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RESEARCH ARTICLE

Natural Resources and Conflicts: Theoretical Flaws and Empirical Evidence from Northern Kenya

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Abstract

The Horn of Africa is viewed as a battleground of violent conflicts which are prompted by growing resource scarcity with population increase. Such conflicts are argued to be particularly violent in poor regions where many ethnic groups have to compete for scarce natural resources and where people hardly have the capacity to develop adaptable and ingenuous approaches to avoid or resolve conflicts. This paper tests the validity of such claims using analyses of a long-term data of inter-ethnic conflicts and associated incidents of loss of livestock to raids, banditry attacks and killings between pastoral communities in Marsabit District, Northern Kenya. The analysis is strengthened using case studies of access to a severely scarce water resources in rural Kenya, and even more so in pastoral areas. The herders escape local drought effects by moving herds to places where potential loss of livestock is anticipated to be less severe. The poor herdsmen, for whom transhumance is not affordable, are left behind in drought areas. According to the herders, it is more rational to cooperate with people from different ethnic groups in times of drought in order to share the scarce water resources. This view was also supported by the yearly statistics on violence which show that twice as many deaths occurred in wet years than in drought years. We find no evidence neither that violence is increasing in relative terms, nor that ethnic violence is related to environmental scarcity. On the whole, the study cannot verify the assumption that increasing competition over scarce resources on Marsabit Mountain results in more ethnic violence. In particular, water resources seem to play a vital role in social interaction, reconciliation, sharing and cooperation in survival strategies. The result shows how important conflict-avoiding institutions are in societies which have learned how to deal with scarcity by century-old experiences in hardship areas. These conflict-avoiding institutions are shaped and reshaped through time, subjected as they are to natural hardship, external stress, modernity and technological change.

Key Words: Natural Resources, Ethnic Conflicts, Pastoralism, Horn of Africa, Marsabit, Drought

The Tenets of Conflicts among East African Pastoralists

The East African pastoralists occupy the arid and semi-arid environments. The ecological marginality of pastoral areas means they are mainly suitable for keeping livestock, and crop cultivation is limited to a few relatively high altitude areas where rain-fed agriculture or riverine cultivation are practiced. Livestock significantly contribute to food production of pastoral households while also serving as different forms of capital, acting as a store of wealth, cementing social relations and mediating other cultural and ritual practices such as marriage and traditional ceremonies (Tablino, 1999). A household ownership of a large herd is not only a source of social standing and prestige, but also serves as savings and insurance against future livestock losses to shock events. It is for these reasons that any means of herd accumulation is economically, socially and culturally rewarding. Herd accumulation is also stated as, and seen to be, the strongest justification for interethnic raids among pastoralists.

Scholars have developed and applied several approaches in trying to understand the causes and the underlying motives of interethnic conflicts (Fearon & Laitin, 1996) and between pastoralists in particular (Oba, 1992; Salih, 1999; Osamba, 2000). Here, two of these reasons are worth pointing out when keeping in mind the pastoralist groups under study: the changes in livestock as the principal assets and as a store of multiple values, and access to environmental (or ecological) resources in tipping inter-ethnic tension over into violent conflicts (Oba 1992; Hussein *et al.*, 1999; Salih, 1999). The arguments stated as mainly fuelling ethnic conflicts can be summarised as follows: declining livestock wealth with differentiated holdings between ethnic groups, and ecological stress that partly bad rangeland policies are

responsible for. We briefly reflect on each of these factors in turn.

Droughts and their Effects on Livestock Numbers

The pastoral economy is synonymous with keeping of animals. Similarly, the East African pastoral communities inhabit areas prone to high risks, where severe droughts and outbreaks of animal diseases occur regularly. The impacts of drought and other adverse factors cause considerable livestock wealth differentiations between households (Fratkin & Roth, 1996) as well as between ethnically different groups. The need to rebuild and accumulate herds, and smoothen out differentiated herd losses after droughts are argued as strong motivations of the inter-ethnic raids and violent conflicts (Osamba, 2000). According to this thinking raids constitute vehicles for climbing out of herd-poverty and gaining a culturally endorsed social status. With repeated droughts and accompanying losses of livestock, and assuming conflict resolution and reconciliation mechanism are not in place, cycles of interethnic raids and counter-raids are likely to reinforce each other. The lack of peace building institutions of avoiding conflicts is moreover a realistic assumption given the weak nation-states and poor enforcement of the rule of law in many African countries today. If this line of argumentation is true, then, drawing inferences on the note of periodic droughts in the past few decades and pastoralists impoverishment, and taking raids as a motive of herd accumulation in arid areas in response to drought-induced high livestock mortality, would show increased raids and violent conflict incidents in the recent, compared to the distant, past.

Ecological Stress

The pastoral production system is founded on flexible herd mobility that optimises production by making use of diverse livestock species combined with spatially distributed rainfall and patchiness of the rangelands. However, the colonial boundaries and present national boundaries are at odds with the pastoral strategies of making opportunistic use of rangelands and of obtaining better livestock production. The national boundaries therefore restrict herd mobility in pursuit of better pasture and water. The restrictive policies on herd mobility result in rangeland degradation, which in turn is followed by negative effect on the pastoral welfare as livestock numbers decline. This process repeats and feeds a downward spiral of livestock populations. Frequent droughts that diminish livestock populations, and deteriorating environmental conditions, which in turn increase livestock deaths resulting from starvation, are argued in the conflicts literature as inter-locked with cycles of raids and rustling. In so far as political powers define territories and physical boundaries hinder herd mobility, then geopolitics becomes a decisive factor in environmental conflicts and a cause of insecurity across border lands (Salih, 1999, p.22).

Today many pastoralists depend on smaller livestock assets than ever before because of declining animal numbers for years in a row. The downward trend in the livestock wealth among the pastoral communities has put human consumption derived from livestock and other obligations that animals fulfil at crossroads. Indeed, pastoralists are today one of the poorest groups of populations in sub-Saharan Africa. The question is, if the widely held view herd accumulation is an important reason for ethnic raids holds, has the occurrence of interethnic raids and incidence of violent conflicts increased with substantial decline in per capita livestock wealth over time? This paper primarily deals with inter-related issues of resource availability with regards to access to water resources and changes in livestock wealth in northern Kenya. The overriding aim of the paper is to investigate the empirical basis of conflicts as it relates to the natural resource scarcity-causes-interethnic violent conflicts paradigm.

The Study Area and Method of Research

This paper is a result of a research conducted in Marsabit District of Northern Kenya (Figure 1). In particular, an investigation on water resource issues of the use and management of shallow wells receives special attention in the paper. Ownership and access rights, allocation and use of water during droughts, were the main topics of investigation that was carried out between 1997 and 2000. The fieldwork for the study coincided with the time of heavy El Nino rains in 1997/98 and the severe drought in 2000 in the region.

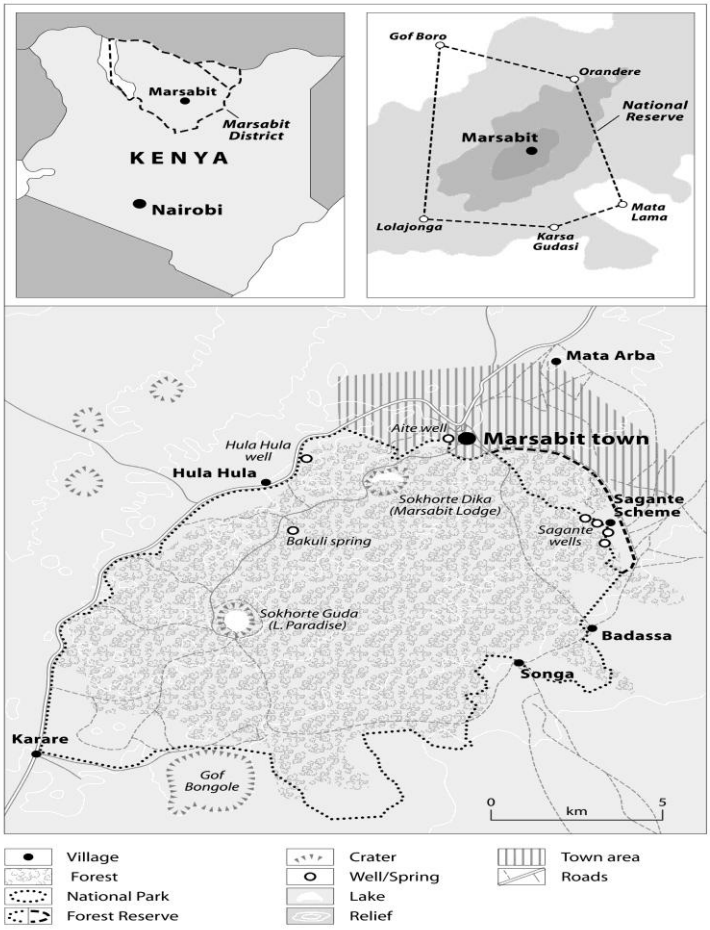

Figure 1. Marsabit Mountain and its Surrounding Areas (Adapted from Map 1, RoK, 1987)

