and actions on any single parcel of land. The process of privatization disregards many customary rights of access and use such as grazing animals on crop residues, taking fallen branches for firewood or collecting medicinal plants from hedgerows (Weibe and Meinzen-Dick, 1998; Meinzen-Dick et al, 1997; Rocheleau and Edmunds, 1997). These rights, though very important for livelihoods, are often the first casualty in the shift toward land privatization. Women, in particular, are disadvantaged due to their inability to claim ownership rights during property rights transitions as their rights to land are indirect and dependent on a male relative (Lastarria-Cornhiel, 1997). Such**

**problems have been demonstrated repeatedly as far back as the Enclosure Movement in 18th Century England.**

**In areas inhabited by pastoralists, privatization programs have not led to any substantial rise in pastoral (livestock) productivity, at least not on a per hectare basis. Scoones (1994) quotes examples from Zimbabwe, Bostwana, Mozambique, South Africa, Kenya, Tanzania, Uganda and Ethiopia. De Ridder and Wagenaar (1984) gave evidence for Botswana. Penning de Vries and Djiteye (1982) present cases in various parts of USA, Australia and Mali. De Leeuw and Peacock (1982) present data on smallstock productivity in Kenyan Maasai lands. Returns per hectare range from being comparable to commercial ranches to being up to ten times as high. Typical levels of pastoral productivity were around two to three times higher than those of commercial ranches, while transhumance systems are at least as productive as the most productive western livestock production system.**

**Johnson (1996) notes that the privatization of land in pastoral areas in New Zealand did not diminish externalities but rather increased them. Land registration, defining exclusivity of ownership, gave the land owner almost complete control over all land forming and caring activities. The ecological consequences were overgrazing by rabbits, the entry of new weeds (e.g. hiercum sp. That reduce forage supply) and an increase in rabbit numbers, and overgrazing.**

**While it may still be arguable in the West that natural resources are best conserved when they are in private ownership, there seems to be no evidence at all from Africa to support the contention; indeed, all the evidence suggests the contrary.**

**Since different authors site divergent paths of institutional change, this study will focus analysis on two possibilities: Libecap's (1989) proposition that bargaining of political actors is key to the transformation of property rights, and Firmin-Sellers' (1995) theoretical assertion that where contractual processes fail to assign property rights, state actors use coercive mechanisms to terminate egregious conflict. Evidence from my pre-dissertation field research points to the possibility of both coercive and cooperative processes. The coercive mechanism is exemplified by the President's periodic intervention in the group ranch subdivision process. The release of a Presidential statement supporting subdivision during the late 1980s essentially sealed public debates on subdivision. Contractual bargaining is exemplified by the intense lobbying of political and state actors (such as bureaucrats) by various private actors such as the councils of elders, the "moran" or warrior age-sets and the activities of non-governmental organizations such as the Kenya Pastoralists Forum. This study will have the opportunity of investigating the conditions under which either coercion or cooperation, or both prevail.**

## 2.4 Research in Kajiado District, Kenya:

While a wealth of literature exists on the Maasai community in Kenya, and in particular on the Maasai of Maasai, relatively few attempt to critically analyze issues related to the evolving nature of property rights. Earlier studies were predominantly anthropological and focused on establishing Maasai socio-cultural and political organization (Herskovitz, 1923; Jacobs, 1975; Galaty, 1977; Galaty, 1980; Galaty, 1982; Spencer, 1988; Kipuri, 1989).

Other more recent studies focus on ecosystem dynamics and human-wildlife interactions within Kajiado District (Western, 1973; Njoka, 1979; Western, 1982 a,b; King et al.,1985; Lindsey, 1987; Homewood and Rogers, 1991; Western, 1994). Discourses on human-wildlife interactions occurred simultaneously with conversations on issues surrounding land use and land management thus fostering a greater interest on issues related to land subdivision.

Kituyi's (1990) anthropological account provides a comprehensive analysis of the socio-economic transformations confronting the Maasai. Rutten (1992), narrowing his analysis to two ranches, Olkinos (subdivided) and Embolioi (group), investigates the economic and ecological viability of subdividing these ranches that are located in areas receiving about 500mm of rainfall. He finds that ecologically, there is not much difference between group and individual ranches and that both were in 'fair' ecological condition. He also finds, very importantly, that more than 70% of the individual ranchers had overstocked their ranches. Many of the ranchers increased their herd sizes further after subdivision. Contrary to this is de Vreede's (Undated) investigation which finds that about 30% of the former Elangata Wuas group ranch (now individual units) had fewer cattle after subdivision, which leads him to quickly conclude that individuals reduced livestock herds in order to sustain them on their smaller, subdivided units. Interestingly, this author acknowledges that 70% of livestock belonging to local Maasai had been decimated by drought around the time of his study.