The well sites seemed the right places to collect the data because most households and animals in Marsabit District use water from man-dug wells. The water table in the wells has sunk deeper and deeper with increasing drought in 2000. Scarcity of labour, time and space at the few well sites demand that not everyone could come to drink at a convenient time. In such a situation, a considerable amount of labour is needed to water a herd, requiring a high level of organisation and cooperation to get this task done. Tight rules and water schedules were drawn. Moreover, ownership of resources seems to be ethnically linked, so we were particularly interested in how newcomers or people from different ethnic groups without their own well were treated at the well site. We made case studies of the wells and their use, for which we interviewed the well owner and all the important elders related to a particular well. Groups of well users were interviewed at the spot, while individuals were interviewed in their houses.

The case studies of wells reported here were carried out around Marsabit Mountain, which is a high *inselberg* of volcanic origin, rising to an altitude of 1,700 m out of the surrounding semi-desert at 400 m altitude. A dense mist forest grows on its peaks and is responsible for the cool and sub-humid climate on the mountain. The average rainfall on the mountain is 800-1,000 mm annually, and drops to 200 mm in the surrounding lowlands, dispersed over a bi-modal rainfall pattern. Vegetation growth in large parts of the district is scanty due to low rainfall and high salinity of soils and water resources.

Marsabit Mountain supports farming which can be successful in years of normal rainfall. During the colonial era, pastoralist groups were attracted by the green mountain, but were not allowed to settle (Adano & Witsenburg, 2005). However, a large movement to the mountain started in the 1970s as a result of the Somali secessionist war, large losses of livestock and the droughts of 1973/1974. The Ethiopian war also caused widespread immigration into Kenya. Marsabit Mountain has become an area of refuge for victims from war and droughts.

More than one fifth of the population in the District has tried to establish a livelihood on the fertile slopes of Marsabit Mountain. The population density on the

mountain has increased from 1 person/km^2 in 1959 to 18 persons/km^2 in 1999. Impoverished pastoralists of Rendille, Samburu, Gabra, Borana and Turkana origin, as well as Ethiopian migrants with a farming background, live in close proximity trying to establish new livelihoods in an insecure environment. It requires little imagination to guess that the population pressure on land, vegetation and water resources has increased tremendously. The mountain area therefore provides a suitable location for investigating issues of interethnic conflicts, with a primary focus on water, at the height of water scarcity during and after a driest year in the history of rainfall records.

A number of reports and books, including the annual reports and intelligence reports of the Northern Frontier District in the British colonial era until 1960, and the Kenyan Human Rights publication of 2000 on Marsabit and Moyale Districts, were the main sources of information for the study. In the Colonial period, these districts together were part of the Northern Frontier District (NFD). Present-day Moyale District was part of Marsabit District until 1995, and the incidents in both districts have been counted together and weighted for population growth for comparison reasons (see Adano and Witsenburg for an overview of incidents derived from various reports, 2004, p.736-48). In this paper, especially the historical overviews from Marsabit District Annual Reports of the colonial time, Tablino (1999) and Sobania (1979) were a valuable source in assessing whether violence in the region had increased over the past century, since they describe each and every incident in great detail. In this regard, Marsabit District is considered a 'hardship area' by the Kenyan Government; meaning civil servants get a 'hardship' bonus on top of their salaries. It does not benefit the police to underreport ethnic violence and raids, as that would reduce the chance that their area of service earns the 'hardship status'. Neither can one rule out the possibility that it might result in over reporting. All the incidents and killings that were reported by the colonial government were listed and compared to the number of incidents and loss of life in the last decade. The annual reports of the present-day government do, however, not systematically list incidents and numbers of people killed in armed conflicts. Unfortunately, we had no data for the period from 1960 to 1989, which was an extremely violent time due to the Somali secessionist (*shifta*) war during part of this period.

Issues Linking Resource Scarcity to Ethnic Conflicts

The availability of natural resources in relation to increasing population densities is to some extent problematic to address, as the danger of severe resource scarcity seems to be ever-present (see Witsenburg and Adano 2007 for details). Development workers and scholars alike have expressed fears of increasing tension between different groups in society in degrading environments (Kaplan, 1994) and in their competition for access to resources (Homer-Dixon, 1999). The fear about the relationship between environmental scarcity and violent conflicts is presently receiving considerable attention. It is widely assumed that in less developed countries environmental conflict is likely to happen because of high population growth and high dependency on renewable natural resources. Moreover, Homer-Dixon (1999) argued that poor countries cannot allocate (enough) wealth to research and development to invent new techniques to produce or substitute scarce resources (the so-called 'ingenuity gap'). In addition, developing countries are thought to lack well-defined or enforceable property rights to govern renewable resources (Maxwell & Reuveny, 2000, pp. 301-302). A substantial feature of the argumentation is the neo-Malthusian assumption that food production cannot cope with population growth, leading to all sorts of problematic events, including violent conflicts. At the core of this thinking lies the assumption that poverty is related to a lack of social institutions that are necessary to deal with increasing resource scarcity, which will inevitably result in violence. As Homer-Dixon asserts:

> Poor countries start at a disadvantage: many are under-endowed with the social institutions that are necessary for an ample supply of both social and technical solutions to scarcity… (Homer-Dixon, 1999, p. 108).

Thus, the explanation is that violence that results from competition over scarce resources is triggered by governance failures like unequal access to resources and social exclusion, the misuse or overuse of a common property resource and free riding problems among others. In the scarcity-causes-violence paradigm, this lack of good governance is held responsible for increasing tension and violent conflicts in developing countries in general and Africa in particular.

The Marsabit Mountain area, where an increasingly armed population from various ethnic backgrounds has to rely on a limited resource base, is a typical area in which to test the plausibility of the scarcity-causes-violence paradigm. An increasingly sedentary population from groups with a history of violent encounters live, more than ever before, in each other's vicinity. After losing large parts of their livestock wealth to periodic droughts and thus settling down because of holding too few herds to subsist on, they presently have to share scarce resources like water, pasture and farmland. In addition, the Marsabit Mountain population is a society in transition from nomadic pastoralism to a more settled way of life, which involves changes in traditional norms and values, loose family ties and less social control. Intuitively, violent encounters between people have become more

intensive, with higher numbers of casualties per incident, because present-day arms are more lethal than the arms of the past (KHRC, 2000; Mkutu, 2002). Population growth, environmental scarcity and violent ethnic conflicts are manifest phenomena in Marsabit District, and this paper explores their relationships.

Evidence of Increasing Resource Scarcity with Reference to Livestock Assets

In marginal areas like semi-arid northern Kenya, people have coped with scarcities for centuries. Many institutions exist that have been shaped and reshaped over time to avoid 'resource conflicts' between ethnic groups during crisis times. In pastoral areas, scarcities increase during droughts. Lack of rainfall is directly linked with a number of environmental problems, which undermine the well-being of livestock and pastoralists.

The supply of and demand for resources fluctuate through time. Our first fieldwork period in 1998 was characterised by abundant rainfall. While excessive rainfall can cause its own scarcities, such as lack of food supplies in town, fuel, transport and medicine because of flood caused inaccessibility, for nomadic households it is also a time of herd growth, enough milk for consumption, good pastures and relatively adequate water supply. However, in 2000 a severe drought had caused severe problems for farmers and nomads alike, and Kenya as a whole experienced an economic crisis. Salaries had gone down, shops closed, projects stopped, children dropped out of school and a famine was threatening the lives of thousands. Only relief food prevented this happening as more than 80% of the households in the District received relief handouts.

The above situation shows that resources are so dynamic and so fluctuating in their supply and demand that quantifying relative scarcity is difficult. There are nonetheless indications that point in the direction of increasing resource scarcity; when units of time, labour and money have to increase in number to extract the same unit of a renewable resource. One way of throwing some light on scarcity would be to assess trends in livestock numbers – the principal assets of the pastoralists. The absolute number of people and livestock has increased over the last century. Whereas rangelands have had to support a larger number of animals, the number of animals (expressed in tropical livestock units (TLU - using 1 camel equal 1.2 TLU, 1 cattle equal 0.7 TLU, 1 sheep or goat equal 0.1 TLU) per person has decreased tremendously (Table 1).

Based on a study in the district, Fratkin and Roth (1996) observe that 8 TLU per capita is generally considered sufficient for subsistence livestock production as pure pastoralists. In the literature, a threshold of 4.5 TLU per capita is the recommended minimum required to generate subsistence production. The estimate of minimum 4 TLU per capita is based on different TLU values for other parts of Kenya, but does not incorporate the livestock requirements needed to support a social network. Thus, the TLU per capita of 5.3 in 1984 was already barely sufficient to support the population (Table 1), and the 2000 survey figures give much lower values. In 1998 we measured 5.3 TLU per capita only in the lowlands among the mobile pastoralists at Korr and Maikona centres of Marsabit District. The settled households on the mountain had 1.3 TLU per capita both in 1998 and 2000, and settled households in the lowlands had 3.4 TLU per capita in 2000. The households on the mountain clearly have much lower levels of TLU per capita. Similarly, Fratkin and Roth (1996) found a decline in the average TLU per household in the District of about 36% between 1976 and 1985 among Samburu Ariaal. McPeak (1999) reports average household herds of 6.9 TLU per capita in Chalbi and 3.9 TLU per capita in Dukana among Gabra nomads. The downward trend in livestock wealth among pastoral groups is evidently a general phenomena, and not unique to Marsabit (see Dietz *et al.*, 2001 for four Kenyan case studies). Since many inhabitants of Marsabit District presently live a settled life, then, the TLU per capita ratio is far below 5 TLU. This suggests that livestock as productive capital has become increasingly scarce, while livestock is still considered the most valuable household capital, and herd accumulation remains critical in building up assets.

Table 1. Human Population and TLU Measures in Marsabit District

	Rendille Country[a]		Household survey[b]	
	1932	1984	1998	2000
Population	7,250	24,501	2,036	1,901
TLU	106,118.3	129,554.2	4,278.8	3,498.2
TLU per capita	14.6	5.3	2.1	1.8

Source:

a. Rendille country is part of Marsabit District and is inhabited by Samburu and Rendille (from O'Leary, 1990).

b. Authors' surveys, 1998 and 2000. The 1998 figures are for mobile pastoral households in the lowlands and Marsabit Mountain, while the 2000 figures are for settled households in the lowlands and Marsabit Mountain.

In many arid and semi-arid areas like Marsabit District, rainfall remains the most significant factor that influences conditions of the range, resource availability and herd growth. Yet, the relationship between livestock numbers and rainfall pattern for the period data is available does not show a significant correlation (Adano & Witsenburg, 2005). While rainfall is quite variable, livestock population in per capita has declined dramatically over the last 30 years, and the human population continued to grow.

Water and other natural resources became increasingly scarce during the drought. Many people with large herds moved away from the area in 2000 to escape local drought effects, and in so doing released the pressure on water and pasture. Still, people and animals had to queue for long hours to get access to water. The demand for forest resources, especially firewood needed to cook relief food, increased since 1998, and demanded high labour inputs of household members. One could argue that these scarcities are cyclical, but cyclical scarcities have had an increasingly worse impact on the population in the course of the last century. Despite high level of poverty in the region, there was nevertheless a (temporary) situation of peace, cooperation and reconciliation between the ethnic groups, which question the validity of the scarcity-causes-violence relationship.

Many authors deal with violence as a static phenomenon, as if it would not come to an end (Mkutu, 2002; Kahl, 1998). Yet violence often suddenly stops, even when resources do not suddenly stop being scarce, because local people find ways to share or to cooperate, but this seldom gets emphasis. Also the assumption that common property resources are used as open-access resources still guides the 'scarcity-causes-violence' paradigm, even though others (Bromley, 1992; Berkes, 1989) have provided convincing examples which falsify this assumption. Local property regimes and conflict solving or conflict-preventing mechanisms are thus ignored, while these mechanisms are of crucial importance in mitigating conflicts. The following example illustrates how existing institutions in societies deal with the allocation and management of natural resources without resulting in violent interethnic conflicts. While such institutions have been routinely neglected in much literature, outbursts of violence have been over-emphasised as much as wrongly interpreted as caused by competition over scarce resources.

Ethnic Tension and Reconciliation in Marsabit

Increase of Violence in 1998 and 1999

From 1994 to 1999, ethnic violence in Marsabit District seemed to increase. In 1998 and 1999, the local residents talked about nothing else than raids and killings and during certain months our research was seriously hindered. People were afraid to travel on the roads, especially after some bandit attacks on the main roads and murders on the forest road between Songa and Badassa. It was absolutely impossible to ask people questions on ethnically delicate topics and to acquire reliable answers. In 2000, the Kenya Human Rights Commission published a report in which most of the armed incidents that took place between 1992 and 1999 in Marsabit and Moyale Districts were described in detail. In 1998, 24-armed incidents were registered, in which at least 93 people were killed and 12 people were wounded. There were 50 incidents in 1999, with 38 people killed and 69 people wounded. These were years in which tension and fear were almost palpable in Marsabit town. In 1998 and 1999, the situation looked like an escalation of ethnic violence, and it was tempting to interpret the violent conflicts in this ethnically diverse area as arising from competition over scarce resources. The powers of politics in instigating one ethnic group against ethnic others are often understated (Salih, 1999). Dietz (1996) work on North-Narok contains vivid examples of how political-economic reasons used to claim rights over natural resources caused violence clashes between different ethnic groups.

Reconciliation in 2000

In 2000, the severe drought situation seemed a 'good' opportunity to find out how the 'traditional ways of resource management' would deal with this increased scarcity situation. Surprisingly, we found a peaceful atmosphere on the mountain, even though the drought had caused widespread starvation among animals due to a lack of pasture. People with large herds had moved away from Marsabit, to places in Ethiopia and southwards to places like Waso and Garba Tula in Isiolo, Wamba and Maralal. This reduced the pressure on Marsabit wells from large herds. However, thousands of poorer herders with small herds still had to use the mountain waterholes. Only waterholes with a greater capacity were used. This resulted in a situation ethnically different groups all depended on a few water holes. Contrary to the expected outcome, the situation around the waterholes was one of cooperation, sharing and mutual understanding.

A case in point was the temporary reconciliation around Bakato wells: a watering site in a grazing area between Badassa and Songa, exactly on the boundary between the Borana and Rendille/Samburu speaking communities. In 1998, the water site was the scene of fighting and shooting, killing and raiding. It proved impossible to visit that well site because of the fights. Nineteen ninety eight was a year with high rainfall, good pastures and lots of raids. According to the herdsmen, traditionally long distance raids tend to increase in a wet year when there was sufficient grass and water to give a good chance of getting any stock taken back home, while the environment provides better possibilities to hide. The result of the violence in 1998

was that the Bakato dam and the nearby wells were not used for a long time. With the onset of the drought, pasture on the mountain deteriorated and the number of usable wells decreased. Herdsmen of both Rendille and Boran groups (usually rivalry groups) met and agreed that they should stop fighting (temporarily) in order to use the wells and pasture of Bakato. They said that they used to reconcile in such times of stress, for the sake of sheer survival. They pointed out that people with small herds are not as inclined to engage in raids and murder as those who have larger herds. In addition, wealthy herd owners and politicians like to instigate conflicts for their personal gain, without considering how poorer herdsmen suffer from such conflicts. Although fights often happen during the wet season and around water places, people do not fight over access to water, as is often reported. Raids happen at water places because so many animals accumulate around a watering point and people are extremely busy with providing water for their animals. They are therefore completely unprepared for others' attack which exposes them to extreme vulnerability of loss of herds and life. Traditionally, if people want to get access to a certain water point they reconcile and negotiate, but to fight.