White and Meadows (1981) in an attempt to quantify the extent to which group and individual ranch development has changed pastoral production systems and improved the living standards of the Maasai, finds little difference in productivity between group and individual ranches. The development of group and individual ranches had minimal effects in prodding the Maasai away from subsistence and towards commercial beef production. In considering the ecological condition of the group and individual ranches, they find range condition good throughout the period of their study, and in fact conclude that the group ranch concept is "technically sound." In a similar study relating socio-economic performance of three former group ranches to ecological potential, Lusenaka (1996) demonstrates that socio-economic performance increases with ecological potential.

Galaty (1994) argues that the group ranch program in Maasailand failed to fulfill the institutional requisites that would have increased its chances of success. Contrary to other scholars such as Helland (1980), Hoprcraft (1980), Migot-Adholla and Little (1980), Raikes (1980) and Little and Brokensha (1980), Galaty argues that group ranch failure is the result of subdivision, rather than subdivision being the result of failing group management. In other parts of Kajiado, such as the Kimana area close to the Amboseli swamps, the success of irrigated cultivation for commercial purposes is resulting in calls to further subdivide the Kimana group ranch (Woodhouse, 1997). Much of this cultivation is conducted by cultivating immigrants from the Kikuyu highlands in Kenya and by the Chagga from Tanzania. Kimani and Pickard (1998) examine the reasons for failure of group ranches and their subsequent subdivision. They find that current trends of land sub-division in Kajiado district are much higher than in previous decades. Most recently Zaal (1999) seeks to find out the conditions of markets in Kajidao district and what factors influence these conditions. This author finds that climatic variability and food grain production were important factors. Government policy, by influencing tenure arrangements, infrastructure and exchange rates and prices was another factor.

While these studies highlight the complexity of property rights transformations in Kajiado district, crucial angles of this transformation need further investigation. First, the political dynamics of property rights change in Kajiado district needs further elaboration. Current studies seem to lean more towards organizational capacities within the group ranches, yet other forces outside the group ranches may be operational. In 1980, for instance, President Moi reacted to conflict by pronouncing that all group ranch members have a right to subdivide their land. This pronouncement interfered with local debate and placed a seal of Executive approval on property rights change. Also, my discussions with officials from the Ministry of Lands and Settlement during pre-dissertation research indicate that they prefer to have land under individual title so as to minimize conflict. A systematic analysis of actors, their incentives, and their use of political mechanisms to articulate preferences and achieve desired outcomes is thus necessary. This is conspicuously absent from current research in Kajiado.

Second, current analyses of property rights in Kajiado district seem to suggest that the mechanism of change is homogeneous. Observations during my pre-dissertation study indicate the presence of variation in the logic of change. Rainfall distribution (thus land productivity) and proximity to main market centers appear to influence the likelihood of change. Consequently, areas receiving higher rainfall that are closer to key urban centers seem to have larger proportions of individual than group ranches, and in some cases have fully subdivided such as in Ngong,

about 40 miles south of Nairobi. Interestingly, such areas also seem to have greater disagreement regarding the process of subdivision.

Third, all the studies reviewed do not make any reference to theory or the testing of theory. This lack of explicit theoretical content limits the broader application of their findings in Kenya and elsewhere.

Fourth, the environmental outcomes of property rights transitions remain a matter of conjecture. Rutten's (1992) attempts at evaluating ecological outcomes were not rigorous enough to allow meaningful evaluations. Classifying range health as 'fair' without detailed information on vegetation species composition and soil properties is inadequate. More significantly, his research design does not support his claims regarding the influence of property rights regime-on environment. The environmental status of a range can be explained by a variety of factors such as rainfall variation, stocking densities and grazing management system. In the absence of research design that controls for these variables, associating environmental status with property rights regime is at best misleading.