In any event, the situation during 2000 drought was a very illuminative contribution to our investigation on the mechanism of use rights allocation and emphasised the importance of the principle that everybody should have access to water, irrespective of ethnic or clan affiliation. In this respect it is interesting to mention the historical claims to the same water source by Rendille and Boran herdsmen on Mount Marsabit.

The Rendille Galmagor was the first settler in Hula Hula. He said that the spring at Hula Hula was used by Laikipiak Maasai and Loroguchu Samburu before the Boran came to occupy the mountain with their cattle. By the time Galmagor settled in Hula Hula in 1969, Boran had dug wells and improved them with troughs. The Rendille were initially refused access to the water there. The Provincial Commissioner came to settle the case and in 1970 the Rendille were allocated one day in the watering schedule. Since then, the watering schedule has been such that the Samburu/Rendille, the town and the Burji and the Boran, Gabra and Manyatta Ginda are assigned one day. Every household pays Ksh. 10 per month to the water manager who opens the tap and manages the equipment at the well of Hula Hula (from own field notes, 2000).

In times of ethnic tension, Boran and Rendille/Samburu claim ownership over wells such as the Hula Hula and Bakato water sites, which lie on the border between the groups. During times of reconciliation, people admit they understand why the enemy has a rightful claim to the same well. The Boran readily admit that the Rendille and the Samburu have used the water on Mount Marsabit long before they migrated from Ethiopia. The Rendille/Samburu admit, in turn, that the Boran have improved the wells over a long period of time. Everyone in Marsabit knows that improving a well and contributing labour and investments means building up use rights.

Situations of Peace and Cooperation in the Colonial Era

This case-study shows how in certain situations resource scarcity can contribute to reconciliation and cooperation between otherwise antagonistic ethnic groups. Evidence from the colonial records shows similar phenomena. The following was reported in both 1939 and 1955, which were years of severe droughts:

> During part of the year it was common to find Boran, Rendille and Gabra using common water holes, and surprisingly little friction occurred between them (Marsabit District Annual Report, 1939, p. 7).

> There was no internal unrest; in fact relations between the three tribes were most friendly – which is most surprising in view of the severe drought conditions prevailing throughout the year. As with the Boran, the Rendille-Gabra relations remain most friendly and have shared their water and grazing (Marsabit District Annual Report, 1955, pp. 7-16).

The suggestion of the herdsmen that more violent ethnic conflicts take place during the rainy seasons is interesting, because of high grass, strong animals, and the availability of surface water, which makes it easier to trek with the animals. That means that there should be a correlation between years of high rainfall and number of violent attacks. This contradicts the 'scarcity-causes-violence' paradigm, which stipulates that higher numbers of violent conflicts ought to occur at times of severe droughts and higher scarcity. Furthermore, livestock can be a burden during droughts and all parties therefore profit from cooperation in a situation of drought. Alternatively, one could argue that after severe droughts herdsmen could wait until the rains have started to raid their enemies to replenish their stock losses. That suggests that resource scarcity caused in a dry year could be a probable reason for conflict during a subsequent wet year. This also agrees with the hypothesis that restocking after heavy livestock losses to drought is one of the main reasons of raids. That evidence should show an increase in violence in a wet year following a drought, and tested empirically using long-term incidents data.

Is there a Trend in Increasing Violence?

In this paper, violent conflict encounters refer only to those incidents resulting in death, abductions and torture

or injuries. The incidents are classified in the original reports as 'raid', 'armed attack' or 'murder' (Adano & Witsenburg, 2004; Table 17.6). 'Raid' is an armed attack where livestock is involved, and 'murder' is an armed attack where one or two individuals are assassinated for various reasons. These incidents have an 'ethnic' character, as the identity of the groups involved was almost always reported. The incidents also includes 'violent' abductions of Kenyan residents by the Ethiopian army where threaten and abducted people are usually tortured severely. The militia operate more openly under the questionable protection of uniforms and legal possession of guns. Armed violence is regarded as a typical characteristic of Kenya's drylands, or of the Horn of Africa in general.

> ...in the Horn of Africa in recent times, conflict among pastoralists has taken on new, exaggerated dimensions. A shrinking resource-base has provoked a desperate struggle for survival in which the existence of some groups is threatened (Markakis, 1993, p. 13).
>
> The most obvious threat to pastoral survival is the increase in violence in the sparsely populated pastoral areas: warfare and raiding have been constant features in the lives of most pastoral peoples, but automatic weapons and grenades have revolutionised the intensity and deadliness of conflicts and quite altered their nature (Baxter, 2001, p. 236).

It is true that modern weapons have a different level of destruction, causing more deaths in a short time. Yet, to avoid misinterpretation of the present, it is necessary to look at the past. One can only claim 'an increase of violence' when there is evidence of an upward trend in violent incidents over time. While literature claiming 'increasing conflict' fails to give evidence of trends (Hussein *et al*., 1999), absolute numbers of incidents do not say much in an area where population growth is high. Thus, a trend in conflict incidents should be adjusted for changes in human population over time.

Markakis (1997) stated in his book '*Resource conflict in the Horn of Africa*' that 'the Horn of Africa is a textbook case of environmental degradation and conflict'. He convincingly quantified the trends of population growth, resource degradation and increasing food insecurity, but silent on trends in conflict incidents over time. The book largely describes how tribal, descent groups, and cultural movements confront each other or the state in different ways. Mkutu (2002, p. 4) claims violent conflicts involving pastoralists being widespread and increasingly severe in much of the Horn of Africa without listing any trend in numbers. Kahl (1998) shows how trends in population growth and increasing scarcity of resources in Kenya seem to have contributed to widespread politically motivated ethnic clashes in Rift Valley, Nyanza and the Western Provinces. The reported number of 1,500 deaths and about 300,000 displaced people were counted from 1991 to 1993 (Kahl, 1998, p. 7). The question is how large the population was on which these numbers are based. It has been suggested that Kenya has long been a relatively calm country, but we have no proof of population growth-related ethnic violence in the past. Despite a large number of studies on civil war, only a few have systematically tested scarcity-violence links using hard data (De Soysa, 2002).

Although there have been a number of qualitative and descriptive case studies that tried to prove the 'scarcity-causes-violence' paradigm, the lack of statistical evidence is not compensated for by convincing qualitative studies. This paper attempts to serve two goals: (i) to use hard data to indicate trends in violent conflict incidents; and (ii) to combine quantitative and qualitative information on the governance of water resources (Adano and Witsenburg, 2004: 271). Before giving evidence of trends, let us first look at what statistical data on violence in Marsabit, related to population numbers, tells us.

Analysing Trends according to Population and Rainfall Data

In addition to sources of information stated before, rainfall data from the Marsabit Meteorological Station was another important source of data for the study. In this regard, droughts in the rangelands in Marsabit District (Sobania, 1979; Tablino, 1999) correspond fairly accurately with an annual rainfall of 700 mm or less on Marsabit Mountain. As years of low rainfall usually result in scarcities of resources - reduced vegetation and pasture for animals, a lack of surface water in pools and wells, a lack of milk and crop harvest and starvation of animals - a drought year can also be an indicator of a water scarcity, and general environmental scarcity.

Interestingly, the majority of firearms deaths in several Kenyan districts are attributed to police activities (Leyan, 2002): 'six out of every ten Kenyans who are shot dead are victims of police shootings'. But the statistics rise dramatically in 2001, when the police shot dead nine out of every ten victims. The study, first of its kind carried out in Kenya, attributes an average of 60% of firearm deaths to police and 39% to criminals in the past five years. Adano and Witsenburg (2004) show that past conflicts were usually raids, and the proportion of incidents in which the Kenyan and Ethiopian army was involved in the 1990s is quite substantial (p.736-48). For example, twenty-three of the fifty incidents in 1999 were caused by the Ethiopian militia against Kenyan civilians, causing eight deaths and numerous abductions. In the same year, the Kenyan

army was involved in nine incidents in which 17 civilians were killed in an alleged attempt to stop people from supporting the Oromo Liberation Front (OLF). In only 16 incidents, in which 12 people were killed, was the army not involved. One conclusion that can be draw from the results is, contrary to common belief, the number of violent conflicts in the course of last century has not increased proportionately to the human population growth. There has been an increase in violent conflicts during the last decade, but its level is not as high as during pre-independence time, and even much less when military cases are taken into account.

Analysis of the Relationship between Resource Scarcity and Ethnic Violence

The question as to whether violence is related to the scarcity of renewable resources is more difficult to answer. Scarcity of resources is a relative variable and scores of indicators should be measured against scores in the previous years.

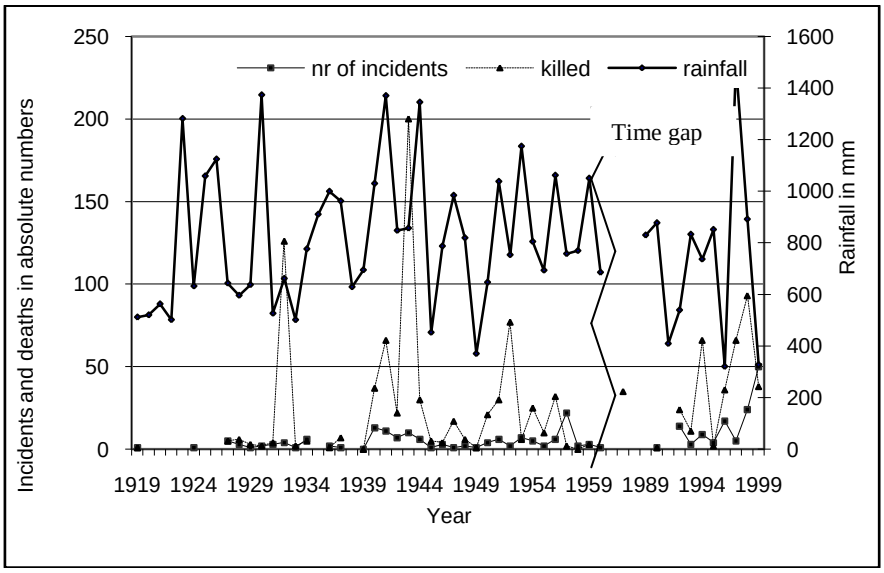

Figure 2. Absolute Number of Armed Incidents, People Killed, and Rainfall Figures (Compiled from MDAR Several Years, KHRC (2000) and Meteorological Station, Marsabit)

Figure 2 shows trends in absolute numbers of incidents, numbers of people killed and rainfall (409 people were killed in 1943 is omitted in the graph, for 'distortion of scale' reasons but is included in the following calculations). In some years it looks as if the number of incidents is higher, in line with increased rainfall. However, correlation measures do not show a significant correlation between rainfall (in mm) and violence in absolute and in per capita terms (Table 2). One could think of a situation that droughts in one year could result in violence in the following year. That is tested in the row 'one-year time lag' in Table 2, which shows no direct significant correlation between rainfall and violence, and neither is there correlation between armed violence and rainfall in the previous year (violence rates lagged one year). However, using the average number of incidents and killings ('incident rate' and 'kill rate' is the number of incidents and killings, respectively, divided by population numbers and multiplied by 100,000.) in wet, average and dry years of rainfall produces interesting results (Table 3). What is most clear from this table is that more than twice as many people are killed in wet (or wetter) years (50 versus 23) than in drought (or drier) years, in both relative and absolute terms. Surprisingly, the number of incidents and killings does not rise in wet or average years following a drought. In fact, fewer people were killed (23) in wet years following droughts than in wet years in general (50). While the standard deviation is high to derive firm statements based on these figures, there is clearly less violence in and directly after drought years than in wet years. Therefore, the violence occurring in the District is not related to drought-induced scarcity of resources (see Table 4 for details).

Table 2. Correlation Coefficient for Rain, Armed Incidents and Killings in Marsabit District

	Absolute number of incidents	Relative number of incidents	Absolute number of killings	Relative number of killings
Rainfall	-0.156	0.237	0.078	0.045
1-year time lag	0.141	0.128	0.094	0.016

Note: All figures are not significant at the 0.05 level.

Table 3. Average Number of Killings in Dry, Average or Wet Years

Event (mean, std. dev)	Drought years (<700 mm) (n=13)	Average years (701-850mm) (n=10)	Wet years (>851 mm) (n=16)	Average and wet years* (>700mm, <701 mm) (n=8)
Incidents	7.6 (13.84)	6.2 (6.3)	6.5 (6.0)	5.5 (3.4)
Killed	23.5 (34.06)	40.1 (57.5)	50.1 (99.7)	23.4 (22.2)
Incident rate	14.7 (12.67)	24.0 (22.7)	27.1 (26.8)	27.5 (25.8)
Kill rate	127.4 (339.3)	142.9 (203.5)	262.5 (676.5)	79.7 (83.6)

* This refers to average and wet years following drought (years >700 following years of <701 mm).
Sources Compiled from MDARs, several years, and KHRC (2000)

Table 4. Average Number of Incidents and Deaths in Drought and other Years

	Sample size (n)	Absolute number of incidents	Absolute number of deaths	Incidents rate (weighted for population)	Death rate (weighted for population)
Drought years	13	7.6	23.5	14.7	127.4
Other years	26	6.4	46.3	26.0	216.5

Source: Compiled from MDARs, several years, and KHRC (2000)

The absolute number of violence-related deaths is twice as high in years in which rainfall exceeded 700 mm, and there were even fewer deaths in the year following a drought (Table 3). In a sequence of years following a drought, the highest death rate is measured in the second and fourth year after a drought (Table 5). This table also shows a decrease in per capita deaths in years following a drought. There is a sharp increase in the second year after a drought year. The first rains usually cause more death and disease among the weakened livestock, and the first wet year after a drought is crucial for herd survival. After rangelands and livestock have improved, especially in the second year after a drought, there are more incidents and higher death rates. Most interestingly these results suggest that it is not during times of environmental scarcity that ethnic violence increases. An additional question is whether the situation in Marsabit is different compared to places elsewhere, where scholars found apparently enough evidence to relate violent conflicts with resource scarcity.

Table 5. Mean Number of Incidents and Deaths in Drought Years and Years Following Droughts (Compiled from MDAR, several years)

No. of years after drought (<700 mm)	n	Absolute no. of incidents	Absolute no. of deaths	Incidents rate (weighted for pop.)	Death rate (weighted for pop.)	Rainfall in mm
Drought year	13	7.6	23.5	14.7	127.4	531.4
1 year after drought	8	5.5	23.4	27.5	79.7	1048.4
2 years after drought	7	10.1	72.1	26.0	235.8	910.0
3 years after drought	6	4.2	6.2	20.2	36.1	910.1
4 years after drought	4	5.0	111.0	28.2	732.6	918.3
5 years after drought	1	6.0	30.0	38.7	193.3	1344.7

Explaining the Decrease in Violence in Drought Years

Violence and Collective Action

The explanation offered by the herdsmen at the well sites in 2000 suggests a situation where cooperation or fighting between parties in question depends on which situation is expected to offer most advantages. Game theory, which is based on the analysis of choices in situations where the outcome of a decision by one player depends on the decision of another player, and where these decisions of others are not known in advance (i.e. game theory decision-making under uncertainty), may offer insights into this phenomenon. As vast field of game theory is beyond the scope of this paper, we would only suggest a pattern in part of the violence which is occurring in Marsabit.