Drawing from the information provided by previous studies I will conduct an empirical analysis of the processes that underlie the transition of property rights to land from communally-held to individually-owned units. I will establish how different actors press their claims in the political arena in order to achieve their desired policy outcomes. In particular I will analyze how the incentives of particular actors such as group ranch members, group committee members, individual ranch owners, politicians and bureaucrats are oriented towards supporting or opposing particular property rights systems, and the institutional mechanisms they use to make their preferences a reality. A variety of institutions provide for the articulation of interests e.g., councils of elders, the bureaucracy, local government, and the presidency. The resource endowments of different actors enhance or limit their abilities to access these political institutions. How actors access these institutions, and how they use these institutions is the main subject of this research. In addition to this, I will also examine the environmental consequences of this transition in property rights.

## 3.0 Research Design;

### 3.1 Hypotheses:

1. Group ranches located in areas having higher proportions of immigrant, non-Maasai communities will be more likely to subdivide. Sub-division is expected to result in secure property rights for the Maasai and thus to prevent the encroachment of non-Maasai into Maasai territory. The Maasai have historically endured land losses in the creation of

**National Parks/Reserves and in the settlement of colonial farmers. The most recent threat to Maasai land ownership is the increase in immigrant land ownership in Maasai territory.**

2. **Group ranch subdivision is more likely to occur in ranches that have large proportions of Maasai youth, in particular those who are educated and/or employed. At the time of its inception, group ranch membership was restricted to adult Maasai males. Three decades of group ranch existence has resulted in a new crop of adult males who now seek their own share of land. They will thus agitate to have their names incorporated into the register of members, or to have the group ranches subdivided so that they can make claims to their fathers' shares. Individual title will enable access to credit and loans that can be used for land development. These youths will seek alliances among bureaucrats and government officials to ensure that adequate pressure is brought to bear on their fathers.**
3. **In group ranches where indigenous Maasai institutions are still influential, for example the council of elders, group ranch subdivision is unlikely. The elders, aware of the risks to survival and to the reproduction of the Maasai culture that subdivision entails, will pursue avenues to ensure that group ranches do not subdivide. As such, they will use their political positions not only to block initiatives to subdivide, but they will seek access to high-ranking Maasai politicians to whom they will launch their appeals. Vote-seeking politicians will respond positively to these appeals. The elders will find likely allies in the group ranch committee members and executives. By virtue of their position, they have access to authority and to group resources and face the erosion of this authority with the dissolution of group ranches. Though women are not directly involved in land decisions, they are also likely to form important allies for the elders, especially as development projects targeting women's involvement continue to multiply in Maasailand. Given that women face negative consequences with subdivision, they will likely oppose it, and seek to maintain group ranches.**
4. **Personnel holding government positions, both locally and nationally, and in particular those in the Lands and Settlement Office, will encourage the subdivision of group ranches. Individual titles provide unambiguous avenues for the settlement of land disputes. Additionally, many bureaucrats may also see an opportunity for land acquisition, since they have access to land records and importantly, are directly involved in the surveying, demarcation that characterizes the land titling process. This direct involvement of land officers assures them a greater influence upon Maasai land preferences, relative to officials from other government departments such as livestock**

development, water development and range management who see the group ranches providing economies of scale in development initiatives and who also see group ranches as being a more viable land use option under the environmental conditions.

5. Subdivision is more likely in areas having higher rainfall and in areas closer to main market centers. Higher rainfall totals are associated with higher land productivity and land rents. Individuals will thus seek to secure property rights in order to capture the gains from increasing land rents. Similarly, higher land rents close to market centers will provide incentives for individuals to seek to secure property rights in order to capture the gains associated with higher land rents.
6. The subdivision of group ranches into individual units will result in deteriorating range conditions. These deteriorating conditions will be characterized by differences in plant species composition and abundances. For example, there will be higher proportions of unpalatable woody and herbaceous plant species and a higher incidence of annual to perennial forbs and grasses in the individual relative to group ranches. In sum, there will be a higher occurrence of increaser species (i.e. those that increase in abundance under conditions of high grazing pressure) and decreaser species (those that decrease in abundance under conditions of high grazing pressure). These ecological differences will occur because individuals do not lower their stock sizes as they make the shift from group to smaller individual units; instead, many choose to increase their herds. The confinement of livestock in smaller units concentrates and intensifies the undesirable ecological effects of large herds such as overgrazing, trampling and erosion, which typically result in rangeland deterioration.

### 3.2 Data collection and Analysis:

I will use archival records, interviews and vegetation survey methods to collect data.

#### 3.2.1 Archival Search:

I will analyze literature in the Kenya National Archives and Kajiado District Archives to obtain a clearer understanding of the recent history of group ranch division in Kajiado District. This literature will help me determine the reasons why and the conditions that resulted in the wave to subdivide, that appeared to have taken place from the mid-1980s to the early 1990s. It will enable me identify and draw the set of political actors involved, providing me with a schedule of individuals such as policy makers, elders and politicians with whom I will conduct in-depth interviews.

### 3.2.2 Sample Selection:

Since rainfall is the key factor limiting land production potential, I will stratify the district into two zones according to annual rainfall as follows: less than 400mm and greater than 700mm. I will leave out the transition zone of 400-600mm rainfall for two reasons. First, this will significantly reduce the amount of time in an already intense research design without compromising the fact that rainfall is a crucial component in any activity in Kajiado district. Secondly, eliminating a transition zone of rainfall makes for easier interpretation of ecological data.

Within theses two rainfall zones, I will randomly select group and individual ranches according to distance from main towns. I will select two group ranches near town centers and two distant from town centers for analysis in each rainfall zone. I will also select two individual ranches near and two distant from town centers for analysis in each rainfall zone. I expect to sample a total of 8 group ranches and 8 individual ranches. Since the length of time in which individual ranches have been in existence is an important ecological variable, and would likely affect the characteristics of plant species, I will attempt to hold the time factor constant. I will ensure that all individual ranches in my sample were created in roughly the same years, preferably the mid-1980s when most group ranches were racing to subdivide.

### 3.2.3 Survey Interviews:

I will conduct interviews, both structured and unstructured, in an attempt to capture the mechanism and process of group ranch subdivision. Within each group ranch, under the guidance of the local area Chief and group ranch officials, I will stratify the inhabitants of the group ranch into the following categories: Elders, Youths, Women, Politicians, and Bureaucrats. I will randomly select one third of the individuals in each stratum for interviewing. In addition, I will interview all group ranch executives and management committee members.

The purpose of these interviews will be to establish what factors motivate individuals to prefer subdivision and to which formal or informal political institutions the individuals turn to ensure that their preferences are realized. The interviews will focus on finding out which individuals and groups of individuals are agitating for subdivision, why they do so and who their likely allies are. The interviews will also focus on establishing the legal and political avenues that these individuals and groups appeal to. In the same vein the interviews will enable me establish what resources these groups and individuals use to access the mechanism that they use. The

resources may vary from access to the state to access to informal courts and cultural institutions. Some of the questions will focus on finidng out how key decisions are made on the group ranch; whether ranch members are satisfied with key decisions made on the group ranch; what the main conflicts are and how they are resolved; and also the state of use of indigenous Maasai environmental institutions. These interviews will enable me establish who is for against subdivision, their motivations, and the mechanisms by which the transformation is occurring.

I will interview other groups and individuals outside the framework of the group ranch, but who also bear some influence over the functioning of the group ranch. These include government officials from lands and settlement offices, range management officers, livestock development officers, water development officers, and wildlife officers. Interviews with government officials will provide me with perspectives on what drives government to support subdivision in an environmentally precarious area, and whether the individual incentives of government officials is an important factor in driving land transformation. In Thailand, for example, government officials were ready to supply institutional change in situations where they were direct beneficiaries of this change.

I will interview Maasai political representatives, both at the national and local levels, to find out what their property rights preferences are, why they hold these preferences and how they manipulate institutions to ensure that their desired outcome is implemented. Responses to these sets of interviews will enable me examine in closer detail the political character of the transition in property rights.

The aim of interviewing individual ranchers will be to establish, retrospectively, their decisions for making this change. Where possible, the individual ranches will also be selected based on whether the group ranches from which they were carved are still operating as such.

I will also use the interviews to gain a better understanding of past land uses and the changing (if at all) ecology of the area. I will specifically ask individuals to reflect on any perceptible changes and propose reasons for the change. I will ask them about the incidence of plant species that they consider desirable or undesirable, whether their herds have increased or decreased, and whether or not they apply certain management procedures to their range.