Game Theory under Uncertainty

In Marsabit we could test a simplified game theory model for two different ethnic groups who can chose between three possible types of collective action: they can cooperate, fight, or avoid each other. In the first type of collective action people cooperate, for example, by using water from a source together. Similar to the Folk theorem which says ‘make a deal to cooperate every period, if you don’t, you don’t ever cooperate again’ (Gravelle & Rees, 1992), herdsmen of different ethnic groups tend to cooperate during periods of water scarcity because the deals ensure that they will always have access to certain water sources, and the pay-off is survival. The second form of collective action is to fight where groups of herdsmen raid each other’s livestock and try to ban the other group from the water source. The pay-offs vary from stolen cattle to blood revenge, honour and increased unequal power relations between

different groups and status for a local political leader. The third action is avoidance of each other resulting in a neutral outcome.

The question is now which type of collective action is more likely to occur during droughts? The herdsmen themselves suggested that cooperation and making deals during droughts was more rational, while they (sometimes) fight in times of high rainfall and abundance. The ultimate aim of each herder is that he and his livestock survive a drought. Negotiating access to a water source and cooperation as regards maintenance of this well, even if it belongs to another ethnic group, will increase the chance of survival for all. If fights were to occur and people were to try to steal each other's animals, there would be no place to water them. Tracking stolen animals during droughts can be rather stressful because of, among other reasons, the difficulty of trekking weak animals, limited water points and a high labour demand among pastoral communities during droughts. The lack of information about the other parties' behaviour is limited because of the deal that is made: no cooperation during drought will mean a ban from the water place forever. It is thus more rational to fight during wet times and death rates are therefore lower in drought years.

The herdsmen in 2000 also contributed another aspect, namely that of poverty. Pastoral households require a large herd and pack animals to make mobility worthwhile. During droughts, the poor herders remain behind on the mountain because they have too few herds to move, and they reconcile to be able to use the pasture and water that is left. The interviewed herders suggested that it was more rational for the poor who stayed behind to cooperate and share their resources, in the absence of the wealthy elites.

Mancur Olsen challenged the idea that if members of a group have a common interest or object they would all be better off if that objective were achieved through cooperation and that as a result individuals in that group would act to achieve that objective, assuming they were rational and self-interested. He says that 'unless the number of individuals is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, rational, self-interested individuals will not act to achieve their common or group interests' (Olsen, 1965 cited in Ostrom, 1990, pp. 5-6). This idea usually serves to explain why people lack enough incentives to contribute to common goods, but it explains precisely why large-scale fights are not likely to occur in Marsabit District during periods of drought. Ethnic conflict is a type of collective action where the benefits to the group do not outweigh the costs of fighting that has to be watched out by each individual. The advantages might be higher in wet years, when the costs are low and fights can be carried more easily. Therefore, fights occur more often during times of abundance of rain and grazing.

Intervening Circumstances not Related to Resources

The next step in the analysis of violence should be to identify the years of high occurrence of armed violence (the circumstances of years with high numbers of armed incidents and killings are described in Adano and Witsenburg, 2004, pp. 748-49) and study for each specific incident such as which circumstances could have played a role. When herdsmen say that raids take place in the wet season because of bush growth and improved livestock body conditions, there must be a time-lag between rainfall, improved range condition and raids. This time-lag varies from weeks to months during which animal health might be disturbed by epidemics, the rangelands may be infested with locusts, or bushfires might destroy pastures.

Anthropological studies have shown that raids often take place as revenge for previous attacks. However, revenge activities are not supposed to coincide with religious ceremonies, which take place in certain periods corresponding to the lunar cycle, irrespective of rainfall which is highly variable in distribution and amount, and uncertain in timing. In addition, a slight increase in violence is said to take place after age-set ceremonies, during which groups of warriors are initiated or ritual leaders are installed (Baxter, personal communication, 2002). Age-group warriors might also see raids as a form of adventurous sport which carries some sense of pride and achievement. The occurrence of ethnic violence in Marsabit Town from 1997 to 1999 was also linked to political activities of the 1997 multi-party general elections. Moreover, a lot of violence in the 1990s resulted from the agreement between the Kenyan and Ethiopian governments to eradicate the OLF from Marsabit District. It is extremely sad to learn too of the mistreatments and torturous beatings of innocent civilians in the hands of armed forces (KHRC, 2000; Osamba, 2000, p. 21). The malpractices of these sorts are in sharp contrast with the general public interest's role of such forces to protect fellow citizens, to maintain order and to observe respect for the laws of the land. These considerations mean that the best way to investigate armed violence is a good analysis and explanation of specific case study.

In sum, if ecological parameters influence incidents of violent conflicts, they might not be scarcity induced because times of rain are times of relative abundance. Although we do not deny that environmental conditions can correlate with conflicts, we think that other factors, which presently feature less prominently in the inter-ethnic conflicts and raids literature, might better explain eruptions of violence. In questioning the applicability of the 'scarcity-causes-violence-paradigm' in Marsabit District, it seems that increasing scarcity does not

couple with ethnic violence. Neither do we find an increasing trend in ethnic conflicts in per capita terms, leading us to the question of how Marsabit *might be* different from the areas in which this relationship does seem to exist.

The Fluidity of Ethnic Identity

The reason for ethnic conflicts in times of scarcity being different in the Marsabit Mountain area might partly lie in the fluidity of ethnic identity in migratory areas. Territory in areas like Marsabit District and Mountain is not as strictly and permanently defined along ethnic lines as may appear at first glance. Similarly, the ethnic identity of an individual, or even a whole family, is not as strict as it might seem. So far we have dealt with 'ethnicity' as if it is easy to define and distinguish ethnic groups. Ethnicity seems to be an important variable in explaining all sorts of problems in Africa, including violent conflicts. But, what role does ethnicity actually play?

Although individuals carry identity markers like beads, ear holes, and spears to show to which ethnic group they presently identify themselves with, it does not mean that all their relatives belong to that group alone, or even that they have been born into that ethnic group. For instance, anthropologist Günther Schlee (1989) found that every ethnic group in this area has clans which consist of individuals that come from neighbouring ethnic groups. People can decide during their lifetime to move to a neighbouring ethnic group if that is advantageous. These clans of people who once belonged to another ethnic group seem to be quite large in villages like Kituruni and Songa, where people have relatives in both Samburu and Rendille families. In Hula Hula there are many people who belong to the Rendille Odhola clan or who have blood relatives in the Gabra Odhola clan. There are numerous families who have blood relatives among other ethnic groups. People do not like to emphasise this duality in ethnic identity, but double ethnic identity is especially used or reinforced when people marry or migrate and change their livelihood. For instance, when pastoralists settle on Marsabit Mountain, some redefine their own identity, and adopt the ethnicity of the receiving area. Such people do not profit from conflicts at all as it forces them to take sides and this reduces the chance of obtaining assistance from another ethnic group. Thus, while sedentarisation increased the pressure on certain resources, it actually might also have increased the peacekeeping forces in the society. Because more households have settled they have to keep some peace in order to negotiate access to resources in times of environmental stress. However, violence among settled people can result in death of women and children, and loss of houses and food stores. Other factors of violence among mobile pastoralists tend to be restricted to man and cattle or camels.

Even though this fluidity of ethnic boundaries is a characteristic of Marsabit District, it would be wrong to suggest that this phenomenon would not exist outside this area. Barth observed flexibility in ethnic identity among the Basseri in South Persia (Jenkins, 1997), Salih (1999) observed ethnic merging and alliances in the Sudan and Nigeria, and Duijzings (1999) observed it in Kosovo before the war. Multiple ethnic identities might be a more common phenomenon than appears in studies because the existence of a single ethnic identity is assumed. But, as Markakis commented:

> A persistent confusion between form and substance has often confounded our understanding of social conflict in Africa. Ethnicity, for instance, is often the ideological form such conflict takes, but its substance is seldom a clash of cultures. Like all ideologies, ethnicity is a symptom of social disorder, not its cause (cited in Salih, 1999).

The social reality is a rather dynamic and complex pattern of multiple and changing ethnic identities, where cultures, norms and values merge and change until conflicts create boundaries and ethnic 'clarity'.

Fluidity and Flexibility of Property Regimes

Contemporary studies on resource conflicts have emphasised problems in land tenure and property regimes governing natural resources. Hardin's (1968) idea that the use of common property resources will inevitably lead to over-use and degradation, based on the assumption that common property resources are used as open-access resources, still inform much of the literature on scarcity and violence (Homer-Dixon, 1999; Maxwell & Reuveny, 2000). However, it appears that in Marsabit strong common property regimes governing water resources cope well with increasing water scarcity, despite poverty and population growth (Adano & Witsenburg, 2005). Numerous other studies have described similar phenomena (Berkes, 1989; Bromley, 1992), showing that in fact very few scarce natural resources are open-access resources.

Even though droughts are of a cyclical nature, scarcities are having an increasingly negative impact on people's livelihood and future opportunities. We can therefore state that where it is needed to avoid conflicts, there is a strong enforceable property regime over natural resources, which does not change when population pressure increases. Interestingly, use rights to common property systems seem to be vaguely defined to avoid conflicts. Evidence shows that the traditional institutions of natural resource management, and stress coping mechanism are effectively blended with current practices to make wise use of available resources. The Bakato well site described earlier, does not belong to a specific ethnic group. Some of the wells have been dug

by the Boran, and therefore, the ownership legitimately claimed by Boran clans. However, the area of high water table was used as a watering point by the Rendille long before the Boran emigrated from Ethiopia to Kenya, so it is obviously and equally legitimate to call it part of Rendille territory. This well site is a typical example of a case in which double ethnic use rights exist. This suggests that vaguely defined property systems leave room for negotiation and flexible use rights. It is important therefore to recognise such 'duality' in such areas, not only for possible conflictive claims, but also especially for their potential peacekeeping functions during times of severe scarcity such as droughts.

Proponents of the 'resource scarcity-violent conflict' paradigm might still be right in their assertion that the situation in Marsabit is different to that in other areas where the relationship is evident: violent conflicts are not caused by a scarcity of natural resources, *because* there are clearly defined and enforceable property rights, while common property resources are not used as open-access resources. But what about the Bakato well site where vague ownership rights exist in order to *prevent* conflicts? Unfortunately, many scholars and policy makers fail to see these nuances in property systems and easily deny their existence. Policies thus often result in defining and enforcing new legislation based on ethnic territories like group or individual title deeds and boundaries, where previously duality existed, would create conflicts. In this regard, the 'water conflicts' along Tana River between Pokomo farmers and Orma pastoralists started after the government launched a land adjudication programme there (Daily Nation Team 10 March 2001). Where vagueness in property rights along the Tana River existed, the attempt to define territory triggered violent conflicts resulting in at least 60 deaths and numerous injured and displaced families, while being explained as a typical case of scarcity-induced conflicts. There are numerous such examples in Kenya of attempts to implement 'high-order' policy decisions without prior consultation with local-level players, resulting in negative impacts on resource use arrangements at the communities' level. Ethnic violence resulting from land adjudication activities may, for instance, be reinterpreted in this light or seen as conflicts over natural resources, rather than that ethnic violence is attributed to lack of ingenuity and institutions.

Unlike present-day assumptions in the environmental security debate, the evidence on a causal relationship between population growth, environmental scarcity and ethnic violence in Marsabit is not strong. Neither is there a clear increasing trend of ethnic violence. What is more, there is more evidence that violence diminishes when scarcity increases. In direct opposition to Homer-Dixon's view (1999), we suggest that poor people have also developed institutions to cope with the increasing scarcity of renewable resources and rather cooperate than indulge into violence.

Explaining the Existence of Ethnic Violence

One important question that still remains unanswered is: what causes these eruptions of violent conflicts in Marsabit if not the scarcity of natural resources and traditional cattle raiding or revenges of past conflicts? Ethnic violence in the area, though no more violent now than in the past, *is* a problem and hindrance to development. Where violence is partly an institutionalised and organised pattern in society, the breakdown of traditional social institutions might mean that violence is reducing or changing its appearance. What is apparently clear is that the character of conflicts has changed over the last century (Adano & Witsenburg, 2004): the number of traditional raids in the overall ethnic violence is decreasing, while the violence during election time and during land adjudication programmes or state-sponsored violence is increasing.

We observed that in the genesis of a violent conflict, people consistently refer to resourceful and powerful individuals who seem to orchestrate confrontations between less resourceful people. A study of the psychology of the sly and manipulative ways these leaders operate could illuminate much more on ethnic conflicts than a general 'scarcity-causes-violence' paradigm. That means that a study on the origin of violence should focus more on the people who own resources rather than on those who lack them and those who profit from violence instead of those who suffer from it. This means that the present focus on poverty and resource scarcity disguises the causal factors behind ethnic violence, because the 'resource owners' who coordinate violence go unseen. At a low level of analysis, this implies that the role of traditional elders, the new political elites, the small-arms traders and the local police for instance, should be investigated. The apparently visible firearms possession by ethnic groups illuminates perhaps more failure of the state to provide physical security entrusted in her than it shows cultures of violent conflicts and periodic raids. At a higher level of scale an analysis should take place of the role of the police, the army and business companies at district or national level. On a global scale, an analysis of the role and profits of multinationals and international organisations, and the arms industry could provide new insights.

The correlation between resource wealth and violence might thus be much more revealing than a focus on resource scarcity. A number of studies on a high scale of analysis have been carried out in this context (Collier & Hoeffler, 1998; Collier, 2000). De Soysa (2002), for example, correlated the scarcity of renewable resources

and the occurrence of violent conflicts for 76 countries over 11 years and found that:

> … at no time did natural resources, both renewable and non-renewable, come close to predicting conflict negatively, nor human and institutional development positively. The results find ample [evidence] … that greed rather than grievance is likelier to generate armed violence (pp. 28-29).

In line with these results, a test needs to be carried out as to whether this relationship also exists at lower levels of analysis. A focus on the 'flow of wealth' to and from war-torn areas, and the identification of those groups or individuals who benefit will offer better causal explanations for the occurrence of violence. Given that such a focus is much more difficult and also dangerous for the researcher and his/her informants might partly explain why there is a lack of studies at a low level of scale.

Conclusions

According to Homer Dixon (1999), resource scarcity can cause violent conflicts when populations increase. Such conflicts are particularly violent in poor, marginal regions where many ethnic groups have to compete for scarce natural resources and where people hardly have the capacity to develop 'ingenuity and adaptation'. However, results from our research cannot verify the assumption that increasing competition over scarce resources on Marsabit Mountain results in more ethnic violence. Water resources seem to play a vital role in social interaction, reconciliation, sharing and cooperation in survival strategies.

The poor herdsmen for whom transhumance is not affordable are left behind in drought areas. They explained that it is more rational for them to cooperate with people from different ethnic groups in times of drought in order to share the scarce water resources. This explanation was also verified by the yearly statistics on violence which showed that more than twice as many deaths occurred in wet years than in drought years. There is also no evidence violence is increasing in relative terms, or that ethnic violence is related to environmental scarcity. The result shows how important conflict-avoiding institutions are in societies which have learned how to deal with scarcity by century-old experiences in hardship areas. Such institutions are shaped and reshaped through time, and subjected to external stress, modernity and technological change.

At national level, there are many examples in Kenya where policy interventions have tended to ignore the importance of local institutions in resources allocation. The role of such institutions in caring about avoiding conflicts as much as easing tensions between groups is fundamental in enhancing inter-ethnic cooperation. For such institutions to be useful we need to be more critical about popular rhetoric that natural resource scarcity causes ethnic conflicts, and we also need to move beyond rating local resource governance structures as archaic and primitive in dire needs of overhaul change. Exploiting the synergies between local-level resource governance issues and national level policy prescription might hold a key to a mutual understanding of production possibilities of concern to the state and local communities, with a special focus on pastoral groups here.