### 3.2.4 Ecological Assessment:

I will assess environmental consequences of property rights transitions by comparing composition and cover of grass species between communal and private ranches. The main external influences on plant growth are the type of soil and surface gradient, rainfall and grazing (Van wyk et al, 1995; Scoones, 1992; Greig-Smith, 1983). The properties of pastureland such as

species composition, biomass, and grass cover are established indicators of the environmental health of a range (Dykesterhuis, 1949; Walker, 1976; Mabbut, 1978; Walker et al, 1981; Thurow, 1986; Schlesinger, 1990; Milchunas and Lauenroth, 1993; Sheehy, 1993 Van Duivenbooden, 1993), and are altered by livestock grazing since they respond differently to different grazing intensities. High stocking rates lead to lower vegetation cover and increased soil exposure; thus lower plant cover and especially lower annual cover may be related to higher grazing pressure (Tadmore, 1960; Morley, 1981; Mwendewera et al, 1997). An intensive grazing regime of 2-3 rotational grazing periods on the same pasture leads to a decline in pasture yield or biomass in the following year of 37-72% of a control area (Tserendash and Erdenbataar, 1993; Kenya, 1997). Highly preferred species decline, as they are selectively grazed and are replaced by less preferred species as grazing pressure increases (Dyksterhuis, 1949; Perrings and Walker, 1997). Similarly, herbaceous annuals replace perennial grass species as grazing intensity increases. Species that decline due to increased grazing pressure are termed "decreasers", while species whose abundance and distribution increase under high grazing pressure are termed "increasers". A range dominated by a larger proportion of increasers relative to decreasers, and by a higher proportion of annuals to perennials is recognized as being relatively more degraded (Dykesterhuis, 1949; Walker, 1976; Mabbut, 1978; Walker et al, 1981; Schlesinger, 1990; Milchunas and Lauenroth, 1993).

I expect range degradation to be greater in individual units than in group ranches because of an over concentration of livestock within the smaller, individual land units. I will evaluate a range dominated by a larger proportion of increasers and annual species that are known to increase under higher grazing intensity as being more degraded. I will also measure soil pH, soil physical and mechanical composition, as well as moisture levels and slope conditions. All these properties are known to influence grass species composition, abundance and distribution (Greig-Smith, 1983).

I will conduct vegetation surveys within each of the group and individual ranches selected for interviewing. In each ranch, I will use the random bearings method (Randolph, 1998) to locate my vegetation sampling plots. The random bearings method of locating plots uses a series of random table numbers to establish the bearing of each plot and the distance between successive plots. Each sampling location will comprise a series of three nested plots of $1m^2$, $9m^2$ and $25m^2$, for the purpose of sampling herbaceous, shrubby and tree species, respectively. In each of these plots I will record the species type, height and estimate the percentage cover of each species within the plot. I will endeavor to sample 20-30 plots in each area depending on the heterogeneity of vegetation type. I will establish more plots in heterogeneous vegetation as

opposed to relatively homogeneous vegetation. I will conduct all vegetation sampling in the period following the rains as this corresponds with the peak growing season for most grasses. I will also conduct sampling during the dry season in order to provide me with a sense of seasonal variations in vegetation.

In addition, I will estimate the distance from settlement or watering point of each plot, the slope, and will take soil samples from 10 and 20cm below ground surface. Soil samples shall be analyzed for pH, moisture content, and chemical nutrient such as nitrogen and phosphorous. I will record and store the location of all plots and ranches on a GPS.

In addition to taking quantitative vegetation measurements, I will ask individuals selected for interviewing on their perceptions of the status of vegetation both before and after subdivision into individual units. Other questions I will ask include those to do with range management activities. For example whether they fence and why; whether they use fire, how often and for what purpose; whether they practice rotational grazing, where they move their livestock to and why; their stock numbers, stock composition and whether these are increasing or decreasing; whether there is much interaction between domestic stock and wild herbivores and what kind of effects these interactions have on vegetation. In order to establish grazing pressure I will question individuals on the number of cattle they keep in a known area over a known time period.

The question of whether past management practices or other environmental shocks may be responsible for current vegetation characteristics is crucial, yet obtaining such information is difficult. In order to establish the environmental history of the area, I will ask the elders to describe the vegetation of the area when they first arrived. I will also ask them to reflect on ancient folklore as a way to deduce the environmental history. I will reinforce these stories with narratives and accounts by early explorers that I will obtain during my search in the archives.

### 3.2.5 Data analysis:

Data from the interview schedule will be analyzed appropriately.

For the vegetation data, species frequencies, cover and dominance will be determined. The data will also be used to estimate the following regression model:

Plant species composition = f (institutions, soil characteristics, grazing management, stocking densities, rainfall, evapotranspiration).

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