The governments have attempted to respond to the conflicts through punitive measures (Dietz, 1987), which treat only the consequences but not the causes of unrest, which unfortunately do not seem to resolve the problem. What is more, such measures have sad enough been on occasions associated with brutal human right abuses (Osamba, 2000; KHRC, 2000). In our minds, a serious redress of the problem requires a clear understand of the underlying causes of inter-ethnic conflicts in the region. For example, the claim that there is a connection between conflicts and availability of environmental resources is seriously questionable. Getting the underlying causes wrong aggravates interethnic tensions rather than resolving it, and by doing so creates waves of ethnic hostilities that are likely to result in raids and counter-raids with no end in vision. Both the state and socially constructed ethnic groups stand to gain from reducing conflicts in terms of all forms of human rights abuses and better governance of natural resources.

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References

Adano, W. R., & Witsenburg, K. (2005). Once Nomads Settle: Assessing Process, Motives and Welfare

Changes on Marsabit Mountain. In: Fratkin, E. & Roth Eric A. (Eds.) 'As Pastoralists Settle: Social, Health, and Economic consequence in Marsabit District Kenya'. Kluwer Academic /Plenum Publishers.

Adano, W. R., & Witsenburg, K. (2004). Surviving Pastoral Decline. Sedentarisation process, Natural Resource Management and Livelihood Diversification in Marsabit District, Northern Kenya. PhD thesis, University of Amsterdam, the Netherlands.

Baxter, P. T. W. (2001). Immediate problems: a view from a distance. In: Salih, M.A., Dietz, T. & Mohamed Ahmed (Eds.) African pastoralism: conflict, institutions and government'. London: Pluto Press, p. 235-246.

Berkes, F. (1989). 'Common property resources: ecology and community-based sustainable development'. Bellhaven Press, London.

Bromley, D. (1992). The Commons, Common Property and Environmental Policy. Environmental and Resource Economics, 2(1), p. 1-18.

Collier, P. (2000). Doing Well Out of War. In: Berdal, Mats and avid Malone (Eds.) Greed and Grievance: Economic Agendas in Civil War. Boulder, CO: Lynne Rienner, p. 91-111.

Collier, P., & Hoeffler, A. (1998). On the Economic Causes of Civil War. Journal of Peace Research 39, p. 417-433.

Daily Nation Team (2001). Daily Nation Team. *Now 15 killed in water battle*, March 10 2001. Online:

De Soysa, I. (2002). Ecoviolence: Shrinking Pie, or Honey Pot? Global Environmental Politics 2:4, November 2002.

Dietz, T. (1987). Pastoralists in Dire Straits: Survival Strategies and External Interventions in a Semi-arid Region and the Kenya/Uganda Border: Western Pokot, 1900-1986. PhD thesis, University of Amsterdam, Selecta Offset.

Dietz, T. (1996). 'Entitlements to Natural Resources. Contours of Political Environmental Geography'. Inaugural Lecture 28 June 1996, University of Amsterdam. Amsterdam International Books.

Dietz, T., Nunow, A. A.; Adano, W. R. & Zaal, F. (2001). Pastoral Commercialization: On Caloric Terms of Trade and Related Issues. In: Salih, M. A; Dietz, T. & Abdel, G. M. Ahmed(Eds.) 'African Pastoralism: Conflict, Institutions and Government'. Pluto Press, in association with OSSREA, p. 194-234.

Duijzings, G. (1999). Religion and the politics of identity in Kosovo. PhD thesis, Hurst & Co., London

Fratkin, E., & Roth, A. E (1996). Who Survives Drought? Measuring Winners and Losers among the Ariaal Rendille Pastoralists of Kenya. In: Bates, Daniel, G. & Lees, S. H. (Eds.) 'Case Studies in Human Ecology'. Plenum Press, New York, p. 159-173.

Fearon, J., & Laitin, D. (1996). Explaining Interethnic Cooperation. American Political Science Review, 90 (4), p.715-735.

Gravelle, H., & Rees, R. (1992). 'Microeconomics'. Longman, London. Hardin, G. (1968). The Tragedy of the Commons. Science, 162, p. 1243-48.

Homer-Dixon, T. (1999). 'The environment, scarcity and violence'. Princeton, NY: Princeton University Press.

http://www.nationaudio.com/News/DailyNation/10032001/News/News33.html, accessed 10 Junuary 2005.

Hussein, K., Sumberg, J. & Seddon, D. (1999). Increasing violent conflict betweenherders and farmers in Africa: claim and evidence. Development Policy Review 17, p. 397-418.

Jenkins, R. (1997). 'Rethinking Ethnicity'. Arguments and explorations. Sage Publications, London.

Kahl, C. (1998). Population growth, environmental degradation and state-sponsored violence: the case of Kenya. International Security, Fall 1998, Vol.23, no.2, pp.80. Available online: http://www.uky.edu/RGS/Patterson/

Kaplan, R. (1994). The Coming Anarchy. The Atlantic Monthly 273, p. 44-76.

Kenya Human Rights Commission (KHRC) (2000). The forgotten people revisited. Human rights abuses in Marsabit and Moyale Districts. KHRC, Nairobi.

Leyan, B. (2002). Sharp rises in killings by police, says report. Nation Insight Report. DailyNation (January 14, 2002), 2002. [Available online: http://www.nationaudio.com/News/DailyNation/14012002/News/Insight4.html] accessed: January 14, 2002.

Markakis, J. (Ed.) (1993). 'Conflict and decline of pastoralism in the Horn of Africa'. Institute of Social Studies, Macmillan and The Hague, London.

Markakis, J. (1997). Resource conflict in the Horn of Africa. Sage Publications, London.

Marsabit District Annual Report (MDAR) (1939). Marsabit District Annual Report, 1939, PC/NFD1/2/2, 1937-43, Kenya National Archives, Nairobi.

Marsabit District Annual Report (MDAR) (1955). Marsabit District Annual Report, 1955, PC/NFD1/2/3, 1952-56, Kenya National Archives, Nairobi.

Maxwell, J. W. & Reuveny, R. (2000). Resource scarcity and conflict in developing countries. Journal of Peace Research 37 (3), p. 301-322.

McPeak, J. G. (1999). Herd growth on shared rangeland: herd management and land-use decisions in northern Kenya. Ph.D. dissertation, University of Wisconsin-Madison.

Mkutu, D. (2002). 'Pastoralism and conflicts in the Horn of Africa'. Africa Peace Forum. [Available online : http://www.saferworld.org.uk]

Oba, G. (1992). Ecological Factors in Land Use Conflicts, Land Administration andFood Insecurity in Turkana, Kenya. ODA-Pastoral Development Network, Paper 33a.

Osamba, J. (2000). The Sociology of Insecurity: Cattle rustling and banditry in North-western Kenya. African Journal of Conflict Resolution, Vol. 1, No.2, p.11-38.

Ostrom, E. (1990). 'Governing the commons: The evolution of institutions for collective Action'. Cambridge university press, Cambridge.

Republic of Kenya (RoK) (1987). Range Management Handbook of Kenya. Ministry of Agriculture and Livestock Development, Marsabit District, Vol. II, Physical map, 1987.

Salih, M. A. (1999). Environmental Politics and Liberation in Contemporary Africa. Environment and Policy, Volume 18. Kluwer Academic Publishers, London.

Schlee, G. (1989). 'Identities on the Move: Clanship and Pastoralism in Northern Kenya'. 1994 edition. Gideon S. Were Press, Nairobi.

Sobania, N. (1979). 'Background History of the Mt. Kulal Region of Kenya'. UNESCO-UNEP IPAL report A-2, Nairobi.

Tablino, P. (1999). 'The Gabra: Camel Nomads of Northern Kenya'. PaulinesPublishers Africa, Nairobi.

Witsenburg, K., & Adano, W. R. (2007). The use and management of water sources in Kenya's drylands: Is there a link between scarcity and violent conflicts? in: Bill Derman, Rie Odgaard and Espen Sjaastad (eds.) *Conflicts over Land and Water in Africa*. Oxford: James Currey, pp.215-238.